The days of China as the low-cost, low-tech manufacturer of the rest of the world’s high-tech innovations may soon be coming to a close. China now leads in the production of not just low-end manufactured consumer goods but also some high-tech devices, many of which were developed in the United States. This is making it harder and harder for even our high-tech companies to create jobs and compete in lucrative export markets.

The goals President Barack Obama presented in last night’s State of the Union address for U.S. competitiveness vis-à-vis China are right on the mark. He acknowledged the fundamental role innovation plays in driving economic growth when he said, “In America, innovation doesn’t just change our lives. It is how we make our living. … maintaining our leadership in research and technology is crucial to America’s success.”

But the president also recognized the strides China has made in investing in their innovation-driven future. “China,” he said, is “educating their children earlier and longer, with greater emphasis on math and science. They’re investing in research and new technologies. … and China is building faster trains and newer airports.”

These statements echo the findings of our recent report, “Rising to the Challenge: A Progressive U.S. Approach to China’s Innovation and Competitiveness Policies,” and so did his conclusion. “If we want to win the future,” he said, “if we want innovation to produce jobs in America and not overseas … we need to out-innovate, out-educate, and out-build the rest of the world.”
The president is right. Staying competitive means investing in the building blocks of an innovation-driven economy, from science and math education to university research, including partnerships with small businesses, investors, and manufacturers who create jobs by building markets for new technology. Accomplishing these goals, however, will require a well-crafted and comprehensive policy vision. As the president and the new Congress work together to build a new foundation for economic growth, here are the top 10 things they can do to ensure our world-class innovation engine continues to run smoothly.

**Invest in future talent through strong science, technology, engineering, and math education programs and workforce training**

Science and math expertise are critical to sustaining an innovative economy. But as the president said last night, “the quality of our math and science education lags behind many other nations.” Students in China consistently score higher on standardized math and science tests. Furthermore, 59 percent of Chinese students major in fields related to science or engineering, as opposed to only 32 percent in the United States. To remedy this disparity, we need to add 10,000 new STEM teachers each year and strengthen the skills of the 250,000 current STEM teachers by implementing the programs in the president’s Educate to Innovate agenda. The president also needs to ensure that reform of No Child Left Behind includes a strong emphasis on science and math training.

**Create new opportunities and improve educational quality for working learners**

Only 34 percent of working learners who return to college actually complete a degree after six years of study. Creating opportunities for working learners is critical to giving them the necessary skills to be competitive in emerging fields. To keep our workforce educated and competitive, we need to build bridges from STEM education programs and academia by revising and revitalizing the Workforce Investment Act of 1998, which is up for reauthorization.

**Invest in seizing the clean energy opportunity**

U.S. public investment in renewable energy has fallen from $9 billion in inflation-adjusted dollars in 1980 to $3.2 billion in 2006. Meanwhile, by some estimates,
China spends as much as $12 billion monthly on new energy technologies and export expansion. Six of the top 10 global photovoltaic manufacturers are now located in China, accounting for roughly one-quarter of global production.

The United States needs to get back in the race to seize the vast economic opportunity embodied in clean energy. From cleaner air to increased energy security and price stability; to more job creation; to lower heating, lighting, and transportation bills; clean energy innovation is a win-win-win for those countries willing to invest in it.

To that end, we need to invest in a three-tiered approach of expanding markets, harnessing private financial capital, and building the infrastructure needed to seize the job-creating, economic benefits of clean energy. More concretely, we need to put a price on pollution to help clean energy become the profitable kind of energy; set a clean energy standard to signal long-term market stability to investors; and reform the outdated regulatory system that governs our aging national transmission grid so that a new and smarter grid can bring clean energy and efficiency savings to every household in the country.

**Focus federal investments in technology innovation on the critical valley of death gap**

Part of what China has done to help leapfrog the technological ladder is to double down in not just research and development but critical commercial activities where new technologies enter the market and wean themselves off of government funding. Programs funded by the Recovery Act of 2009, such as the Advanced Research Projects Agency-Energy, or ARPA-E, and the regional innovation cluster grant competition are already helping move technologies from the university to the lab. We need more federal attention for this kind of activity in the coming years.

**Harness private capital flows toward innovative, job-creating small businesses**

The pool of venture capital for innovative new technologies has decreased in recent years, making it difficult for small businesses with new technologies to grow and bring their products to market. In this financial environment, VC investors are choosing to take less and less risk in their investments, which deprives promising young technologies of the capital they need to get off the ground.
What’s more, programs such as the Small Business Innovation Research grants, Small Business Technology Transfer grants, Technology Innovation Program grants, and others are poorly coordinated to ensure maximum effectiveness of their already small program budgets. And for clean energy, we need a green bank to extend credit enhancements to financers for investments in clean energy and other technologies of national priority such as information technology and advanced manufacturing.

Policymakers need to turn their attention to how we can lure private capital toward the job-creating and innovative small businesses that drive technology commercialization and make up the backbone of our economy.

Increase our focus on domestic manufacturing capabilities

Manufacturing is an essential component of a successful innovation and competitiveness strategy. Not only do high-tech goods account for $231 billion in export earnings, or roughly a quarter of our overall manufactured exports, but manufacturing is a key element of successful technology innovation.

Unfortunately our balance of trade in high-tech manufactured goods has declined from a $60 billion surplus in 1990 to a deficit of $60 billion in recent years. To stay competitive with China we need to make the technologies we invent here, rather than letting China take all the benefits of incremental improvements and cost-reducing assembly line innovation.

As a nation, we need to commit to the manufacturing of high-end products in the United States, by strengthening federal investment in the Manufacturing Extension Partnership Program and by expanding and extending the 48C advanced energy manufacturing tax credit program to give it a long-lived lifespan and predictable sunset.

Reform immigration laws to encourage the immigration of skilled foreigners

Foreign nationals comprise two-thirds of Ph.D. students and are responsible for founding 50 percent of Silicon Valley startup companies. Yet our immigration laws make it difficult for immigrants to transition from education to work, and to move from job to job in the innovation economy, drastically reducing the potential that these skilled workers have to contribute to growth.
We need to streamline visa processing for international students, make it easier for students graduating with degrees in STEM fields to remain in the United States, make the cap on highly-skilled visas more flexible, and create easier paths to permanent residence for highly skilled workers with graduate-level degrees in these fields. We also need to ensure those undocumented immigrants raised in the United States and now in college get the chance to become citizens and contribute to the nation they call their own.

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Invest in regional races to the top and clustered industry growth

Study after study shows that regional innovation clusters are an efficient means of facilitating industry collaboration and synergy. Chinese innovation and economic planners are also well aware of the importance of clustering by encouraging Chinese companies in similar industries to clump together to improve their access to incremental innovation, share supply chains, and boost the competitiveness of their workforces.

The America COMPETES Act signed by the president late last year unfortunately did not include language passed by the House of Representatives to support regional innovation cluster grant programs. We need to establish far-reaching programs like the Energy Efficiency Regional Innovation Cluster grant that align national innovation priorities with regional economic development plans. One way to do this would be for Congress to take back up the Energy Innovation Hubs Authorization Act of 2010, which would provide $860 million in grants over five years to encourage the R&D and commercialization of critical clean energy technologies.

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Pass legislation to spur long-term innovation

While the America COMPETES Act is a solid stepping stone, the passage of three additional pieces of legislation is critical to bolstering the United States’ long-term innovation strategy. The Department of Energy Office of Science Authorization Act of 2010, the ARPA-E Reauthorization Act of 2010, and the Energy Innovation Hubs Authorization Act of 2010 would collectively work not only to fund additional groundbreaking research but also to find new commercial applications and help bring emerging technologies to market.
Establish metrics for competitiveness by which to measure progress, and create a coordinated interagency effort to address our innovation and competitiveness challenges

In “A Focus on Competitiveness,” CAP outlines a few mechanisms that should be put in place to help coordinate the kind of cross-cutting, multi-agency collaboration needed to implement a real innovation and competitiveness agenda. Metrics and oversight are needed to promote collaboration of otherwise uncoordinated activities across many federal agencies. To this end we suggest a Quadrennial Competitiveness Assessment, a Biannual Presidential Competitiveness Strategy report, and an Interagency Competitiveness Taskforce to point the United States in the right direction.

Conclusion

With a strong contingency of well-trained workers, the proper infrastructure for innovation, and a government dedicated to investing in research for the next great technological breakthroughs, the United States would be properly equipped to stay competitive in a future of booming growth in China and elsewhere. We can and must rethink, retool, and reinvest in our nation’s innovation potential if we are to succeed. As the president said last night, “that’s what Americans have done for over 200 years: reinvented ourselves.”

Sean Pool is a co-author (along with Kate Gordon, Susan Lyon, and Ed Paisley) of the recent report from the Center for American Progress titled “Rising to the Challenge: A Progressive U.S. Approach to China’s Innovation and Competitiveness Policies.” David Murdter is an Intern in the Online Communications department at the Center.