Chairman Manchin's Opening Statement for the Full Committee Hearing Examining the Department of Energy's Lead Role in Advanced Computing Research, Application, and Security

- The Committee will come to order.
- Before we begin, I want to acknowledge the terrible loss of the former Director of Los Alamos National Laboratory, Charles McMillan, who died in a car accident last week.
- Charlie was a true patriot to this country who made extraordinary contributions to our nuclear weapons programs and other critical scientific missions at our national labs for over 40 years.
- This morning we're here to discuss where we are and where we're going in the field of advanced computing, which touches on a wide range of technologies and applications across every one of our lives.
- We will also discuss legislation our members have introduced in three specific areas: artificial intelligence, quantum computing, and cybersecurity.
- Computing technology is advancing rapidly across the globe, and America must proceed with both ambition and

caution, particularly when it comes to our national security and public safety.

- DOE has a long legacy in computational science dating back to the Manhattan Project in the 1940s, which relied on computational modeling.

- Today, the labs currently operate the fastest two supercomputers in the entire world.

- The opportunities that high-performance computing provide are endless. In my state of West Virginia, it was recently announced that a new supercomputer, Rhea, will be installed in the city of Fairmont to improve drought, flood, and wildfire prediction and forecasting.

- Like during the Manhattan project, we are now engaged in a new kind of technological race – one that requires us to innovate with similar urgency and vigilance.

- We are watching our adversaries ramp up their investments in advanced computing technologies and even deploy them in battlefields across the world.

- The chart behind me displays the findings of a study funded by the State Department. It shows the top 3 nations based on their share of quality research papers that have been published on advanced computing technologies.

- We are using published research paper data in place of spending because the U.S. government does not trust how China is reporting their expenditures.

- As the chart shows, America is at a real risk of falling behind to China in this race.

- And it is becoming increasingly apparent that whoever leads in the development of these technologies will secure the unequivocal lead in scientific and technological innovation writ large.

- For the United States to maintain our position as a global leader, we must accelerate our efforts.

- The stakes are nothing short of our economic prosperity and national security.

- Our national laboratories have spent decades building a workforce and infrastructure to answer the challenging questions about how to safely deploy these emerging technologies in a way that sets an example for the rest of the world.

- While we're proud that our private sector is making incredible strides developing and deploying advanced computing, this does not replace the need for government research and development.

- Complex societal challenges like advanced manufacturing, nuclear security, and genomics are a few areas of application where there is not yet an established commercial market.

- And this is why Senator Murkowski and I have introduced bipartisan legislation to reinforce the artificial intelligence research and development programs at our DOE labs.

- This bill authorizes the *Frontiers in Artificial Intelligence for Science, Security, and Technology,* or FASST*,* initiative at the Department of Energy, which will give the United States the tools to deliver secure and dependable AI solutions.

- This bill will create AI research and innovation hubs at our labs that will harness testbeds for the development of AI platforms; develop foundational models for various applications for energy and national security; verify the safety of new large language models; and establish a risk evaluation program to respond to security risks.

- It is just common sense to use our nation's brain trust at our national labs, and their state of the art facilities that we have already built and maintained, to safely advance AI while safeguarding taxpayer dollars.

- Industry and the science community alike have publicly supported our bill. I would like to submit for the record the supportive statements of Hewlett Packard Enterprise, AMD, Intel, Arm, and the Energy Sciences Coalition.

- Let me also reiterate that America will need more energy to meet the growing demand from data centers and the manufacturing resurgence that has resulted from the Bipartisan Infrastructure Law, CHIPS & Science Act, and Inflation Reduction Act.

- For decades, power demand has been decreasing, but now we are expecting a rapid turnaround this decade.

- But while demand is increasing, we have 2.6 million megawatts of generation waiting an average of 5 years to connect to the grid, and we're also retiring baseload and dispatchable generation faster than we can replace it.

- This is unacceptable.

- If America can't build the energy infrastructure needed to support high-tech industries, companies will choose to take their business elsewhere.

- We simply must get common sense policy like our bipartisan energy permitting bill enacted, or we'll have squandered this opportunity and really put ourselves at risk.

- Today we will also be discussing quantum computing, which processes information much more quickly and efficiently than even our fastest super-computers today.

- Senators Durbin and Daines recently introduced bipartisan legislation to reauthorize many quantum programs throughout the Department of Energy, and Senator Durbin will be joining us to speak briefly about their bill.

- And we can't discuss this new era of emerging technology development without considering cybersecurity and broader national security implications.

- These technologies can serve as assets, but also threats to the cybersecurity posture of the United States.

- We have seen the devastating effects of a cyberattack on our critical infrastructure, like the Colonial Pipeline Attack in 2021 that forced the shut down the country's most important fuel pipeline.

- Last year, I joined Senator Risch in introducing the *ETAC ["E-TACK"] Establishment Act*, which establishes the Energy Threat Analysis Center at DOE.

- ETAC will serve as the energy sector's centralized hub in the federal government for cyber information sharing and threat response to better defend the U.S. energy sector against cyber threats.

- We must also pay attention to how we are protecting our scientific programs from nefarious actors.

- We will not out-compete China if they're able to just steal the technology funded by our taxpayers' dollars.

- The CHIPS & Science Act authorized improvements to our research security policies that are already being implemented by the Department.

- But as the threat environment becomes more complex and the stakes become higher, more must be done.

- During the past several months, Senator Barrasso and I have been working with our colleagues on the Intelligence Committee to strengthen our research security policies to secure the science performed at our national labs while not stifling their work or closing ourselves off to the global scientific community.

- I'm confident this is something we can get done in this year's National Defense Act Authorization bill.

- We have a lot to cover this morning, and I'm looking forward to hearing our witnesses' perspectives on specific steps we can take to ensure America is advancing all these technologies in a competitive and responsible manner.

- I know we certainly do not need to start from scratch to achieve this.

- Instead of duplication, we can invest smartly in emerging technologies in a cost-effective way by building upon the resources we already have at DOE and its national labs.

- That is how we will maintain our global lead in scientific innovation.

- With that, I will turn it over to Senator Barrasso for his opening remarks.

- Thank you, Senator.

- I'd like to turn to our panel of witnesses.

    - Ms. Helena Fu, Director of the Office of Critical and Emerging Technology at the Department of Energy

    - Dr. Shaun Gleason [GLEE-SEN), Director of Science-Security Initiative Integration at Oak Ridge National Laboratory

    - Dr. Divyansh Kaushik [KAW-SHIK], Senior Fellow, American Policy Ventures

- Now to witness opening remarks.

    - Ms. Fu, we'll begin with you.

- Thank you. Next, we'll hear from Dr. Gleason.
- Thank you. Finally, we'll hear from Dr. Kaushik.

- Thank you all again for being here with us and for your testimony. We will now begin with questions.