

Chairman Manchin's Opening Remarks During a Full Committee Hearing to Examine Opportunities and Challenges Associated with Advanced Nuclear Reactor Commercialization

- The committee will come to order.
- Today we will be discussing the opportunities and challenges associated with advanced nuclear energy commercialization.
- But before we do, I would be remiss if I did not acknowledge that our time with our nuclear fellow, Dr. Sarah Stevenson, is coming to an end.
- Sarah has been an integral part of our team here and she will be missed as she goes on to do greater things for our Air Force.
- Thank you, Sarah.
- Our conventional nuclear fleet of light water reactors has provided reliable power for over 60 years, and makes up about 95 gigawatts of generation capacity and around 20% of our annual energy production.
- Nuclear power is available 24/7 and emissions-free, making it incredibly important to our energy security while also helping us meet our climate goals.
- DOE estimates that 200 gigawatts of new nuclear plants will be needed by 2050—more than double our current nuclear capacity.
- We must have this reliable power for our critical infrastructure, our defense, our homes, and our economy.

- And there is a growing sense that the next generation of nuclear power will have a smaller footprint using different technologies than we've relied on in the past.
- These “advanced nuclear technologies,” have the potential to play a significant role in securing our energy security and independence.
- Advanced reactors have a range of end-uses.
- For example, advanced reactors under 50 megawatts—often called “micro-reactors”—have the potential to provide off-grid energy for remote towns, villages, and defense applications.
- And “small modular reactors”—which can provide several hundred megawatts of power—have the potential to provide traditional baseload power generation, as well as more flexibility for peaking, and also high-temperature process heat for industrial applications.
- In the last few years, Congress has provided significant investments through public-private partnerships to support the demonstration of first-of-a-kind reactors, such as the Department of Defense's Project Pele.
- I have supported Project Pele as a Member of the Armed Services and Appropriations Committees.
- This transportable micro-reactor will provide 5 megawatts of safe and secure power for three years without needing to be refueled, circumventing the risks associated with transporting additional diesel generators and large volumes of diesel fuel for our forces.

- The Pele reactor is also small enough to be transported anywhere in the world by C-17 aircraft, and I'm proud to say its inaugural flight will be carried out by the West Virginia National Guard.
- In addition to supporting Pele, Congress has supported commercial technology demonstrations through the Department of Energy's Advanced Reactor Demonstration Program.
- The Bipartisan Infrastructure Law provided \$2.4 billion to support competitive DOE awards for advanced reactor demonstration projects at commercial scale. The Terrapower project in Wyoming and the X-Energy project in Texas have won grants under this program.
- Terrapower's reactor is being built at a retiring coal facility and will be used to follow daily electric load changes, and X-Energy has partnered with Dow to provide heat and power for one of their manufacturing plants.
- I look forward to hearing more on the progress of some of these demonstration projects from our expert panel of witnesses today.
- Building upon these demonstration programs, the Inflation Reduction Act provided ten years of certainty to commercialize advanced reactors through a 30% investment tax credit or \$25 per megawatt-hour production tax credit for new nuclear plants, along with making tens of billions of dollars in Title 17 loan guarantees available for nuclear projects.
- And we ensured a 10% bonus credit for advanced nuclear in coal communities—like my home state of West Virginia, and Ranking Member Barrasso's home state of Wyoming—and other communities

that have sacrificed for generations to power our country, but now face the threat of being sidelined during the energy transition.

- The IRA incentives were not just about building power plants, but also securing our nuclear supply chain. Congress provided \$700 million for High-Assay Low-Enriched Uranium (HALEU), which is the fuel that most advanced nuclear technologies need, including Pele, Terrapower, and X-Energy.
- But despite all of the federal and private sector support, we're witnessing struggles and hesitancy in getting advanced nuclear projects off the ground.
- There are large design, cost, and regulatory uncertainties associated with first-of-a-kind nuclear technology—which is why we've now created numerous federal programs to help reduce these risks.
- But someone will need to go first, and unfortunately many of the utilities I've spoken with won't get in the game until others have done it first.
- We also must continue to ensure that taxpayer dollars are being spent judiciously and we're managing risks—and learning from instances like the NuScale project with UAMPS, which fell far short of our expectations.
- I'm grateful to have our witnesses here today to discuss their plans and challenges as they attempt to build the first generation of advanced reactors in our country.
- And looking further into the future, several of the incentives Congress has created for new nuclear sunset after 2032, so I'm

interested to hear what our witnesses think is needed to create sustained development for the coming decades.

- It is clear to me that our country is at a critical juncture, and our actions today will impact our nuclear landscape for years to come.
- The U.S. has long been a leader in civil nuclear energy, which has allowed us to share our expertise and gold standards for safety and non-proliferation around the world.
- Over time, Russia and China have made a concerted effort to supplant our nuclear leadership. We must push back.
- To regain our civil nuclear leadership, we need to demonstrate domestically that we can develop and deploy the next generation of nuclear energy to attract our international partners.
- We also need to export these technologies to our allies and partners to help reduce their energy dependence on foreign adversaries.
- That is why Senator Risch and I introduced the International Nuclear Energy Act and the Civil Nuclear Export Act, to provide strategic guidance and the financing mechanisms required for the U.S. to retake its leadership position on the global stage.
- But our adversaries aren't just pushing to dominate the export market for nuclear technology. Putin has a stranglehold on the nuclear fuel supply chain.
- Currently, Russia is the only commercial supplier of HALEU, the fuel used for our DoD micro-reactor project, DOE Advanced Reactor Demonstration Projects, and many other advanced nuclear technologies.

- That is why I led the bipartisan Nuclear Fuel Security Act of 2023 alongside Ranking Member Barrasso and Senator Risch, which authorizes a DOE program to onshore U.S. uranium conversion and enrichment capacity, for both traditional and advanced reactors.
- We must re-establish a domestic nuclear fuel supply chain, and our bill will do just that.
- I've also worked with Senator Barrasso and other members of this Committee to introduce legislation that would limit and eventually ban uranium fuel imports from Russia.
- Today, I'm calling on my Congressional colleagues to include these critical nuclear fuel bills and associated funding in the defense and appropriations packages we're currently negotiating.
- I look forward to hearing our witnesses' views of what else we need to do to achieve our shared vision of American advanced nuclear commercialization and global leadership.
- We have a distinguished panel representing the government and industry perspectives that are essential to discuss this public-private partnership.
- Before I introduce the panel, I will turn it over to Senator Barrasso for his opening remarks.
- Thank you, Senator Barrasso.
- I'd like to turn to our witnesses. Today we have:
 - Dr. John Wagner, Director, Idaho National Laboratory

- Dr. Jeff Waksman, Program Manager, Office of the Secretary of Defense Strategic Capabilities Office
 - Mr. Edward Stones, Vice President, Energy and Climate, Dow Inc.
 - And finally, The Honorable Jeff Merrifield, Vice Chair of the U.S. Nuclear Industry Council and Former Commissioner of the Nuclear Regulatory Commission.
- Thank you all for joining us today.
 - Dr. Wagner, we'll begin with your opening remarks.
 - Thank you, Dr. Wagner. We will now go to Dr. Waksman.
 - Thank you, Dr. Waksman. And now we will now go to Mr. Stones
 - Thank you Mr. Stones. And finally, Mr. Merrifield.
 - Thank you all again for being here with us, and for your testimony. We will now begin with questions.
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