Research, Development, and Innovation in the 111th Congress

John Sargent
Specialist in Science and Technology Policy
Congressional Research Service

Presentation prepared by the Congressional Research Service
Old Washington Adage:

Those who know don’t talk.

Those who talk don’t know.
Context for Federal R&D

- Meet federal mission needs (e.g., national defense)

- Advance knowledge, develop and support scientific and technical workforce
  (*Science: The Endless Frontier*, Vannevar Bush, 1945)

- Address societal issues (e.g., health, safety, environment, energy security)

- Support U.S. innovation, competitiveness in the global economy
Changing Composition of Global R&D

1960

- Rest of the World: 31%
- Federal Defense-related R&D: 34%
- Other U.S. R&D: 24%
- Other Federal R&D: 11%

2002

- Rest of the World: 67%
- Other U.S. R&D: 24%
- Federal Defense-related R&D: 5%

(based on global R&D estimates and NSF data)

Presentation prepared by the Congressional Research Service
# Sectoral Perspective on R&D: Who Funds What
(based on NSF data for 2006)

<table>
<thead>
<tr>
<th>Research Type</th>
<th>Government</th>
<th>Industry</th>
<th>Universities</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Research</td>
<td>58.8%</td>
<td>17.2%</td>
<td>10.4%</td>
<td>13.6%</td>
</tr>
<tr>
<td>Applied Research</td>
<td>33.3%</td>
<td>58.9%</td>
<td>3.2%</td>
<td>4.6%</td>
</tr>
<tr>
<td>Development</td>
<td>16.2%</td>
<td>82.7%</td>
<td>0.3%</td>
<td>0.9%</td>
</tr>
</tbody>
</table>

Source: Science and Engineering Indicators, 2008, National Science Board
Some Constraints, Limitations

- **Available funding**
  - Pressure on discretionary spending
  - Impact of economic downturn on revenues
  - Competition among S&T disciplines
  - Competition with non-S&T priorities

- **Differing perspectives on the federal role in R&D**
  - Effectiveness of federal R&D funding
  - Picking winners and losers
  - Corporate welfare
  - Directed spending
  - Effect of new technology on jobs
  - Appropriate level of federal R&D spending
  - Ability to capture benefits

*Presentation prepared by the Congressional Research Service*
Federal Spending for Defense, Non-defense R&D as a Percentage of Corresponding Discretionary Outlays

SOURCE: Congressional Budget Office

Presentation prepared by the Congressional Research Service
Projected Growth in Medicare, Medicaid Spending

Source: Congressional Budget Office

Presentation prepared by the Congressional Research Service
Mandatory Spending Growth

SOURCE: White House Office of Management and Budget

Presentation prepared by the Congressional Research Service
OMB’s Federal Budget Projections, by category

DATA SOURCE: White House Office of Management and Budget

Presentation prepared by the Congressional Research Service
Efforts to Address Downturn

  - Troubled Assets Relief Program (TARP), $700 billion
  - Loans to General Motors ($9.4 billion) and Chrysler ($4 billion), additional $4 billion available in February

- New stimulus package
Many S&T Agenda’s

Among them, those of

- President-elect Obama
- Speaker Pelosi
- House S&T Committee Chair Gordon
- Trade, professional, and business association

Another old Washington Adage:

The President proposes.
Congress disposes.

Presentation prepared by the Congressional Research Service
It’s time we once again put science at the top of our agenda and worked to restore America’s place as the world leader in science and technology.

...science holds the key to our survival as a planet and our security and prosperity as a nation.

...my Administration will engage leaders in the technology community and harness technology and innovation to create jobs, enhance America’s competitiveness and advance our national priorities.

...I will also ensure that our defense, homeland security, and intelligence agencies have the strong research leadership needed to revitalize our defense research activities and achieve breakthrough science that can be quickly converted into new capabilities for our security.
Obama: Changes

- Vision, Priorities
- Programs, Personnel
- R&D Assessment System (PART)
President-elect Obama’s Team
Science and Technology

John Holdren
Physicist/environmental science and policy
A/P for Science and Technology/Director, OSTP

Eric Lander
Co-chair, PCAST
Mathematics/systems biology

Harold Varmus
Co-chair, PCAST
Medical doctor/cellular biologist

Jane Lubchenco
Administrator, NOAA
Environmental scientist/marine ecologist

Presentation prepared by the Congressional Research Service
President-elect Obama’s Team

Energy and Environment

Carol Browner
A/P for Energy and Climate Policy Coordinator

Nancy Sutley
Chair, CEQ

Steven Chu
Secretary, Department of Energy

Lisa Jackson
Administrator, EPA

Sen. Ken Salazar
Secretary, Department of the Interior

Lawyer

Government/public administrator

Physicist

Chemical engineer

Presentation prepared by the Congressional Research Service
R&D in the Stimulus Package

- Speaker Pelosi: Forward-looking; not a 1930's public works project; bold and persistent

- Lawrence Summers:
  “It does not strike me that running up the research budget and then running down the research budget is a terribly rational way to run a country.... science as a short-term stimulus doesn't seem quite right to me.”

(Source: Manufacturing and Technology News, 12/3/2008)
Federal Investments in R&D

- Summers: Over the long term, robust investments in science and technology are driver of future economic growth

“Basic science is basically very, very important....only government can provide the support at the most basic level...on the other hand, the track record of governments in picking winners and losers -- in deciding what are the most fruitful industries -- is not hugely encouraging over time and in the quality of its judgment. So I would be tilting a bit more towards basic research.”

(Source: Manufacturing and Technology News, 12/3/2008)
Obama-Biden Campaign
Science and Technology Policy

- Ensure the Full and Free Exchange of Ideas through an Open Internet and Diverse Media Outlets
- Create a Transparent and Connected Democracy
- Deploy a Modern Communications Infrastructure
- Improve America's Competitiveness
- Prepare All our Children for the 21st Century Economy
- Prepare Adults for a Changing Economy
- Employ Science, Technology and Innovation to Solve Our Nation's Most Pressing Problems
- Appointment of a Chief Technology Officer (CTO)
Obama-Biden Campaign
Improve America’s Competitiveness

- Double federal funding for basic research over ten years
- Expand research at American colleges and universities; provide grants to early-career researchers
- Make the R&D tax credit permanent
- Restore scientific integrity
- Increase support for high-risk, high-payoff research portfolios at our science agencies
Obama-Biden Campaign
Employ Science, Technology
and Innovation to Solve Our Nation's
Most Pressing Problems

- Lower health care costs by investing in electronic information technology systems
- Invest in clean energy development and deployment
- Modernize public safety networks
- Advance biomedical research
- Advance stem cell research
Obama-Biden Campaign
Chief Technology Officer

- ICT for governance
  - Transparency
  - Use of best-in-class technology
  - Citizen input to agencies
  - Interoperability of ICT broadly and for emergency communication
- Cybersecurity
- Technology and innovation policy
Speaker Pelosi on S&T

“Americans must continue to innovate in order to create new thriving industries that will produce millions of good jobs here at home and a better future for the next generation.”

Innovation Agenda

– Creating a new generation of innovators
– Sustained commitment to R&D
– Affordable broadband access for all Americans
– Declaring energy independence
– Small business tools for innovation
Chairman Gordon on S&T

There’s a misperception that we cannot afford to invest in science because of the current economic conditions. I believe that investing in science and developing new technologies is the path to reinvigorating our economy, growing jobs, meeting our energy needs, and helping us address climate change.

- Innovation: Maintaining Our Competitiveness
- Energy: Developing Clean Technologies
- Workforce: Creating Jobs of the Future
- Environment: Protecting Our Natural Resources
- Space: Exploring and Inspiring
- Transportation: Building New Types of Infrastructure
- Security: Protecting People from Natural and Man-Made Threats
- Investigations and Oversight: Uncovering Mismanagement and Restoring Scientific Integrity
“It’s time we face reality, my friends. ... We’re not exactly rocket scientists.”