Statement of
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Committee on Science, Space, and Technology
United States House of Representatives
on
"The Federal Perspective on a National Critical Materials Strategy"

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Chairman Broun, Ranking Member Edwards, and Members of the Subcommittee, thank you for the opportunity to testify today about the Federal perspective on a national critical materials strategy and the Department of Energy's ongoing work on this topic.

Earlier this year I visited the Mountain Pass Mine in southern California. I was impressed by the facility and its potential to provide a domestic source of rare earth metals. According to the owners, the mine will produce at an annual rate of about 19,000 tons of rare earths by end of 2012 and 40,000 tons by early 2014, using modern technologies at a globally competitive cost. That's an important step in the right direction.

The issue of critical minerals is important and needs priority attention in the months and years ahead. The Department shares the goal of establishing a stable, sustainable and domestic supply of critical minerals, and we look forward to discussions with the Congress on ways to address this issue as we move forward.

GLOBAL CLEAN ENERGY ECONOMY

The world is on the cusp of a clean energy revolution. Here in the United States, we are making historic investments in clean energy. The American Recovery and Reinvestment Act was the largest one-time investment in clean energy in our nation's history – more than $90 billion. At the Department of Energy (DOE), we're investing $35 billion in Recovery funds in electric vehicles; batteries and advanced energy storage; a smarter and more reliable electric grid; and wind and solar technologies, among many other areas. We aim to double our renewable energy generation and manufacturing capacities by 2012. We are working to deploy hundreds of thousands of electric vehicles and charging infrastructure to power them, weatherize at least half a million homes, and help modernize our grid.

Other countries are also seizing this opportunity, and the market for clean energy technologies is growing rapidly all over the world. For example, the Chinese government is launching programs to deploy electric cars in over 25 major cities. They are connecting urban centers with high-speed rail and building huge wind farms, ultrasupercritical advanced coal plants and ultra-high-voltage long-distance transmission lines. India has launched an ambitious National Solar Mission, with the goal of reaching 20 gigawatts of installed solar capacity by 2020.

In Europe, strong public policies are driving sustained investments in clean energy. Denmark earns more than $4 billion each year in the wind turbine industry. Germany and Spain are the world's top installers of solar photovoltaic panels, accounting for nearly three-quarters of a global market worth $37 billion in 2009. Around the world, investments in clean energy technologies are growing, helping create jobs, promote economic growth and fight climate

change. These technologies will be a key part of the transition to a clean energy future and a pillar of global economic growth.

DOE STRATEGY

In recognition of the importance of certain materials in the transition to clean energy, DOE has begun to address the use of critical materials in clean energy components, products and processes. As a first step, DOE released its Critical Materials Strategy last December. The report found that four clean energy technologies—wind turbines, electric vehicles, photovoltaic cells and fluorescent lighting—use materials at risk of supply disruptions in the next five years. In the report, five rare earth elements (dysprosium, neodymium, terbium, europium and yttrium), as well as indium, were assessed as most critical in the short term. For this purpose, "criticality" was a measure that combined importance to the clean energy economy and the risk of supply disruption.

The Critical Materials Strategy highlighted three pillars to address the challenges associated with critical materials in the clean energy economy. First, substitutes must be developed. Research and entrepreneurial activity leading to material and technology substitutes improves flexibility to meet the material demands of the clean energy economy. Second, recycling, reuse and more efficient use can significantly lower global demand for newly extracted materials. Research into recycling processes coupled with well-designed policies will help make recycling economically viable over time. Finally, diversified global supply chains are essential. To manage supply risk, multiple sources of material are required. This means encouraging other nations to expedite alternative supplies and exploring other potential sources of material (such as existing mine

tailings or coal ash) in addition to facilitating environmentally sound extraction and processing here in the United States. With all three of these approaches, we must consider all stages of the supply chain: from environmentally-sound material extraction to purification and processing, the manufacture of chemicals and components, and ultimately end uses.

Since the Critical Materials Strategy was released last year, DOE's work in this area has ramped up considerably. Earlier in 2011, ARPA-E issued a $30 million Funding Opportunity Announcement (FOA) on Rare Earth Alternatives for magnets in wind turbines and motors. EERE's Vehicle Technology and Wind Programs have also issued relevant FOAs this year. In addition, the President's FY 2012 budget supports a Critical Materials Hub. These activities build on DOE's longstanding expertise on these topics. For example, the Office of Basic Energy Sciences (BES) has funded research at Ames Laboratory on the production of high quality rare earth magnets, magnetic technologies, synthesis technologies and superconductors for a number of years. The Office of Energy Efficiency and Renewable Energy (EERE) has funded several projects at Ames Laboratory and Oak Ridge National Laboratory addressing alternate magnet and motor designs.

This year, DOE will update its analysis in light of rapidly-changing market conditions. DOE is analyzing the use of critical materials in petroleum refineries and other applications not addressed in last year's report. In addition, DOE may identify specific strategies for materials identified as critical, including strategies with respect to substitution, recycling and more efficient use. In support of this year's analysis, DOE issued a Request for Information that focused on critical material content of certain technologies, supply chains, research, education

and workforce training, emerging technologies, recycling opportunities, and mine permitting. The RFI closed last month. We received nearly 500 pages of responses from 30 organizations, including manufacturers, miners, universities, and national laboratories. Many organizations shared proprietary data on material usage that will help us develop a clearer picture of current and future market conditions.

Within this larger context, we do intend to address domestic production of critical materials in our 2011 report. Production within the United States is important for at least three reasons. First, domestic production is the most secure. Second, the United States' considerable reserves of some critical materials could add significantly to total global production and to greater diversity in the global supply of these materials. Third, U.S. technology and best practices developed during mine operations can help promote safe and responsible mining in other countries, further contributing to supply diversity and the sustainable development of resources. With regard to mining in the United States, it is important to point out that permits are not the only requirements that can extend the time required to open a mine. The required accumulation of hundreds of millions of dollars of capital for mine development can also lead to delay.

Managing supply chain risks is by no means simple. At DOE, we focus on the research and development angle. From our perspective, we must think broadly about addressing the supply chain in our research and development (R&D) investments, from extraction of materials through product manufacture and eventual recycling. It is also important to think about multiple technology options, rather than picking winners and losers. We work with other Federal agencies to address other issues, such as trade, labor and workforce, and environmental impacts.

The White House Office of Science and Technology Policy has been convening an interagency effort on critical materials and their supply chains. In fact, this group met last week to discuss a number of important developments on these topics.

CONCLUSION

One lesson we have learned through experience is that supply constraints aren't static. As a society, we have dealt with these types of issues before, mainly through smart policy and R&D investments that reinforced efficient market mechanisms. We can and will do so again. Strategies for addressing shortages of strategic resources are available, if we act wisely. Not every one of these strategies will work every time. But taken together, they offer a set of approaches we should consider, as appropriate, whenever potential shortages of natural resources loom on the horizon.

So in conclusion, there's no reason to panic, but every reason to be smart and serious as we plan for growing global demand for products that contain critical minerals. The United States intends to be a world leader in clean energy technologies. Toward that end, we are shaping the policies and approaches to help prevent disruptions in supply of the materials needed for those technologies. This will involve careful and collaborative policy development. We will rely on the creative genius and entrepreneurial ingenuity of the business community to meet an emerging market demand in a competitive fashion. With focused attention, working together we can meet these challenges.