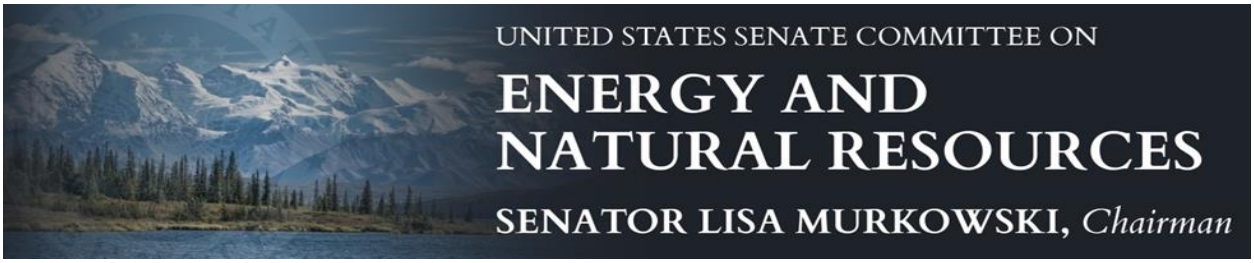

Opening Statement
Full Committee Hearing on Blockchain
Chairman Lisa Murkowski
August 21, 2018

Good morning, the Committee will come to order. We welcome everyone.

Back here in August, back for another week of work. We've got a hearing today, a subcommittee tomorrow and hopefully a business meeting sometime this week—so we're working.

This morning, a topic that I think has generated a great deal of interest—not necessarily within this committee, but certainly when you think about the implication to our energy grid overall, and just energy more broadly, the topic this morning is one of considerable interest. So, we're going to delve into whether or not blockchain and related technologies will soon have a transformative impact on energy infrastructure.

While not everyone knows what 'blockchain' is, I think most people have heard of like bitcoin currencies, cryptocurrencies like bitcoin. Blockchain is the way the bitcoin system stores data. I feel like I'm doing a little bit of introductory 101, but having had this conversation with my family members at Christmas a couple years ago where it was confirmed that none of us knew what we were talking about, I think it is helpful to give a little bit of background.

Electronic transactions are stored as blocks that are linked together to form a chain. The more transactions recorded, the longer the chain. The chain is stored in numerous locations simultaneously so the system is decentralized.

The verification needed for this data has created an entire new industry. So-called 'miners' are paid by some blockchain applications to verify data blocks as trustworthy. As a result, entire warehouses of computers have been set up to verify this kind of data.

Obviously this type of computer-driven industry needs electricity – and a lot of it. Miners have flocked to places with the cheapest electric rates, I know Senator Cantwell, you've certainly seen the impact in your state, but an overnight demand for more power can cause serious stress on a local utility and impact the grid. There's also the question of how long this new load will need to be served.

Some areas are starting to respond. The State of New York recently authorized its municipal utilities to charge cryptocurrency miners higher electric rates than other consumers. And Hydro-

Quebec has proposed new rules that would require cryptocurrency miners to bid for electricity and quantify their community impact in terms of jobs and investment.

At the same time, utilities are looking at blockchain as a way to boost both consumer engagement and grid efficiency through secure energy transaction platforms. Puerto Rico is looking at this very concept, where the effort to rebuild in a more resilient way has focused on microgrids, and the use of blockchain technology to trade power among the companies that operate the microgrids.

Finally, our hearing will examine any cybersecurity advantages that blockchain and similar technologies might offer over other ways of securing our energy infrastructure—that's something that is always at the forefront of the minds of many of us on this Committee.

We are fortunate to have a very impressive panel of experts here today to help us understand these issues, including Dr. Arvind Narayanan, an associate professor at Princeton who literally wrote the book on bitcoin. As well as Dr. Robert Kahn, who invented the fundamental communications protocols which are at the heart of the internet, so it's truly a pleasure to have you here. I think it's recognized that Dr. Khan is called one of the true "fathers of the internet" and we are very fortunate that he is here to discuss this technology and the issues surrounding its deployment, along with the other esteemed members of our panel this morning.

So I look forward to today's testimony, and the opportunity to have an exchange with you on this important issue.

Senator Cantwell, I welcome your remarks.

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