Secretary of Commerce Gary Locke  
Remarks to the President’s Council of Advisors on Science and Technology  
Washington, D.C.

I hope everyone had a wonderful New Years and you were able to spend some time somewhere warmer than Washington, D.C.! Back in December, Dr. Holdren invited me to speak in front of all of you, and I have been looking forward to this day ever since.

I joined the Department of Commerce last spring and since then, I’ve tried to answer one question every day when I come in to work: How can the Commerce Department help save and create more American jobs?

Outside the confines of Washington, D.C., there are millions of Americans—far too many Americans—out of work. That is a tragedy for them and their families—and a tragedy for this nation, which needs these people’s skills to maintain our position as the strongest economy in the world. The issues being explored by the President’s Council of Advisors on Science and Technology are of singular importance for putting Americans back to work in the type of high-wage jobs that can support a family—the type of jobs that have unfortunately been disappearing for years. Now, we can talk about all the structural factors that have caused these jobs to disappear; be it global competition, productivity gains, or the recent folly of building an economy on the ephemeral surface of a bubble.

But the deeper problem is an American economy that simply isn’t innovating enough to create advanced new technologies.

In the past, America has depended, above all, on one thing to keep growing: a continuous flow of new technologies and new ideas entering the marketplace that sweeps away old ways of doing business and replaces them with new ones. But today, America has a broken innovation ecosystem that does not efficiently:

- create the right incentives or allocate enough resources to generate new ideas;
- develop those ideas with focused research; and,
- turn them into businesses that can create good jobs.

The evidence is everywhere you look. You see it the industries that used to be dominated by American companies but are now led by companies in Europe and Asia. Just a decade or two ago, the United States had the unquestioned lead in the design and production of things like semi-conductors, batteries, robotics and consumer electronics. No longer.

Our balance of trade in “advanced technology products” turned negative in 2002—and has shown little sign of abating. You see America's innovation deficit in the gross distortions in our economy, where almost $4 out of every $10 in corporate profits was coming from the financial industry in recent years. And most strikingly, you see it in the job numbers. America has created no net new jobs over the past decade, and median wages have remained flat.
These troubling numbers should be a wakeup call to every American policymaker and business leader that America’s economic challenges go well beyond the turmoil we saw last year in our financial markets. America simply does not have an efficient system to take new ideas from government, academic and private-sector research labs and translate them into commercially viable products and businesses. And that is a problem that I hope PCAST can help rectify, and what I hope we can spend the balance of our time discussing today.

The first problem with our broken innovation system is urgent—but at least we have a pretty good idea how to fix it. We’ve got to devote more resources to research and development—especially at the federal level. As you all know, America was able to thrive through much of the last century, because we had sprawling public- and private-sector research labs that were constant sources of new ideas. Massive federal spending in areas like defense, energy and aeronautics, that might have been too risky for private investors helped spin off countless private-sector innovations. We may have seen the Internet come of age in Silicon Valley, but it first came to life in the labs of the Defense Advanced Research Projects Agency. The folks at Tempur-Pedic have given us mattresses that make us feel like we're sleeping on a cloud, but they are using technology that was first developed by NASA.

Meanwhile, we had well-funded private research operations at companies like AT&T through Bell Labs and Xerox, that pioneered everything from semiconductors to cellular phones.

But both of those engines of research innovation are running on fumes.

Take for example, Bell Labs, which as recently as 2001, had 30,000 employees. Today, under its current owner, Alcatel-Lucent, Bell Labs has 1,000 employees. And even as overall spending in corporate R&D has increased, more of it has been focused on short-term applied work—and more of it is happening outside our borders. American manufacturers, for example, are now expanding their foreign research and development spending three times as fast as their domestic spending.

Or look at federal government research. As a share of GDP, American federal investment in the physical sciences and engineering research has dropped by half since 1970.

Fortunately, President Obama has grasped the urgency of the problem. Overall, the President’s Recovery Act included $100 billion to support groundbreaking innovations in diverse fields, from healthcare IT and health research, to smart grids and high speed trains. And last spring, the president went before the National Academy of Sciences and committed to devote more than 3 percent of America’s GDP to research and development, which would represent the biggest such investment since John F. Kennedy’s administration. These are huge steps, but they can only be viewed as the beginning.

Because the second problem with our innovation system is that even in areas where we are allocating enough funding for R&D, we’re not doing a good enough job getting these ideas into the marketplace. And that above all, is where I hope PCAST can help shine a light. For much of the last century, the way we moved federal R&D out of our labs and into the marketplace worked well enough. We’d give billions of dollars to the Defense Department to develop new military applications or to NASA to develop new space technologies, and eventually that work would find its way to private-sector innovators who saw commercial opportunities. To paraphrase the old line from Field of Dreams, the attitude was basically: “If we fund it, the entrepreneurs and venture capitalists will come.”
It wasn't a terribly efficient system, but for a time, it didn't really matter because the United States was the unquestioned leader in innovation. From World War II on, there was barely any world-changing technology that wasn’t first pioneered in the United States. But those days are over—and today, too many of our research ideas never make it out of the lab, and if they do, they get lost in the “valley of death,” where a high-risk idea doesn't have the resources or the funding to make it to market.

The United States has not adjusted to a new global marketplace where foreign countries and foreign companies have the ability to outpace their American counterparts. We’ve all read the stories about China, which is churning out hundreds of thousands of engineers every year, growing its R&D budget by 20 percent annually and making a national commitment to take the lead in promising new industries like clean energy. Not only are countries like China increasing their spending on research faster than the United States, they are doing it in a more focused way.

It’s not tenable for the United States to continue with the status quo, where we take a buckshot approach to research and hope that eventually, there will be some commercialization. Researchers—especially those relying on taxpayer dollars—need to understand that while the pursuit of knowledge for its own sake is and always will be important, we’ve got to do a better job focusing on lines of discovery that have real potential to spawn new industries, new businesses and new jobs. And when we do discover promising new ideas, we’ve got to ensure their benefits are captured for American consumers and workers.

I think an unfortunate line of thinking has developed over the past few decades that figured as long as we designed products and owned a piece of the intellectual property, it didn't really matter if someone else made it.

But now we’re starting to see the folly of that approach.

Just yesterday, I read an article in the New York Times showing that Chinese and Taiwanese computer makers—who had previously just built PCs designed by the likes of HP and Apple—had now started to move into research and design, and were grabbing market share from their former American partners. We shouldn’t be surprised. When products are designed and manufactured side-by-side in America, businesses can discover new efficiencies and develop second-, third- and fourth-generation upgrades that simply would never occur in a cloistered research lab. When they are not, we allow other countries to develop new businesses and new jobs that can only be created when a company is engaged in the entire chain of innovation: from the inception of an idea, to its production and ultimately sale to the customer.

Since I took over at Commerce, I’ve directed people throughout our organization to start examining how research and development is commercialized and how we can turn more of them into businesses, and more quickly. In fact, we recently launched the Office of Innovation and Entrepreneurship, whose mandate is to drive policies that help entrepreneurs translate new ideas, products and services into economic growth, and to accelerate technology commercialization of federal R&D.

Next month, this Office will convene a meeting with universities, innovators, entrepreneurs and investors to discuss technology commercialization issues. In addition, the Office of Innovation and Entrepreneurship is working with an interagency team to explore ways to support proof-of-concept centers at universities. But these issues I’ve discussed today are so fundamental to our national
economic competitiveness that we need more leaders engaged in addressing them. Leaders like the people in this room.

At this point, there are a lot more questions than answers. Do we need an "eBay for ideas" that makes all ideas generated from federally-funded research publicly available to entrepreneurs? Should we give university innovators a choice of agent to license their intellectual property? How do we better integrate federal research that is happening across multiple government agencies? And should we factor a university's track record of commercialization in our decision to award R&D grants?

These are all ideas worth considering.

I'd like to challenge PCAST to explore these questions and come up with new ones to find answers to. You have the ability, and the responsibility, to focus policymakers and the American public on an innovation deficit that simply must be a preeminent national priority. Virtually every critical line of economic development you can think of, whether it’s clean energy, biotechnology, or nanotechnology, would be greatly improved by changing the way our researchers come up with ideas and turn them into tangible businesses that will put the American people back to work. I can't wait to hear your ideas.