Statement of Dr. Ernest J. Moniz
Secretary of Energy
Before the
Subcommittee on Environment and the Economy
Energy and Commerce Committee
U.S. House of Representatives
July 31, 2013

Chairman Shimkus, Ranking Member Tonko, and members of the Subcommittee thank you for inviting me to talk about the Administration's strategy and activities to fulfill its obligations to manage and dispose of used nuclear fuel and high-level radioactive waste.

The United States, like all countries, faces challenges associated with ensuring its people have access to affordable, abundant, and environmentally friendly sources of energy. President Obama has made climate change mitigation a priority and set a goal of reducing emissions in the range of 17 percent below 2005 levels by 2020. The promise of nuclear power is clear. Electricity generation emits more carbon dioxide in the United States than transportation or industry, and nuclear power is already the largest source of carbon-free electricity in this country. Nuclear power has an important role in President Obama's all-of-the-above approach to energy, and will play a significant part in reducing carbon pollution under the President's Climate Action Plan. As the President noted in Korea last spring, "in the United States, we've restarted our nuclear industry as part of a comprehensive strategy to develop every energy source." This includes providing conditional commitments to loan guarantees to support the first commercial reactors licensed and built in the U.S. in three decades. Currently, we have five new commercial nuclear reactors under construction, including four AP1000 reactors, with passively safe features. The Department of Energy (DOE) is also helping accelerate the commercialization of first generation of Small Modular Reactors (SMR) through a cost shared program with industry. We believe SMRs will be part of the future model of nuclear energy worldwide, where both SMRs and gigawatt-class reactors are deployed depending on the requirements.

Nuclear power has reliably and economically contributed almost 20 percent of electrical generation in the U.S. over the past two decades. It remains the United States' single largest contributor (more than 60 percent) of non-greenhouse-gas-emitting electric power generation. We believe that nuclear energy will continue to be an important part of the Nation's low carbon future.

Any workable solution for the final disposition of used fuel and nuclear waste must be based not only on sound science but also on achieving public acceptance at the local and state/tribal levels. When this Administration took office, the timeline for opening Yucca Mountain had already been pushed back by two decades, stalled by public protest and legal opposition, with no end in

sight. It was clear that the stalemate could continue indefinitely. Rather than continuing to spend billions of dollars more on a project that faces such strong opposition, the Administration believes a pathway similar to that the Blue Ribbon Commission laid out — a consent-based solution for the long term management of our used fuel and nuclear waste — is one that meets the country's national and energy security needs, has the potential to gain the necessary public acceptance, and can scale to accommodate the increased needs of a future that includes expanded nuclear power deployment.

The Administration's *Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste* provides a basis for discussions between the Administration and Congress on a path forward for disposal of nuclear waste and provides near-term actions to be implemented by the Department of Energy pending enactment of new legislation. We are facing a unique opportunity to address the needs of the back-end of the nuclear fuel cycle by setting it on a sustainable path and providing the flexibility needed to engage potential host communities and anticipate advancements in technology development. I appear before this committee today to reinforce that the Administration is ready and willing to engage with both chambers of Congress to move forward.

Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste

Finding a solution to managing and disposing the nation's high-level radioactive waste and used nuclear fuel is a long-standing challenge. Such a solution, however, is necessary to assure the future viability of an important carbon-free energy supply and further strengthen America's standing as a global leader on issues of nuclear safety and nonproliferation.

In FY 2010, Secretary Chu, at the direction of President Obama, established the Blue Ribbon Commission on America's Nuclear Future (BRC, or the Commission) composed of representatives from government, labor, academia and industry. The charter charged the Commission with conducting a "comprehensive review of policies for managing the back end of the nuclear fuel cycle, including all alternatives for the storage, processing, and disposal of civilian and defense used nuclear fuel, high-level waste, and materials derived from nuclear activities… [and to] provide advice, evaluate alternatives, and make recommendations for a new plan to address these issues." The Commission issued its final report on January 26, 2012.

In January 2013, the Administration released its *Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste*, which endorses key principles of the Commission's report. The *Strategy* lays out plans to implement, with the appropriate authorizations from Congress, a long-term program that begins operations of a pilot interim storage facility, advances toward the siting and licensing of a larger interim storage facility, and

makes demonstrable progress on the siting and characterization of repository sites to facilitate the availability of a geologic repository. It is important to stress that neither the BRC recommendations, nor the Administration's *Strategy*, make recommendations on siting of such storage facilities or repositories.

As noted, the Administration's *Strategy* endorsed the concept of the development of three different, but intimately related, facilities. While the *Strategy* indicates one of each of three separate facilities, it is conceivable, as the result of a consent-based siting process, that some or all of these facilities could be co-located and/or more than one of each type could be constructed.

Consolidated interim storage is a critical component of an overall used fuel and waste management system and offers a number of benefits. As outlined in the *Strategy*, it offers an opportunity to remove fuel from shutdown reactors – places where in many cases removal of used fuel is one of the last steps to releasing the site for other uses. There are now twelve such sites. In addition, a consolidated interim storage facility could enable the Federal government to begin meeting its waste acceptance obligations sooner and ultimately reduce the government's liabilities caused by its delay in meeting its obligations. These liabilities are currently projected to be as much as $23 billion over the next 50 years, assuming waste pick-up begins in 2020. Also, a consolidated interim storage facility or facilities would provide additional capability to receive spent fuel in emergency situations. It would allow for repository designs for waste emplacement after a sustained cooling period. Finally, an interim storage facility would also support the repository by providing a buffer for disposal operations and flexiblity for the system as a whole, even potentially providing the capability to package waste for disposal prior to shipment to the repository. The BRC recommended that the interim storage facility include facilities to monitor and characterize waste packages over time and to have or develop the capability for making sure that the waste meets transportation criteria over time. In short, the BRC viewed a storage strategy as important, independent of the siting and timing of geologic repositories.

The Administration supports the development of a pilot interim storage facility with an initial focus on accepting used nuclear fuel from shut-down reactor sites. Acceptance of used nuclear fuel from shut-down reactors provides a unique opportunity to build and demonstrate the capability to safely transport and store used nuclear fuel, and therefore to make progress on demonstrating the federal commitment to addressing the used nuclear fuel issue. A pilot would also build trust among stakeholders with regard to the consent-based siting process and commitments made with a host community for the facility itself, with jurisdictions along transportation routes, and with communities currently hosting at-reactor storage facilities. There are reports that a number of communities are exploring the possibility of hosting a consolidated storage facility.

Beyond a pilot-scale facility, the Administration supports the development of a larger consolidated interim storage facility with greater capacity and capabilities that will provide flexibility in operation of the transportation system and disposal facilities. A larger-scale facility could take possession of sufficient quantities of used nuclear fuel to make progress on the reduction of long-term contractual liabilities, and could also accept defense wastes. In parallel, as supported in the Administration's *Strategy* and recommended by the BRC, DOE has initiated an analysis of the pros and cons of commingling civilian and defense waste.

The rationale for deploying interim storage in no way minimizes the need for a permanent disposal capability, and the Administration is committed to advancing development of both interim storage and geologic disposal facilities in parallel, even though they may become operational at different times. The development of geologic disposal capacity is currently the most cost-effective way of permanently disposing of used nuclear fuel and high-level radioactive waste while minimizing the burden on future generations. The Administration agrees with the BRC that linkage between storage and disposal is critical to maintaining confidence in the overall system. Therefore, efforts to implement storage capabilities within the next 10 years will be accompanied by actions to engage in a consent-based siting process and initiate preliminary site investigations for a geologic repository.

No matter how many facilities or what specific form they take, a consent-based approach to siting is critical to success. The Administration supports working with Congress to develop a consent-based process that is transparent, adaptive, and technically sound. The BRC emphasized that flexibility, patience, responsiveness and a heavy emphasis on consultation and cooperation will all be necessary in the siting process and in all aspects of implementation. Experiences in other countries indicate that a consent-based process – if developed through engagement with states, tribes, local governments, key stakeholders, and the public – can be successful. For example, Sweden and Finland have successfully executed programs to select a site among multiple volunteer communities. Others such as France, Switzerland, and Canada, have programs underway that appear to be demonstrating some success. DOE is currently evaluating critical success factors in the siting of nuclear facilities in the U.S. and abroad to facilitate the development of a siting process.

The *Strategy* highlights the need for a new waste management and disposal organization to provide the stability, focus, and credibility to build public trust and confidence. Again, there are multiple models that exist along a continuum from a government program to federal corporations – entities that report to a cabinet secretary and those that have their own board of directors that report independently to the President. Whatever form the new entity takes, organizational stability, an *appropriate* level of autonomy, leadership continuity, oversight and accountability, and public credibility are critical attributes for future success. Further, the authorities and responsibilities of the new organization are more important than the specific form. The

Administration will work with Congress to ensure that the authorization of any new body established for this purpose provides adequate authority and leadership as well as appropriate oversight and controls.

The Administration also recognizes that providing predictable funding is critical to the success of the nuclear waste mission. The *Strategy* and the FY 2014 President's Budget propose a funding approach that contains three critical elements: discretionary appropriations within existing spending caps to pay for program management and administrative support costs; legislative reclassification of annual fee income from mandatory to discretionary or a direct mandatory appropriation to make dedicated funds available in sufficient amounts for multi-year projects and program activities without competing with other government priorities; and eventual access to the existing balance of the Nuclear Waste Fund in the Treasury.

Full implementation of this program will require legislation to enable the timely deployment of the system elements noted above, independent of the process to site storage and disposal facilities using a consent-based approach. The Administration supports the goal of the Nuclear Waste Administration Act of 2013 recently introduced in the Senate to establish a new, workable, long-term solution for nuclear waste management and looks forward to working with Congress to move forward on this important national issue. The constructive efforts and dedication of Senators Wyden, Murkowski, Feinstein and Alexander are deeply appreciated. In the meantime, the Administration, through the Energy Department's Office of Nuclear Energy, is undertaking activities consistent with existing Congressional authorizations and appropriations to plan for the eventual transportation, storage, and disposal of used nuclear fuel.

Ongoing Activities

Since the closure of the Yucca Mountain Project in 2010, the Department of Energy has continued activities related to the management and disposal of used nuclear fuel and high-level radioactive waste as part of its Fuel Cycle Research and Development program. Initial activities were outlined in DOE's *Nuclear Energy Research and Development Roadmap,* sent to the Congress in 2010, and included research into the performance of high burn-up used fuel in storage, among other activities. The roadmap noted the establishment of the Blue Ribbon Commission on America's Nuclear Future and acknowledged that all research and development activities and plans outlined would be revisited and revised as needed to reflect the Commission's findings and associated Administration decisions while, at the same time, remaining consistent with existing statutes.

In December 2011, the President signed the Consolidated Appropriations Act of 2012, which provided $60 million in funding for used fuel management and disposal activities. Specifically, the Joint Explanatory Statement accompanying the bill provided that DOE should build upon its current knowledge base to fully understand all repository media and storage options and their

comparative advantages and expand its capabilities for assessing issues related to storage of spent fuel.

In its final report in January 2012, the Blue Ribbon Commission noted the need for near-term actions that can lay the groundwork for the next generation of nuclear waste policies and programs. For the most part, these near-term activities identified by the BRC were encompassed in activities already being undertaken by the Department. It included in its recommendations:

- Continuation of a research effort in used fuel and storage system degradation phenomena, vulnerability to sabotage and terrorism, and others.
- Moving forward with geologic disposal through valuable, non-site specific activities, including R&D on geological media, work to design improved engineered barriers, and work on the disposal requirements for advanced fuel cycles.
- Development of a research, development, and demonstration plan and roadmap for taking the borehole disposal concept to the point of a licensed demonstration.
- Performance of system analyses and design studies needed to better integrate storage into the waste management system, including standardization of dry cask storage systems and development of a conceptual design for a flexible federal spent fuel storage facility.
- Development of a database to capture the experience and knowledge gained from previous efforts to site nuclear waste facilities in the United States and abroad.
- Completion of policies and procedures for providing technical assistance funds to states, tribes, and local jurisdictions which are likely to be traversed by transportation shipments.

The Administration's *Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste* recognized the ongoing research and development, analytical and planning activities already underway and endorsed them as laying the groundwork for implementation of the *Strategy*. DOE is currently undertaking activities to address these recommendations. For example, DOE is working with industry to conduct R&D (lab, field, and modeling) to further develop the technical basis for continued safe storage. Specifically, a key element of the storage R&D is to implement, on a cost-sharing basis with industry, a full scale storage demonstration project focused on getting field information on the long term storage of high burn-up fuel. This demonstration project was awarded in April.

DOE is also working to analyze the characteristics of various geologic media that are potentially appropriate for disposal of radioactive waste. This research will help provide a sound technical basis for a repository in various geologic media, and will help provide confidence in whatever future decisions are made. To leverage expertise and minimize costs, DOE is taking advantage of existing analyses conducted by other countries that have studied similar issues.

With regard to borehole disposal, DOE is developing a draft plan and roadmap for a deep borehole project. The project would evaluate the safety, capacity, and feasibility of the deep borehole disposal concept for the long-term isolation of nuclear waste. It would serve as a proof of principle, but would not involve the disposal of actual waste. The project would evaluate the feasibility of characterizing and engineering deep boreholes, evaluate processes and operations for safe waste emplacement and evaluate geologic controls over waste stability.

In FY 2012, DOE initiated system-level analyses for the overall interface between at-reactor consolidated storage and geologic disposal and the opportunities for use of standardized canisters, including the development of supporting logistic simulation tools to better understand aging of fuel and loading requirements. In addition, DOE acquired services of the industry to develop design concepts for a generic interim storage facility and in FY 2013 is evaluating their submissions.

A database on experiences with siting radioactive materials facilities both in the U.S. and abroad has been developed that will be a public resource and will inform the planning process. A report on the findings of the initial studies and an examination of case studies in the database of siting experience is being prepared and will be available this summer.

For transportation planning and engagement with stakeholders, DOE has convened a Working Group comprised of Federal, State, and Tribal governmental representatives to address training-related issues and develop a revised policy for preparing public safety officials along proposed transportation routes, as required by Section 180(c) of the Nuclear Waste Policy Act. The Working Group will analyze and, when possible, make recommendations on specific issues related to Section 180(c) policy and implementation.

The Department has also initiated studies to evaluate whether defense and commercial wastes should be "commingled" in a single repository. While it has been the U.S. policy since 1985 to commingle these wastes, the *Strategy* stated that the commingling of these waste would be the subject of analysis going forward, consistent with the urging of the BRC.

The President's Fiscal Year 2014 Budget Request

The President's FY 2014 budget request includes a multi-part proposal to move ahead with developing the nation's used nuclear fuel and high-level waste management system outlined in the Administration's *Strategy*. First, it lays out a comprehensive funding reform proposal that includes three elements. Ongoing discretionary appropriations within existing funding caps are included to pay for planning, management, and regulatory activities. . In addition, the proposal includes reclassification of existing annual fees from mandatory to discretionary or a direct mandatory appropriation, and eventual access to the balance of the nuclear waste fund. Included

in the amounts that would be made available under this proposal are defense funds to pay for the management and disposal of government-owned wastes within the overall system. These elements, in combination with anticipated offsets result in relatively modest pay-as-you-go cost of about $1.3 billion. Significantly, the Administration proposes $5.6 billion in spending to implement the *Strategy* over the next 10 years within the framework of this funding proposal.

Second, for the first time, the budget baseline reflects a more complete estimate of potential future costs of the liability associated with continuing to pay utilities based on the Government's liability for partially breaching its contract to dispose of used nuclear fuel. The cost of the Government's growing liability for partial breach of contracts with nuclear utilities is paid from the Judgment Fund of the U.S. Government. While payments are extensively reviewed by Department of Energy, and must be authorized by the Attorney General prior to disbursement by the Department of the Treasury, as mandatory spending they are not subject to Office of Management and Budget or Congressional approval. Previously, judgments were recorded in the budget largely after the fact, but until now the budget has included only a partial estimate of the potential future cost of continued insufficient action. To improve budget projections, the baseline for the Judgment Fund in the FY 2014 budget request reflects a more complete estimate of potential future cost of these liabilities. By reflecting a more complete estimate of the liability payments in the baseline, costs over the life of the nuclear waste management and disposal program would eventually be offset (for the purposes of scoring against the baseline) by reductions in liabilities as the Government begins to pick up sufficient waste from commercial sites.

Third, the President's budget includes funding for the Environmental Protection Agency (EPA) to begin the review and update of generic (non-site specific) disposal standards to help guide the siting of used fuel and high-level waste facilities. Current EPA standards for all sites other than Yucca Mountain are defined in 40 CFR Part 191, "Environmental Radiation Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes," and were last updated in 1993. The Administration agrees with the BRC that generally applicable regulations are more likely to earn public confidence than site-specific standards. In addition, having an updated generic standard will support the efficient consideration and examination of multiple sites.

Finally, in FY 2014, DOE's Office of Nuclear Energy will support the *Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Waste* by funding activities to lay the ground work for the design of an integrated waste management system as well as related research and development work. Specifically, in the used nuclear fuel research and development area, the Department will work with industry on conducting investigations into the extended storage of used nuclear fuel and the transport of such fuel under a range of cask loadings. In addition, ongoing research into alternative disposal environments, including modeling,

experiments, and field tests will be continued. Finally, the Used Fuel Disposition program will undertake R&D activities to further the understanding of hydro-geochemical, physical geology, structural geology, geophysical state and engineering properties of deep crystalline rocks for deep borehole disposal.

In the management and disposal system design area, DOE will conduct system architecture and operating evaluations of various used fuel management systems, including consolidated and/or regional storage facilities, various repackaging scenarios and acceptance rates. DOE will also update transportation and storage system models, and develop cost databases. Further, DOE will conduct analyses for initial used fuel shipments from shutdown reactor sites including staffing, routing, procurement, operations, security, quality assurance, emergency response, training, logistics, site servicing, mobilization, operational readiness, and site servicing schedules. Work will also continue on an evaluation of standardized containers for storage, transportation, and potentially disposal. Outreach activities to stakeholders on transportation planning will also continue. When the new management organization is established in legislation, it will be able take over many of these activities.

Closing

The Administration looks forward to working with this Committee and other Members of Congress on crafting a path forward for used nuclear fuel and high-level waste management and disposal. This progress is critical to assure that the benefits of nuclear power are available to current and future generations. I will be happy to answer any questions you may have.