Nuclear Energy Advisory Committee Public Meeting April 30, 2024 Microsoft Teams

Committee Members Participating:

Lake Barrett J'Tia Hart William (Bill) Magwood, IV, Chair Raluca Scarlat Stu Bressler Temitope Taiwo Maria Korsnick Kemal Pasamehmetoglu Sonja Schmid Richard Arnold

Other Participants:

- Tracey Bishop, Deputy Assistant Secretary for Nuclear Infrastructure Programs, USDOE
- Alice Caponiti, Deputy Assistant Secretary for Strategic Crosscuts, USDOE
- Mike Goff, Principal Deputy Assistant Secretary, Office of Nuclear Energy, USDOE
- Sal Golub, Associate Deputy Assistant Secretary for Nuclear Fuel Cycle, Office of Nuclear Energy, USDOE
- Kathryn (Katy) Huff, Assistant Secretary, Office of Nuclear Energy, USDOE
- Rory Stanley, Chief of Staff, Office of Nuclear Energy, USDOE
- John Krohn, Deputy Chief of Staff, Office of Nuclear Energy, USDOE
- Krystal D. Milam, Special Assistant, Office of Nuclear Energy, USDOE & Designated Federal Officer, NEAC
- Kimberly (Kim) Petry, Acting Deputy Assistant Secretary for Spent Fuel and Waste Disposition, Office of Nuclear Energy, USDOE
- Robert Rova, Office of Nuclear Fuel Cycle and Supply Chain, Office of Nuclear Energy, USDOE
- and Alternate Designated Federal Officer, NEAC
- Hally Ramirez, NEAC Support Staff, Allegheny Science and Technology
- Jon Carmack, Deputy Assistant Secretary for the Nuclear Fuel Cycle, USDOE
- Frances Chandler, Senior Executive Assistant, USDOE
- Sarah Chilton Senior Advisor, Office of Nuclear Energy, USDOE
- Cheryl Moss-Herman, Senior Policy Advisor, Office of Nuclear Energy, USDOE
- Melinda Higgins, Director of STEM Programs, Office of Nuclear Energy, USDOE
- Dennis Miotla, Chief Operating Officer, Office of Nuclear Energy, USDOE
- Billy Valderrama, Associate Deputy Assistant Secretary, for International Nuclear Energy Policy and Cooperation, Office of Nuclear Energy, USDOE
- Paul Murray, Deputy Assistant Secretary for Spent Fuel & High Level Waste Disposition, Office of Nuclear Energy, USDOE
- Brian Smith, Acting Deputy Assistant Secretary for Nuclear Reactors, Office of Nuclear Energy, USDOE

Welcome and Opening Remarks - Dr. Kathryn Huff & Hon. William Magwood

Office of Nuclear Energy Update - Dr. Kathryn Huff

- NE Reorganization Update (See Chart)
 - Highlights Include:
 - Creation of Office of Strategic Crosscuts, NE-7
 - Office of External Innovation, NE-71
 - Office of Crosscutting Capabilities, NE-72
 - Rescoping Office of Nuclear Reactors, NE-5
 - Office of Reactor Sustainability, NE-51
 - Office of Advanced Reactors, NE-52

- Retitling of NE-4
 - Office of Fuel Supply Technologies, NE-41 (New Office)
- Retitling of NE-8, Retitling of NE-32 & Retitling of NE-6
- Separation of NE-82 to create to separate offices
 - Office of Storage and Transportation, NE-82
 - Office of Consent-Based Siting, NE-83
- NE FY25 Budget
 - 2024 and 2025 budget requests and appropriations were reviewed (see chart)
 - Highlights Include:
 - Overall NE Budget: Decreased by 6% (\$94M) from FY 2024.
 - HALEU Production: Request: \$150M Increase: +\$50M
 - Purpose: Continue near-term production from DOE uranium inventories and enrichment facility in Piketon, Ohio.
 - Advanced Materials & Manufacturing Technologies: \$23M
 - Increase: +\$12.4M
 - Purpose: Support advanced reactor designs and deployment.
 - Includes: \$6M for advanced reactor supply chain issues.
 - ARDP Risk Reduction for Future Demonstration Awards:
 - Request: \$142.5M Increase: +\$5.3M
 - University and Competitive Research Programs:
 - Request: \$143M Increase: +\$3.4M
 - Purpose: Fund university reactor fuel procurement and disposition, R&D projects, scholarships, and fellowships.
 - Clean-Energy Reactor Deployment Support:
 - Request: \$8M Increase: +\$4.7M
 - Purpose: Support deployment of U.S. technology clean-energy reactors in Africa, Asia, and Eastern Europe.
 - The NE Budget proposes <u>six</u> new budget lines to provide enhanced visibility and clarity for ongoing Nuclear Energy activities and the Department's crosscutting R&D efforts.
 - 1. Advanced Sensors and Instrumentation (ASI)
 - 2. GAIN
 - 3. INEC
 - 4. Advanced Materials and Manufacturing Technologies & NEET
 - 5. Next Generation Fuels (Fuel Cycle R&D)
 - 6. Integrated Energy Systems (Reactor Concepts RD&D)
- Nuclear Energy R&D Program <u>Planned Accomplishments for 2025</u>
 - Dr. Kathryn Huff "So, there was no real void to fill those dollars didn't really exist and their absence didn't create any new room however that \$800 million that I mentioned earlier was part of the repurposing of the civil nuclear credit program went to fuel. Part of it went to a university program \$100 million part of it went to an infrastructure program \$100 million, and part of the \$800 million will go OSED for a light water reactor SMR demonstration program. So, if you're looking if you're a SMR developer I mean you're not obviously you're at ARGON but you have friends who are smart developers the whole text that etcetera AP1000, AP300 it's you know the list new scale all of those would be likely eligible for the program that has been proposed by congress with that 800 million dollars. One more sort of thing just to flag is the budget lines that we choose have a couple of features enhance kind of the visibility of certain programs and help to clarify something. We made them appropriately and categorizing them right there are 6 new line items in this particular budget request we request for example that international cooperation the last one be its own line item. It's possible this will not occur but making this request is important to us because otherwise it's funded out of the program direction

which is the same bucket from plants we fund like federal salaries and things of this nature so that be quite constrained. There are a few others here - reactor concepts who's like IDE nuclear energy enabling technology is advanced sensors and GAIN probably. What's going on in terms of playing the accomplishments? So, in the active concepts there's this sort of just general continued interest in conducting RD on abstractive technology it in 2025 we do want to conduct research to support the existing fleet that includes things like more improvements and automations associated with artificial intelligence and machine learning technologies to the extent that we can use those to enhance plans planning performance or reduce the cost of operations. We want to complete the fabrication of fuel and components for marvel the test reactor that's being built out of Idaho as soon as we're done those fondly fill and component manufacturing items. We're really on track to kind of turn on that reactor pretty soon. For example, we're developing and testing thermal distribution components and systems for a number of heat transfer fluids necessary so that we can do systems modeling and design for various integrated energy systems within this program so these are just some highlights. There's a lot going on facility they are producing HALEU they produce over 100 kilograms as well. We want to focus on high-risk high reward concepts and longer-term projects. Consultations with communities and States and tribes around of course concept residing at federal consolidated interim storage you know all of the work within our used nuclear fuel disposition R&D and our integrated lease management program, and our consent based citing work all of that is within our 2025 fuel cycle R&D budget and goals but it of course lives in NE –8. ARDP is of course is a key component of all of this but our reactor space includes things like construction of the dome test bed out there in Idaho the former ER 2 containment structure is getting ready to start being used for demonstration. Launch MSTEC-salt reactor. Continue RnD and working on reactors MSRS the fibrous production awards that we already made in 2020 as I said will continue along their proposed project plan budget profiles. Will continue to coordinate with industry in the NRC to work on technology gaps associated with refractive regulation. That includes things like our advanced nuclear energy cost share grant programs. So, the idea here is we're interested in seeing some opportunities to help with cost share for advanced clear energy activities. LOTUS that's being built in the zipper cell out there at Idaho is another one of these test beds for micro activities."

- o Infrastructure
 - Idaho Wet Lab
 - Maintaining ATR and MFC , including repair and replacement of end-of-life components and systems
 - Initiate preliminary conceptual designs for modernizing end-of-life fuel research and development capabilities.
 - Continue regulatory compliance program management, including meeting INL Site Treatment Plan milestones.
- International Nuclear Energy Cooperation
 - Support FEED studies for U.S. nuclear projects in foreign markets and continue nuclear safety efforts in Armenia and Ukraine. Deploy Clean Energy Training Centers and increase technical presence through bilateral cooperation, especially in Eastern Europe, Southeast Asia, and the Americas. Leverage U.S. experts in international organizations to advance U.S. nuclear interests.
 - <u>Dr. Kathryn Huff</u> "We'll discuss even more but Alicia's team has so much more work than they could conceivably do and we collectively are constantly out in the world I just got back from Japan and India you know Mike & Alicia are traveling all over the planet and her team are constantly traveling all over the planet because everyone in the world has such incredible interest in NE. New nuclear and fuels associated with existing nuclear and a million other things for a number of reasons. Employment support markets are needed there are more countries wanting feed studies and what not than we can possibly support and while we rely on the USDA and others as was alluded to already to support some of those studies, that start the commercial relationship between some existing reactor vendor in in American technology space

and some future buyer in some you know foreign market those feed studies you know need federal help in a lot of cases we will try to support some of those in 2025. If there were more dollars, we would be able to support more such activities. We have had like over a decade of work on the nuclear safety and reactors in Armenia and Ukraine this of course includes significant emergency support regarding the ongoing hostilities in Ukraine. While most of the reactors in Ukraine are continuing to operate and actually represent massive fraction of the continuing to operate power in Ukraine where a lot of thermal plants and renewables have been disconnected from the grid through either attacks on the transmission systems or the thermal plants themselves. Many of the reactors are continuing to operate. We do really have a lot of work that we have been doing to make sure that those reactors are operating in a safe environment and have all the all the safety support that they need from the US government. It's taking a little while but as of just a couple of weeks ago they're finally all fully in we continue to deploy clean energy training centers in a number of different nations the most recent one we opened up it's in Poland. (so Mike was there)"

- Question: Maybe you'll get to it but I was curious to learn more about the workforce capacity building?
- Answer: <u>Dr. Kathryn Huff</u> "Alright well that's Alicia Duncan does work in this area and so I wanted to highlight her if she was here but ultimately things like our clean energy training centers. The idea here is that we want to make sure that there's like a sort of single clearing house for the US government and US industry to share information with nuclear newcomer countries in a specific region like for example Poland. But they don't have a regulator. They don't have I mean they have a regulator with that like for commercial scale and their power their regulators were focused on instructors' regulatory capacity, building industry, capacity building finance etcetera can all be shared through workshops, and you know valid sharing under a single umbrella. So those clean energy training centers are the kinds of things that we as a government can set up but even beyond that workforce capacity building. Includes things like our contributions to the IEA. Which supports things like the Lisa Minor fellowship program and other you know scholarships associated with the increase of workforce across the world in nuclear people."
- Thanks to Alice for expanding NE –5 over the years and the hard work put in. Great accomplishments coming soon.
- Question: Can you elaborate on Ukraine?
- Answer: Dr. Kathryn Huff "We assigned a whole person John Krohn. He went to Ukraine a 0 couple times to sort of be a parent post when we needed it. Putting a whole person on detail in Ukraine I think it was very helpful. We have of course in the international cooperation office have real leadership from Damian Pico and others who've been collaborating with ARGON National Lab and other national laboratories. It ensures deliveries on the ground and real you know equipment and fuels and capabilities and whatnot to ensure the continued safe operation in the nuclear plants but from a sort of just broader perspective. On the status in Ukraine the most recent set of attacks on Ukraine have really devastated the energy system and continued to devastate the transmission system in particular in a way that will kind of continue to cause real problems until there's a clear field for rebuild. Even in the rebuild space and even with the Ukraine supplemental that's finally been passed the speed with which you can make Transformers fast enough to deploy them at the rate that they're being destroyed you know it's, it's pretty limited. So, we have real serious concerns about the continued stability of the energy system in Ukraine but the reactors have been the backbone of that energy system and you can see it and the leadership's interest in identifying new nuclear reactors to build afterwords over once they're allowed and enabled to rebuild. Recently of course Westinghouse was there in

Ukraine you know committing to new nuclear there when it's time. HOLTEC and others have also associated with the Ukrainian.

- <u>Thoughts From John on Ukraine:</u> "The nuclear sector in Ukraine has been really pretty amazing and the one thing I wanted to add on that and this goes back to the workforce stuff through this all we have still maintained an internship program with Ukrainian students. ARGON has sponsored this for a number of years in fact we hosted a number of students that have been working on their graduate degrees in nuclear engineering last week here at the department and they gave their presentation and they give them presentations on assessing the new skills, safety systems looking at the HOLTEC, and dry cask storage systems. So, they have these students through all of this for still working on their degrees and still wanting to move forward on nuclear technology to be ready for that additional deployment. It's just been pretty astounding and how engaged they are in that as well so yeah hopefully they will still have a good strong future in the nuclear area and we're happy to be working with them."
- Westinghouse has provided alternative fuel for the Ukraine site. Significant success. Large step in decoupling from Russian supply chain. Happened on rapid time scale.
- Question: Can you address impact on global nuclear fuel supply?
- Dr. Kathryn Huff "... developed uranium strategy that had sort of two pillars 1 reducing our 0 Russian imports and the other expanding our conversion capabilities. The former requires either an act of Congress or an executive action and Russian uranium and the latter requires dollars to support capital investment. In the new version of the regiment capability in the United States Senate among our allies and to ensure you know a broader fuel supply chain we've stood up a pencil lateral cooperation between ourselves, UK, France, Japan, and Canada called SOBORO 5. It started in April last year (mike was there) with the secretary and a side meeting with the G5 countries that I just described to stand up for cooperation where we say you know -these are the countries that we trust to provide fuel and to be engaged in this sort of more robust fuel supply. What are we going to do to fix -the leadership of many many in this office and around the interagency ... We would identify and mobilize something like \$4.2 billion towards that increase in capital investment nuclear fuel supply worldwide. And the US government are gearing up to mobilize from the FY24 civil nuclear credit program repurposing and if you include the French, Indian, and British expansions in there you know state driven enrichment capabilities. If you include declarations by Japan to expand their enrichment capability and sort of continued commitment the Canadians to continue operating with finding and conversion capabilities, we're really, we're getting there very quickly and certainly hit our three-year goal within less than six months. It is absolutely necessary we will plan ahead and accept request for proposals that will support the expansion of brownish geranium enrichment capability in the United States very soon. To accompany our high asset low enriched uranium request for proposals from the 700 that existed in the inflation reduction act together those will help bolster private investment to stand up new conversion and enrichment capability in the US. It will take a few years during that time we may have to draw down some of our inventories, but it will need to be paired with some import restriction legislatively that money cannot be spent until there is such a restriction which can either be done by Congress by the administration.

Tribal Update - John Krohn

- Introduction:
 - John Krohn, Deputy Chief of Staff for the Office of Nuclear Energy, presenting on behalf of Lauren Rodman.
 - o The team includes Lauren Rodman & Melinda Higgins (Idaho)
 - Also includes Jay Jones former DOE employee now contractual support
- Team is dedicated to engaging our sovereign tribal partners

- Works with Fort Hall Business Council as well as the Idaho National Laboratory and tribes concerned with their homelands.
- NE intersects with two tribal working groups: NETWG and TRMTC.
- Overseeing cooperative agreements for tribal radioactive materials transportation.
- Provide training and create a best practices and resource guide for tribal engagement.
- Intentionally solicit tribal views for the siting of a consolidated interim storage facility for spent nuclear fuel.
- Participate in consultations with tribes, such as the Ute tribe, on uranium mining concerns.
- Discuss impacts of mining on water contamination, health, flora and fauna, and sacred lands.
- Tribal Consultations:
 - Notify all federally recognized tribes about new processes and listening sessions.
 - Conduct virtual and in-person listening sessions to solicit tribal comments.
 - Ensure convenient scheduling for tribal participation.
- Key Concerns from Tribes:
 - Address issues like health impacts, waste disposition plans, and advanced reactor safety.
- Goals:
 - At headquarters the primary goal is implementation, oversight and the interaction interception of programmatic responsibilities with tribal rights treaties, engagement and consultation. Focused on more direct engagement.
 - Maximize tribal attendance and reduce costs.
 - o Implement governmental reforms based on network members' priorities.
 - Expand the working group to include other interested tribal nations.
 - Ensure tribal nations are involved early in nuclear energy initiatives.
 - Implement and oversee programmatic responsibilities with tribal rights and treaties.
- Accomplishments:
 - o Development of a white paper on tribal and Alaskan native engagement for nuclear reactor siting.
 - Conducting successful listening sessions and consultations with tribal leaders.
 - Took over active management of the cooperative agreement previously overseen by the Office of Environmental Management.
 - Hiring of Lauren Rodman as a dedicated tribal liaison. Previously was Jay Jones but he had many responsibilities and was not solely focused or dedicated to tribal issues.
 - Ensure portfolio is moving and a positive direction in terms of the human resources that we've provided to it and the focus that we are glad to assist NETWG
- Initiatives
 - Incentivize the private sector to create a domestic HALEU supply chain to reduce reliance on foreign sources like Russia.
 - Engagement with tribal nations on HALEU supply chain development and waste disposition plans.
 - Including tribal views in the consent-based siting process for commercial spent nuclear fuel storage.
 - Providing training and resources for tribal engagement in nuclear energy projects.

Overview of NE nuclear waste activities Paul Murray

- Introduction
 - Worked on a large sodium reactor (630 MW thermal).
 - Responsible for reprocessing fuel.
 - Supported PNNL in designing, building, and commissioning the thermal oxide reprocessing plant at Sellafield.
 - Assisted Belgium with reprocessing efforts.
 - Only country not worked with on reprocessing: France.
 - Naval Experience: Focused on reactor and propulsion systems.
 - Move to the U.S. (1996):

- Supported technology transfer from the UK to the U.S. Department of Energy (DOE).
- Deployed large-scale technology at all DOE Environmental Management (EM) sites.
- Reprocessing Work in the U.S.
 - Focused on reprocessing in the U.S. and related plant reactors.
- Joined DOE to address waste issues.
- Stakeholders
 - Current Reactor Fleet:
 - Generates approximately 140,000 tons of spent nuclear fuel at the end of their operational lives.
 - High-Level Waste Management:
 - Savannah River Site
 - Hanford Site
 - West Valley Demonstration Project
 - Idaho National Laboratory
 - o Naval Reactors
 - o DOE Spent Nuclear Fuel
 - Advanced Reactor Spent Nuclear Fuel: New stakeholder in the management landscape due to emerging technologies and reactor types.
- Spent Nuclear Fuel
 - o Timeline:
 - Long History, over 60 years of history in nuclear waste management.
 - Initial Assumptions:
 - Early assumptions were made when the nuclear industry was young and growing.
 - These assumptions are no longer valid 50 years later.
 - Current Challenges:
 - Waste packages being loaded at utility sites were not originally anticipated.
 - Original waste acceptance criteria were not intended to be all-inclusive.
 - There are now waste packages and streams that were never envisioned at the start of the program.
 - Taxpayer Liability for Spent Nuclear Fuel Billions (see chart)
 - Context:
 - The United States began using commercial nuclear power in 1958.
 - As of 2023, 93 operating commercial reactors and 53 nuclear power plant sites operate in 28 states
 - 90,000 plus metric tons of spent nuclear fuel
 - 20 nuclear power plants have shut down
 - end of current fleet 140,000 metric tons of spent nuclear fuel (previously mentioned)
 - Waste Management for Advanced Reactors
 - NRC License Approach
 - Operators must be in good faith negotiations with DOE for an operating license.
 - An amended standard contract from DOE is required, stating DOE will accept the waste form into a future geological repository
 - Making technical assessments on fuel acceptance and treatment.
 - Repository only accepts spent nuclear fuel, not coolants, which may need treatment before disposal.
 - Assessing costs and responsibility for fuel treatment and disposal.
 - National Academy of Sciences conducted a relevant study, funded by DOE.
 - Critical for the ongoing program as Congress Energy will apply for their operating license in 2026.
 - Determination on TRISO fuel needed by later this summer.

- o 2038 Interim Storage Facility Plus 50 years to move the fuel and open depository
 - Operation 150 years
 - End of Project 2238
- Engagement: Working and meeting collaboration with DOE, EM, and NR.
 - None site specific program plan to consider options for management
 - SNF & HLW
 - Updating the waste acceptance criteria
 - DGR & DPC
 - R&D for storage of spent nuclear fuel next 5-7 years
 - UK, Belgium, Germany, Japan
- CBS Consortia not looking for site at this time
 - Looking to educate and engage around NE
 - CBS Monthly Updates (See Graphic)
 - Critical path to success...leads back to reducing taxpayer funds

Briefing on DOE SNF recycling R&D - Stephen Kung

- Material Recovery and Waste Forms Development (MRWFD)
 - Mission: Develop advanced fuel recycle technologies to improve resource utilization, reduce repository burden, limit proliferation risk and improve economics.
 - Use recycling technologies to produce HALEU materials for advanced reactor fuel-fabrication R&D needs.
 - Expand capabilities and knowledge for Nuclear Chemistry for broader range. International Collaboration on nuclear fuel cycles and applications.
 - Innovation & Recycling
 - Engagement with universities and national laboratories and small business' to develop efficient economic technology options
 - Managed by NE-43
 - Advanced Aqueous & Vapor Phase Separations
 - Tech Focus Areas:
 - Aqueous and Vapor Phase Separations
 - Pyroprocessing / Molten Salt Separations
 - Off-gas Capture and Immobilization
 - Adv. Waste Form Development
- Fuel Cycle
 - a) Mining & Milling
 - b) Conversion
 - c) Enrichment
 - d) Fuel Fabrication
 - e) Power Plant
 - f) Fuel Storage
 - g) Waste Disposal
 - Recycling encompasses the entire cycle. Recycling could provide economic and waste management benefits, while spurring domestic adoption of advanced reactor technologies making the U.S. more competitive in global market and advancing U.S. energy security and carbon reduction goals.
- Low Temperature Chemical Decladding:
 - Focus on LWR, Zr, and Al claddings.
 - Zr recovery and reuse, including 90Zr enrichment.
 - Mechanochemical methods to convert oxides to halides.
- National and Foreign Collaboration

- Aim to separate uranium for recycling into enrichment plants.
- Use advanced coordination methods for decladding and material separation.
- Initial box station for off-gas element removal to streamline waste processes.
- Focus on noble gases like Krypton for cost reduction.
- Parallel Processing:
 - Debundling of fuel assembly.
 - Advanced voloxidation for off-gas, reducing costs by 7%.
 - Fluoride volatility recovery of uranium with safeguards.
 - Simplification of decision-making steps in recycling technology.
- Waste Form and Off-gas Technologies:
 - Work with NE-8 to improve fuel cycle performance.
 - Aim for minimal processing and waste.
 - Development of processes to capture iodine, krypton, and carbon.
- Domestic Nuclear Material Safety Impact Program:
 - Develop tools and techniques for material accountancy and control.
 - Focus on back end and coordinate with material recovery and waste management.
 - Provide safeguard education and outreach to support industry and NRC.
 - Milestone: Safeguard and security by design demonstration for pyroprocessing technology by 2020.
 - Domestic safeguard performance model for recycling processes like PUREX.
- Budget:
 - o 2023: 45M
 - o **2024: 55M**
 - o 2025: 38.5M

Infrastructure Subcommittee Update - Stu Bresler

- Introduction
 - Stu Bresler from PJM Interconnection, a regional transmission organization approved by FERC, an agency under DOE.
 - PJM's primary responsibility: reliable operation and planning of the bulk power transmission grid, leveraging competitive markets to do so at the lowest reasonable cost.
 - Recognized early that infrastructure is a broad topic.
 - Interactions with areas like workforce development and innovations.
 - Received presentations on budget planning, daily loan programs, and more.
 - Clear that the clean energy transition and carbon reduction goals in the U.S. (stretching to 2050) require significant additional nuclear resources.
 - Recognizing the conflicting challenges and requirements in achieving these goals.
- Recommendations
 - o Mission Need
 - Focused Deployment
 - o Strategy
 - o Demo projects (short-term)
 - Materials, Construction,
 - Workforce (medium & long term)
 - Timescale strategies (medium & long-term)
 - HALEU prioritization
 - o Reprocessing and recycling
 - $\circ \quad \text{User Facility Models}$
 - Capability Metrics
 - Advanced Reactors Input

- Commercial deployment R&D
- Question: Does the grid need transformed is it supported?
 - Answer: Our responsibilities include not just operating the grid reliably but also planning to ensure that the grid will remain reliable in the future. Yes the grid needs enhancing. There's an ongoing debate around exactly how the transmission grid should be planned. There are some assertions out there about the need for interregional transfer capability. What's the right level of transfer capability to plan for? What's the cost benefit? Transmission investment is not cheap. There's all kinds of uncertainties around planning far into the future. Right now we're for the first time in a long time forecasting load growth on a significant scale. Need for all types of resources, including nuclear. Planning for the future grid is very difficult but the grid will require significant investment in the future.
 - Partnerships with DOE helpful
 - Our transmission owners are ready willing and able to invest as necessary in the grid as well.
 - Proliferation of intermittent resources is changing the needs of the grid both in terms of transmission planning and reliability services

Consent-based Siting of Spent Nuclear Fuel Update - Dr. J'Tia Hart

- Committee Goal:
 - Understand the current status of Nuclear Waste Management within NE.
- Key Contributors:
 - Former Senator Jeff Bingham (Nuclear Waste Administration Act)
 - Lisa Frizzel (Nuclear Waste Management)
- Consent-Based Siting (CBS) Process:
 - Requires iteration and stakeholder trust.
 - Move at the "speed of trust" determined by stakeholders.
- Funding Allocation:
 - Allocate resources for continuity and stakeholder engagement.
 - Advocate for collaboration between consortia partners with extended timelines and funding.
- Expanded Stakeholder Engagement:
 - Involve civil society organizations representing marginalized communities.
 - Facilitate access to expertise for these groups.
- Integrated Waste Management Strategy:
 - Expedite publication of a strategy with community awareness as a foundation.
- Focus on Near-Term Wins:
 - Achieve tangible results to demonstrate progress to the public.
 - Start with smaller, manageable projects rather than large-scale initiatives.
- Future Plans:
 - \circ $\;$ Review and revisit previous recommendations.
 - Consider creating an independent organization for waste management.
 - \circ $\;$ Examine partnerships for site governance and involve local stakeholders.
 - Continue developing recommendations with a focus on R&D and international collaboration.

Workforce of the Future Update Dr. Sonja Schmid

- Recommendations:
 - Share the Results
 - Broaden funding targets
 - Create new programs and strengthen existing four-year college and graduate programs.

- Improve diversity and inclusion efforts, targeting community colleges, trade schools, nontraditional students, and career changers.
- Support certificate programs, mentorship, and practical experience.
- Diversify the Content
- Future steps
 - Work with international subcommittee and infrastructure subcommittee
 - Learn more about tribal colleges
 - Interdisciplinary component importance

International Engagement Update William D. Magwood, IV

- Broaden Funding Targets:
 - Create new programs and strengthen existing ones at four-year colleges and graduate programs.
 - Improve diversity and inclusion, targeting community colleges, trade schools, non-traditional students, and career changers.
 - Support certificate programs, mentorship, and practical experience.
- Discussions with US Government:
 - Engaged with various agencies (Commerce, State Department) to understand the US government's posture on nuclear energy.
 - Observed a strong, unified stance on the importance of nuclear energy.
 - Highlighted the bipartisan support for nuclear energy, providing stability and continuity in policy.
- Challenges:
 - Agencies tend to stay within their lanes and lack a clear organizing mechanism for a strategic, unified approach.
 - Historical gap in sponsoring international students for advanced degrees, which was a powerful relationship-building tool.
- Strategic Observations:
 - US needs a strategic vision and policy-level discussion among agencies to achieve a coherent strategy.
 - Emphasized the importance of long-term relationship building, similar to competitors like Russia and China.
 - o Identified the need for better financial mechanisms to support international projects.
- Strategic Vision:
 - Create a high-level, coordinated strategic vision for international nuclear engagement.
 - Suggest a role similar to John Podesta's on climate, but for nuclear energy.
- Long-term and Short-term Focus:
 - Develop long-term relationships and engagement, not just immediate project opportunities.
 - Recognize the importance of nuclear technology in foreign policy.
- US Solution for Fuel Supply:
 - Address both front-end and back-end supply challenges.
 - Consider domestic and international aspects of fuel supply to enhance competitiveness.
- Comments and Concerns:
 - Emphasized the urgency of forming international relationships and taking decisive action.
 - Recognized potential barriers like protectionism and nationalism within the EU.
 - Highlighted the need for the US to stay competitive and address internal challenges.
- Further Discussion:
 - Potential gaps in US approach to international nuclear engagement.
 - The importance of addressing nuclear waste disposal, referencing Finland's progress with its geological repository.
- Overall Goals:
 - Strengthen US competitive position in the global nuclear energy market.

- \circ $\;$ Foster collaboration and build long-term relationships internationally.
- Ensure strategic, coordinated efforts within the US government to support these goals.

Discussion/Closing Remarks

- No Public Comments
- Thanks to all involved in NEAC and contributions.