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Lamar Smith, Chairman

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Statement of Energy Subcommittee Chairman Randy Weber (R-Texas)

Innovation in Solar Fuels, Electricity Storage, and Advanced Materials

Chairman Weber: Good morning and welcome to today's Energy Subcommittee hearing. Today, we will hear from a panel of experts on the status of America's basic research portfolio, which provides the foundation for development of solar fuels, electricity storage, and quantum computing systems.

Hearings like today's help remind us of the Science Committee's core focus – the basic research that provides the foundation for technology breakthroughs. We're going to discuss the science behind potentially ground breaking technology today. But before America ever sees the deployment of a commercial solar fuel system or we move to quantum computing, a lot of discovery science has to be accomplished.

For the solar fuel process, also known as artificial photosynthesis, new materials and catalysts will need to be developed through research. If this research yields the right materials, scientists could create a system that could consolidate solar power and energy storage into a cohesive process. This would potentially remove the intermittency of solar energy and make it a reliable power source for chemical fuels production. *That* is a game changer.

In the field of electricity storage research, there is a lot of excitement about more efficient batteries that could operate for longer durations under decreased charge times. But not enough people are asking how we could design a battery system that moves more electrons at the atomic level – a key aspect to drastically increasing the efficiency or power in a battery. This transformational approach, known as multivalent ion intercalation, will use foundational study of electrochemistry to build a better battery from the ground up.

Finally, there is quantum computing, which relies on a thorough understanding of quantum mechanics… a challenging concept that is a longer discussion for a different hearing! For today, I hope we can discuss how a quantum computing system could change the way computers operate. In order to achieve this kind of revolutionary improvement in computing, we're going to need foundational knowledge in the materials needed to build these systems, known as quantum materials. I look forward to hearing from Dr. Broholm about his research in that field.

Today, we hear a lot of enthusiasm for solar power, batteries, and high performance computing technology. Yet few innovators are talking about how these technologies could be transformed at the fundamental level. In Congress, we have to take the long-term view and be patient, making smart investments in research that can lead to the next big discovery.

When it comes to providing strong support for basic research, the Science Committee won't get any major accolades or headlines today. But someday, when the next disruptive technology changes our economy for the better, I firmly believe that discovery science will play a central role.

DOE must prioritize basic research over grants for technology that is ready for commercial deployment. When the government steps in to push today's technology in the energy market, it competes against private investors and uses limited resources to do so. But when the government supports basic research and development, everyone has the opportunity to access the fundamental knowledge that can lead to the development of future energy technologies.

I want to thank our accomplished panel of witnesses for testifying today, and I look forward to a productive discussion about the DOE basic energy research portfolio.

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