



The 2012 Budget: Winning the Future Through Investments in Innovation, Education, and Infrastructure

John P. Holdren

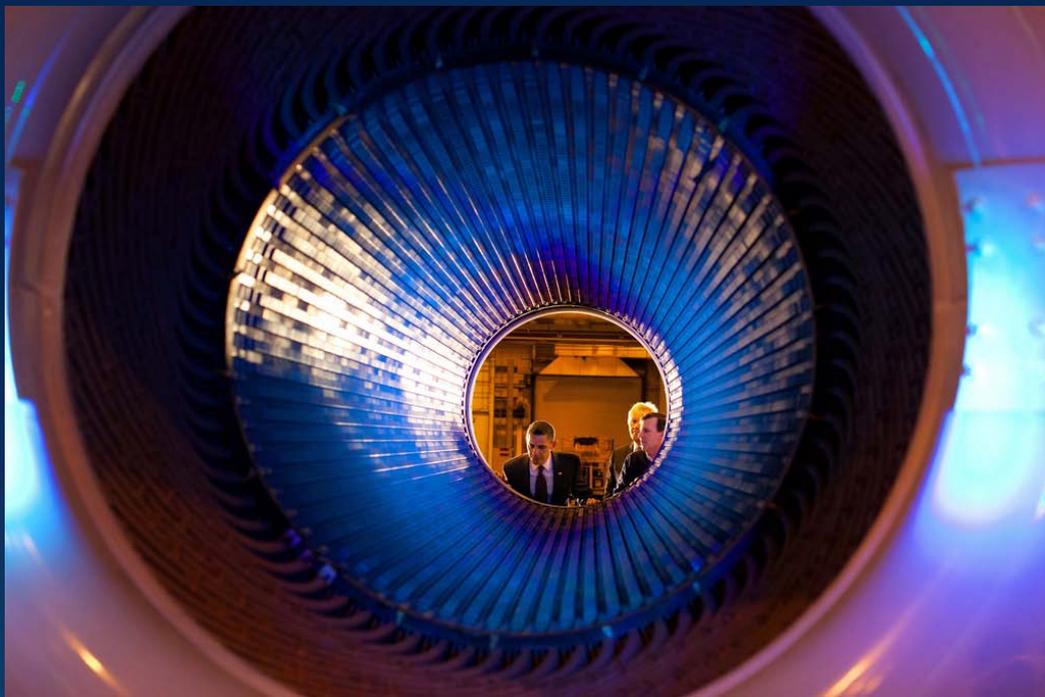
Assistant to the President for Science and Technology
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“We know what it takes to compete for the jobs and industries of our time. We need to out-innovate, out-educate, and out-build the rest of the world.”

- President Barack Obama
January 25, 2011



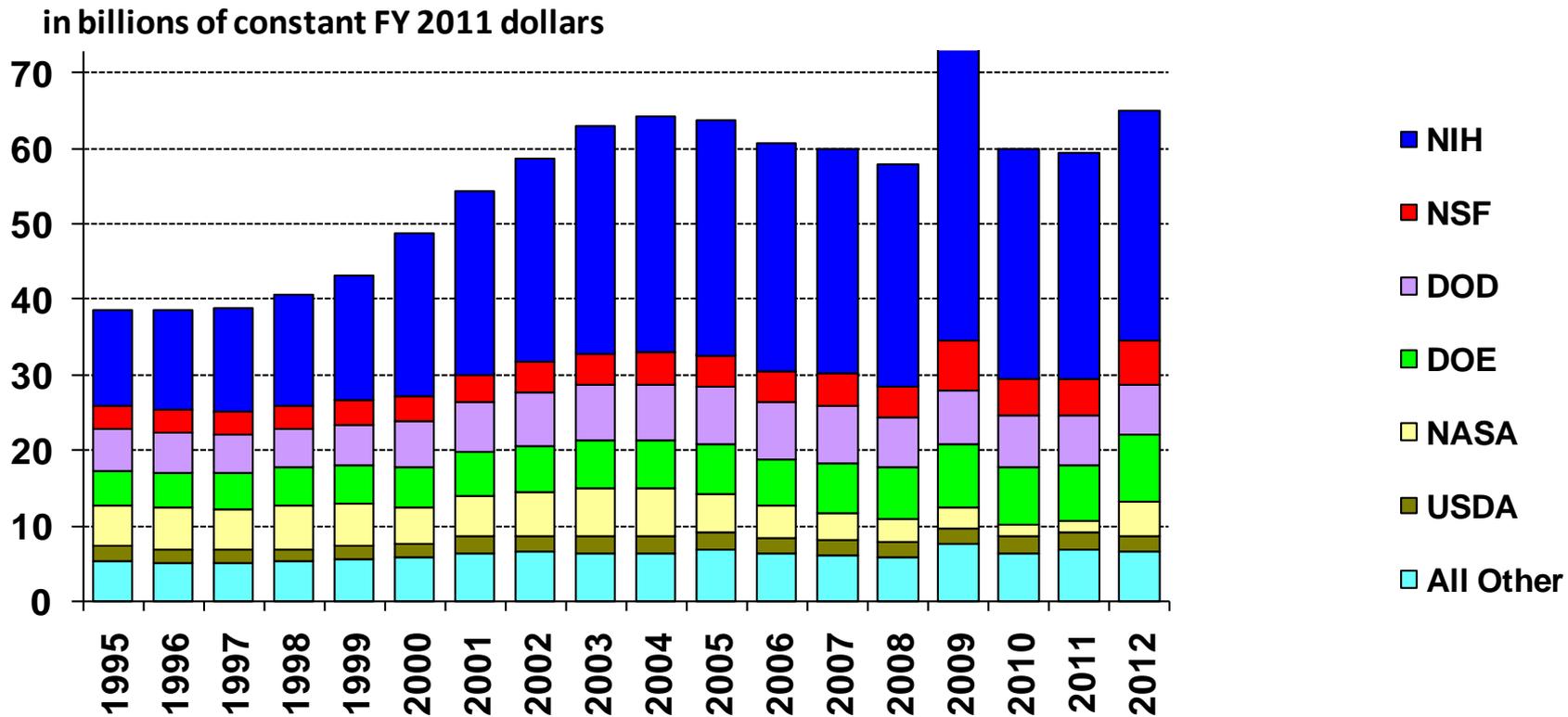


“This is our generation’s Sputnik moment... We’ll invest in biomedical research, information technology, and especially clean energy technology – an investment that will strengthen our security, protect our planet, and create countless new jobs for our people.”

- President Barack Obama
January 25, 2011

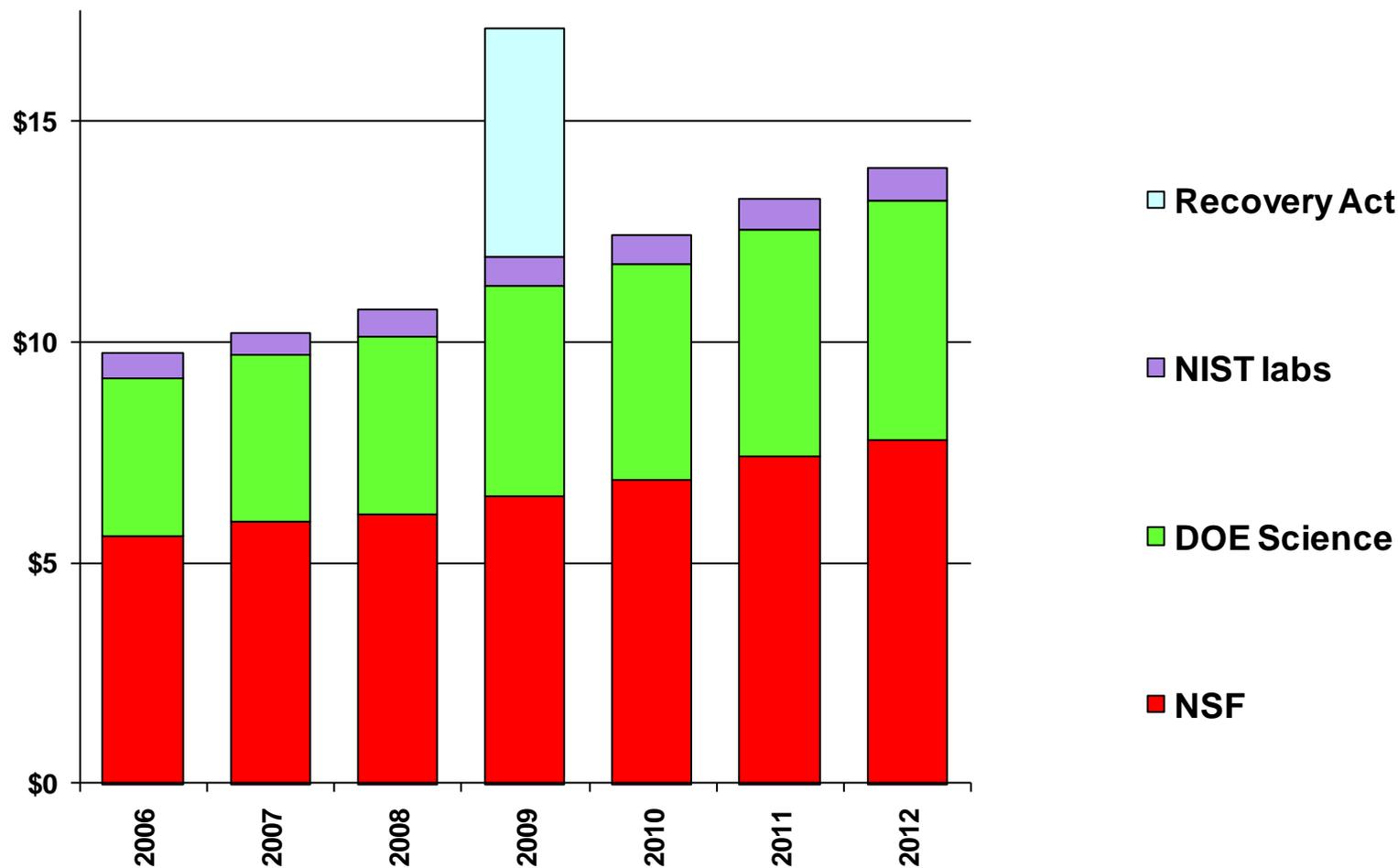


Winning the Future: Federal Research by Agency, FY 1995-2012



FY 2009 figures include Recovery Act appropriations.
 2011 figures are preliminary estimates.
 Research includes basic research and applied research.
 FEB. '11 OSTP

Investing in the Building Blocks of American Innovation: The President's Plan for Science and Innovation



budget authority in billions of current dollars
(2011 figures are from the 2011 Budget)

The 2012 Budget: Winning the Future

- Jumpstarts Innovation
- Supports STEM Students
- Invests in Infrastructure
- Makes Tough Choices
 - Offsets all increases with cuts in other programs
 - Keeps non-security discretionary spending flat for the second year in a row





Carl Wieman

Associate Director for Science

White House Office of Science & Technology Policy

Investing in basic research to drive innovation

- Invest in biomedical research: Nearly \$32 billion in 2012 for the National Institutes of Health (NIH).
- NSF science – \$6.3 billion in 2012 for Research & Related Activities.
- DOE Science – \$5.4 billion in 2012 for the Office of Science.





“Maintaining our leadership in research and technology is crucial to America’s success. But If we want to win the future – if we want innovation to produce jobs in America and not overseas – then we also have to win the race to educate our kids.”

- President Barack Obama
January 25, 2011



Educating a Competitive Workforce

\$3.4 billion for STEM Education in programs throughout the Federal government.

- Launch the NSTC Committee on STEM Education to coordinate this investment.

- The “Educate to Innovate” campaign leverages these Federal resources with over \$700 million in private-sector commitments.

- The 2012 Budget also proposes \$90 million to launch ARPA-ED with the mission of supporting transformational education technology.



Moving U.S. students from the middle to the top of the pack in math and science

New in 2012

- Prepare 100,000 new STEM teachers over a decade: \$100 million (\$80 million in the Dept. of Education, \$20 million in NSF) in the 2012 Budget.
- NSF's "Transforming Broadening Participation in STEM" program is \$20 million.
- Moving improved undergraduate STEM education practices to scale: NSF \$20 million.
- NSF and NIH grants for graduate fellowships increased.





Shere Abbott

Associate Director for Environment

White House Office of Science & Technology Policy



“We’re telling America’s scientists and engineers that if they assemble teams of the best minds in their fields, and focus on the hardest problems in clean energy, we’ll fund the Apollo projects of our time.”

- President Barack Obama
January 25, 2011



Energy R&D Highlights in the 2012 Budget

Winning Our Clean Energy Future

Advance Critical Energy Research

Energy Innovation Hubs

- Doubles the number of Energy Innovation Hubs from 3 to 6

ARPA-E

- \$550 million to DOE for support of transformational clean energy research

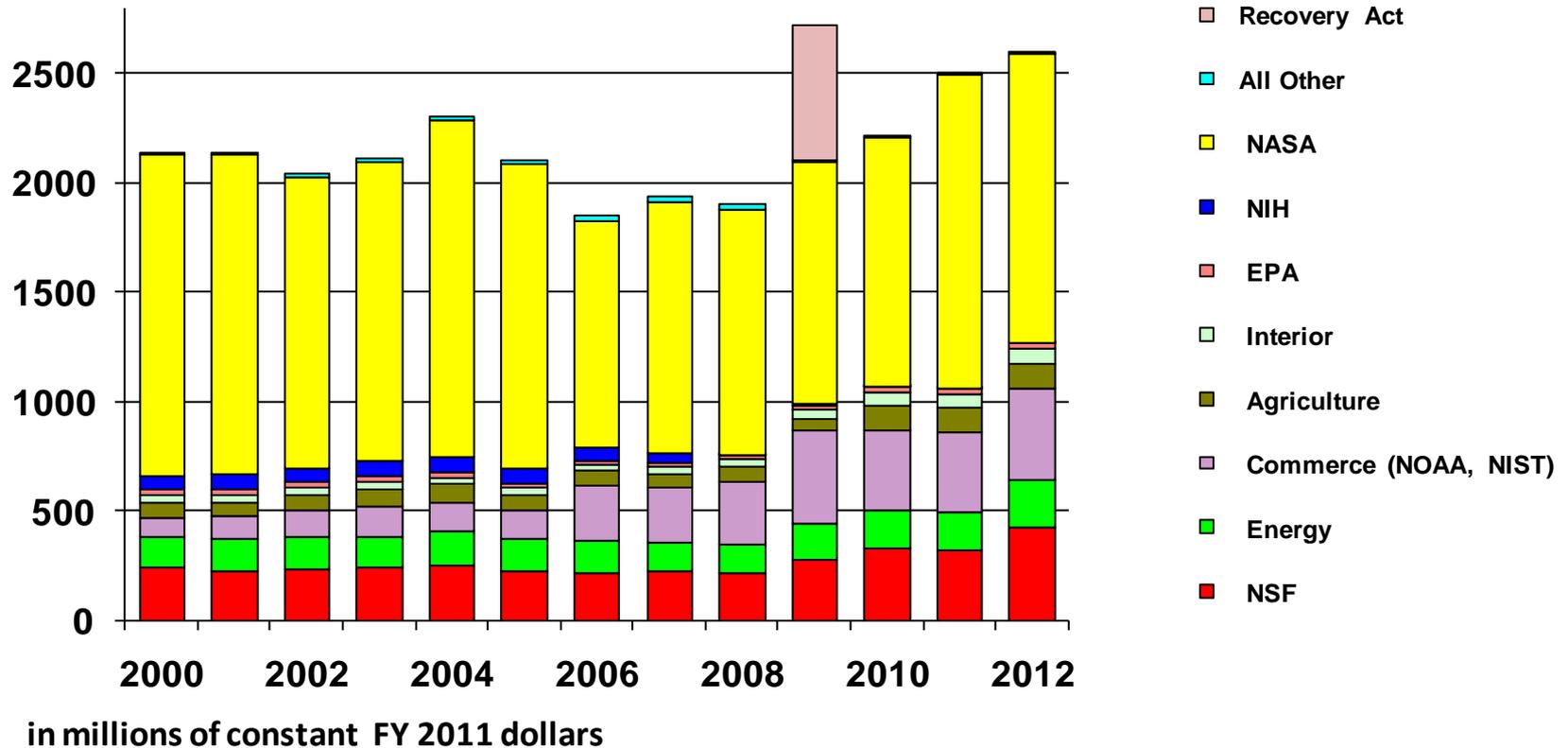
Support American Leadership in Clean Energy

Clean Energy Technology

- Invest \$8.7 billion from basic research to development and deployment by ending fossil fuel subsidies



Understanding and Responding to Our Changing Planet: US Global Change Research Program



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2011 figures are preliminary estimates.

Global Change Research in the 2012 Budget

Winning the Future for People AND the Planet

- Reaffirms commitment to addressing the climate change challenge.
- \$2.6 billion for USGCRP, an increase of 20.3 percent or \$443 million over 2010 enacted level.
- National Climate Assessment is a priority for USGCRP.
- Significant interagency research effort to monitor and verify greenhouse gas emissions.
- Science for sustainability is a priority (NSF, EPA, NOAA).





Philip Coyle

Associate Director for National Security & International Affairs

White House Office of Science & Technology Policy

Defense Research Drives Innovation

\$ M	2010 actual	2012 budget	'10-'12 Change
DOD basic research ("6.1")	1815*	2078	+ 14.5%
DOD applied research ("6.2")	4984*	4787**	- 4.0%
DOD adv. technology development ("6.3")	6507*	5481	- 15.8%

- The Budget invests in defense S&T across a diverse portfolio, including biodefense, cybersecurity, medical R&D, force protection, rapid fielding, undersea warfare, and advanced energy technologies.
- The Budget provides \$3 billion for DARPA's breakthrough research.

* Includes Congressional projects

**Includes \$100 million from WIN Fund



S&T to Support Nuclear Security

\$ M	2010 actual	2012 budget	'10-'12 Change
Weapons Activities R&D	2564	2936	+ 14.5%
Defense Nuclear Nonproliferation R&D	311	345	+ 10.9%

- The 2012 Budget grows S&T to enable a smaller nuclear weapons stockpile consistent with the Nuclear Posture Review and the New START Treaty, while maintaining a safe, secure, and effective nuclear deterrent.
- The Budget makes investments in the development of next-generation tools to support nonproliferation, treaty monitoring, and transparency.



Innovation Secures Our Homeland

\$ M	2010 actual	2012 budget	'10-'12 Change
DHS S&T	1006	1176	+ 16.8%
Domestic Nuclear Detection Office (DNDO)	350	210	- 40.0%

- The 2012 Budget reflects a shift toward technology development and a focus on the fielding of responsive, practical, operational solutions.
- The Budget emphasizes R&D on cybersecurity (51% growth) and explosives detection.
- The Budget continues the transfer of elements of DNDO portfolio to DHS S&T/HSARPA.



Cybersecurity Research, Development, and Education

\$ M	2010 actual	2012 budget	'10-'12 Change
Cyber Security and Information Assurance/NITRD	407	548	+34.6%

The 2012 Budget includes:

- New NSF programs in the science of cybersecurity and “game-change” research.
- Increased DOE investments in control-systems cybersecurity.
- New DARPA initiatives in information assurance, survivability, security by design, and insider threat mitigation.
- New NIST support for the National Initiative for Cybersecurity Education (NICE) and the National Strategy for Trusted Identities in Cyberspace (NSTIC).



R&D to Counter Weapons of Mass Destruction (WMD)

- The 2012 Budget invests more than \$6 billion in science and technology to counter the proliferating threat of weapons of mass destruction
- “Whole of government approach” across multiple agencies including HHS, DoD, DHS, DOE, and others
- A spectrum of investments from innovation to continuous enhancement of operational capabilities
- The Budget includes investments in accelerated vaccine development, advanced medical countermeasures, and the new National Bio and Agro-defense Facility (NBAF)





Aneesh Chopra

U.S. Chief Technology Officer

Associate Director for Technology

White House Office of Science & Technology Policy

President's Strategy for American Innovation

Tech Role in Securing Our Economic Growth and Prosperity

**Startup America;
R&E Tax Credit
(expanded,
simplified, and
permanent);
patent reform
(modernized
Patent Office)**

Catalyze Breakthroughs for National Priorities

- Unleash a clean energy revolution
- Accelerate biotechnology, nanotechnology, and advanced manufacturing
- Develop breakthroughs in space applications
- Drive breakthroughs in health care technology
- Create a quantum leap in educational technologies

**Health IT
innovation**

Promote Market-Based Innovation

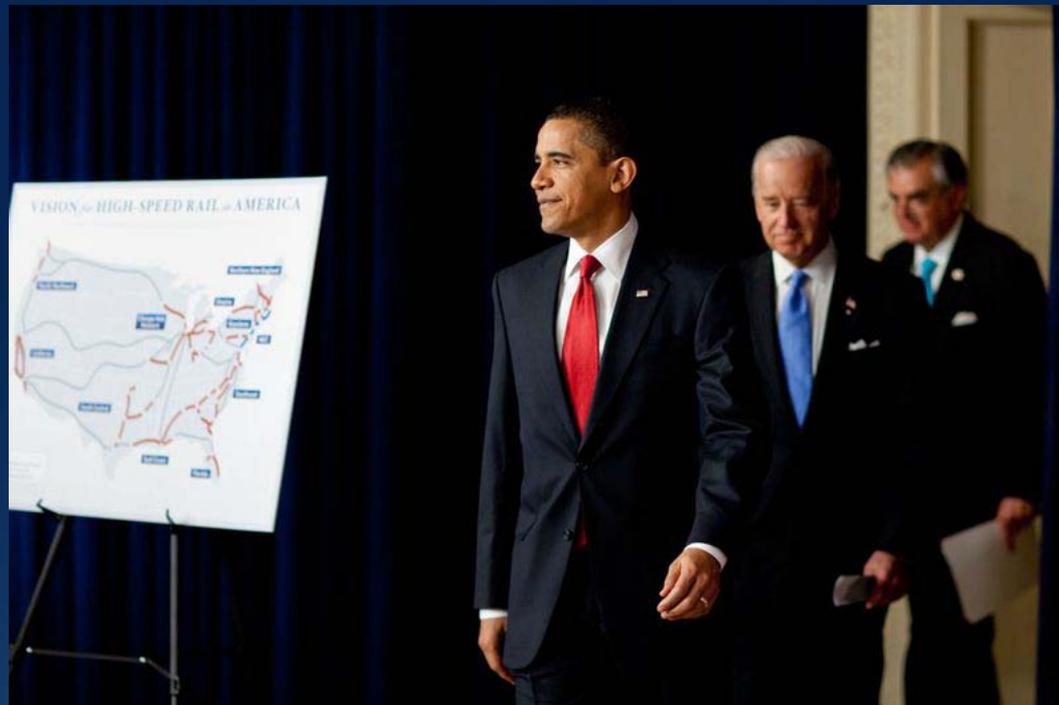
- Accelerate business innovation with the R&E tax credit
- Promote investments in ingenuity through effective intellectual property policy
- Encourage high-growth and innovation-based entrepreneurship
- Promote innovative, open, and competitive markets

**Wireless
Innovation &
Infrastructure
Initiative
("Wi3")**

Invest in the Building Blocks of American Innovation

- Educate Americans with 21st century skills and create a world-class workforce
- Strengthen and broaden American leadership in fundamental research
- Build a leading physical infrastructure
- Develop an advanced information technology ecosystem





“The third step in winning the future is rebuilding America. To attract new businesses to our shores, we need the fastest, most reliable ways to move people, goods, and information — from high-speed rail to high-speed Internet.”

- President Barack Obama
January 25, 2011



“We’re Going to Have to Up Our Game, Marquette”

Plan to Win the Future through Expanded Wireless Access

National Wireless Initiative (Wi3)



#1: Voluntary incentive auctions; goal to free 500 MHz of spectrum

#2: \$5 billion investment incentives to cover 98% with 4G wireless coverage

#3: \$10.7 billion investment to build nationwide public safety broadband network; re-allocate D block

#4: \$3 billion Wireless Innovation (WIN) Fund

“For our families and our businesses, high-speed wireless service, that’s the next train station; it’s the next off-ramp. It’s how we’ll spark new innovation, new investment, new jobs.”

—President Barack Obama,
February 10, 2011



Technology Highlights in the 2012 Budget

Harnessing Technology and Innovation to Transform the Economy

Invest in the Building Blocks of American Innovation

Wireless Innovation (WIN) Fund

- \$3 billion fund for: basic research, test beds, and public sector application development from spectrum receipts.
- NSF, DARPA, ARPA-E, NIST, and others will participate.

Promote Market-Based Innovation

Advanced Manufacturing

- \$190 million to NSF for promising areas like “materials by design,” nano-manufacturing, next-generation robotics
- \$1 billion over five years to DARPA dramatically reduce time to production
- \$500 million to DOE for flexible electronics, lightweight materials, etc.
- \$12 million to NIST for Advanced Manufacturing Technology Consortia

Catalyze Breakthroughs for National Priorities





“All these investments – in innovation, education, and infrastructure – will make America a better place to do business and create jobs.”

- President Barack Obama
January 25, 2011

