COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
CHAIRMAN LAMAR SMITH

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Statement of Energy Subcommittee Chairman Cynthia Lummis (R-Wyo.)
Hearing on "America's Next Generation Supercomputer: The Exascale Challenge"

Chairman Lummis: Good morning and welcome to today's Energy Subcommittee hearing to examine high performance computing research and development challenges and opportunities.

The development and expanded availability of supercomputers has enabled society to push the frontiers of nearly every scientific discipline, and accelerate applications of that science in countless fields. It has enabled modeling and simulation necessary to address national security needs. It drives the boundaries of medical research, reduces cost to develop new products, and improves materials design processes, just to name a few areas.

High performance computing has also revolutionized how the energy sector operates. Advanced modeling and simulation techniques, driven by complex algorithms and faster computing speeds, improve the efficiency of energy production and consumption technologies.

These advancements ultimately trace back to Federal investments in basic research that provided the foundation for most of today's computing technologies. From the first megaflop supercomputers of the 1960s, Federal investments have led the push across each landmark thousand-fold speed barrier—to gigaflops, teraflops, and petaflops. Throughout this computing age, we have witnessed as yesterday's supercomputers become today's desktop computers and consumer devices often in incredibly short time frames. The spillover benefits to society are countless and immeasurable.

The Department of Energy, led by the Advanced Scientific Computing Research program, plays a unique and critical role in driving these computing technology breakthroughs. DOE supports world-class computational science facilities, such as the National Energy Research Scientific Computing Center. Additionally, DOE funds cutting edge applied mathematics research and next generation networking activities.

DOE's next major computing challenge—constructing an "exascale" computer system that is a thousand times faster than current world-leading supercomputers—may be the most daunting. Key scientific and technical obstacles associated with the architecture and energy efficiency of an exascale system must be overcome, and an immense amount of resources and effort will be required.

As we head down this inevitable path to exascale computing, it is important we take time to plan and budget thoroughly to ensure a balanced approach that ensures broad buy-in from the scientific computing community. The Federal government has limited resources and taxpayer funding must be spent on the most impactful projects. We need to ensure DOE efforts to develop an exascale system can be undertaken in concert with other foundational advanced scientific computing activities. This morning, we will hear testimony from expert witnesses regarding how best to achieve this balance.

I would like to recognize a leader of this effort, my colleague on the Energy Subcommittee, Representative Randy Hultgren. I would now like to yield the balance of my time to the gentleman from Illinois to summarize the discussion draft of his bill, “American High-End Computing Leadership Act.”

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