Universities in Innovation Networks

The Role and Future Promise of University Research in U.S. Science and Economic Policymaking

Krisztina “Z” Holly  December 2011

The fourth report in a series on U.S. science and economic competitiveness from the Doing What Works and Science Progress projects at the Center for American Progress
About this series on U.S. science and economic competitiveness

The U.S. Congress in late 2010 asked the Department of Commerce to complete two studies as part of the reauthorization of the America COMPETES Act. The first, which was released on January 6th, 2012, at the Center for American Progress, focuses on U.S. competitiveness and innovation. The second, due to Congress in early 2013, offers specific recommendations for developing a 10-year national innovation and competitiveness strategy.

We applaud the commissioning of these reports but believe we cannot afford to wait that long to take action. That’s why we convened in the spring of 2011 the group of experts listed on the following page. We spent two days in wide-ranging discussion about the competitive strengths and weaknesses of our nation’s scientific endeavors and our economy, before settling upon the topics that constitute the series of reports we publish here. Each paper in the series looks at a different pillar supporting U.S. science and economic competitiveness in a globally competitive economy:

- “Rewiring the Federal Government for Competitiveness”
- “Economic Intelligence”
- “Universities in Innovation Networks”
- “Manufacturers in Innovation Networks”
- “Building a Technically Skilled Workforce”
- “Immigration for Innovation”

The end result, we believe, is a set of recommendations that the Obama administration and Congress can adopt to help the United States retain its economic and innovation leadership and ensure that all Americans have the opportunity to prosper and flourish now and well into the 21st century.

Many of our recommendations are sure to spark deep resistance in Washington, not least our proposal to reform a number of federal agencies so that our government works more effectively and efficiently in the service of greater U.S. economic competitiveness and innovation. This and other proposals are sure to meet resistance on Capitol Hill, where different congressional committees hold sway over different federal agencies and their policy mandates. That’s why we open each of our reports with this one overarching recommendation: Congress and President Obama should appoint a special commission to recommend reforms that are packaged together for a single up-or-down vote in Congress. In this way, thorough-going reform is assured.

This new commission may not adopt some of the proposals put forth in this series on science and economic competitiveness. But we look forward to sharing our vision with policymakers as well as the American people. President Obama gets it right when he says, “To win the future, we will have to out-innovate, out-educate, and out-build” our competitor nations. We need to start now.
Coordinating editors for the series on U.S. science and economic competitiveness

Ed Paisley, Vice President, Editorial, American Progress
Gadi Dechter, Associate Director, Government Reform, Doing What Works
Sean Pool, Assistant Editor, Science Progress

American Progress taskforce on U.S. science and economic competitiveness

John Alic, science, technology, and economic policy consultant and former staff member of the Congressional Office of Technology.

Joseph Bartlett, of counsel in Sullivan & Worcester’s corporate department and former undersecretary of commerce at the U.S. Department of Commerce.

Maryann Feldman, S.K. Heninger distinguished chair in public policy at the University of North Carolina, Chapel Hill.

Kate Gordon, VP for Energy Policy at the Center for American Progress.

Michael Gurau, president, Clear Innovation Partners, a venture capital investment firm.

David Hart, director of the Center for Science and Technology Policy at George Mason University School of Public Policy.

Christopher Hill, professor of public policy and technology at George Mason University School of Public Policy and former vice provost for research at George Mason.

Neal Lane, senior fellow for science and technology policy at Rice University and former advisor to the president on science and technology policy.

Rachel Levinson, director of National Research Initiatives at Arizona State University and former assistant director for life sciences at the White House Office of Science and Technology Policy.

Jonathan Moreno, Editor-In-Chief of Science Progress and Senior Fellow at the Center for American Progress.

Arti Rai, Elvin R. Latty Professor of Law at Duke University and former Administrator for External Affairs, USPTO.

Andrew Reamer, research professor at the George Washington University Institute of Public Policy and non-resident senior fellow at the Brookings Institution.

RoseAnn B. Rosenthal, president and CEO, Ben Franklin Technology Partners of Southeastern Pennsylvania.

Jonathan Sallet, partner in the law firm of O’Melveny & Myers LLP, Science Progress advisor, and former director of the Office of Policy and Strategic Planning of the U.S. Department of Commerce.

Daniel Sarewiz, director of the Consortium for Science, Policy, and Outcomes at Arizona State University.

James Turner, Senior Counsel for Innovation & Technology, and Director of Energy programs at the Association of Public and Land-Grant Universities and former professional staff and chief counsel for the House Committee on Science and Technology.

William A. Wulf, professor of computer science at the University of Virginia and former president of the National Academy of Engineering.
Introduction and summary

The United States is known for its innovativeness and entrepreneurial spirit. Between half and three-quarters, or even more, of all economic growth in the last half-century can be tied to technological innovation, depending on which study you use. Yet in the last few decades, measures increasingly demonstrate that the United States is falling perilously behind in innovation.

When we think of technological innovation, we think of inventors, entrepreneurs, and corporations joining novel ideas with financial capital and market opportunities. Efforts to increase innovation should help support circumstances for the private sector to bring new products and services to market. The spark of technological innovation, however, often begins well before the opportunity is obvious or attractive to private sector. As a result, the partnership between the U.S. government’s funding of research in the nation’s public and private universities plays a larger role than most observers recognize.

Universities play a vital and extensive role in driving innovation in the United States. They offer a vast research base (a total of $50 billion nationwide), the ability to teach and develop a fresh new workforce (3 million graduates each year), goodwill of successful alumni, the ability to convene disparate expertise, and a deep commitment to local communities. Universities have been important players to date, and we have an opportunity to further nurture these vibrant ecologies to sustainably generate greater innovation and economic growth.

In the context of the declining state of innovation in the United States, we have an opportunity to tap into universities in a variety of ways, among them:

• **Stoking the engine of innovation**—supporting university research, the foundation for the most groundbreaking innovations and innovators that can create new industries
• **Supporting the flow and application of knowledge**—bringing industry expertise to academia and reducing scientific risk to enable early discoveries to advance to the stage where the private sector is willing to invest and capitalize on them

• **Seeding innovation ecosystems**—creating the culture, human capital, and connections necessary to form innovation networks where researchers, entrepreneurs, investors, manufacturers, and other research interests can collaborate and compete

• **Measuring for success**—developing the right framework and infrastructure for measuring innovation to guide policymaking and investments

• **Preparing for shifts in competitiveness**—rethinking assumptions and trying new approaches so that policy can drive new frontiers of innovation

Increasing globalization, connectivity, access, and acceleration of technology only make the need to invest in innovation all the more urgent. And ultimately, we must realize that the landscape is shifting, and what works yesterday may not be as effective today, nor be the best approach in the future. The United States and its universities should not only accelerate its investments in research and innovation but also continually reevaluate and redesign the traditional mechanisms for doing so to prepare for the changing face of innovation long term.

In the pages that follow, we examine all five of these ways to stoke innovation through and around universities, relying on public- and private-sector support and collaboration. We include specific policy recommendations at the end of each chapter of this report, but here is a brief synopsis of our main recommendations:

• Increase investments in early-stage research, targeting part of these investments toward high-risk, large-scale, transformational projects, with an emphasis on the development of talent

• Bridge the gap between early-stage research and the marketplace through policies that support technology transfer, programs that increase knowledge flow between academia and industry, and partnerships that support translational research and proof-of-concept projects
• Refocus federal economic development funding on regional and local ecosystems that develop talent and create links between researchers and the private sector.

• Develop new, more comprehensive methodologies to measure the linkages between investments in innovation and the broader impacts in human capital, new products, and jobs to drive better policy decisions and incentives for innovation.

• Develop radical policy experiments and incentives to enable universities to be at the forefront of trends in innovation and competitiveness as the future mechanisms of innovation change.

This paper will demonstrate that these recommendations are definitively appropriate for our nation to pursue in order to boost the global strength and competitiveness of our science and our economy.
About the Center for American Progress
The Center for American Progress is a nonpartisan research and educational institute dedicated to promoting a strong, just and free America that ensures opportunity for all. We believe that Americans are bound together by a common commitment to these values and we aspire to ensure that our national policies reflect these values. We work to find progressive and pragmatic solutions to significant domestic and international problems and develop policy proposals that foster a government that is “of the people, by the people, and for the people.”

About Science Progress
Science Progress, a project of the Center for American Progress, is designed to improve public understanding of science and technology and to showcase exciting, progressive ideas about the many ways in which government and citizens can leverage innovation for the common good. Since its inception in the fall of 2007, Science Progress has helped shape the conversation about our country’s investment in science.

About Doing What Works
CAP’s Doing What Works project promotes government reform to efficiently allocate scarce resources and achieve greater results for the American people. This project specifically has three key objectives:

- Eliminating or redesigning misguided spending programs and tax expenditures, focused on priority areas such as health care, energy, and education
- Boosting government productivity by streamlining management and strengthening operations in the areas of human resources, information technology, and procurement
- Building a foundation for smarter decision-making by enhancing transparency and performance measurement and evaluation