Statement of

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Chairman Bingaman, Ranking Member Murkowski and Members of the Committee, thank you for the opportunity to appear before you today to continue the conversation we began at my confirmation hearing.

During that hearing, I touched on the enormous challenges and threats we face – to our economy, our security, and our climate. In the 20th century, America's economic engine was powered by relatively inexpensive domestic fossil fuels. Today, we import roughly 60 percent of our oil, draining resources from our economy and leaving it vulnerable to volatility in oil prices. Additionally, the potentially adverse effects of global greenhouse gas emissions and their cost to the world economy were not widely realized until the end of the past century but are well-established today.

If we, our children, and our grandchildren are to prosper in the 21st century, we must decrease our dependence on oil, use energy in the most efficient ways possible, and decrease our carbon emissions. Meeting these challenges will require both a sustained commitment for the long-term and swift action in the near-term.

During his address to the Joint Session of Congress last week, President Obama reiterated his commitment to reducing our dependence on oil and sharply cutting greenhouse gas emissions. I look forward to working with others in the Administration, this Committee, and the Congress to meet the President's goal of legislation that places a market-based cap on carbon pollution and drives the production of more renewable energy in America. Such legislation will provide the framework for transforming our energy system to make our economy less carbon-intensive, and less dependent on foreign oil.

In the near term, President Obama and this Congress have already taken a key step by passing the American Recovery and Reinvestment Act of 2009. This legislation will put Americans back to work while laying the groundwork for a clean energy economy.

American Recovery and Reinvestment Act

I would like to highlight a few of the energy investments in that law.

First, the Recovery Act will put people to work making our homes and offices more energy efficient. It includes $5 billion to weatherize the homes of low-income families; a $1,500 tax credit to help homeowners invest in efficiency upgrades; $4.5 billion to "green" federal buildings, including reducing their energy consumption; and $6.3 billion to implement state and local efficiency and renewable programs.

The Recovery Act also includes $6 billion for loan guarantees and more than $13 billion in tax credits and financial assistance instruments (grants and cooperative agreements) that may leverage tens of billions in private sector investment in clean energy and job creation. This will help clean energy businesses and projects to get off the ground, even in these difficult economic times. The bill also makes investments in key technologies, such as $2 billion in advanced battery manufacturing, and $4.5 billion to jumpstart our efforts to modernize the electric grid.

Getting this money into the economy quickly, carefully, and transparently is a top priority for me. I know that your constituent states, cities, and businesses are eager to move forward, and are seeking more information about how to access this funding. I have met with many of them already, and we will have much more detail in the coming weeks.

I know the Title XVII loan guarantee program is of great interest and concern to this committee. We are already in the process of making improvements to this important program that I believe will satisfy many of these concerns.

Reshaping Energy Research, Development, and Deployment

With that, I would like to turn to a topic that is near and dear to my heart: how we can better nurture and harness science to solve our energy and climate change problems. I have spent most of my career in research labs – as a student, as a researcher, and as a faculty member. I took the challenge of being Secretary of Energy in part for the chance to ensure that the Department of Energy Laboratories and our country's universities will generate ideas that will help us address our energy challenges. I also strongly believe that the key to our prosperity in the 21st century lies in our ability to nurture our intellectual capital in science and engineering. Our previous investments in science led to the birth of the semiconductor, computer, and bio-technology industries that have added greatly to our economic prosperity. Now, we need similar breakthroughs on energy.

We're already taking steps in the right direction, but we need to do more.

First, we need to increase funding. Dan Kammen of U.C. Berkeley has conducted studies showing that while overall investment in research and development is roughly three percent of gross domestic product on average, it is roughly one-tenth of that average

in the energy sector. As part of the President's plan to double federal investment in the basic sciences, the 2010 Budget provides substantially increased support for the Office of Science, building on the $1.6 billion provided in the Recovery Act for the Department of Energy's basic sciences programs.

We also need to refocus our scarce research dollars. In April, a more detailed FY 2010 budget will be transmitted to Congress. This budget will improve energy research, development, and deployment at DOE: by developing science and engineering talent; by focusing on transformational research; by pursuing broader, more effective collaborations; and by improving connections between DOE research and private sector energy companies.

Developing Science and Engineering Talent: Several years ago, I had the honor and privilege of working on the "Rising Above the Gathering Storm" report commissioned by Chairman Bingaman and Senator Alexander. One of the key recommendations was to step up efforts to educate the next generation of scientists and engineers. The FY 2010 budget supports graduate fellowship programs that will train students in energy-related fields. I will also seek to build on DOE's existing research strengths by attracting and retaining the most talented scientists.

Focusing on Transformational Research. The second area that I want to discuss is the need to support transformational technology research. What do I mean by transformational technology? I mean technology that is game-changing, as opposed to merely incremental. For example, in the 1920's and 1930's, when AT&T Bell Laboratories was focused on extending the life of vacuum tubes, another much smaller research program was started to investigate a completely new device based on a revolutionary new advance in the understanding of the microscopic world: quantum physics. The result of this transformational research was the transistor, which transformed communications, allowed the computer industry to blossom, and changed the world forever.

DOE must strive to be the modern version of the old Bell Labs in energy research. Because the payoffs from research in transformational technologies are both higher risk and longer term, government investment is critical and appropriate.

Here is an example of current DOE transformational research. As this Committee knows, we have funded three BioEnergy Research Centers – one at the Oak Ridge National Laboratory in Oak Ridge, Tennessee; one led by the University of Wisconsin in Madison, Wisconsin, in close collaboration with Michigan State University in East Lansing, Michigan; and one led by the Lawrence Berkeley National Laboratory. Each of these centers is targeting breakthroughs in biofuel technology development that will be needed to make abundant, affordable, low-carbon biofuels a reality. While these efforts are still relatively new, they are already yielding results, such as the bioengineering of yeasts that can produce gasoline-like fuels, and the development of improved ways to generate simple sugars from grasses and waste biomass.

We need to do more transformational research at DOE to bring a range of clean energy technologies to the point where the private sector can pick them up, including:

1. Gasoline and diesel-like biofuels generated from lumber waste, crop wastes, solid waste, and non-food crops;
2. Automobile batteries with two to three times the energy density that can survive 15 years of deep discharges;
3. Photovoltaic solar power that is five times cheaper than today's technology;
4. Computer design tools for commercial and residential buildings that enable reductions in energy consumption of up to 80 percent with investments that will pay for themselves in less than 10 years; and
5. Large scale energy storage systems so that variable renewable energy sources such as wind or solar power can become base-load power generators.

This is not a definitive list, or a hard set of technology goals, but it gives a sense of the types of technologies and benchmarks I think we should be aiming for. We will need transformational research to attain these types of goals. To make it happen, we will need to re-energize our national labs as centers of great science and innovation. At the same time, we need to seek innovation wherever it can be found – the new ARPA-E program will open up research funding to the best minds in the country, wherever they may be. I pledge to you we will have this program up and running as soon as possible.

Broader, More Effective Collaboration: DOE also needs to foster better research collaboration, both internally and externally. My goal is nothing less than to build research networks within the Department, across the government, throughout the nation, and around the globe. We'll better integrate national lab, university, and industry research. And we will seek partnerships with other nations. For example, increased international cooperation on carbon capture and storage technology could reduce both the cost and time of developing the range of pre- and post-combustion technologies needed to meet the climate challenge.

Speeding Demonstration and Deployment: While we work on transformational technologies, DOE must also improve its efforts to demonstrate next-generation technologies and to help deploy demonstrated clean energy technologies at scale. The loan guarantee program will be critical to these efforts by helping to commercialize technologies, and the Recovery Act funding for weatherization and energy efficiency block grant programs will accelerate the deployment of energy efficient technologies.

Conclusion

I am excited about the prospect of improving DOE's clean energy research, development, and deployment efforts. The Nation needs better technologies to fully meet our climate and energy challenges, and DOE can be a major contributor to this effort.

We already have ample technology to make significant, near-term progress toward our energy and climate change goals. The most important of these is energy

efficiency, which will allow us to reduce costs and conserve resources while still providing the same energy services. The potential there is huge, as is the potential to increase the use of existing technologies such as wind, solar, and nuclear. We will move forward on all of these fronts and more, as we invest in the transformational research to achieve breakthroughs that could revolutionize our Nation's energy future.

Thank you. I would be glad to answer your questions at this time.