

**Select Committee On Energy Independence And Global
Warming Hearing
July 31, 2008**

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Good morning, Mr. Chairman and House Committee Members. It's a pleasure and an honor to come before this Committee and speak about the critical energy and global warming issues facing our country. If our nation is to continue to thrive, we must embrace new technologies that will increase our energy independence and strengthen our electricity infrastructure.

American Superconductor is a leading provider of energy technologies for the power grid and alternative energy sectors.

Before I proceed further, I would ask you to examine the copper cables in my left hand and the superconductor wires manufactured by American Superconductor in my right hand. Similar wire bundles are being passed among you.

These few, hair thin superconductor wires carry as much power as all of this copper. Copper has been the way we have transmitted power since the days of Thomas Edison. In fact, many power

cables in the U.S. grid are about a century old. I submit that we will not solve our country's difficult energy problems with 100-year-old technology.

After two decades of development, high temperature superconductors are beginning to play a key role in powering our homes and businesses. Superconductor power distribution cables have been operating in power grids in Albany, New York and Columbus, Ohio for two years now. And, just a few months ago, we energized the world's first superconductor power transmission cable system in a commercial power grid on Long Island, New York. The poster you see here shows the three conduits for the superconductor power cables during the installation process.

This cable system is able to carry 574 megawatts of power – enough to power 300,000 homes – in just a four-foot right of way. This is a far smaller right of way than the 300 feet needed to transmit the same amount of power by conventional overhead lines.

To put this in perspective, you only need seven of these “electricity pipelines,” to carry all of the power that will be generated by Mr. T. Boone Pickens' first 4,000 megawatt wind farm. These

electricity pipelines can and should be a part of our drive to energy independence and reduced power plant emissions.

American Superconductor, with support from the Departments of Energy, Defense and Homeland Security, has led the world in the development of this revolutionary energy technology for more than 20 years. I am pleased to report that during this period, American Superconductor has invested over \$800 million in developing and deploying its energy technologies, over two-thirds of which has been from private financing. This collective private and public investment has produced breakthrough technologies that are ready to power our 21st century economy.

Given the power density advantage you see and even feel here, power cables made with superconductor wire are able to carry up to 10 times as much power as traditional copper cables. This is a tremendous benefit for our cities, where power demands continue to rise rapidly and underground real estate is severely congested.

Grid modernization with superconductor cables and other energy technologies – including advanced power electronic converters we also manufacture – will provide the capacity needed for the wide use of plug-in electric vehicles. They also will reduce the

likelihood of blackouts such as the one that hit the northeast in 2003.

In addition, superconductor cables can add a layer of defense to the grid to protect our centers of commerce from severe weather or intentional acts of destruction. The superconductor cable project we are currently working on for Consolidated Edison's grid in New York City, for example, is the first leg of what will be the Internet of power in Manhattan and cities around the US. The objective is to foil attempts by terrorists to knock out Manhattan's grid through the destruction of individual electrical substations. This project, known as Project HYDRA, requires the special properties of superconductors. It is being jointly funded by the Department of Homeland Security, Consolidated Edison, American Superconductor and our subcontractors.

Superconductor technology also is being applied in a significant way to zero-emission, wind generated electricity. We have, in fact, begun work on a program to effectively double the power capacity of today's wind turbines utilizing the power of superconductors.

The largest wind turbines on the market today are rated at 5 to 6 MW. The generators in these turbines are massive - weighing

hundreds of tons. In fact, they are so large that it is nearly impossible to transport them over roads and install them at the top of towers hundreds of feet in the air.

Superconductor technology is able to break through this power capacity barrier. We are partnering with TECO Westinghouse Motor Company in Round Rock, Texas under a National Institute of Science and Technology Advanced Technology Program to develop the core technologies needed for a superconductor generator that would go into a 10-MW-class wind turbine.

To put the impact of this into perspective, a single 10MW turbine could provide electricity for thousands of homes and eliminate 15,000 tons per year of CO₂ generated by the mix of fossil fuel plants in use today. In addition, superconductor wind turbines will open the door to truly large offshore wind farms where construction costs are highest.

We will soon be taking on the next phases of this project, which are to design the complete wind turbine and then build and test a prototype before commercializing the wind turbine.

Our work will demonstrate that superconductor technology is the ‘disruptive technology’ needed to significantly reduce the cost of

wind power and enable broader deployment of this zero-emission form of electricity.

In summary, superconductor technology is a fundamental weapon in our arsenal to lower the costs of energy, reduce harmful greenhouse gas emissions and meet the goal of having wind supply 20% of our electricity needs by 2030.

To accelerate the development and deployment of superconductor materials and high capacity wind turbines, we encourage Congress to pass a multi-year extension for wind production tax credits. We believe funding from the DOE for the development and testing of a 10MW class superconductor wind turbine would significantly accelerate the deployment of this technology. Finally, implementing tax incentives to recognize the energy efficiency benefits of power grid technologies like superconductor cables would enable electric utilities to implement these solutions faster and help spare our nation from costly blackouts.

I thank you for your time and attention.