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Testimony before the House Committee on Science and Technology

Reauthorization of the America COMPETES Act

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Chairman Gordon, Ranking Member Hall and members of the Committee, thank you for the opportunity to provide testimony on the reauthorization of the America COMPETES Act. This landmark legislation signed into law in 2007 was a turning point in the effort by many people inside and outside of government to refocus America's attention on the critical importance of innovation as the driver of economic growth. Your leadership and that of the Committee was crucial to the legislation's success and I hope the effort to reauthorize the legislation will be similarly successful.

In my testimony today, I would like to share with the Committee a brief history of the impetus and outcome of the Council's work on a national innovation agenda and how critical parts of this agenda related to the legislation passed in 2007. Then, I want to highlight some transformational changes in the national and global economy that have occurred in the past few years and how those shifts are impacting where and how innovations occurs; and, as a result, what issues this committee should consider as it seeks to reauthorize the America COMPETES Act.

THE COUNCIL ON COMPETITIVENESS AND THE NEED FOR AN INNOVATION AGENDA

The Council on Competitiveness is a non-partisan and non-governmental organization of CEOs, university presidents and labor leaders working to ensure U.S. prosperity. To achieve this mission we convene top private and public sector leaders to address America's long-term competitiveness challenges by generating innovative public policy solutions and galvanizing our unique coalition to translate ideas into action. We also seek to measure U.S. performance in the global marketplace to identify key obstacles and opportunities facing the nation.

The Council on Competitiveness was founded in 1986 during a time when the United States was facing its most dire economic challenges since the end of World War II. The country had slid from being the world's largest creditor to its largest debtor, its position as a global leader in technology and innovation was being challenged and American

industries were losing market share to international competitors. To meet these mounting challenges, two-dozen industrial, university and labor leaders joined together to found the Council, a forum for elevating national competitiveness to the forefront of national consciousness.

The 21st century poses new challenges to American competitiveness - globalization, high-speed communications, enterprise resilience and energy sustainability issues are forcing organizations at all levels to rethink how U.S. companies will remain competitive and how we will sustain and grow high paying jobs. After two decades, the Council on Competitiveness continues to set an action agenda to drive U.S. productivity and leadership in world markets and to raise the standard of living for all Americans.

The Council's work on innovation dates back to the late-1990s when we held a major innovation summit at MIT. This summit brought together private sector and government leaders to begin the conversation around where the United States stood with regard to its long term role as the world's innovator. By 2003, it was clear that America could no longer assume that its past leadership in innovation would ensure its future prosperity. The world had changed.

- The United States was now competing and collaborating globally to attract the best and brightest minds to develop new knowledge and create the disruptive technologies that will launch new industries and products and create jobs.

- The United States was now competing and collaborating in a world in which the power of networked communications, the extended manufacturing enterprise and access to low-wage talent has enabled the outsourcing of both low and high-skilled jobs.

- And the United States was now competing and collaborating in a post-Cold War security environment in which the United States must protect its citizens and homeland from threats from terrorist groups and rogue nations which have the technological means to wreak havoc on advanced economies.

The Council also recognized that the very nature of how innovation occurs, where it occurs and who the innovators are were changing as well.

- It was diffusing at ever-increasing rates. It took the radio 38 years to reach a market audience of 50 million people, but only 13 years for television, 4 years for the Internet, 3 years for the I-pod and 1 year for Facebook.

- It was multidisciplinary and technologically complex arising from the intersections of different fields or spheres of activity encompassing physical and biological sciences as well as social sciences and the humanities.

- It was becoming global in scope – with advances coming from centers of excellence around the world and driven by the demands of billions of new consumers.

What became clear as the Council prepared to launch its innovation initiative back in 2003 was that the innovation economy is fundamentally different from the industrial or even the information economy. It requires a new vision, new approaches and a new action agenda. The United States must create the conditions that will stimulate individuals and enterprises to innovate and take the lead in the next generation of knowledge creation, technologies, business models, dynamic management systems and high value job creation. A new relationship among companies, government, educators and workers is needed to ensure a 21st century innovation ecosystem that can successfully adapt and compete in the global economy.

NATIONAL INNOVATION INITIATIVE

This is why the Council launched the National Innovation Initiative (NII) under the leadership of Duane Ackerman, the CEO of BellSouth and Chairman of the Council from 2003-2005 and co-chaired by Sam Palmisano the CEO of IBM, and Wayne Clough, the President of the Georgia Institute of Technology and now the Secretary of the Smithsonian Institution. We relied on the input of more than 400 public and private sector leaders including my colleagues testifying with me today and other leaders such as Norm Augustine, Craig Barrett, Chuck Vest and Bill Brody from the private sector as well as a bipartisan Honorary Committee of Members of Congress and Governors.

The 2005 NII report, *Innovate America* was downloaded more than 300,000 times and coupled with subsequent reports from the National Academies, the Business Roundtable, the National Governors Association and many others, helped build the momentum for congressional action on an innovation agenda for the country. It also created interest around the world with countries like China, Korea, Brazil and Turkey fashioning innovation agendas modeled on the NII.

Innovate America had three foundational platforms —Talent, Investment and Infrastructure – the building blocks for an integrated, resilient innovation ecosystem and the subsequent legislation in many ways mirrored this structure.

In brief, *Innovate America* called for:

<u>Talent</u>

- Ensuring all Americans have the skills necessary to compete and prosper in the 21st Century with a strong emphasis on science, technology, engineering and math education (STEM).

- Increased support for multidisciplinary education and research.

- Attracting the best and brightest from around the world to study and work in the United States.

Investment

- Increased national investment in a balanced basic research portfolio.
- A focus on high risk/high reward research.
- A move towards regional economic development and a transition to an advanced manufacturing infrastructure.

Infrastructure

- Accelerating the deployment of 21st Century innovation infrastructures from broadband and high performance computing networks to a 21st Century patent system.
- A manufacturing infrastructure that will enable America to capture the economic value from our investments in research and our people.
- Tax incentives to encourage research and risk taking.

THE AMERICA COMPETES ACT

Needless to say, the Council strongly supported the America COMPETES Act as it mirrored many of the recommendations included in *Innovate America* as well as our *2006 Competitiveness Index*. Among those provisions that were included and should be included in any future authorizations were strengthened STEM education for all Americans regardless of their career aspirations; steady and predictable increases in federal research funding for long term basic research across all agencies; and greater coordination across Federal agencies and with the states on innovation policy.

Without going into great detail, I would like to highlight a few of the provisions from the 2007 legislation that I think remain critical and should be supported by the Members of the Committee.

1. The Council on Competitiveness strongly urged the creation of a President's Council on Innovation and the legislation included such a provision, yet the reality has not matched the intent. What became clear as we sought the input and advice from leaders within government and the private sector was that the government's innovation policy was fragmented, poorly coordinated and often running at cross purposes between agencies and departments. We would urge a fresh look at this provision.

2. Predictable and steady support for long-term research across federal agencies including the National Science Foundation, DoE Office of Science, NIST and

NASA is a vital first step towards an innovation-based economy. America COMPETES made great strides in this area. Any authorization should continue this commitment.

3. Support for the National Institutes of Standards and Technology's (NIST) work in the area of manufacturing is critical to many small and medium sized manufacturers. These companies are key job producers in America's economy. NIST has made strides towards embracing innovation in manufacturing and this trend is worthy of the Committee and Congress's support.

4. Strengthening STEM education through programs at the Department of Education, the National Science Foundation and other R&D agencies and departments is important. I realize there are multiple programs that touch upon this issue across the Federal government and I will not try to analyze each one separately here. I only urge the Committee to recognize that almost every career today requires some grasp of or skill in science, technology, engineering and mathematics and we must ensure that all Americans have a solid grounding in these fields.

Before turning to where we go from here, I want to highlight a couple of items that were important parts of the Council's report, but were not included in the legislation. I recognize that not all of these issues fall under the Science Committee's jurisdiction, but any comprehensive innovation bill is going to touch multiple committee jurisdictions.

- Attracting the best and brightest from around the world to study, work and innovate in the United States would benefit our economy, but our high skilled immigration system continues to fail in this regard. This is a competitiveness issue as much as if not more than an immigration issue and should be addressed as such. A green card should be given to any foreigner who passes appropriate security screening and receives an advanced degree in science or engineering.

- *Innovate America* called for the creation of and support for regional innovation hot spots--locally developed and federally incentivized regions that bring together the public and private sectors to capitalize on local competitive assets to create new jobs and new industries. The Administration is currently looking at ways to achieve this goal and those efforts should be supported.

- *Innovate America* also sought to focus attention on the importance of critical technologies and processes that need to remain viable in the United States if we are to generate value from our investments and continue to create jobs in the United States.

- *Innovate America* also identified over-the-horizon issues like energy security and sustainability that led to our recent Energy Security, Innovation and Sustainability initiative and summit last fall.

As the Committee looks to reauthorize the America COMPETES Act, I can only emphasize that the importance of these provisions has not waned with the passage of time and the deterioration of the global economy—they are critical to America's prosperity.

GLOBALIZATION CONTINUES TO CHANGE THE WORLD IN WHICH WE COMPETE

We knew the global economy was changing when the America COMPETES Act was first debated. Now, we know the global economy has fundamentally shifted. Global competition has accelerated—especially the rapid advancement of emerging economies:

- Because of their large and rapidly growing markets and relatively low wage labor, they are the favored location for foreign direct investment

- In just one generation, emerging economies' shares of global imports, global exports and foreign direct investment have nearly doubled

- And some are advancing rapidly as R&D performing countries. In about a decade, China's R&D grew from $12 billion to $86 billion. In 2008 China's R&D spending was $102 billion, placing China in third place in R&D spending, behind only the United States and Japan. China is now poised to surpass Japan as the world's second largest economy.

The integrated global enterprise has developed rapidly. These enterprises use global networks for developing products and services, and for serving customers.

- For example, sales from foreign affiliates of U.S. companies are more than three times greater than U.S. exports of goods and services.

- These global enterprises are building global talent networks for innovation. And it is vital for regions to enter these networks.

Global trade in tasks has grown rapidly. If work is routine, rule-based, or if it can be digitized, there's a low cost source of labor somewhere in the world to compete for that work and those jobs.

Information, knowledge and technology are increasingly commodities. And rewards do not necessarily go to those who have a great deal of these things, but to those nations who are prepared to create new industries and deploy new products and services. Besides, many nations have rapidly built-up their own science and technology assets, so having those alone does not ensure success.

Instead, rewards go to those who know what to do with knowledge, information and technology once they get it. This has created an innovation imperative for the United States that is, if anything, more urgent today than it was four years ago.

BEYOND AMERICA COMPETES

America still has the best innovation system in the world, but if we want to see investments, jobs and growth in the United States, we need a vibrant and diversified manufacturing sector. Our national security, energy security and economic competitiveness demand it.

America lacks a strategy for manufacturing competitiveness. We need policies that make America a really attractive place to invest – a pro-innovation, pro-investment, pro-growth, pro-opportunity environment.

And that means we need to look at manufacturing as a value chain that spans ideas to delivered products, including cutting-edge science and technology, sustainable design and systems engineering, supply chain excellence and smart services – as well as lean and green production. The integration of these systems and services creates the value premium that captures global market share.

The Council is launching a major initiative in this area that will seek to:

- Redefine manufacturing as a value creation system, not product fabrication
- Focus on productivity drivers that enable us to rise above a rising bar
- Benchmark policy incentives and strategies competitor nations use to attract manufacturing investment
- Develop an integrated action agenda for 21st century competitive success.

A successful manufacturing strategy will exploit the leading edge of nanotechnology, biotechnology and digital technology. Advances in these fields will increase technological possibilities exponentially, unleashing a flood of innovation—creating new industries, companies, products, services and markets.

This ability to move quickly to deploy and capture value is a focus of the Council's Technology Leadership and Strategy Initiative, chaired by Dr. Ray Johnson, Senior Vice President and Chief Technology Officer for Lockheed Martin Corporation and Dr. Mark M. Little, Senior Vice President and Director of Global Research for the General Electric Company.

There is a great and growing need to solve global grand challenges—food and water shortages, pandemics, security threats, the needs of aging populations worldwide, climate change and meeting the global need for cheap, clean energy.

Energy and environmental challenges alone have created a perfect storm for energy innovation. As detailed in the Council's recent call to action on energy security, innovation and sustainability**—Drive—**energy and energy efficiency innovations are needed in transportation, appliances, green buildings, materials, fuels, power generation, industrial processes and more. I am pleased to enclose the full report for the Committee's review.

The environment for innovation is target rich, but we also need innovation accelerators. Modeling and simulation with high performance computing can be a force multiplier for innovation. These tools offer an extraordinary opportunity for U.S. manufacturers to design products and ancillary services:

- Faster
- To minimize the time to create and test prototypes
- To streamline production processes
- Lower the cost of innovation, and
- Develop high-value innovations that would otherwise be impossible.

Driving HPC, modeling and simulation throughout the supply chain would put these powerful tools into the hands of companies of all sizes, entrepreneurs, innovators and inventors to transform what they do.

CONCLUSION

Mr. Chairman, Ranking Member Hall and Members of the Committee, the America COMPETES Act was not a perfect bill, but it was an urgent wake up call. The bill included some provisions we did not recommend and left some out we felt were critical. Yet, there was no question of the need for action by Congress. That need for action has not diminished and, if anything, the need is greater. Other countries are making investments in their science and technology infrastructure. They are educating and training their people. They are attracting investment and talent from around the world. To prosper, America must compete.

Thank you.