



# Series on U.S. Science, Innovation, and Economic Competitiveness

## Retrofitting to Ensure America Remains No. 1 in the 21st Century

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### Overview of the series

Innovation is and always has been the engine that drives economic growth in the United States. Economists believe that innovation—new technologies, products, processes, and the industries they create—is responsible for between half and 80 percent of all economic growth.

Indeed, U.S. companies and industries, with the help of federally funded research, have invented many things that the world wants to buy—think light bulbs, assembly line automobile production, computers, Internet applications, handheld wireless devices, photovoltaic solar cells, Global Positioning System satellites, and the list goes on. This innovative spirit of the American people, protected by the rule of law, keeps us in the world's top position in innovation, and subsequently ensures we are home to the world's best-paying jobs and highest standards of living.

But in the 21st century our lead is beginning to erode. It's not that we've started doing anything wrong—we are still home to the world's most productive workers and innovative companies. Rather, it is because others have followed in our footsteps, and in some cases gone even further to invest specifically in the interrelated building blocks of a high-performance innovation engine. Across a spectrum of metrics—from education and workforce readiness, to research and development, to manufacturing, to infrastructure—our nation's competitive position is slipping relative to other countries that are investing more in the driver of economic growth and prosperity. This slippage costs us jobs, investment, and wage growth.

In response to these emerging challenges, Congress reauthorized the America COMPETES Act in January 2010. The law is a crucial piece of legislation that ensures investments in the building blocks of innovation and competitiveness: research, education, infrastructure, manufacturing, and innovation networks.

But realizing that the COMPETES Act is only a stopgap measure, Congress also asked the secretary of commerce to complete two important studies of our national innovation capacity and economic competitiveness. The first, released earlier this month by Commerce Secretary John Bryson at an event at the Center for American Progress, was a comprehensive analysis of the competitive position of the U.S. innovation system. The second, due in January of 2012, will outline a 10-year strategic plan to give our national innovation engine a major tuneup.

The Center for American Progress applauds this action by the federal government. But we as a nation need to move faster. That's why two CAP teams, one from Science Progress and the other from the Doing What Works project, convened a taskforce in early 2011 comprised of innovation policy experts to assess these same issues in tandem. This taskforce identified six key areas where policy barriers inhibit innovation and hold back national competitiveness:

- The structure of federal programs itself is out of date and thus unable to respond strategically to the innovation challenges of the increasingly competitive 21st century global economy.
- Federal data and statistical systems are not optimized to gather key 21st century innovation metrics. What isn't measured, isn't managed.
- The U.S. workforce development system does not adequately connect students and working learners to the needs of innovation-intensive industries on the cutting edge of the global economy.
- Federal research and development efforts are not optimized to make the most of basic and applied research occurring in universities in communities across the country.
- The U.S. immigration system needs to reform to ensure that talented foreign-born workers with bright ideas can start business and help contribute to innovation and job creation.
- Better policies are needed to strengthen the vital link between U.S. manufacturing and technical innovation capacity.

These six areas form the basis for the Center's Series on U.S. Science, Innovation, and Economic Competitiveness. Each report in the series focuses on a different building block of our national competitiveness.

In "Rewiring the Federal Government for Competitiveness," Science Progress advisor and former Commerce Department official Jonathan Sallet and Science Progress Managing Editor Sean Pool identify areas where existing federal programs and services could be coordinated more strategically to promote innovation and competitiveness. Specifically,

the paper identifies four key competitiveness areas where the splintered nature of existing programs and policymaking inhibits national competitiveness priorities:

- Trade
- Technology
- Workforce training
- Economic development

The paper proposed that the Department of Commerce become a more robust “Department of Competitiveness,” absorbing several other government agencies and programs to ensure the federal government supports innovation and economic growth more effectively and efficiently across these four competitive arenas. Importantly, the paper presents a “common application” program that would allow for more strategic coordination between the federal government, state and local governments, businesses, universities, and regional economic development players.

The second report, “Economic Intelligence,” by Professor Andrew Reamer, addresses the federal data system that is so important to policymaking. Any national competitiveness strategy must be guided by good data and metrics. Reamer’s paper finds that the current public statistics system leaves both the government and the private sector in the dark about key drivers of innovation and competitiveness, inhibiting our ability to manage and maximize these important economic forces. He proposes four pragmatic and targeted reforms that would:

- Improve competitive analysis in U.S. traded industries—the ones on the front lines of global competition
- Better measure intermediate outcomes of innovation, such as rates of entrepreneurship, invention, and network formation
- Assess structural building blocks of innovation—workforce capacity, R&D, financial capital, physical infrastructure, and clusters
- Directly evaluate the impact of public-sector innovation programs

These reforms are designed to empower not only the government but also technology companies, manufacturers, exporters, entrepreneurs, students, research institutions, and workforce training organizations to make smarter decisions and stay on the cutting edge of innovation.

In “Building a Technically Skilled Workforce,” American Progress workforce experts Louis Soares and Stephen Steigleder address the shortage in our pipeline of middle-skill workers—such as welders, technicians, and nursing assistants—needed to meet the emerging demands of innovation-intensive industries including biotechnology, nanotechnology, clean energy, and advanced manufacturing. The authors find that the projected shortage of 5 million middle-skill technicians by 2018 will hamper the ability of

our companies to get the human capital they need to stay on the cutting edge of innovation. To address this problem, they propose converting an existing federal grant program into a competitive Community College and Industry Partnership Grant designed to catalyze the development of new and better workforce training systems.

In “Universities and Innovation Networks,” Krisztina “Z” Holly brings her experience as University of Southern California Vice Provost for Innovation to bear looking at how federal policies affect the commercialization of university research. Universities are at the heart of our national innovation engine, and Holly identifies five areas for improvement of federal R&D policy to help get the most out of them:

- Increase investment in high-risk, large-scale, potentially transformative early stage research projects
- Help bridge the innovation gap between lab and marketplace with policies that promote small business spinouts and collaboration with cutting edge industries
- Refocus federal economic development funding on capacity building for place-based innovation ecosystems where spinout companies can thrive
- Develop a better infrastructure for measuring the impact of federally funded university research on human capital, jobs, and markets
- Address shifts in the increasingly competitive and hyper-collaborative global innovation landscape and reward “flows,” rather than “stocks” of information

These reforms would help tap the potential of universities to act as engines of innovation and job creation.

Marshall Fitz, in “Immigration for Innovation,” assesses the impact of high-skill immigration on our nation’s economic competitiveness and finds that high-skilled immigrants who have started their own high-tech companies have created hundreds of thousands of new jobs and hundreds of billions of dollars of economic activity. But our current immigration system stops many of the world’s best and brightest from starting companies and creating jobs in the United States, and inadequately safeguards against abuses that harm American-born workers. To stimulate innovation and enhance competitiveness, Fitz outlines reforms to target “job shops” that abuse the system, enhance worker mobility, and strengthen recruiting requirements, while establishing a market-based mechanism to set high-skill immigration rates to the economically optimal level.

Forthcoming in our series are several reports on the importance of manufacturing, particularly advanced manufacturing, to our nation’s continued global competitiveness. Each of these areas—federal program structure, metrics gathering, technical workforce development, university technology transfer, high-skill immigration, and manufacturing—represent key components of the innovation engine that drives long-term economic growth. Giving that engine a tuneup by implementing the policies in these papers is the first step to ensuring a prosperous and broadly shared economic future for all Americans.

Today we call upon the Obama administration and Congress to create a bipartisan commission to consider and then implement these kinds of reforms to our federal science and economic competitiveness programs. The new commission, modeled after the so-called Defense Base Closure and Realignment Commission that enabled the Department of Defense to restructure our military bases so effectively, would be able to overcome congressional and executive branch inertia to retool our innovation engine for competitiveness in the 21st century.