Department of Energy
Washington, DC 20585

November 12, 2014

The Honorable Ed Whitfield
Chairman
Subcommittee on Energy and Power
Committee on Energy and Commerce
U. S. House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

On April 3, 2014, Secretary Ernest Moniz testified regarding "Fiscal Year 2014 Department of Energy Budget."

Enclosed are answers to questions that were submitted by Ranking Member Bobby L. Rush, Representatives Ralph M. Hall, John Shimkus, Lee Terry, Michael C. Burgess, Bill Cassidy, Cory Gardner, John Barrow, and you to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

[redacted]

Christopher E. Davis
Principal Deputy Assistant Secretary
for Congressional Affairs
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Bobby L. Rush, Ranking Member

QUESTIONS FROM CHAIRMAN ED WHITFIELD

Q1. You made reference several times during the hearing to the $6 billion this Administration has invested into clean coal, particularly CCS technologies.

Q1a. Of this funding, please break out the sums already obligated to current, so-called first generation CCS demonstration projects (under the CCPI program, FutureGen 2.0, and the Industrial Carbon Capture and Storage Programs) and the sums obligated for research and development of second generation and transformational CCS technologies, with a specific listing for coal-based power generation.

A1a. Over the past decade, the total investment in carbon capture and storage (CCS) technologies has included $4.45 billion for first generation technologies and $3.15 billion for second generation and transformational technologies. The table below provides details on the obligations for the first generation technologies in the CCS Demonstration Program. With the exception of the three industrial carbon capture and storage projects (ADM, APCI, Leucadia), nearly all of the money obligated is for coal-based power generation.

Project	Obligation	Expenditure (as of July 2014)
Hydrogen Energy California	$408,000,000	$151,481,882
NRG/Petra Nova	$166,804,425	$7,000,000
Summit Texas Clean Energy	$450,000,000	$62,850,540
Southern Company	$293,750,000	$268,750,000
FutureGen 2.0	$1,048,348,112	$128,095,298
Air Products and Chemicals, Inc.	$284,012,496	$274,604,228
Archer Daniels Midland	$141,405,945	$92,302,147
Leucadia	$261,382,310	$15,515,358
Total	$3,053,703,288	$1,000,599,453

Q1b. Please list how much of this obligated funding has actually been expended, and DOE's projected annual spending on these obligations, until all current obligations are expended.

A1b. See the table provided in Q1a for a listing of the amount of obligated funding that has been expended on each carbon capture and storage demonstration project. It is difficult to provide the projected annual spending on these projects until they achieve financial close and enter into construction. Nearly all of the obligated funding is expected to be expensed during the construction phase of the project.

Q2. Please identify and explain what programs, projects, research, or initiatives are eliminated or reduced by DOE's proposed reduction of $114.8 million in Coal Programs, indicated at page 28 of DOE's budget justification.

A2. **Carbon Capture FY15 Budget Impacts:**

The FY 15 request will provide funding levels that support continued development of technologies that reduce the cost of capturing carbon dioxide from fossil energy power plants. Post-combustion activities will continue the scale-up of 2nd generation technologies through large-scale pilot projects and laboratory and bench-scale testing of transformational technologies for fossil-fuel-fired plants. This will include additional projects selected from competitive solicitation, including at least one large scale pilot project for a 2nd generation capture. The scale and number of projects is dependent on the research and development (R&D) and solicitation submittals in FY 2014. Activities will continue the support and testing of advanced pre-combustion capture slipstream projects through support of the National Carbon Capture Center and solicitations focused on scaling up advanced technologies to the small pilot scale.

Carbon Storage FY 2015 Budget Impacts:

- **Storage Infrastructure**: FY 15 funding maintains the current path for continuation of Regional Carbon Sequestration Partnership large-scale field projects and three existing small-scale field tests. It allows storage characterization and field projects for offshore and additional onshore small-scale field projects in geologic reservoirs. The scale and number of projects is dependent on the research and development and solicitation submittals in FY2014. No funding is planned in FY 2015 for CO_2 storage in enhanced oil recovery (EOR) fields or for improved EOR technologies to increase storage efficiency.
- **Geologic Storage Technologies**: Depending on the progress and outcome of FY 2014 research, the FY 2015 funding level focuses resources on current activities that are conducting initial development of the most promising tools and technologies to deliver safe and permanent storage options for CO_2.
- MVAA: Depending on the progress and outcome of FY 2014 research, the FY 2015 request continues funding for R&D projects and initiates preparation for field validation tests. Reduced funding maintains priority on targeted program research on most successful monitoring, verification and accounting and assessment
- **Focus Area for Carbon Sequestration Science**: The FY 15 funding level reflects refocused efforts on targeted key technical challenges (e.g., shifted one MVA effort from CO_2 and pressure plume monitoring to reservoir and seal performance, mechanical and pressure) identified in FY 2014.

AES FY 2015 Budget Impacts:

- Gasification: With the proposed FY 2015 gasification budget, this sub-activity will continue to strive for the development of technologies that will decrease the cost of gasification systems – including capital cost, efficiency and availability improvements – that convert fossil fuels to electricity and other marketable products, such as liquid transportation fuels and chemicals, with at least 90% plant emissions carbon capture. The poly-generation approach is expected to continue, since this approach will enable coal to provide whatever products will be most beneficial to U.S. energy stability, security and global economic competitiveness. The proposed funding level in FY 15 is sufficient to maintain stated level of activities.
- Fuel cell: In the fuel cell sub-activity area, the program will continue at a very low level effort and focus on materials development to refocus the program.
- Advanced Combustion: The sub-activity funding request enables the program to continue the development, through design and construction, of pressurized oxy-combustion and chemical looping combustion pilot-scale systems.
- Turbines: The FY 15 funding level focuses resources on the development of advances in 2nd generation hydrogen turbine component technologies. This will also accommodate a phase-in of component development activities for high pressure ratio and high temperature turbine technologies.
- The requested funding levels are sufficient to maintain the stated level of activities.

Crosscutting FY 2015 Budget Impacts:

The Crosscutting Program will continue a variety of activities:

- field testing of sensors and bench scale testing of advanced control methodologies;
- initiate research on advanced control technologies capable of self-organizing sensor networks for improved performance of complex power systems;
- development of materials capable of withstanding rapid ramping of thermoelectric power plant start-ups;
- verifying materials capable of operating under advanced steam cycle conditions (760°C/5000 psi) and gas turbine performance to 1465°C;
- assess increased plant efficiency and availability;
- integrate research activities on water management improvements in thermoelectric systems with a Department-wide research and development effort focused on identifying and mitigating challenges in water use and reuse;
- and CCSI and NRAP will continue software development efforts to improve sorbent based models for carbon capture technologies and for quantifying risk assessment of long term storage of CO2 in saline reservoirs respectively.

The FY 15 requested funding level will continue to support the scope of 2nd gen sensors and controls R&D activities and the current transformation technology R&D will be evaluated. Only the most promising technologies will be pursued.

Q3. Please explain the basis and justification for initiating the natural gas CSS demonstration program, and the timeline anticipated for reaching full-scale demonstration for power plants in commercial service.

A3. Carbon capture and storage technologies will need to be broadly applied to meet long-term climate change goals. Carbon capture technologies have been developed on coal based applications for direct use on either flue gas or syngas. It is anticipated that carbon capture

technologies currently under development can be applied to natural gas power plants with minimal to moderate investment. Challenges associated with applying the current portfolio of carbon capture technologies to natural gas power plants lie mainly in the adaptation of these technologies to accommodate a lower concentration of carbon dioxide in the feed to the capture system. Different capture technologies will respond to a lower concentration in different ways, with varying capital and operating costs. This initiative is intended to extend the market for carbon capture technologies and effectively create an opportunity to apply carbon capture to a broader fossil-energy power generation fleet. The request would be competed to fund work that demonstrates existing technology to capture and store more than 75 percent of the carbon from treated emissions from a natural gas power system.

Q4. Explain how the reduction in coal-oriented research comports with agency priorities, underscored by your observation at the budget hearing that "we are going to have to keep working to drive costs down" for coal-fired CCS?

A4. The FY 2015 budget request will continue to advance coal-oriented research on technologies related to the reliable, efficient, affordable, and environmentally sound uses of coal which are essential to our Nation's security and economic prosperity. This will include research, development, and demonstration efforts on advanced carbon capture and storage technologies to facilitate achievement of the President's climate goals. The request allows continued scale-up of advanced carbon capture technologies through large-scale pilot tests that will focus on addressing the key issues of lowering the cost of carbon capture and reducing the energy penalty. The request also continues critical core research and development efforts that will lower the cost of geologic storage and monitoring of carbon dioxide. Support for Storage Infrastructure research and development efforts, such as those

by the Regional Carbon Sequestration Partnerships and other small and large-scale field tests, will continue to validate the long-term permanent storage of carbon dioxide.

Q5. The Energy Policy Act of 2005 authorized the Clean Coal Power Initiative and certain tax credits to assist development of next generation clean coal technology, including CCS that: "shall advance efficiency, environmental performance, and cost competitiveness well beyond the level of technologies that are in commercial service or have been demonstrated on a scale…sufficient to demonstrate that commercial service is viable…"

Q5a. Is it correct that four coal-based generation demonstration projects under this EPACT authorization for the Clean Coal Power Initiative, and that only one of the four – the Kemper facility – is presently under construction?

A5a. Yes, only the Southern Company's integrated gasification combined cycle power plant located in Kemper County, MS, is under construction and is scheduled to begin operation in 2015. It should be noted that CCS technology has been and continues to be successfully deployed on a range of projects, and we anticipate ground breaking on several other projects, including coal power projects, this year.

Q5b. Do you believe these projects reflect technology that is already in, or demonstrated as viable for, commercial service in coal power plants? If so, please explain why DOE is funding these. If these technologies are already in commercial service, or demonstrated to be viable for commercial service, then they are not "well beyond" the level that are in commercial service or have been demonstrated for commercial service in coal-based electric generation.

A5b. CCS technology has been and continues to be deployed on a range of projects. Successful CCS pilot projects have demonstrated the viability of CCS technology. A number of technologies being demonstrated in the Clean Coal Power Initiative (CCPI) program have never been operated at commercial scale. For example, the transport gasifier and associated equipment being used in the Southern Company's Kemper County integrated gasification combined cycle (IGCC) project have only been operated at about the 4 MWe scale (at the Power Systems Development Facility), but will be demonstrated at the 524

MWe scale at Kemper. NRG's post-combustion capture project will demonstrate a scale-up of MHI advanced amine technology from 25 MWe to 240 MWe. The three IGCC projects (HECA, Summit, and Southern Company) aim to demonstrate pre-combustion carbon dioxide capture and the use of hydrogen fuel for the gas turbines. All of these advanced technologies offer potential for reductions in plant capital and operating and maintenance costs while improving efficiency. While some of the technologies incorporated into CCPI demonstration projects have been operated individually at commercial scale, many have not been operated in the integrated fashion that is found in these projects.

Q5c. Does DOE continue to stand by its statement in the FY 2014 budget justification that "these demonstrations focus on first generation CCS technologies and seek to demonstrate that CCS can be integrated at commercial scale while maintaining reliable, predictable and safe plant operations. However, in the case of electricity generation, first generation CCS technology cost is not expected to be low enough to achieve widespread deployment in the near term?" If not, what part of the statement does DOE no longer support and why?

A5c. Yes, DOE still stands by these statements.

Q6. You reference, in response to a question about EIA projections on coal retirements from Rep. Griffith, that analyses that you have seen suggest that reliability "will certainly be preserved" if the EIA projected retirements occur over the next few years.

Q6a. Please identify what specific analyses you are referring to, and describe for each analysis the date on which it was prepared and by whom it was prepared.

A6a. In the Annual Energy Outlook 2014, EIA projects that 60 gigawatts of generating capacity, including 46 gigawatts of coal-fired plants, will retire from 2013 through the end of 2016. According to EIA's projections, over the next few years, most regions in the U.S. either have sufficient surplus generating capacity or have planned capacity additions that should provide for adequate generation resources. Based on expected peak demand, reserve margins are met on a regional basis, where necessary through the

addition of new capacity, particularly natural gas combined cycle plants and combustion turbines. The deployment of new capacity in these cases is comparable to that over the past decade.

Q6b. What is DOE doing to respond in the event reliability is not preserved?

A6b. While DOE believes that the compliance with the Environmental Protection Agency's recent power sector regulations[1] will not result in wide-spread reliability issues, DOE does have an emergency authority that can be exercised in the event that a reliability issue does arise. Currently, under section 202(c) of the Federal Power Act, the Secretary can order a generator to operate or a grid connection to be made when outages occur due to weather events or equipment failures, or when there is or may be insufficient electricity supply available. Section 202(c) orders are issued only if a determination is made that an emergency exists due to a sudden increase in the demand for electric energy, a shortage of electric energy, or a shortage of facilities for the generation or transmission of electric energy. The Secretary's 202(c) order can direct the temporary connection or operation of facilities for generation, delivery, interchange, or transmission of electricity in order to best meet the emergency and serve the public interest.

The Department views the issuance of 202(c) orders as a measure of last resort to be used only emergency situations, either proactively or reactively. Orders are available in limited emergency situations and are temporary solutions to imminent reliability threats. If a 202(c) emergency results from inadequate planning, DOE expects the affected entities to

[1] EPA's recent power sector regulations include: the Cross-State Air Pollution Rule (CSAPR); the Mercury and Air Toxics Standards (MATS) Rule for Electric Generation Units; the Coal Combustion Residuals (CCR) Rule; the CWA §316(b) – Cooling Water Intake Structures; and the Steam Electric Power Generating Effluent Guidelines. Some rules are still pending finalization.

take the necessary steps to resolve the problem in order to avoid the need for a continuing emergency order.

Finally, the Quadrennial Energy Review will assess the implications of various transmission system issues, including reliability, under different cases of baseload supply, and will likely examine questions of supply adequacy in greater detail in the next iteration of the QER.

Q7. Could you please provide for the Committee a detailed response on how the current application process works today for approving LNG export facilities, including answers to the following:

Q7a. What is the timeline of review for an application beginning with its filing date and ending with its conditional approval or rejection?

A7a. Application Process Background: DOE's authority over exports of natural gas, including liquefied natural gas (LNG), arises under section 3 of the Natural Gas Act (NGA), 15 USC 717b, and section 301(b) of the DOE Organization Act, 42 USC 7151. An amendment of section 3 in the Energy Policy Act of 1992 (EPAct 92) resulted in two different sets of standards and procedures for processing applications to export LNG from the United States, including (1) standards and procedures for the export of LNG to countries with which the United States has not entered into a free trade agreement (FTA); and (2) standards and procedures for the export of LNG to countries with which the United States has entered into an FTA providing for national treatment for trade in natural gas (FTA countries).

In EPAct 92, Congress amended section 3(c) to the Natural Gas Act. At that time, Congress's attention was focused on North American trade, not on the potential impact of

the amendment on United States trade with other countries overseas. Section 3(c), as amended, created a different standard of review for applications to export natural gas, including LNG, to those countries with which the United States has in effect an FTA requiring national treatment for trade in natural gas. The amended section 3(c) requires such applications to be deemed consistent with the public interest and granted without modification or delay.

For long-term applications for authority to export LNG to FTA countries from proposed liquefaction facilities, once DOE confirms the application is complete, DOE processes those applications as expeditiously as possible, with a goal to issue an order within three months of receipt of the complete application, although actual timing will depend on a number of factors, including the on-going processing of prior applications.

For long-term applications for authority to export LNG to non-FTA countries from proposed liquefaction facilities, DOE conducts a public interest review. The specific information that DOE reviews in each case is included in the docket for that case. In addition, DOE may take administrative notice of authoritative public information. In all cases, the information that DOE draws upon and the analysis that DOE performs is clearly explained in each order. The resulting draft orders are sent to the Secretary of Energy for his review prior to issuance. DOE processes these applications as expeditiously as possible.

Q7b. Can you explain the application process for short term vs. long term contracts? Does a facility need to receive DOE approvals each time it enters into a new contract?

A7b. DOE has separate process requirements for applications seeking authority to export LNG pursuant to contracts of two years or less, versus LNG exports involving contracts greater than two years.

The primary difference in applications submitted seeking authority to export LNG pursuant to short-term or spot market contracts of two years or less is that no short-term or spot market contracts are required to be submitted with the application. DOE issues "blanket" authorizations for those short-term applications that have been found to be in the public interest that permit exports pursuant to any short-term contract of two-years or less.

The process for applications seeking authority to export LNG pursuant to long-term contracts includes submission of those long-term contracts to DOE. In recent long-term LNG export authorizations, DOE has stipulated that applicants can submit those long-term contracts within 30 days of their execution if they were not submitted with the application. In addition, for long term LNG export applications, applicants have requested, and DOE has granted, authorization to export LNG pursuant to multiple long-term contracts under the same authorization.

Q7c. Is the application for a facility's approval based on the volume of natural gas to be exported, the non-FTA country receiving the gas, or other criteria and if so what is that criteria?

A7c. DOE Regulations at 10 CFR 590.202 detail the information that applicants must include in their applications, including the "scope of the project, including the volumes of natural gas involved ... the dates of commencement and completion of the proposed import or export, and the facilities to be utilized or constructed." In addition, applications include details on

whether the proposed LNG exports will be evaluated under Natural Gas Act (NGA) section 3(c) for exports to FTA countries, or under NGA section 3(a) for exports to non-FTA countries. The criteria that DOE uses to evaluate an application to export LNG to non-FTA countries is included in the Notice of Application that DOE issues once an application is received.

For example, in the Notice for the April 2, 2013, application by Sabine Pass Liquefaction, LLC, DOE/FE discussed its evaluation of the application as follows:

In reviewing this LNG export Application, DOE will consider any issues required by law or policy. To the extent determined to be relevant or appropriate, these issues will include the impact of LNG exports associated with this Application on domestic need for the gas proposed for export, adequacy of domestic natural gas supply, U.S. energy security, and the cumulative impact of the requested authorization and any other LNG export application(s) previously approved on domestic natural gas supply and demand fundamentals. DOE will also consider any other relevant issues, including the impact on the U.S. economy (GDP), consumers, and industry, job creation, U.S. balance of trade, international considerations, and whether the arrangement is consistent with DOE's policy of promoting competition in the marketplace by allowing commercial parties to freely negotiate their own trade arrangements. Parties that may oppose this Application should address these issues in their comments and/or protests, as well as any other issues deemed relevant to the Application.

Q8. According to the Department of Energy's website, it appears as though the LNG export applications are seeking approval to ship LNG to "any country with which the United States does not have a FTA requiring national treatment for trade in natural gas…"

Therefore, what criteria does the DOE use to determine whether an LNG export facility is in the "public interest"?

A8. This question is also answered above in A7c.

Q9. In May of last year President Obama was quoted as saying he has to make "an executive decision broadly about whether or not we export liquefied natural gas at all". What discussions have you had with President Obama regarding the issue of LNG exports?

A9. I became Secretary of Energy on May 21, 2013, after the quoted statement and after the Department had begun issuing approvals for LNG exports. While I was not part of that decision, I can assure you that while I have been Secretary, the Department has conditionally approved five export applications to non-FTA countries.

Q10. Currently 24 LNG export licenses await DOE consideration. At the current rate it will take years to move through the entire list. Generally speaking, the arguments for and against LNG exports are the same in each case. It seems an unnecessary burden for DOE to continually reject the opposition's recycled arguments with each and every Order.

Q10a. DOE has existing authority to review and respond to applications in batches. If DOE is serious about acting "expeditiously" on LNG exports, why isn't the agency reviewing these applications simultaneously?

A10a. Applications present issues unique to the specific circumstances of the particular case. In addressing the issues that are specific to a particular case, the decision will invariably supplement and refine the findings in prior cases and apply them to new factual circumstances in each case. In addition, when the docket for each application is created, and the application is noticed in the Federal Register, the public has an opportunity to participate in the proceedings. A simultaneous review and authorization of "batches" of, or all, pending applications would circumvent this review, prevent the evaluation of specific issues in each case, and decrease the public's opportunity to participate.

Q10b. It appears that DOE would have no trouble defending the decision to approve all pending permits. Is there anything in law preventing DOE from doing so?

A10b. Simultaneous review and authorization of all pending applications would circumvent the

review of the application, prevent the evaluation of specific issues in each case, and decrease the public's opportunity to participate.

Q11. The Energy Information Administration (EIA) reported in February that the number of coal-fired power plant retirements will be higher than originally anticipated, and that an estimated 60 gigawatts (GW) of coal-fired capacity will retire by 2020. Notably, EIA expects "90% of the coal-fired capacity retirements [to] occur by 2016, coinciding with the first year of enforcement for the [Environmental Protection Agency's] Mercury and Air Toxics Standards." This means nearly 18% of all coal-fired generation in the United States will retire in the next two years.

Q11a. Is DOE concerned that the loss of these critical generation facilities in such a short timeframe will make it increasingly difficult to meet electricity demands in the next two years, thereby putting reliability at risk and driving up electricity prices for consumers? Why or why not?

A11a. While DOE believes that national-level reliability issues are not likely to result from compliance with the recent and proposed EPA power sector regulations, it should be noted that local reliability issues may still arise for other reasons as decisions regarding equipment retrofits, retirements and scheduling of equipment installations are made. DOE is proactively engaging with states, independent system operators (ISOs) and regional transmission organizations (RSOs) and other stakeholders to identify any potential local reliability concerns in an effort to help facilitate mitigation where possible. Additionally, DOE is also monitoring public retirement announcements of power plant units to identify any potential geographic areas where local reliability may be a concern. DOE encourages early engagement with state and Federal energy and environmental regulators to ensure that compliance with EPA's regulations does not create potential local reliability issues.

Furthermore, DOE will continue to offer technical assistance to stakeholders to help inform, rather than direct, decisions regarding compliance with EPA's regulations. Such

technical assistance may include information regarding retro-fit technologies and retirement alternatives and implications, among other areas. DOE can also provide guidance regarding the use of its emergency authority under Section 202(c) of the Federal Power Act, which DOE views as a tool of last resort to address reliability emergencies when all other options have been exhausted.

Q11b. Has DOE been coordinating with EPA and FERC to ensure that EPA regulations won't cause reliability problems or increase energy prices on consumers?

i. If yes, which agencies and which DOE officials are consulting with EPA and FERC? In your response, please identify when such consultations have occurred and which EPA and FERC officials have engaged in the consultations.

ii. If no, will DOE be consulting with those federal agencies? In your response, if consultations are planned please identify when such consultations will occur and which DOE officials will engage in those consultations.

A11b. DOE has been working with both EPA and FERC, including meeting periodically to address issues arising from EPA's regulations. Additionally, the three agencies have been hosting coordinated calls with several of the independent system operators/regional transmission operators (ISOs/RTOs) to identify any concerns as the ISOs/RTOs respond to plant owners' retro-fit and retirement decisions.

A11bi. DOE's Offices of Electricity Delivery and Reliability, Energy Policy and Systems Analysis (formerly DOE's Office of Policy and International Affairs), Fossil Energy, Energy Efficiency and Renewable Energy, Nuclear Energy, and General Counsel have been engaging with EPA's Offices of Air and Radiation, Water, Enforcement and Compliance Assistance, General Counsel, and Policy as well as FERC's Offices of

Electric Reliability, Energy Policy and Innovation, and General Counsel. Specific participation varied by topic area and over time. As noted above, DOE, EPA, and FERC have met periodically (starting in 2011 for the recent suite of regulations), and as needed, to discuss issues related to EPA's power sector regulations and coordination efforts regarding industry's compliance status. Most recently, DOE, EPA, and FERC met in March 2014 to share information learned about regional greenhouse gas compliance proposals from outside stakeholders and what the three agencies should be aware of from a reliability perspective.

Q12. In addition to CCS technologies, what is your position on advanced coal technologies, such as chemical looping, ultra-supercritical coal combustion and advanced ultra-supercritical coal combustion technologies? How will DOE be supporting these types of highly efficient, low-emitting technologies in addition to CCS?

A12. DOE recognizes the importance of advanced combustion technologies such as oxy-combustion, chemical looping, and ultra-supercritical coal combustion and is investing $18M in FY 2014 to demonstrate these highly efficient, low-emitting technologies at small pilot scale in the 2016-18 timeframe.

Q13. One of DOE's statutory duties under the DOE Organization Act is to "promote the interests of consumers through the provision of an adequate and reliable supply of energy at the lowest reasonable cost."

Q13a. As Secretary of Energy, have you been consulted by EPA about the agency's proposed greenhouse gas regulation for power plants?

i. If yes, please identify when such consultations have occurred and which DOE and EPA officials have engaged in the consultations.

ii. If no, will DOE be consulting with EPA on this matter? In your response, if consultations are planned please identify when such consultations will occur and which DOE officials will engage in those consultations.

Q13b. If you have cost concerns or reliability concerns that may negatively impact consumers, will you raise them with EPA? Have you raised any such concerns?

A13. DOE regularly consults with EPA on a variety of issues. In addition, as part of the interagency review process for the proposed carbon pollution standards coordinated by OMB/OIRA, DOE has participated in a number of briefings with EPA staff and others. DOE expects to have further consultations as the interagency review process continues.

Q14. Do you believe renewable energy sources such as solar, wind, and geothermal can completely replace traditional sources of energy like coal, nuclear, and hydropower? If so, would such a transition come with an increase in energy prices?

A14. DOE supports the President's all-of-the-above energy strategy. President Obama's goal is to generate 80 percent of our electricity from a diverse set of clean energy sources – including renewable energy sources like wind, solar, biomass, and hydropower; nuclear power; efficient natural gas; and clean coal - by 2035. The Office of Energy Efficiency and Renewable Energy has established goals for its technology development programs to make renewable electricity market competitive without subsidies.

Q15. Advances in innovative technologies have played a major role in unlocking the vast oil and gas energy resources that have contributed to our new energy renaissance.

Q15a. Under your leadership, how will DOE support the use of traditional energy resources – such as fossil fuels and nuclear energy – in advanced and innovative ways?

A15a. The Department is committed to supporting energy innovation. The Office of Fossil Energy has and will continue to support numerous programs that seek to improve the utilization of fossil fuel-based resources in increasingly more efficient and environmentally responsible manners. For example, DOE supports:

- Initiation of pilot-scale design and construction for pressurized oxy-combustion and chemical looping systems which have potential to significantly lower the cost of carbon capture;
- Full scale demonstrations of cutting edge technologies that capture, store/reuses carbon

dioxide from fossil fueled power plants and industrial facilities;

- Technologies developed under the Turbines Program which will provide an improvement of 3 - 5 % efficiency points by 2015 above the baseline and a 4 % points improvement (14 % above baseline) in overall IGCC plant efficiency. This is with CCS and reduced CO2 emissions for multiple fuel types, including syngas and natural gas;
- Low cost sensors and controls to better optimize the operations of the power plant;
- High temperature materials research aimed at increasing the steam temperature in existing power systems and advanced;
- Improved water management and reduced overall consumption; and
- Advanced capture technologies that reduce energy penalties and water demands.

The Office of Nuclear Energy (NE) has and will continue to invest in a wide range of innovative technologies to make current plants last longer, new plants more economical, and used fuel safe for the environment. Some examples include cross cutting investments in materials research, instrumentation and control systems, and modeling and simulation that promise incremental improvements in all aspects of nuclear power. NE is also sponsoring an accelerated licensing initiative to support rapid deployment of Small Modular Reactors based on a new economic understanding of the efficiencies of factory produced small-scale nuclear generation. Finally, NE is investing in the next generation of advanced reactor and fuels technologies that are more tolerant of potential hazards while maintaining economics and efficiencies on par with existing light water reactors.

Benefiting fossil, nuclear, and solar, NE is investigating Supercritical CO_2 energy conversion systems to take heat and turn it into electricity with about 50% more efficiency than current systems.

In addition, the Office of Electricity Delivery and Energy Reliability's investments in modernizing the Nation's electric grid support the Administration's "All Of The Above" strategy. The FY 2015 request supports efforts to improve the resiliency, security, flexibility and efficiency of the grid that can accommodate a balanced portfolio of energy resources, including fossil fuels, nuclear energy, and renewable energy sources. Some examples of grid modernization investments include development of cutting-edge cybersecurity tools and solutions that can secure the grid against an increasingly sophisticated cyber threats; development of smart grid technologies for a higher performing, more resilient distribution systems; and advanced modeling and wide-area visualization tools that can give grid system operators real-time and predictive information and control.

Q16. Over the past decade, the European Union has pursued a broad range of climate policies, including renewable energy subsidies for wind and solar power. Those climate policies have led to high energy costs that are threatening the competitiveness of many of Europe's energy intensive industries. Does the European experience with climate policies and rising energy costs raise any red flags for the U.S.? If not, why not?

A16. The previous decade has seen many changes in both European and U.S. power systems – from regulatory to policy to infrastructure and markets. In 2012, renewable sources provided 22% of electrical energy in the EU countries plus Norway and Sweden ("Europe", hereafter), compared to 12% of electrical energy in the United States. In

Europe, variable renewable electricity sources – for example, wind and solar – provided 8% of electrical energy in 2012, compared to 4% in the U.S.

These figures obscure a wide range of renewable electricity penetration across states in both Europe and the U.S.; while the U.S. generally has lower capacity penetration of renewable electricity, certain areas (balancing authorities, states, etc.) have experienced high penetration. For example, in 2012, two states exceeded 20% wind energy penetration, and seven states exceeded 10% wind energy penetration. California and Nevada each had more than 1% penetration of solar energy, not including small capacity generators (less than 1 MW).

From a technical perspective, variable renewables require both long term and short term system flexibility. They often require robust transmission and/or distribution infrastructure to absorb energy fluctuations. At small penetrations – a few percent in most systems – the additional fluctuations will likely be dwarfed by those already seen on the demand side. Furthermore, a strong grid provides opportunity for geographic or technological smoothing of variability, and the ability to share flexible capacity. High penetration of renewables often requires flexibility in generation and demand. Smart grid technologies, demand response, and energy storage are examples of potentially important resources against uncertainty and short-term variability.

Though renewable generation costs have declined precipitously over the last decade, in some markets, renewable technologies still come at a cost premium compared to non-renewable resources. These costs do not take into account greenhouse gas reduction benefits or other environmental, economic development, and security benefits provided

by renewable energy, however. Recognition of these external benefits of renewable energy led policymakers in both Europe and the U.S. to implement mandates and incentives for renewable energy.

As the U.S. incorporates more variable generation into our electric grid, an integration strategy can be crafted with the benefit of lessons learned from the variety of approaches piloted by early European actors. Proven strategies that can be replicated going forward include public engagement around transmission, integrated planning, market rules that enable system flexibility, expanded access to diverse resources, and improved system operations.

DOE is working to continue reducing costs of renewable energy systems, understand the impact on utility business models and evaluate consumer interests in order to avoid the high cost impacts experienced by Europe. The Department views the integration of renewable capacity as a high priority issue and has increased work on the subject over the past six years. This includes significant work with the states and regions on long-term transmission planning with various all-of-the-above resource mixes, development of new tools for wind and solar integration in the Western Area Coordination Council and conducting several preliminary studies investigating the impact of intermittent energy resources on the grid.

Q17. DOE has one active solicitation under its Title XVII loan guarantee program, announced in December 2013, for $8 billion in loan guarantees for advanced fossil energy projects. Please provide relevant details regarding the response to this solicitation.

A17. The Department issued a new Advanced Fossil Energy Projects Solicitation in December 2013 making up to $8 billion in loan guarantees available. This solicitation was issued under

the Section 1703 loan guarantee program and is open to any fossil fuel project, covering the full spectrum from resource development to power generation to end use, which meets the Section 1703 eligibility criteria.

The Department has received Part I applications and is processing those applications. Projects that submitted Part I applications by the first application deadline on February 28, 2014 have already received initial responses regarding the Part I review of their applications and the Department is awaiting additional information required to proceed to due diligence. The Department expects to receive additional applications under future submission deadlines. Additionally, we are continuing due diligence on the remaining active fossil applications that were received under previous solicitations.

Q18. What level of Title XVII loan guarantee activity does DOE anticipate in the coming year?

Q18a. What are DOE's plans for remaining authorities and credit subsidy appropriations in energy efficiency and renewable energy?

Q18b. What are DOE's plans for remaining authorities in nuclear generation ($12.3 billion) and nuclear front-end ($2 billion), as well as its mixed authority ($4 billion)?

A18. On April 16, 2014, the Department issued a draft Renewable Energy and Efficient Energy Projects Loan Guarantee Solicitation for public comment. The draft solicitation proposes to make available the remaining loan authority and appropriated credit subsidy for renewable energy and energy efficiency projects as well as $1 billion in mixed use loan guarantee authority. When finalized, the solicitation is expected to help commercialize technologies that may be unable to obtain full commercial financing.

No decision has been made to allow new applications for either all, or a portion, of the remaining nuclear energy loan guarantee authority.

Q19. Please detail DOE's 2014 plans for the Advanced Technology Vehicle Manufacturing (ATVM) loan program.

A19. The Advanced Technology Vehicles Manufacturing (ATVM) Loan Program has supported the production of over 4 million cars and approximately 35,000 direct jobs across eight states, including California, Illinois, Michigan, Missouri, Ohio, Kentucky, New York and Tennessee. To date, the program has issued more than $8 billion in loans including successful loans to Ford Motor Company, Nissan North America, and Tesla Motors.

While the economics of the automotive sector have improved, conversations with motor vehicle parts manufacturers highlight strong sector growth that is leading to capacity constraints and demand for expansion capital. In particular, with federal requirements increasing the nation's automobile fuel efficiency standards to 54.5 miles per gallon in 2025, we recognize the need for suppliers to accelerate investment in the manufacture of key fuel efficiency technologies.

As a result, the Department recently announced a number of steps it is taking to improve the ATVM program to help support domestic advanced vehicle and component manufacturing. In 2014, the Department will continue to process existing ATVM applications, accept new applications, and issue loans after careful due diligence is performed until the loan authority has been expended, as established by Congress in the Energy Independence and Security Act (EISA) of 2007.

Q20. According to DOE's FY 2015 Budget Justification, the "Environmentally Prudent Development" program is supposed to conduct research on hydraulic fracturing and other shale gas production techniques to assist state authorities in crafting regulations.

Q20a. What states specifically is DOE working with for this program?

A20a. Much of our research is applicable to unconventional resource development in multiple states and geologic basins. State beneficiaries of DOE of research have previously included Alabama, Alaska, Arkansas, California, Colorado, Kentucky, Louisiana, Michigan, Mississippi, Montana, Nebraska, North Dakota, New York, Ohio, Oklahoma, Pennsylvania, Texas, Utah, West Virginia and Wyoming, among others.

Q20b. What specific research has this program done that has been shared with stakeholders?

A20b. DOE research has provided science, technology, and tools to assist states and industry in the deployment of best practices that reduce the environmental impacts of resource development on topics such as low environmental impact drilling practices, wellbore integrity, fracture control and measurement, water use, treatment and recycling, induced seismicity, methane detection, and data management systems for state regulatory agencies.

Q21. DOE's FY 2015 budget would fund a new program to target "Emissions Mitigation from Midstream Infrastructure." Industry is already working with environmental groups to address this issue, so please explain why DOE believes this new program is necessary? What stakeholders have been consulted about the need for this program?

A21. DOE's proposed natural gas midstream infrastructure research and development (R&D) is intended to focus on technology gaps that will not be addressed by others. DOE believes that by working primarily through its national laboratories, and in collaboration with other federal agencies, it can provide industry with advanced pipeline integrity technologies to detect and repair methane leaks and decrease greenhouse gas emissions through

improved operational efficiencies. It also believes that pipeline integrity management and maintenance can ensure the safety and reliability of the pipeline system as well as reduce methane leaks. DOE will also provide technical guidance for natural gas pipeline companies, local distribution companies, and regulatory bodies that can be used to consider GHG emissions when investments are made to restore/replace existing facilities, or to construct new ones.

This view has been fully informed by numerous discussions between the Department and key stakeholder representatives, including the National Association of Utility Regulatory Commissioners; the National Association of State Energy Officials; the North American Energy Standards Board; the American Gas Association; and the Gas Technology Institute. More recently, it has been reinforced through a series of formal and informal meetings with representatives of natural gas pipeline companies and local distribution companies.

Q22. Part of the stated goal of the recent White House "Strategy to Reduce Methane Emissions" is to stop leaks of methane from natural gas pipelines. The House passed H.R. 1900 to help bring certainty to the natural gas permitting process. Is DOE going to look at federal permitting problems that may delay methane reduction efforts? If yes, please describe any such permitting problems under DOE review or expected to be evaluated.

A22. Improving the efficiency of the federal process for permitting is important and is an issue the DOE will be considering in the President's Quadrennial Energy Review (QER). The initial focus for the QER will be the Nation's infrastructure for transporting, transmitting, and delivering energy. As part of the QER process, DOE will evaluate federal permitting

problems that are identified by industry as being an impediment to midstream infrastructure enhancements, including enhancements that will reduce methane emissions.

Q23. In a recent article relating to this past winter's cold weather, the *New York Times* explained that electricity outages and price increases could be exasperated in the future as "coal-fired power plants that utilities have relied on to meet the surge in demand are shuttered for environmental reasons." Similarly, American Electric Power's CEO stated that during January's cold weather "89% of our coal capacity slated for retirement in mid-2015" was running to provide power.

Q23a. What steps is DOE taking to ensure the loss of significant amounts of coal-fired power plants over the next few years will not make it put reliability at risk or increase electricity prices for consumers?

A23a. While DOE believes that national-level reliability issues are not likely to result from compliance with the recent and proposed Environmental Protection Agency (EPA) power sector regulations, it should be noted that local reliability issues may still arise for other reasons as decisions regarding equipment retrofits, retirements, and scheduling of equipment installations are made. DOE is proactively engaging with states, independent system operators/regional transmission organizations and other stakeholders to identify any potential local reliability concerns in an effort to help facilitate mitigation where possible. Additionally, DOE is monitoring public retirement announcements of power plant units to identify any potential geographic areas where local reliability may be of concern. DOE encourages early engagement with state and Federal energy and environmental regulators to ensure that compliance with EPA's regulations does not create potential local reliability issues.

DOE will continue to offer technical assistance to stakeholders to help inform, rather than direct, decisions regarding compliance with EPA's regulations. Such technical assistance

may include information regarding retro-fit technologies, retirement alternatives and implications. DOE will also provide guidance regarding the use of its emergency authority under Section 202(c) of the Federal Power Act, which DOE views as a tool of last resort to address reliability emergencies when all other options have been exhausted.

Q24. Please explain how DOE's pursuit of the President's climate change agenda will not conflict with DOE's statutory duty under the DOE Organization Act to "promote the interests of consumers through the provision of an adequate and reliable supply of energy at the lowest reasonable cost."

A24. DOE plays a significant role in the President's climate change agenda through its promulgation of energy efficiency regulations, support for clean and renewable resources, reducing greenhouse gas emissions from fossil fuels through carbon capture and sequestration, and support for new clean energy technology. These activities directly promote the interests of consumers in a carbon constrained economy and also contribute to reducing the costs of clean, adequate, and reliable energy supplies.

Q25. In DOE's analysis of its March, 28, 2014 final rule for commercial refrigeration equipment energy conservation standards, the agency admitted that the rulemaking will have an adverse impact on small manufacturers.

Q25a. How can the agency move forward in such a detrimental way, harming U.S. manufacturers and U.S. jobs?

A25a. DOE is required by statute to follow specific criteria for prescribing amended standards for covered equipment, such as commercial refrigeration equipment. Any amended standard for covered equipment must be designed to achieve the maximum improvement in energy efficiency that is technologically feasible and economically justified. (42 U.S.C. 6295(o)(2)(A) and 6316(e)(1)) In deciding whether a proposed standard is economically justified, DOE must determine whether the benefits of the standard exceed its burdens. (42 U.S.C. 6295(o)(2)(B)(i) and 6316(e)(1)) DOE conducts a series of rigorous analyses to assess

and estimate the impacts of potential energy conservation standards on consumers, manufacturers—including small manufacturers—utilities, and the Nation as a whole, as the Department did in this case. While one of the Department's analyses found that there is the potential for small manufacturers to face burdens, primarily the purchase of more costly components needed to comply with the standards required by the Final Rule, DOE is required by law to weigh both the costs and benefits in making a determination on the economic justification of potential amended standards. DOE estimates that this standard will yield annualized net benefits of between $704 and $888 million per year due to reductions in the energy consumed by the more efficient equipment, accruing largely to U.S. businesses that own and operate commercial equipment.

Q25b. Is this rulemaking an example of the agency taking actions to implement the President's Climate Action Plan?

A25b. The Energy Policy and Conservation Act, as amended, required DOE to complete the Commercial Refrigeration Final Rule by January 1, 2013. 42 U.S.C. 6313(c)(6). The rulemaking was initiated to meet statutory requirements. The President's Climate Action Plan includes a goal of 3 billion metric tons of carbon dioxide emissions reductions through 2030 from appliance standards and Federal Building codes.

Q25c. What is the justification for moving forward with this standard when the agency itself admits that the rulemaking will have an adverse impact on small manufacturers?

A25c. As discussed in the above response to question 25a, DOE must follow specific statutory criteria for prescribing amended standards for covered equipment, such as commercial refrigeration equipment. While the Department acknowledged the potential for small manufacturers to face compliance burdens associated with the Final Rule, DOE is required to weigh both the costs and the benefits in making a determination on the economic justification

of potential amended standards. DOE examined the impact of the standard on small businesses as required by the Regulatory Flexibility Act in Section VI. B. Ultimately, DOE concluded the benefits to the nation in the form of energy savings, emissions reductions, and the substantial operating cost savings to customers over the lifetime of the equipment, outweighed the burdens on manufacturers and that alternative, non-regulatory measures would not achieve similar levels of savings.

Q25d. What recourse does a small manufacturer have if they are unable to afford compliance with this new regulation?

A25d. If a manufacturer believes that its design is subjected to undue hardship by regulations, the manufacturer may petition DOE's Office of Hearings and Appeals (OHA) for exception relief or exemption from the standard pursuant to OHA's authority under section 504 of the DOE Organization Act (42 U.S.C. 7194), as implemented at subpart B of 10 CFR part 1003. OHA has the authority to grant such relief on a case-by-case basis if it determines that a manufacturer has demonstrated that meeting the standard would cause hardship, inequity, or unfair distribution of burdens.

Q25e. The new rulemaking effectively raises the minimum efficiency level beyond Energy Star to a level that is based on DOE's engineered product identified by DOE as "max tech." How does the agency justify setting the new minimums at the highest level technologically obtainable as determined by computer models and not actual commercial products?

A25e. DOE did not set the standards for commercial refrigeration equipment at the maximum technologically feasible ("max-tech") level considered. In fact, DOE rejected two more-stringent levels than that which the Department selected in the final rule because DOE's cost-benefit analysis found potential benefits would be outweighed by potential burdens

at those higher levels. See section V.C. of the Final Rule for a description of the Secretary's weighing of the benefits and burdens at these more stringent levels.[2]

DOE did rely, in part, on an engineering model to develop the potential standard *levels* for analysis. However, DOE did not rely exclusively on modeled theoretical designs to infer what could potentially be manufactured. On the contrary, based on product data in the ENERGY STAR certification directory, DOE was able to confirm that there are commercially available models on the market today at or above the standard level selected by DOE for each of the equipment classes for which data was available.

With respect to the engineering model, by way of background, it was originally developed in the previous (2009) commercial refrigeration equipment rulemaking and was vetted with stakeholders throughout that proceeding as well as this most recent rulemaking. DOE updated the inputs based on the latest stakeholder comments, supplier literature, manufacturer interviews, and other sources, and corroborated outputs with physical testing of available products on the market, which led to changes in the resulting engineering cost curves and therefore the levels considered for the amended energy conservation standards.

Q26. The Federal Energy Regulatory Commission has adopted a final environmental assessment (EA) on FERC Project No. 12690-005/Admiralty Inlet Tidal Project, and DOE is a cooperating Agency with FERC regarding the EA (DOE/EA-1949).

Q26a. What financial assistance has DOE provided the Admiralty Inlet project and what additional financial assistance does DOE plan to provide this project going forward?

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[2] 79 FR 22277 (April 21, 2014). Available at: http://www1.eere.energy.gov/buildings/appliance_standards/rulemaking.aspx?ruleid=80

A26a. EERE's Wind and Water Power Technologies Office has obligated $3,000,000, via a competitively selected award signed September 2013 for a total of $10,000,000 in DOE funds ($7M out-year mortgages), to Snohomish Public Utility District of Snohomish County (SnoPUD) in support of the Admiralty Inlet project. Currently up to $0.5M may be invoiced, and the remaining $2.5M is under holds pending sub-contracts approval and a final DOE NEPA decision. No further funding or follow-on awards are planned at this time.

Q26b. Identify what additional federal regulatory action, environmental assessments, or reviews may be conducted in connection with this project.

A26b. The Department of Energy has evaluated the Federal Energy Regulatory Commission Environmental Assessment (EA) and its supporting data. DOE is confident that the analysis conducted by the Federal Energy Regulatory Commission (Commission) in the Environmental Assessment provides adequate information for DOE to make an informed decision in compliance with the Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act (NEPA (40 CFR Parts 1500–1508) and DOE's NEPA implementing procedures (10 CFR Part 1021.330 et seq.). DOE completed its evaluation of the EA and does not plan to conduct additional environmental reviews. DOE's decision will be to either prepare an Environmental Impact Statement or issue a Finding of No Significant Impact.

An integral part of the FERC and DOE process also involved consultation with outside agencies that have the technical expertise that assisted in the analysis in the EA. This included the Federal Communications Commission (FCC) and the Naval Seafloor Cable Protection Office (NSCPO). DOE does not have technical telecommunication cable experts on staff but has cooperated and had an active role with the FCC throughout their

NEPA and Licensing processes. DOE has also participated in the Technical Meetings organized by the FCC. Should DOE make a final NEPA decision to issue a Finding of No Significant Impact, all mitigation and provisions established during the NEPA process would be incorporated and enforced through DOE's funding contract.

Q27. In light of questions concerning the appropriate separation distance between the Admiralty Inlet project and a submarine telecommunications cable between the United States and Japan, the Federal Communications Commission has asked the Communications Security, Reliability and Interoperability Council (CSRIC) to develop recommendations/guidelines for safe separation distances between submarine fiber optic cables and other sea bed uses, including for projects similar to the Admiralty Inlet project.

Q27a. Describe any participation DOE will undertake in CSRIC process.

A27a. A representative from DOE's Office of Electricity has participated in CSRIC, and the Office of Energy Efficiency and Renewable Energy is also willing to coordinate with CSRIC if asked.

Q27b. How might any guidelines or determination from the CSRIC inform or affect DOE's decisions relating to the Admiralty Inlet project and/or any other future marine energy project?

A27b. Though in general DOE has been in consultation with CSRIC, the Department will make its NEPA decision independent of the CSRIC process. EERE believes the fact that SnoPUD's project is an experimental prototype project makes it unlikely to set precedent. It would however, provide valuable information and data that can help the committee come to some meaningful decisions for larger scale MHK projects. For future marine energy projects, DOE would consider applicable guidelines and recommendations made by the CSRIC to the Federal Communications Commission for siting marine energy projects during the project planning and NEPA review process.

Q28. In DOE's proposed budget there is substantially reduced funding for the Mixed Oxide

Fuel Fabrication Facility (MOX) currently under construction at Savannah River Site (SRS) in South Carolina. For the options currently under consideration for the disposition of surplus weapons plutonium, please provide the following information:

Q28a. The benefits and drawbacks of each option;

A28a. Irradiation of MOX Fuel in Light Water Reactors

- MOX fuel fabrication process based on existing, operating technology in France.
- Facility must be adapted to U.S. standards for construction and operation of nuclear facilities.
- Significant risk associated with construction and start-up of major nuclear facility.

Irradiation of Plutonium Fuel in Fast Reactors

- Design, construction, start-up and licensing of prototypical modular, pool-type advanced fast-spectrum burner reactor has significant technical risk.
- Design, construction, and start-up of a full scale metal fuel fabrication facility in an existing operating Category 1 facility faces significant technical challenges.
- Metal fuel fabrication process has only been operated at the pilot scale.

Immobilization (Ceramic or Glass Form) with high level waste

- Technical uncertainty of the can-in-canister technology and throughput.
- Technological uncertainty of the glass can-in-canister form for disposal in a geologic repository.
- Specific modifications and impacts to Waste Treatment and Immobilization Plant Project (WTP) are yet to be fully defined. WTP itself is still under construction. This is not a viable option for the Hanford Site

Down-blending and Disposal

- This carries the least risk.
- Two additional glove boxes would be installed to increase throughput; however, the technical requirements are known and in use today.

Deep Borehole Disposal

- Drilling the deep boreholes would be technically viable.
- Technical requirements for the certified waste form are yet to be defined.
- Concept is still under development.

Q28b. The to go lifecycle cost estimate for each option is;

A28b.

- MOX fuel irradiation in light water reactors - approximately $25 billion.
- Plutonium Fuel Irradiation in Fast Reactors - approximately $50 billion.
- Immobilization - approximately $28 billion.
- Down-blending and disposal - $8 billion.
- Deep borehole disposal - costs were not estimated but will likely be closer to the down-blending and disposal option.

Q28c. The length of time necessary for completion;

A28c.

- MOX fuel irradiation in light water reactors – complete around the 2040s timeframe
- Plutonium fuel irradiation in fast reactors- complete around the 2070s timeframe
- Immobilization - complete around the 2060s timeframe

- Down-blending and disposal – complete around the 2040s timeframe
- Deep borehole disposal- uncertain timeline because of the unknown and lengthy process expected for regulatory review, start-up, and qualification of the waste form.

Q28d. Whether the option is consistent with the U.S.-Russia Plutonium Disposition Agreement signed in 2000 by the Clinton Administration;

A28d. The PMDA provides for other disposition methods as may be agreed to by the Parties.

Q28e. Whether the option meets the "spent fuel standard" recommended by the National Academy of Sciences in their 1994 report "Management and Disposition of Excess Weapons Plutonium" chaired by Dr. John Holdren; and

A28e. Response: Of the five options, MOX fuel irradiation in light water reactors, plutonium fuel irradiation in fast reactors, and immobilization all meet the intent of the "spent fuel standard". The 1994 report also discussed other ways to minimize accessibility of the plutonium by creating physical, chemical and radiological barriers. The other two options, down-blending and disposal, and deep borehole disposal, meet some of these barriers.

Q28f. If an option was considered in the 1990's but was not chosen as the preferred option, please describe why it was not preferred then and what circumstances have changed in the intervening years that might alter that earlier conclusion.

A28f. Since 1995, numerous options have been analyzed and dismissed. After careful consideration, and as a result of the cost increases, DOE announced that it would assess alternatives to the current plutonium disposition approach. The following five options, all considered in the 1990s, were deemed the most reasonable to reassess at this time:

- Option 1: Irradiation of MOX Fuel in Light Water Reactors;
- Option 2: Irradiation of Plutonium Fuel in Fast Reactors;

- Option 3: Immobilization (Ceramic or Glass Form) with High-Level Waste;
- Option 4: Down-blending and Disposal; and,
- Option 5: Deep Borehole Disposal.

Q29. Under DOE's agreement with the State of South Carolina regarding the MOX facility, what is the amount of the penalty DOE must begin paying the State in 2016? Has this taxpayer liability been considered in conjunction with the decision to cease construction of the MOX plant?

A29. If the MOX Production Objective is not achieved as of January 1, 2016, the Secretary shall, subject to the availability of appropriations, pay to the State of South Carolina each year through 2021 $1 million per day not to exceed $100 million per year. While this was taken into account for the analysis, it is not included in the cost estimates for the options.

Q30. Under the MOX program, the ultimate disposition of the excess plutonium would be disposal in a geologic repository as spent fuel. For the options currently under consideration by DOE, please indicate the ultimate disposition path and location for disposal. Please list any modifications to existing authority that would be necessary for such alternative disposal paths.

A30. Irradiation of MOX fuel in light water reactors would require a full Nuclear Regulatory Commission (NRC) licensing process; several steps of which have already been completed for the MOX facility. Fuel qualification would also need to be conducted by the NRC, and utilities would need to be willing to use MOX fuel in their reactors. The MOX facility would be located in South Carolina, and fuel would be used around the country depending upon interest from utilities.

Irradiation of plutonium fuel in fast reactors would require a lengthy NRC licensing

process, including fuel qualification by the NRC and compliance with other NRC requirements similar to what already has been and will be required for the MOX process.

Immobilization (Ceramic or Glass Form) with high level waste is not a viable option as the Department needs to maintain its focus and resources at Hanford on completing the WTP for the tank waste immobilization. It would introduce unacceptable technical, regulatory, financial and other risks to the completion of WTP. It is not contemplated under current agreements with Washington State, and would also require qualification and permitting of this waste form in a geologic repository.

Down-blending and disposal would require significant engagement with federal, state, and local representatives before any decision to go forward with this option. Implementation would require Congressional action, including amendment to existing legislation or enactment of new legislation.

Deep borehole disposal would have significant regulatory challenges as well establishing the requirements for the qualified waste form.

Q31. The 1994 NAS report and its successor report in 1995 indicate that time is a crucial security consideration in evaluating plutonium disposition options. Please describe whether any of the options could be brought into operation sooner than completion of the MOX plant.

A31. Down-blending and disposal could begin in 2019 but would require federal and regulatory actions.

Q32. Please provide an estimate of the number of people who will lose their jobs from transitioning the MOX plant from construction to cold-stand-by.

A32. We expect a rigorous discussion with Congress as we determine the best path forward. While that discussion is ongoing, the Department will continue construction activities on the MOX project for the remainder of FY 2014. This interval will also give the Department the opportunity to complete a root cause analysis into the underlying causes of the cost escalation of the MOX project.

Q33. Vladimir Rybachenkov, a former official with the Russian plutonium disposition effort, indicated in a recent paper that Russia might be favorably disposed to revising the agreement since there are changes they would also like to make including removal of the prohibition on the reprocessing of the spent fuel and blanket from their fast reactor. Mr. Rybachenkov also notes the capability of their fast reactor for "...producing more plutonium than it consumes ad whose quality may even surpass that of the weapons plutonium."

Q33a. Please explain the ramifications of Russia pursuing such a course of action.

Q33b. Please describe the extent to which you considered this ramification in your decision to put the MOX plant into cold standby.

Q33c. Would you accept such a modification to the U.S.-Russia Plutonium Disposition Agreement. If not, why not?

A33. We understand that that paper is the product of a non-governmental think tank and have no indication that it has any official standing.

The U.S. remains fully committed to the U.S.-Russia Plutonium Management and Disposition Agreement (PMDA) and has no intention of amending or reopening its provisions. That agreement (paragraph 1 of Article III) allows for disposition by irradiation as nuclear fuel or by "any other methods that may be agreed by the Parties in writing." Adding a new disposition method or option would only be exercising that authority granted to the Parties.

Russia has not indicated to us that it wishes to pursue a course to amend the PMDA. It has indicated that it remains committed to the agreement and to its program.

Q34. Mr. Rybachenkov also indicated that: "It seems that if the US side chooses an alternative plutonium disposition method, preservation of the international monitoring provision in the Agreement will not be a priority for Russia." Please indicate whether you would accept such a modification to the agreement.

A34. Again, the United States has no indication that Russia wishes to amend or reopen the provisions of the PMDA. We also have no indication that Russia's commitment would be less because the United States wished to add another disposition method pursuant to the PMDA's provisions.

Q35. Following up on my discussion during the hearing about the Paducah DOE site, communication between the State of Kentucky, the City of Paducah and the Department of Energy is vitally important as the Paducah Gaseous Diffusion Plan transitions from operating to full scale decommissioning and decontamination. As such, it is important that there be a full time manager on site. Can you provide a timeline of when a manager will be hired?

A35. The Paducah Site Lead position has been filled effective June 15, 2014.

QUESTIONS FROM REPRESENTATIVE RALPH HALL

I am writing to follow up with a question that I asked during your budget presentation to the Energy and Commerce Committee. It related to DOE's "Order of Precedence" for considering conditional approval applications for LNG exports to non-Free Trade Agreement Counties.

As you know, your predecessor, Secretary Chu, prioritized DOE's consideration queue according to when LNG project developers had pre-filled their applications with the Federal Energy Regulatory Commission (FERC) for construction approval and satisfaction of relevant provisions of the National Environmental Policy Act (NEPA).

While I do not argue with DOE's having to formulate some set of priorities for dealing with 30 or so applications, I believe your predecessor's Order of Precedence discriminates against offshore projects that are not under FERC's jurisdiction. You mentioned the parallel regulatory process at the Department of Transportation's Maritime Administration (MarAd), which seemed to be ignored by DOE when it established its list of priorities based on FERC filings.

Indeed, it wasn't until after Congress had acted in December 2012 to amend the Deepwater Port Act of 1974, that offshore LNG projects were placed under MarAd's jurisdiction for much of the same review that onshore projects are given by FERC. But by then, your predecessor's Order of Precedence had been set according to a FERC-only process in which offshore projects had no place. These projects seem to be left out in the cold, and accorded, therefore, a diminished place in the queue, over which developers had no control.

Q1. Do you intend that DOE establish a separate and simultaneous system for processing conditional approval applications for offshore LNG export terminals that are under the jurisdiction of MarAd?

Q1a. If so, when? Timing is a vital consideration in the financing of LNG facilities, and your prompt action could resolve some major uncertainties.

A1a. DOE's role with respect to LNG exports to non-free trade agreement countries is to consider whether the proposed exports are in the public interest pursuant to Section 3(a) of the Natural Gas Act and either to approve or deny the proposed exports on that basis. While DOE is responsible for export of the natural gas as a commodity, other agencies are responsible for approving the siting and construction of LNG terminals: pursuant to Section 3(e) of the Natural Gas Act, the Federal Energy Regulatory Commission (FERC) is responsible for proposals to site and construct LNG terminals onshore or in state waters;

and, pursuant to Section 3(9) of the Deepwater Ports Act, as amended by Section 312 of The Coast Guard and Maritime Transportation Act of 2012 (Pub. L. 112-213), the Maritime Administration within the Department of Transportation (MARAD) is responsible for LNG terminals located in deepwater ports.

Companies seeking to export natural gas from new or modified LNG terminals located onshore or in state waters have typically applied in parallel to both DOE and FERC. This is an efficient approach as it allows both agencies to proceed in their reviews simultaneously rather than sequentially. We believe it would be prudent for companies seeking to export natural gas from LNG terminals located in deepwater ports also to apply in parallel to both DOE and MARAD. To date, DOE has received two applications to export natural gas from MARAD-jurisdictional facilities. To our knowledge, neither of these applicants have yet applied to MARAD or begun the environmental review process there, although nothing in the applicable statutes or regulations would stop them from doing so.

The Department is processing the pending applications to export liquefied natural gas to non-free trade agreement countries on a case-by-case basis as expeditiously as possible in view of the level of appropriate due diligence activities, given that the orders on export applications are complex documents that must withstand public and legal scrutiny.

Q1b. If not, then why note? A decision to not establish a separate and simultaneous process would leave MARAD projects stranded in a FERC-defined template that is inappropriate given the action taken by Congress in December 2012.

A1b. Answered in A1a.

QUESTIONS FROM REPRESENTATIVE JOHN SHIMKUS

Q1. In a letter to this Committee, dated January 6, 2014, Asst. Secretary Peter Lyons stated DOE would honor NRC's request to complete a groundwater supplement to the Yucca Mountain EIS and indicated steps had been taken to do so including procuring contractors' services and drafting a notice of intent. However, on February 28th, DOE notified NRC that it would NOT prepare that EIS supplement. Please describe the basis and rationale for revering the decision communicated to this Committee in the January 6 letter.

A1. As explained in the Department's February 28, 2014 letter to the Nuclear Regulatory Commission (NRC), the NRC is the ultimate adjudicator in the Yucca Mountain license proceeding, and the NRC, rather than the Department, must eventually determine whether any groundwater analysis is sufficient and whether adoption of the Department's environmental review, as supplemented, is practicable. Accordingly, the Department is committed to providing the NRC an updated version of the report it provided to the NRC on July 30, 2009, entitled, *Analysis of Postclosure Groundwater Impacts for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada.* This updated analysis will, in the view of Department staff, provide the NRC with substantially all of the technical information necessary to inform a draft environmental impact statement.

Q2. In its FY 2015 budget proposal, DOE requests $24 million derived from the Nuclear Waste Fund. Please provide an itemized list of the specific activities DOE proposes to undertake with those funds including a detailed description the of the need for each activity, the work product each activity is expected to yield and the section of the Nuclear Waste Policy Act authorizing the activity.

A2. With the $24 million requested in the President's FY2015 budget request DOE proposes to undertake activities required to support preliminary generic process development and other non-R&D activities related to storage, transportation, disposal, and consent-based

siting. The President's FY 2015 request continues and expands on integrated waste management system activities that were undertaken in FY 2014.

Q3. Please provide DOE's current projection for the Government's liability in FY 2015 for its failure to accept spent fuel under the standard contracts with utilities and whether this liability is accounted for within DOE's budget.

A3. As of September 30, 2013, the Government's remaining liability resulting from the delay in beginning the acceptance of spent nuclear fuel in accordance with the provisions of the Standard Contract is estimated to be approximately $21.4 billion. The calculations that support the liability estimate and the memo were finalized on October 30, 2013. Under current law, any damages or settlements in this litigation will be paid out of the Judgment Fund.

Q4. Please provide projections of the Federal Government's cumulative liability in the years, 2015, 2020, 2025, 2030, 2040, 2045, and 2050 assuming no spent fuel acceptance by DOE until 2048.

A4. The only available projection of the Federal Government's liability resulting from the delay in beginning the acceptance of spent nuclear fuel in accordance with the provisions of the Standard Contract is provided in A3 above.

Q5. Please provide the Committee with a detailed schedule and budget for restarting the Yucca Mountain Repository program and commencing spent fuel acceptance following construction authorization by the Nuclear Regulatory Commission.

A5. No such schedule or budget has been developed by the Department. The Administration determined that Yucca Mountain is not a workable solution, convened a Blue Ribbon Commission to evaluate options, and released its new *Strategy for the Management and Disposal of Used Nuclear Fuel and High Level Waste* in January 2013. The Department's FY 2015 budget supports the Strategy.

Q6. Please describe any plans under consideration by DOE for reversing the policy of disposing defense waste and spent nuclear fuel in the same repository.

A6. Disposal of defense wastes alongside commercial wastes is the current policy in accordance with the 1985 decision to use a single repository for both commercial and defense wastes. There has been no decision to reverse this policy.

Q7. Please provide the Committee with a detailed schedule and cost estimate for disposal of defense waste in a defense-only repository.

A7. Disposal of defense wastes alongside commercial wastes is the current policy in accordance with the 1985 decision to use a single repository for both commercial and defense wastes. There has been no decision to reverse this policy and therefore no detailed schedule and cost estimate for disposal of defense waste in a defense-only repository has been developed. The Department's nuclear waste program schedule and budget support the *Strategy for the Management and Disposal of Used Nuclear Fuel and High Level Waste*, including the use of consent-based siting and the deployment of consolidated interim storage in the near term.

Q8. To date, what is the total amount paid into the Nuclear Waste Fund for defense waste disposal and what portion of the total contribution to the total cost of the repository does that amount represent?

A8. As of September 30, 2013, the Government has provided $3.758 billion for defense waste disposal.

QUESTION FROM REPRENSETATIVE LEE TERRY

Q1. Looking at the overall budget for Applied Energy Programs, I find it interesting that batteries and electric vehicles are funded at a much higher level than cyber-security. It seems to me that cyber-security is urgent where as other items should be less urgent. Can you explain the discrepancy?

A1. DOE views cybersecurity as a high priority for the Department. The budget request for fiscal year 2015 includes more than $300 million for activities to strengthen the protection of the DOE enterprise from cyber attacks, bolster the U.S. Government's capabilities to address cyber threats, and improve cybersecurity in the U.S. energy sector in partnership with industry and other Federal agencies. The FY 2015 budget request for EERE's Vehicles Program is $359 million, which includes $100 million for advanced battery technologies. The research and development supported by this investment, among others, would result in technologies that enhance our national energy security by reducing our dependence on imported oil and critical materials, such as rare earths.

QUESTIONS FROM REPRESENTATIVE MICHAEL BURGESS

Q1. Model building energy codes are developed by industry groups, and originally DOE was authorized to serve as a technical advisor during the development of these codes. DOE's role, however, has expanded over time and now, in my view includes advocacy. DOE representatives even pursue very aggressive energy goals that increase the cost of housing. Do you think this is an appropriate role for the agency?

A1. DOE is directed by statute to periodically review the technical and economic basis of building energy codes, and participate in industry processes for review and modification, including seeking adoption of all technologically feasible and economically justified energy efficiency measures. (42 USC 6836) This role has been consistent since adoption of the statute.

In fulfilling its charge, DOE evaluates efficiency concepts for energy savings potential and cost-effectiveness, and develops proposals for model building energy codes, such as the International Energy Conservation Code (IECC). DOE relies upon an established methodology in evaluating the energy and cost impacts associated with building energy codes, which was developed through a transparent process based on feedback from the general public, and provides all analysis and supporting documentation as required by the International Code Council (ICC). In addition, prior to submission to the ICC development and public hearing process, DOE publishes its efficiency concepts, supporting analysis, and eventual code change proposals for public review and comment via the Federal Register.

Q2. Some of my constituents have advocated for energy neutral tradeoffs in the code. These would maintain the same energy use, but would give builders and homeowners more flexibility in reaching these energy goals at a lower construction cost. DOE has not supported such reasonable code changes in the past. Can you explain why?

A2. The International Energy Conservation Code (IECC) contains both prescriptive and performance-based compliance paths, including options for tradeoffs between residential

building systems. The allowance for energy to be traded between residential building envelope and mechanical systems is a concept that previously existed in the code, but was removed following the 2006 IECC. While some remain in favor of the equipment tradeoff, others support different methods of achieving whole-building energy savings. Also, while tradeoffs between envelope and mechanical systems are no longer allowed by the IECC, tradeoffs between building envelope systems are permitted.

In developing proposals for the 2015 IECC, DOE solicited public comments on draft code changes, including the topic of equipment tradeoffs. Stakeholder feedback yielded a polarized mix of support and opposition surrounding a reinstatement of equipment tradeoffs within the IECC, and DOE did not pursue an analysis or proposal on this topic.

As part of recent 2015 IECC development, as administered by the ICC, other organizations did submit proposals targeting such tradeoffs, but these proposals were ultimately rejected by the ICC. However, DOE notes that the 2015 IECC will include an additional compliance path based on achievement of a specified home energy rating index, which includes additional allowances for whole-building tradeoffs, including tradeoffs between building envelope and mechanical systems. The ICC is expected to publish the 2015 IECC in June 2014.

Q3. GAO recently submitted to your agency for comment the first of two reports it is issuing at Senator Markey's and my request detailing the issues surrounding DOE's actions taken to assist USEC's American Centrifuge Project, many of which have had serious, negative impacts on the domestic uranium industry. GAO's draft report details a number of areas where DOE has taken action where GAO found DOE to lack authority to have taken such action. After reviewing GAO's findings in the first report, has DOE made any changes to the way it makes its Secretarial Determination, pursuant to Section 3112(d) of the USEC Privatization Act?

A3. As you may be aware, the Department does not agree with GAO's analysis and conclusions regarding DOE's compliance with section 3112(d) of the USEC Privatization Act and other requirements related to its uranium transactions. DOE provided a detailed response to GAO's criticisms, explained its positions, and identified appropriate actions to be taken in the future in response to GAO's concerns.

Q4. Has this first GAO report resulted in DOE making changes to any other procedures, operations, or agency actions pertaining to USEC, DOE's support for any of USEC's current or former operations, or the transfer of uranium or direct payments to USEC or any other entities?

A4. DOE carefully considered the recommendations and findings in the GAO report. As in the past, DOE's future transfers or sales of uranium and any future interactions with USEC will comply with all applicable law and DOE will continue to seek opportunities to improve the way it carries out its missions.

Q5. Please provide the following documents:

Q5a. The recently completed, official use only, report required under Section 321 of the Omnibus Appropriations Act for Fiscal Year 2014 that includes a cost-benefit analysis of available and prospective domestic enrichment technologies for national security needs and the scope, schedule, and cost of the preferred option. This report was required to be submitted to the House and Senate Appropriations Committees in order for the Secretary of Energy to transfer up to $56.65 million of the NNSA funds to further the research, development, and demonstration of national nuclear security-related enrichment technologies.

A5a. The report was completed and delivered to the House and Senate Appropriations Committees on April 15. We will provide copies of the report to the House Energy and Commerce Committee.

Q5b. A complete inventory of DOE's uranium that is not included in its Excess Uranium Inventory Management Plan (i.e., uranium that has not been deemed "excess").

A5b. A classified report containing the complete inventory of DOE's uranium that is not included in its Excess Uranium Inventory Management Plan will be provided to the House Energy and Commerce Committee.

QUESTIONS FROM REPRESENTATIVE BILL CASSIDY

Q1. As the U.S Department of Energy finalizes locations for its Quadrennial Energy Review Task Force, I ask that you not only include Louisiana as one of the destinations for the public regional meetings (I understand location logistics are currently being finalized), but I ask that you also work with the Louisiana Oil and Gas Association during the development and review of petroleum product transmission & distribution policy. Over 88 percent of U.S. oil rigs are located on the state's outer continental shelf, Louisiana is the 2nd largest crude oil producer (including offshore production) and the 3rd largest natural gas producer in the nation. Louisiana has significant intellectual capital and assets that should be leveraged for the discussion of both upstream and downstream operations for energy distribution and transmission.

A1. The Department acknowledges the importance of Louisiana to the nation's energy situation, and a public stakeholder meeting on the Quadrennial Energy Review (QER) in Louisiana has been priority from the very early days of establishing this process. The Louisiana QER meeting was held at the LSU Health Sciences Center - New Orleans on May 27, 2014. EPSA will review any comments submitted by the Louisiana Oil and Gas Association (LOGA) and other stakeholders during this QER process.

A report by the non-partisan Congressional Research Service shoes that the 15 lease sales in U.S. waters that are included in President Obama's five-year plan represent the lowest number of lease sales ever proposed in a plan since the process began in 1980.

Q2a. I realize offshore energy production is regulated by the Department of Interior and not Energy, but shouldn't offshore energy production be a part of the national energy strategy?

A2a. The President's All-of-the-Above Energy Strategy supports an all-inclusive approach to energy sources, including the continued research and development of offshore oil and gas. The "Blueprint for a Secure Energy Future" specifies that the Administration encourages the exploration, development, and production of oil and natural gas, including offshore, but identifies that it must be accomplished safely, responsibly, and efficiently.

In addition, the Consolidated Appropriations Act, 2014 (H.R. 3547) Division D – Energy and Water Development and Related Agencies Appropriations Act, 2014 Explanatory Statement notated that in FY14, $10,000,000 would be allocated by the Department for use in activities to improve the economic viability, safety, and environmental responsibility of offshore exploration and production in challenging conditions, of exploration and production from unconventional natural gas and other petroleum resources, and of production by small producers.

Q2b. Since the President took office, oil and gas production has decreased in federal offshore waters. This means fewer jobs for working Americans, fewer opportunities in the energy service industry, why wouldn't the Administration want all Americans to have these opportunities? What can you do in your role as Energy Secretary to advance offshore energy production?

A2b. The Department of Energy is currently conducting research focused on ensuring offshore and unconventional resources are developed safely and sustainably. In addition, the Department is utilizing our FY 2014 appropriations for activities to improve the economic viability, safety, and environmental responsibility of offshore exploration and production in challenging conditions.

Q3. At what point did you learn that Mr. Chu's FERC-based "Order of Precedence" ignored – and discriminated against – MarAd-jurisdictional offshore projects that legally couldn't fit any kind of DOE queue that was based on develops' pre-filings at FERC?

A3. The process that established the "Order of Precedence" includes a provision that DOE would review long-term LNG export applications to non-free trade agreement countries received after December 5, 2012, in the order the applications are received by DOE. After that date, any such application received by DOE, whether FERC or MARAD

jurisdictional, would receive the same treatment in their placement in the "Order of Precedence".

DOE's role with respect to LNG exports to non-free trade agreement countries is to consider whether the proposed exports are in the public interest pursuant to Section 3(a) of the Natural Gas Act and either to approve or deny the proposed exports on that basis. While DOE is responsible for export of the natural gas as a commodity, other agencies are responsible for approving the siting and construction of LNG terminals: pursuant to Section 3(e) of the Natural Gas Act, the Federal Energy Regulatory Commission (FERC) is responsible for proposals to site and construct LNG terminals onshore or in state waters; and, pursuant to Section 3(9) of the Deepwater Ports Act, as amended by Section 312 of The Coast Guard and Maritime Transportation Act of 2012 (Pub. L. 112-213), MARAD is responsible for LNG terminals located in deepwater ports.

Companies seeking to export natural gas from new or modified LNG terminals located onshore or in state waters have typically applied in parallel to both DOE and FERC. This is an efficient approach as it allows both agencies to proceed in their reviews simultaneously rather than sequentially. We believe it would be prudent for companies seeking to export natural gas from LNG terminals located outside state waters also to apply in parallel to both DOE and MARAD. To date, DOE has received two applications to export natural gas from MARAD-jurisdictional facilities. To our knowledge, neither of these applicants have yet applied to MARAD or begun the environmental review process there, although nothing in the applicable statutes or regulations would stop them from doing so.

The Department is processing the pending applications to export liquefied natural gas to non-free trade agreement countries on a case-by-case basis as expeditiously as possible in view of the level of appropriate due diligence activities, given that the orders on export applications are complex documents that must withstand public and legal scrutiny.

Q4. When were you first made aware that non-FERC projects even existed?

A4. The first LNG export project within the jurisdiction of the Maritime Administration (MARAD), Main Pass Energy Hub LLC, applied to DOE for an authorization to export LNG to free trade agreement (FTA) countries in September 2012. That application was granted on January 4, 2013. Freeport McMoRan Energy LLC, Main Pass Energy Hub LLC's corporate affiliate, applied to DOE for an authorization to export LNG to both FTA and non-FTA countries on February 22, 2013. Each of these events occurred prior to my tenure as Secretary.

Q5. When were you first made aware of Congressional requests going back to April 2013 that a "separate and simultaneous" conditional approval process be established by DOE for MarAd projects that were made "homeless" by Mr. Chu's original FERC-based queue?

A5. The order of precedence announced in December 2012 prioritized applications that had already begun NEPA review at FERC, but only for applications received by the Department prior to that date. All applications received after that date were to be reviewed in the order received by DOE. As noted above, no deepwater projects had applied to DOE for non-FTA export authority prior to December 2012, and therefore would not have been affected by the queue as established.

On May 29, 2014 the Department announced a proposed procedural change pursuant to which it would no longer issue conditional authorizations but would evaluate all LNG

export applications to non-FTA countries in the order in which they are ready for final decision. This proposed procedure, like its predecessor, will place FERC-jurisdictional and MARAD-jurisdictional projects on equal footing regarding the timeliness of their review by the Department. Regardless of where the applicant now stands in the queue, following the proposed process change, DOE would consider the application as soon as it has completed its NEPA review, — whether that review is conducted by FERC or MARAD.

Q6. Why have you ignored several Congressional requests for a "separate and simultaneous process" for MarAd-jurisdictional projects, and why has your senior staff seemingly dismissed the same request from DOE's sister agency?

A6. DOE has received and responded to letters from members of Congress and from MarAd that have requested that DOE establish a separate and simultaneous process for MarAd jurisdictional projects.

Please see the response to question 3.

Q7. On October 18, 2013, Acting MarAd administrator Paul Jaenichen wrote to your Deputry Chief of Staff, Jonathan Levy, asking for the same "separate and simultaneous" review process that many members of Congress had already requested for offshore LNG terminals.

A7. See answer A6.

Q8. Why has Deputy Chief of Staff Jonathan Levy never respond to Acting MarAd Administrator Jaenichen's written request? Will either Mr. Levy or you finally respond to MarAd now six months later?

A8. My understanding is that Mr. Levy responded contemporaneously to acting Administrator Jaenichen via telephone. There is nothing in DOE's process — either currently or under the proposed change — to prevent applicants from moving forward with their NEPA review.

Q9. Will you now recognize that then-Secretary Chu's original FERC-based queue is flawed for its having ignored non-FERC jurisdictional projects, and will you now finally establish a

separate and simultaneous conditional approval queue for MarAd-jurisdictional LNG export terminals?

A9. When DOE established the order of DOE's review of pending long-term applications to export LNG to non-FTA nations, DOE gave precedence to those applicants that had made the greatest strides toward obtaining a final decision on the proposed exports. After December 5, 2012, any long-term application to export LNG to non-FTA countries received by DOE, whether FERC or MARAD jurisdictional, would be placed in the "Order of Precedence" in the order received, and therefore a MARAD jurisdictional application would not be treated differently than a FERC jurisdictional application received after December 5, 2012.

Please see the response to question 3.

Q10. In the Consolidated Appropriations Act of 2014, we provided some $343 million for MOX Construction activity this year. We did not provide for or permit any expenditure of appropriated funds for any "cold standby" or "mothballing" of the MOX facility.

Q11. By what authority does DOE decide, on its own, to effectively cancel a major construction project, which Congress – during periods of both Republican and Democrat control – has decided over the years (as recently as January) to continue? Please provide us your view of our appropriations authority and your freedom to circumvent it.

A10/11. The MOX project has not been cancelled, and the Department has determined and has communicated to the contractor, MOX Services, that the Department will continue with construction activities through FY 2014, retaining the key nuclear engineers and other highly-skilled workers. However, given that the Department has determined that the MOX fuel approach is significantly more expensive than anticipated, NNSA intends to work with the contractor on a plan for placing the project in cold standby during FY 2015, and we are continuing our ongoing discussions with Congress as they review and

evaluate the FY 2015 budget request, while the Department further studies more efficient options for plutonium disposition.

Q12. The MOX project is debated every year in Congress based on construction cost estimates provided us by DOE. What's new this year is your introduction of a vague and unsubstantiated estimate of $30 billion in "life cycle" costs.

Q13. Please provide the Committee a full accounting to substantiate your $30 billion estimate. Please explain all methodologies and assumptions used to arrive at a figure that is, again, new to the discussion.

A12/13. The $30 billion life cycle cost estimate (LCCE) includes a $10.5 billion total project cost for the MOX Fuel Fabrication Facility (MFFF) with a projected completion date of 2027. This is approximately over $2 billion more than was in used in the $24 billion LCCE reviewed by the GAO. This analysis was conducted by the U.S. Army Corps of Engineers. In addition, the Los Alamos National Laboratory (LANL) steady state operations estimate provided by LANL was reviewed by an independent review team (independent of LANL), which concluded that the estimate was closer to $5 billion versus the $2.9 billion used in the $24 billion LCCE reviewed by the GAO. Furthermore, due to the MFFF projected completion date of 2027, operations for the MFFF and Waste Solidification Building would also be delayed, contributing to the cost increase due mainly to compounded escalation associated with pushing operations far out into the future.

Q14. Given that DOE's application of a "life cycle" cost estimate seems unique to its treatment of MOX, then accounting consistency across all major DOE construction programs would demand the same. This would include, for instance, the Waste Treatment and Immobilization (WTP) project at Hanford in Washington State, and the Uranium Processing Facility (UPF) at the Y-12 National Security Complex at Oak Ridge in Tennessee.

Q14a. Please provide the Committee with DOE's most recent "life cycle" cost estimate for the WTP at Hanford. Please specify how your methodologies and assumptions track with, or differ from, those that DOE has applied to MOX.

A14a. The Waste Treatment and Immobilization Plant (WTP) is the cornerstone of the River Protection Project's mission to clean up hazardous and radioactive waste contained in underground storage tanks at the Hanford Site in southeastern Washington State. It is a one-of-a-kind facility to turn 56 million gallons of radioactive tank waste located at the Hanford Nuclear Reservation into an immobilized form using a process called vitrification.

The construction cost for WTP will undergo a re-estimation pending resolution of technical issues. Specific WTP subprojects not impacted by the major technical issues are currently undergoing a re-estimation. The most recent cost estimate for the construction of the Waste Treatment Plant (WTP) is $12.3 billion. This estimate includes direct contractor costs and DOE contingency. The estimate for direct construction costs was prepared by the construction contractor using standard industry practice existing in 2006. It was reviewed by external independent entities including the U.S. Army Corps of Engineers. The current total tank farm operations estimate is $62.2 billion through the year 2050; which in addition to WTP operations and maintenance, includes operation of the tank farm, waste feed delivery to WTP, closure of emptied tanks, and all other ancillary tasks necessary to complete the liquid waste treatment mission.

The Department follows similar management and cost estimating procedures for other projects including when necessary to provide information for decision makers to respond to project execution that does not meet established objectives.

Q14b. Please also provide the Committee with DOE's most recent "life cycle" cost estimate for the UPF at Oak Ridge. Again, please specify how your and assumptions track with, or differ from, those that DOE applied to MOX.

A14b. The UPF Project is needed to ensure the long-term viability, safety, and security of the Enriched Uranium (EU) capability in the United States. UPF is a unique facility that will support the Nation's nuclear weapons stockpile, down blending of EU in support of nonproliferation, and provide uranium as feedstock for fuel for naval reactors.

The most recent life-cycle estimate was completed in April 2009 for the CD-1 Analysis of Alternatives. The estimates were $9.1B for a new UPF building and $12.3B to upgrade the existing facilities, with a recommendation to pursue the cheaper former option. Both estimates are in 2007 dollars and include all investments related to construction, operations and maintenance, deactivation and decommissioning, and other productivity improvements from FY 2007 through FY 2074.

QUESTIONS FROM REPRESENTATIVE CORY GARDNER

Q1. The University of Colorado estimates that 68,000 jobs could be lost in Colorado if hydraulic fracturing is prohibited. As you may know, there is the potential for a statewide fracking ban on the ballot this November in Colorado. I oppose any attempts to ban hydraulic fracturing, which would greatly harm our state and local economies and eliminate Colorado jobs. Where do you stand on hydraulic fracturing and what is your position regarding a potential ban on fracking in Colorado?

A1. Research conducted by the U.S. government and industry over a number of decades led to the development and commercial deployment of horizontal drilling and hydraulic fracturing technologies. The advancements of combined horizontal drilling and hydraulic fracturing technologies have dramatically increased the nation's technically-recoverable domestic unconventional oil and natural gas (UOG). The new economics enabled by these technological innovations have greatly expanded the production of these resources. The increase in UOG production in recent years has given a glimpse of the potential for UOG development to enhance America's energy, economic, and environmental security, and create significant income, employment, and other benefits crucial to the States', including Colorado, and the country's economy. However, these resources must be developed safely, efficiently, and in an environmentally responsible way.

Title X of the Energy Policy Act of 1992 requires the Department to reimburse, at last annually, licensees of active uranium and thorium processing sites for costs incurred to remediate Federal-related byproduct material. These sites were commercially operated mills which provided uranium and thorium concentrate in support of U.S. defense programs. Today, many of these sites are located in or near minority and economically distressed communities.

As a result of the Energy Policy Act legislation, thirteen active uranium licensees and one active thorium licensee (located in seven states: Colorado, Illinois, New Mexico, South Dakota, Utah, Washington, and Wyoming) were identified by DOE as qualifying for reimbursement under Title X. From FY 1994 until FY 2008 the Department provided ample resources within its annual budget request to reimburse these licensees for the work they executed toward bringing these sites to substantial closure.

Unfortunately, the Department has shirked its obligations under Title X since FY 2009 by including no funding in its annual budget request to Congress. As a result, the program has accumulated over $54 million in unpaid claim balances as of December 2013.

It is my understanding that at least one of these sites is facing demobilization because it continues to wait for over $15 million in reimbursements from the Title X program for work already completed. The said irony is that demobilization will significantly increase the cost to complete this project at a time when this site is within 2 years of achieving completion. It is unacceptable for the federal government to abandon communities with unfinished radioactive waste remediation projects that at best will have no restart date in sight and at worst will remain a hazard to peoples' health forever without further intervention.

Q2. Why has the Department failed to include sufficient resources within its annual budget submissions to reimburse the Title X licensees for their efforts to bring these sites to closures, despite legal obligations to do so?

A2. Taking many variables into account, the Environmental Management program has generally prioritized its cleanup activities as follows:

- Activities to maintain a safe, secure, and compliant posture in the EM complex
- Radioactive tank waste stabilization, treatment, and disposal
- Spent (used) nuclear fuel storage, receipt, and disposition
- Special nuclear material consolidation, stabilization, and disposition
- Transuranic and mixed/low-level waste disposition
- Soil and groundwater remediation
- Excess facilities deactivation and decommissioning.

The Department supports the Title X Uranium and Thorium Reimbursement Program and has been able to provide reimbursements to uranium and thorium licensees through fiscal year (FY) 2012.

Q3. Absent fulfilling this legal obligations what plan does the Department have to remediate those sites?

A3. In accordance with section 765.20(g) of 10 CFR Part 365 (revised), the Department continues collection of annual claims. Each year, the Department publishes a Federal Register Notice requesting uranium and thorium licensees to submit their claims to the Department for cleanup work performed in the prior fiscal year, which identifies that the ability to reimburse approved claims is subject to the availability of funding. Any remaining unpaid approved claims are carried over to the next fiscal year, until they can be paid in full by the Department.

The Department does not have the authority to conduct the actual physical cleanup at these privately owned sites.

QUESTIONS FROM RANKING MEMBER BOBBY RUSH

Q1. Of the DOE's $27.9 billion budget request, what is the amount allocated to the Office of Impact and Diversity (OEID), the department primarily responsible for enacting the Minorities in Energy Initiative (MIE), both in terms of dollars and in percentage?

A1. Of the DOE's $27.9 billion FY 2015 budget request, the Office of Economic Impact and Diversity (OEID) budget request is $7,247,000, or 0.026% of the DOE budget request.

Q2. Does this budget adequately reflect the priority of reaching out and engaging minorities in the energy sector for both you and President Obama, and if it does not, what additional funding can be added to show its importance to the Administration?

A2. Started in September 2013, MIE is currently supported by existing OEID funds. While the near-term budget for OEID engagement of minorities in the energy sector through MIE is bound by FY 2014 appropriation and FY 2015 budget request, the program is a DOE initiative and a Secretarial priority. In pursuing MIE outcomes, OEID coordinates efforts with program offices and National Labs to leverage resources and activities that align with the OEID mission and MIE focus areas.

MIE aligns with the long-standing mission of OEID and is a sustainable platform for enhanced achievement of the original statutory mandate of ensuring that minorities have an opportunity to fully engage in the programs of the Department and the overall energy sector. MIE provides increased emphasis on minority community engagement, adds the Ambassador program; strengthens science, technology, engineering and mathematics (STEM) education; expands economic development; and adds climate change awareness.

Q3. What was the budget for OEID before MIE was established and has this budget increased in order to account for added duties and responsibilities?

A3. The OEID budget is $8,956,000 for FY 2014. The FY 2015 request is $7,247,000. The budget decrease from FY 2014 to FY 2015 is due to transition of the Office of Small and Disadvantaged Business Utilization from OEID to a separate program office. Taking this office transfer into consideration, the net budget increase request for OEID in FY 2015 is $794,000.

Q4. Does OEID have the budget, staff, resources, and authority to fully and effectively make the MIE successful by engaging minority communities and helping them gain access to the enormous opportunities available within all the different aspects of the energy sector?

A4. OEID engages the minority communities through a holistic, long-term approach to supporting increases in awareness; energy literacy; STEM workforce development; and business expertise of historically underserved communities, which enables us to best accomplish our objectives.

Q5. How will the MIE initiative be supported by other departments within the agency?

A5. OEID will serve as a resource and partner to DOE program offices to better engage and support minority and tribal communities. Program offices will continue to include relevant aspects of MIE as part of their engagement of minority communities. They will assist OEID in measuring the level of engagement of these communities and the outcomes. Additionally, program offices provide technical assistance and advise OEID on how to best engage external communities in specific areas within the energy sector.

Q6. How does the entire agency reflect the mission of the MIE through its own hiring and promotion of diverse candidates into leadership positions to ensure that the interests and concerns of minority communities are proactively addressed?

A6. The Department of Energy understands the importance of a diverse workforce and leadership structure in fulfilling our external obligations to minority communities, as well

as enhancing our internal capabilities to address complex energy challenges. The entire Department is committed to being inclusive of our minority communities across all of our mission responsibilities, including MIE. Through our diversity and inclusion strategy, we not only place emphasis on the availability of minority leaders for community outreach, but also work to equip all of our leaders to effectively engage minority communities.

DOE recruitment practices include advertisements in media that serve predominantly minority communities, very strong relationships with minority serving institutions, and activities with numerous organizations having direct access to those communities. We continually review our selection and promotion practices to ensure proper attention to establishing recruitment strategies to attract and grow a diverse pool of talent, especially at the senior and executive levels.

Q7. Of the 17 publicly-funded national research labs, how many are operated and/or managed by minority firms outright or in partnerships with other firms?

A7. None of the Department's national research laboratories are managed by minority firms. However, some of the entities that manage the Office of Science laboratories are comprised of university consortia that include minority serving institutions. For example, Fermi National Accelerator Laboratory (Fermi) is operated by the Fermi Research Alliance, LLC., which is a partnership between the Universities Research Association, Inc. (URA) and the University of Chicago. URA is a consortium of 88 universities, including some minority serving institutions. Thomas Jefferson National Accelerator Laboratory is managed by Jefferson Science Associates, LLC., which is a partnership between the Southeast Universities Research Association (SURA) and PAE Applied

Technologies. SURA is a consortium of 23 universities including several minority serving institutions.

Q8. Do minorities make up a significant part of the leadership teams for any of the 17 labs and what steps are needed to increase the number of minorities in these leadership positions?

A8. The National Renewable Energy Laboratory (NREL) has two Executive Leadership team members who self-identify as minorities and three female team members. At the Idaho National Laboratory (INL), women and minorities make up 21% of the leadership team. Women and minorities make up 26% of the total management ranks at INL. Minorities do not make up a significant part of the senior leadership at the ten Science national laboratories. The DOE laboratory contractors are required to provide diversity plans on an annual basis. The plans address workforce diversity and results-oriented Equal Employment Opportunity and Affirmative Action programs. Recruitment of minorities into leadership positions is highly encouraged by DOE.

Q9. What are the levels of engagement with minority contractors/subcontractors doing business at Argonne and Fermi labs in Illinois and what are the levels of minority contractors/subcontractors doing business with all of the labs nationally?

A9. In FY2013, The Argonne National Laboratory subcontracted $21,175,086 to small, disadvantaged businesses, accounting for 7% of the lab's total subcontracting dollars. Additionally, the laboratory awarded $649,306 to large minority businesses. The Fermi National Accelerator Laboratory subcontracted $8,256,000 or 6.3% of total FY2013 spend to small disadvantaged businesses. Nationally, our labs typically meet or exceed their minority subcontracting goals.

Q10. What steps are needed in order to increase the levels of minority contractors/ subcontractors doing business with all of the national labs and what steps has the agency taken under your leadership?

A10. All of our labs re-negotiate their subcontracting goals on an annual basis. In addition to specific dollar and percentage goals, DOE requires that our laboratory contractors conduct outreach activities. At each of the national labs, outreach activities are recorded and submitted monthly to DOE. These various outreach activities include, but are not limited to: attending business/ minority related conferences hosted by DOE and other agencies, holding one-on-one networking activities, maintaining websites disclosing subcontracting opportunities, and maintaining relationships through a mentor-protégé program. Additionally, each of DOE's lab contractors has a small business program manager that is focused on subcontracting opportunities for various socio-economic groups.

The Office of Small and Disadvantaged Business Utilization (OSDBU)is focused on assisting the Department to achieve its statutory goals for small disadvantaged (SDB), women-owned (WOSB), HUBZone and service-disabled veteran owned (SDVOSB) small businesses. In FY2013 the Department achieved the following results for prime and subcontracting awards: SDB ($2 billion), WOSB ($1.7 billion), HUBZone ($.4 billion) and SDVOSB ($.3 billion).

The OSDBU is providing outreach opportunities for small businesses and minority contractors specifically to engage the Department of Energy. The objective of the outreach events is to assist small businesses in navigating the Department's procurement process, identify upcoming contract opportunities and connect small businesses with the

appropriate staff to build meaningful relationships. The OSDBU has recently hosted women-owned, HUBZone and service-disabled veteran owned small business events in Washington, DC. In addition, the OSDBU is participating with the following minority-related organizations in webinars or as conference participants to increase awareness of contract opportunities: Women Impacting Public Policy, Women Construction owners and Executives, US Women's Chamber of Commerce, Women's Business Enterprise National Council, National Center for American Indian Enterprise Development, Greater Washington Hispanic Chamber of Commerce, led breakout session at the 2014 National 8(a) Association Winter Conference, US Pan Asian American Chamber of Commerce, US Black Chamber of Commerce and the Minority Business Development Agency. In FY2013, the OSDBU participated in over 50 outreach events in addition to the national labs' outreach activities. The OSDBU is hosting our 13th Annual Small Business Forum & Expo in Tampa, FL on June 10th through June 12th. This event is being actively marketed with the aforementioned organizations and other small business stakeholders.

Q11. How well are the Management and Operations (M&O) Contractors adhering to the diversity clauses in their contracts and what steps are needed to improve this record?

A11. All of our lab M&O contractors adhere to the diversity clauses in their contracts by submitting annual diversity plans. The plans focus on promoting diversity and must address: 1) the contractor's work force, 2) educational outreach, 3) community involvement and outreach, 4) subcontracting, 5) economic development (including technology transfer), and 6) the prevention of profiling based on race or national origin.

Q12. What are the levels of participation for minority business and minority-serving institutions in research and development and technology transfer at the national labs and what steps are needed to increase these types of partnerships?

A12. DOE Headquarters currently does not collect the level of participation by business and minority-serving institutions engaged in the DOE laboratories' Work for Others (WFO), Cooperative Research and Development Agreements (CRADAs), Agreements for Commercializing Technology (ACTs) and other technology transfer mechanisms. We are in the process of collecting this information and will report back to the committee separately.

Some specific examples of actions that are being taken to increase these types of partnerships follow.

The INL participates with minority/small businesses through technology licensing and CRADAs. From FY 2012 - FY 2014, the INL executed new license agreements with 30 minority/small businesses. Additionally, from FY 2012 – FY 2014, the INL completed cooperative research under the WFO and CRADA programs with 23 minority/small businesses.

The INL continually seeks licensing and research with minority/small businesses; however some limitations include the DOE requirement for full cost recovery, which smaller businesses have fewer resources to cover. When possible, the INL seeks and supports research and development through the DOE Small Business Innovation Research and Small Business Technology Transfer programs.

As an applied science laboratory, the NREL engages many small businesses in research, development, demonstration and deployment activities. The Laboratory engages these companies through several different agreement forms, including subcontracts, WFO, and CRADAs. Of the seven companies that have been recruited into NREL's mentor protégé program, four are research and development companies. Recently, DOE approved a new pilot program, Agreements for Commercializing Technology (ACT), designed to allow the labs to enter into more industry-like agreements. Continued use of new and innovative programs, which allow small businesses to access the DOE labs more easily, will increase these types of cooperative relationships.

Savannah River National Laboratory (SRNL) has been working with colleges (such as Georgia Tech) to recruit minority graduates, as well as advertising in journals targeted at minority scientists. Also, SRNL is anticipating having 7 minority interns this summer from historically black colleges and universities which have received grants from DOE.

QUESTION FROM REPRESENTATIVE JOHN BARROW

Q1. As you know, the Strategic Petroleum Reserve ("SPR") was established pursuant to the Energy Policy and Conservation Act to store crude oil that could be deployed in an emergency to minimize the impact of petroleum supply disruptions. In 2000, a separate Northeast Heating Oil Reserve was established solely to address disruptions for that product, and the Reserve was placed strategically in the region of the country most dependent on that fuel. What do you think about establishing a reserve of refined products like gasoline?

A1. As part of the Obama Administration's response to Superstorm Sandy, the Secretary of Energy, Ernest Moniz, announced on May 2, 2014, the creation of a one million barrel refined petroleum product reserve containing gasoline to be located in the Northeast. The new reserve complements the Northeast Home Heating Oil Reserve (NEHHOR), a one million barrel supply of diesel for the Northeast. Emergency withdrawals from NEHHOR were used for the first time in response to Superstorm Sandy to supply first responders and emergency generators in the region.