

Research and Development in the FY 2011 and FY 2012 Federal Budgets

Patrick Clemins

April 6, 2011

for Congressional Visits Day

AAAS R&D Budget and Policy Program
<http://www.aaas.org/spp/rd>

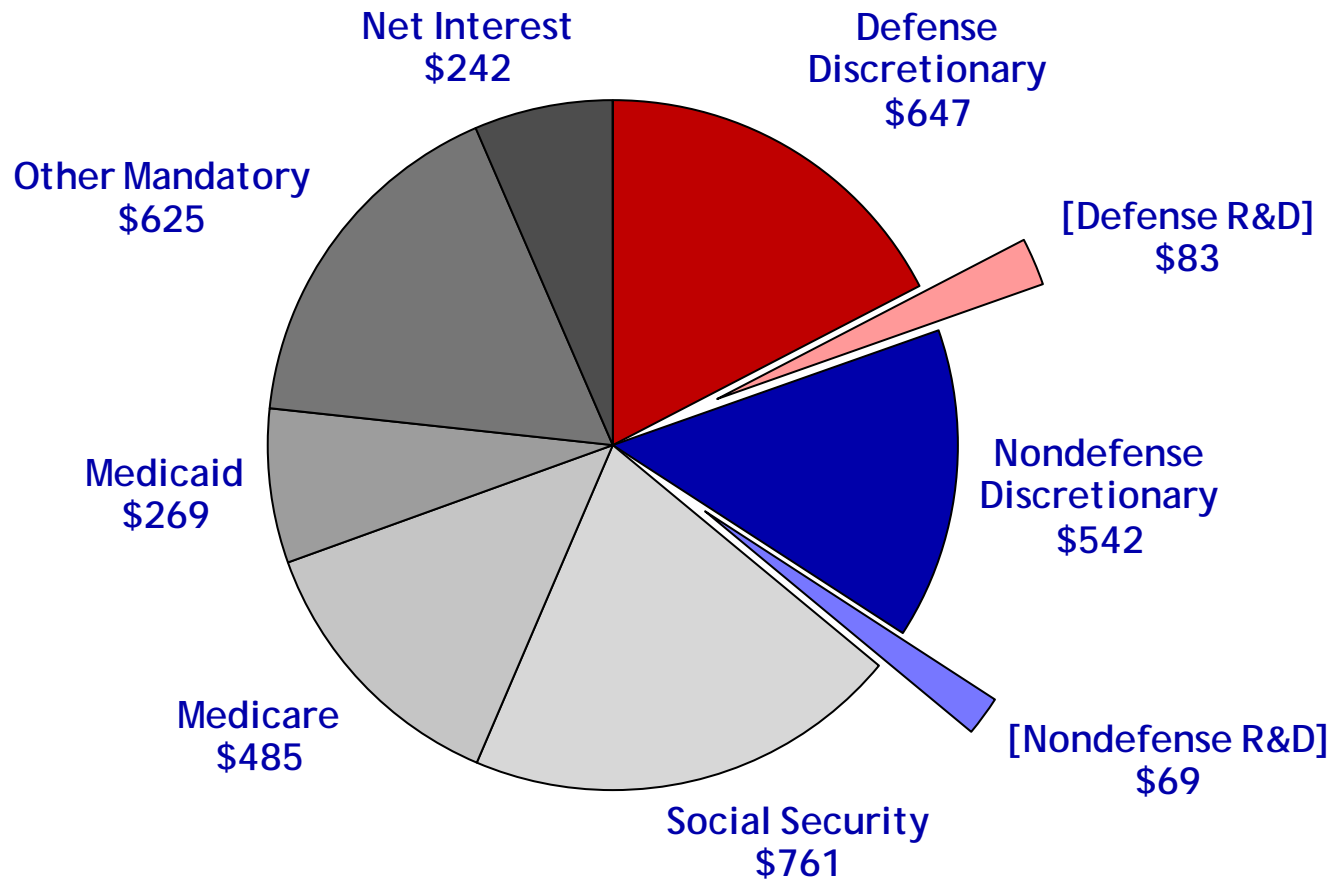
The U.S. Federal Budget in FY 2012

- Total Budget: \$3.7t
 - Almost one quarter (23.6%) of the total U.S. economy
 - Total Receipts: \$2.6t
 - Deficit: \$1.1t
 - \$77b borrowed from Social Security and Postal Service
-
- Moving from Rescue to Rebuilding
 - Tax relief, increased trade, infrastructure investments
 - Putting the Nation on a Sustainable Fiscal Path
 - Spending freeze, entitlement/tax reform, govt reorganization
 - Competing and Winning in the World Economy

Composition of the Proposed FY 2012 Budget

Total Outlays = \$3.7 trillion

outlays in billions of dollars



Source: *Budget of the United States Government FY 2012*.

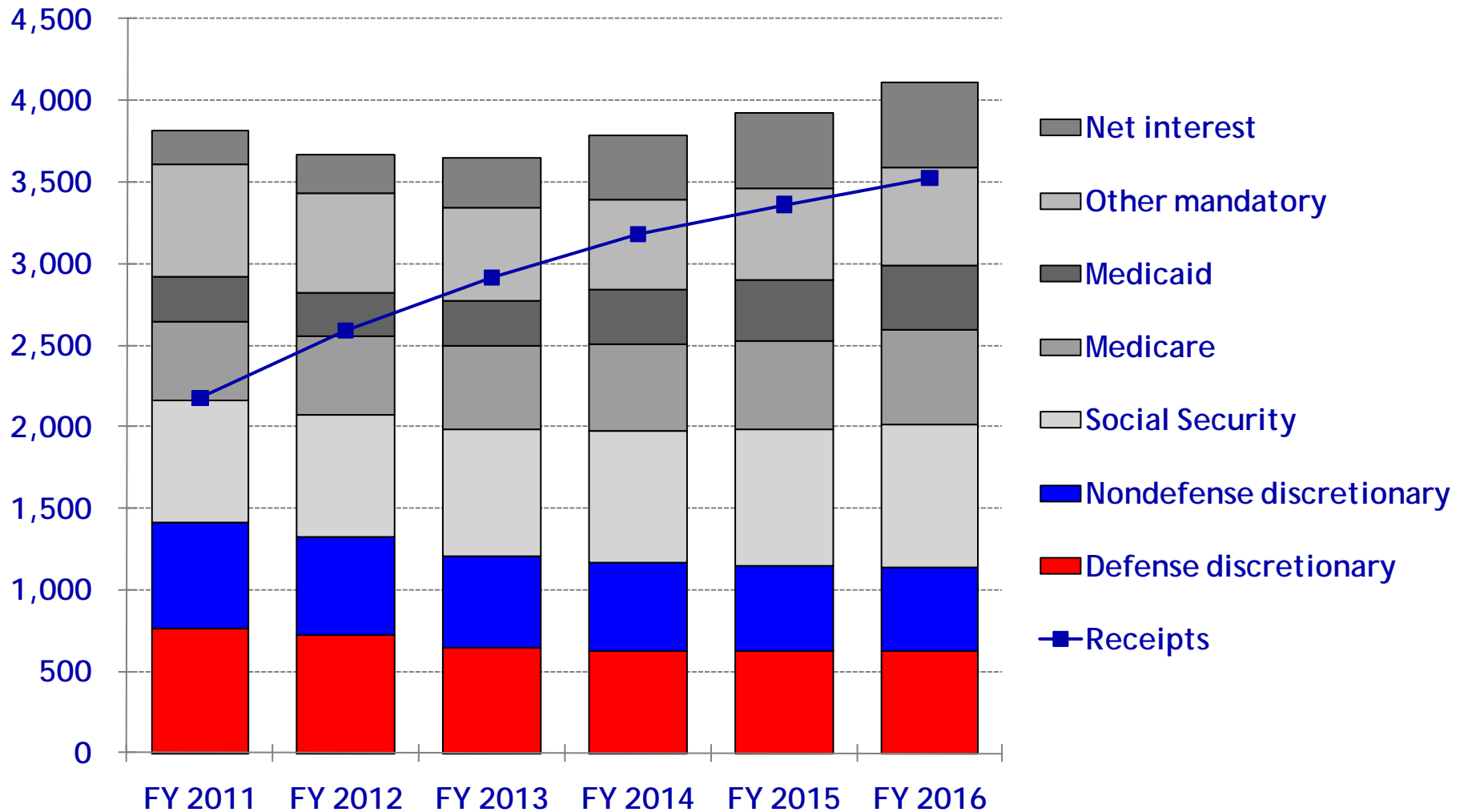
Projected unified deficit is \$ 1.1 trillion.

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FY 2012 Budget Projections

outlays in billions of constant FY 2011 dollars



Source: *Budget of the United States Government FY 2012*.

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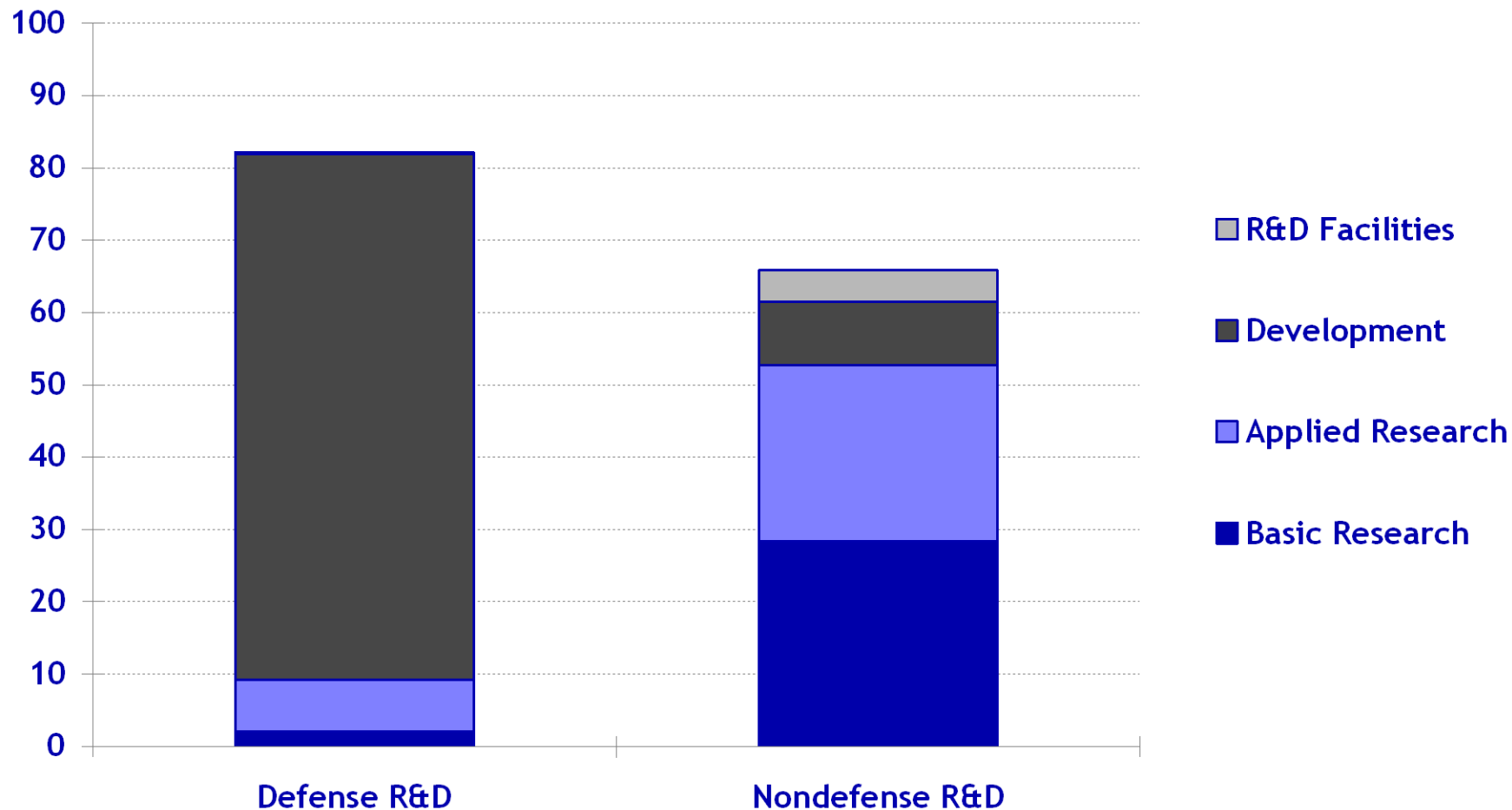


Federal R&D in Context

- The federal R&D investment is spread across over two dozen departments and agencies
 - Only two manage more than 10% of the investment
 - Department of Defense (51.8%)
 - Department of Health and Human Services (21.9%)
- The federal R&D investment is also spread across 11 of the 12 appropriations subcommittees.
- Role of federal R&D
 - Supports federal missions
 - Drives U.S. innovation

Character of R&D, FY 2011

budget authority in billions of dollars



Source: OMB R&D data, agency budget justifications, and agency budget documents.

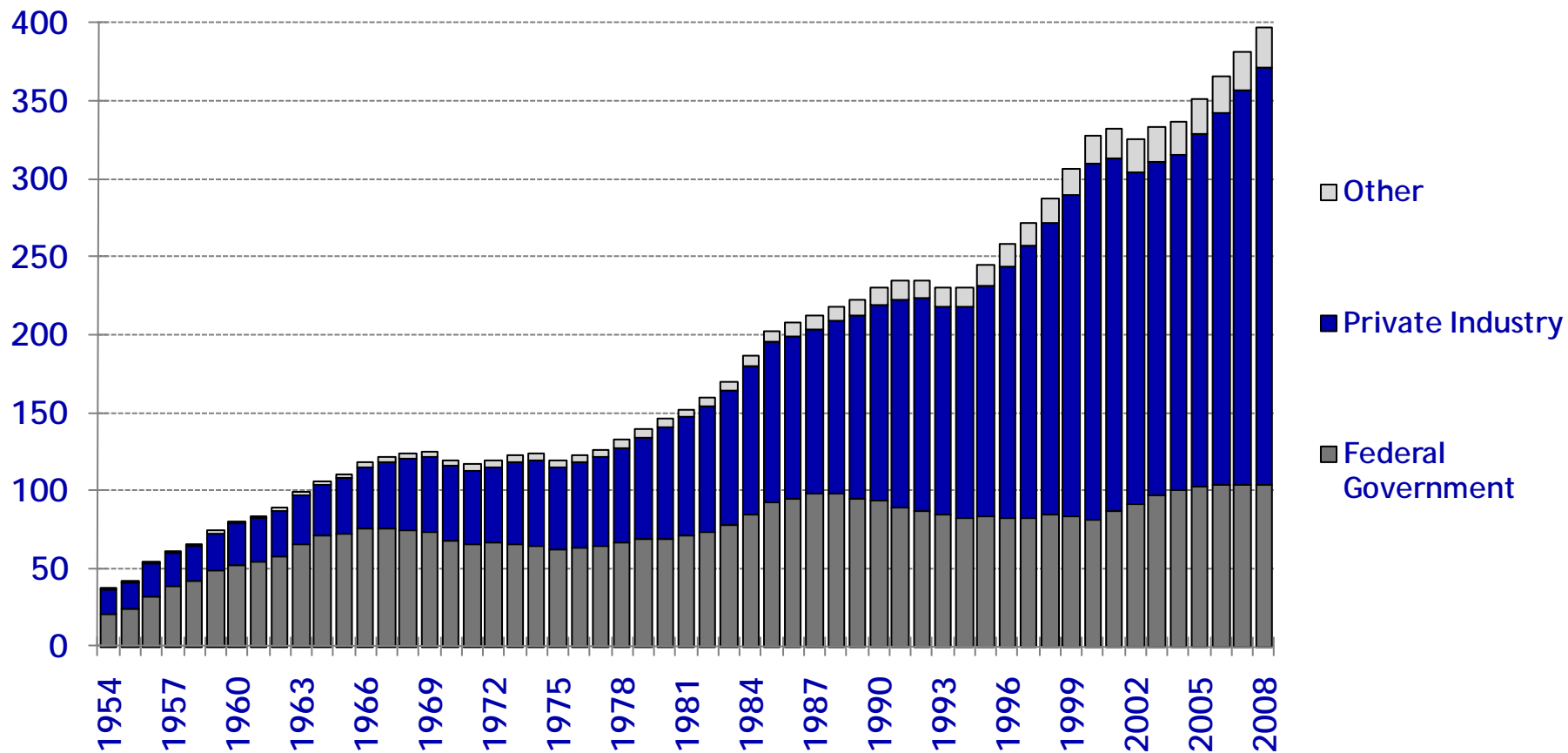
Defense R&D = DOD + DOE defense.

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National R&D Funding by Source

outlays in billions of constant 2008 dollars



Source: NSF, Division of Science Resources Statistics,
National Patterns of R&D Resources (NSF 08-318)

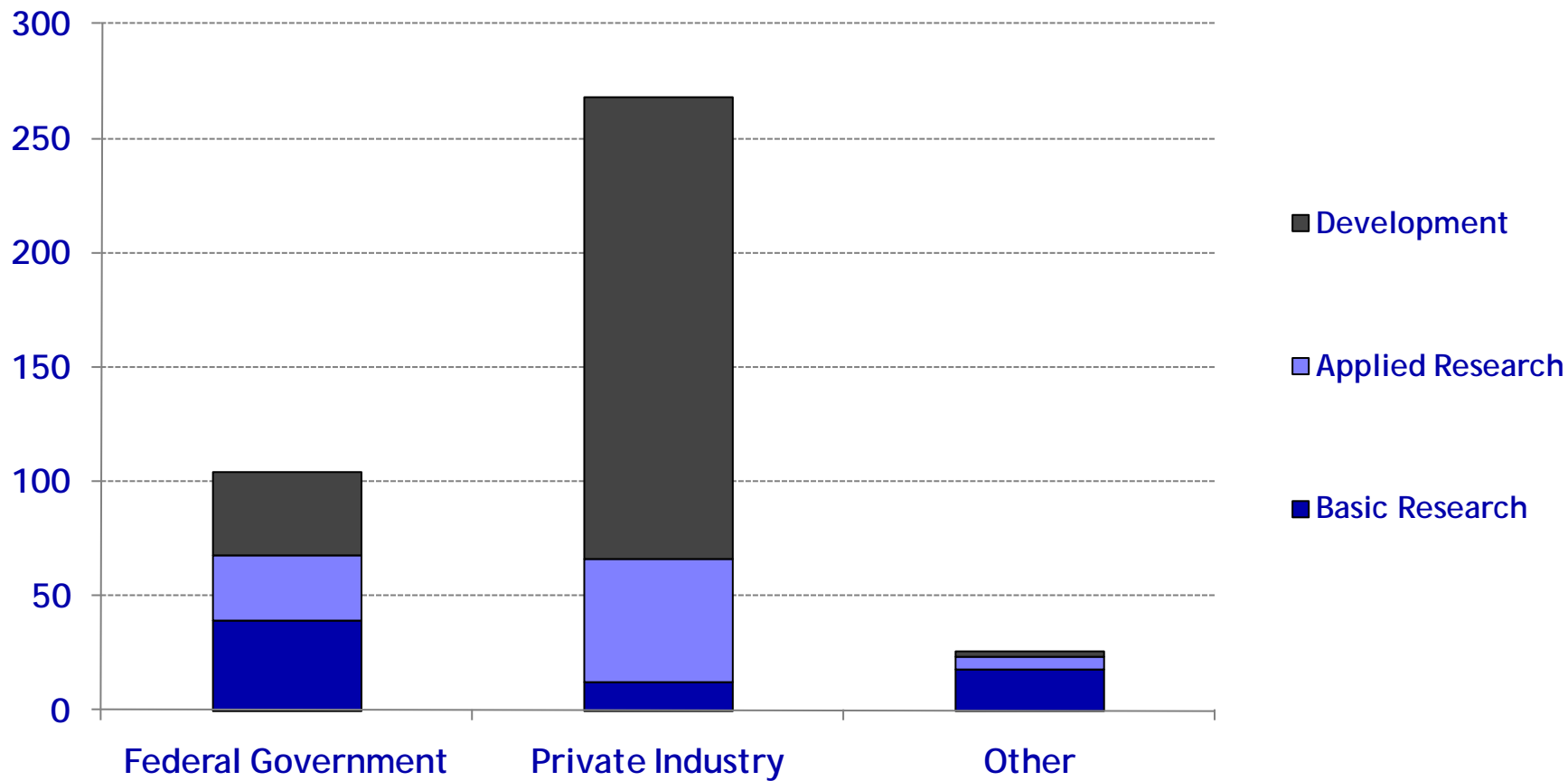
2008 figures are preliminary.

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Character of R&D, 2008

outlays in billions of dollars



Source: NSF, Division of Science Resources Statistics,
National Patterns of R&D Resources (NSF 08-318)

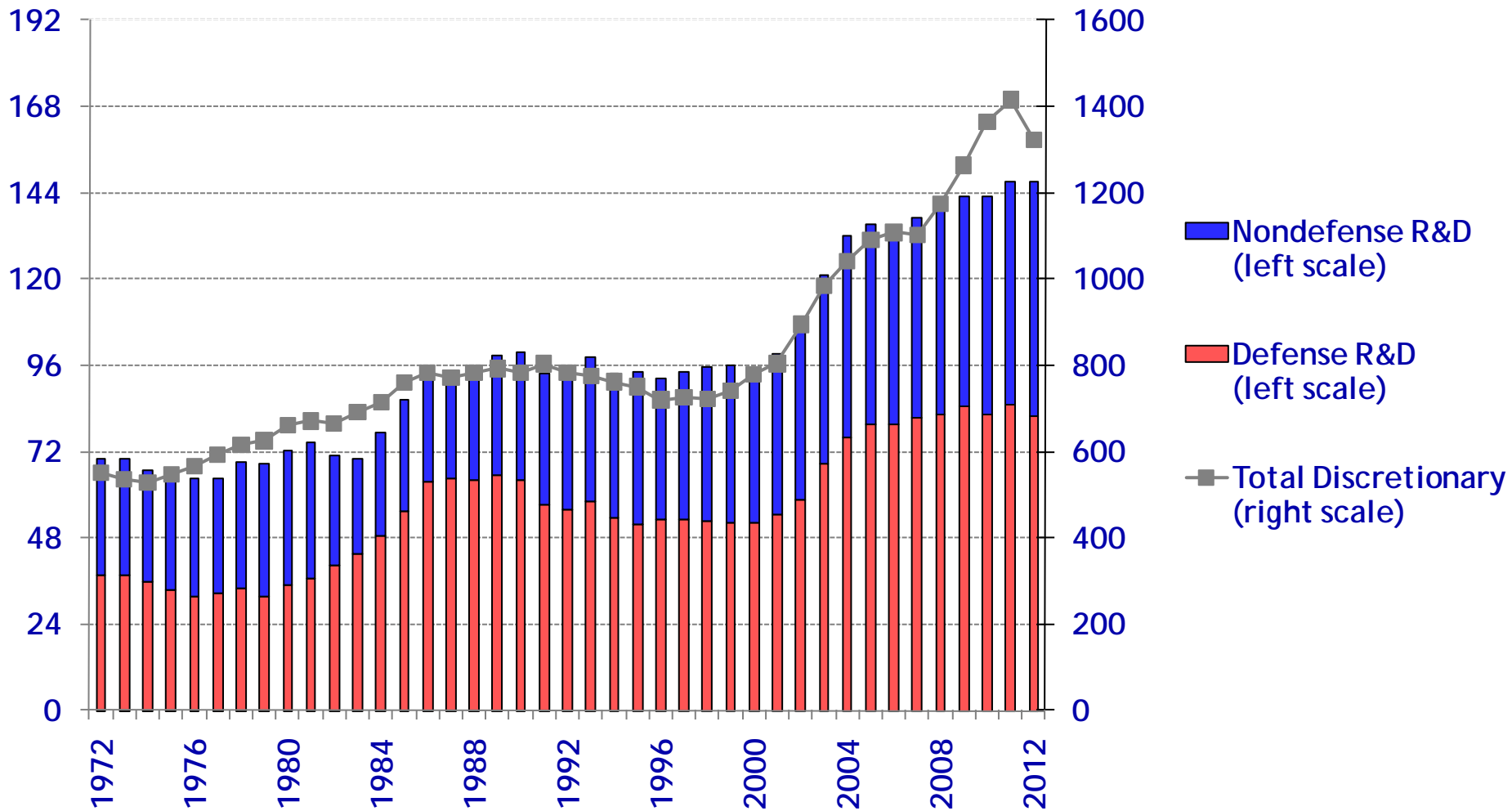
Figures are preliminary.

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Trends in R&D and Discretionary Spending

outlays in billions of constant FY 2011 dollars



Source: *Budget of the United States Government, FY 2012*.
 R&D totals do not include construction of facilities and equipment.
 FY 2011-2012 data are budget projections.
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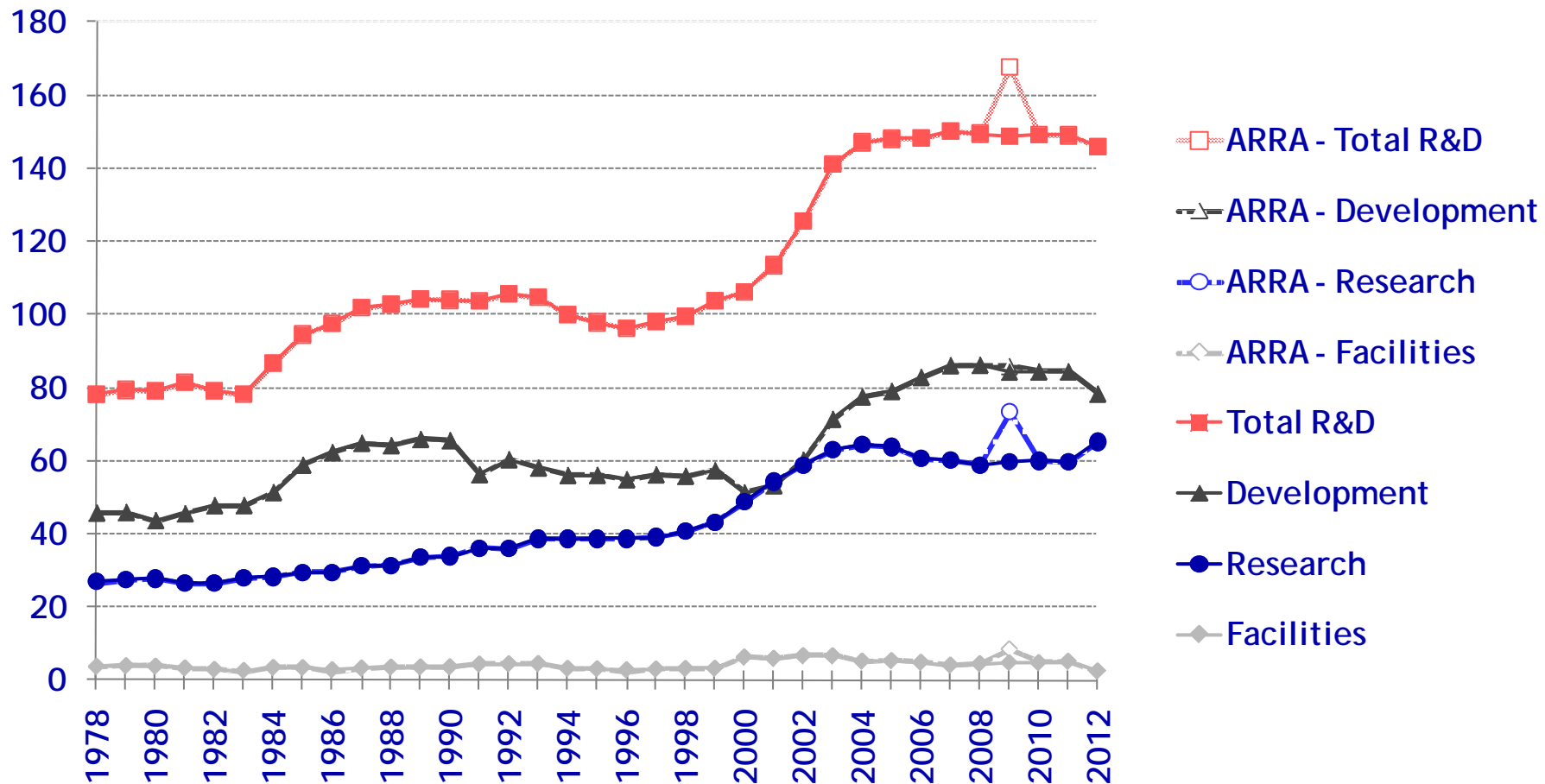


The FY 2012 Federal R&D Investment

- Total R&D: \$147.9b, +0.5% from FY 2010
 - Basic Research: \$32.9b, +11.9%
 - Applied Research: \$33.2b, +11.4%
 - Development: \$79.4b, -4.7%
 - Equipment and Facilities: \$2.4b, -47.8%
- \$81.2b for defense R&D, -3.9%
- \$66.8b for non-defense R&D, +6.5%
- -2.2% in constant dollars from FY 2010 (Non-defense: +3.7%)
- -0.8% in constant dollars since FY 2004 (Non-defense: +1.0%)
 - Peak in FY 2007

Trends in Federal R&D

in billions of constant FY 2011 dollars



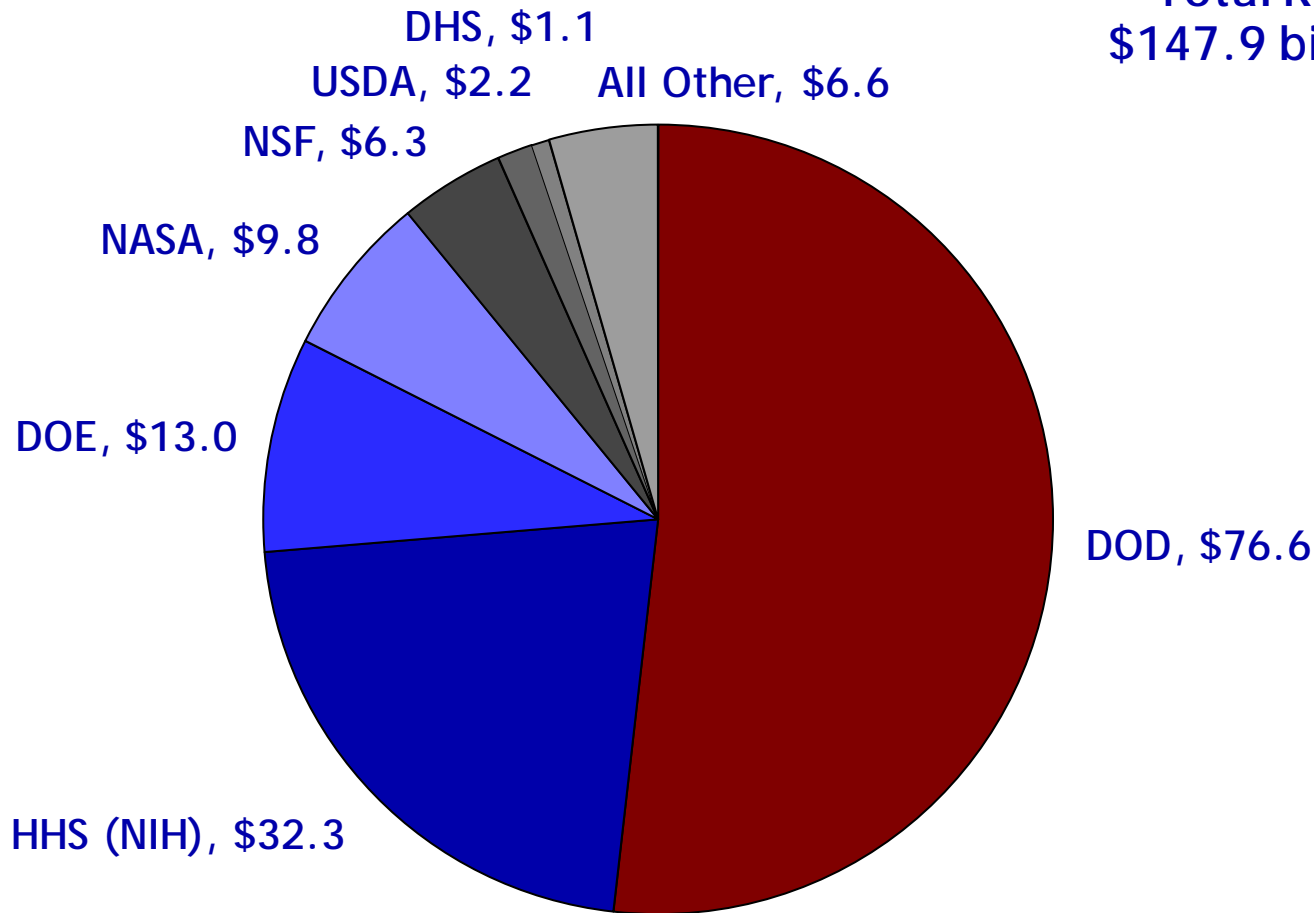
Source: OMB R&D data, AAAS analyses of R&D in annual AAAS R&D reports.
 FY 2011 and FY 2012 figures are latest AAAS estimates.
 R&D includes conduct of R&D and R&D facilities.
 1976-1994 figures are NSF data on obligations in the Federal Funds survey.
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Total R&D by Agency, FY 2012

budget authority in billions of dollars

Total R&D =
\$147.9 billion



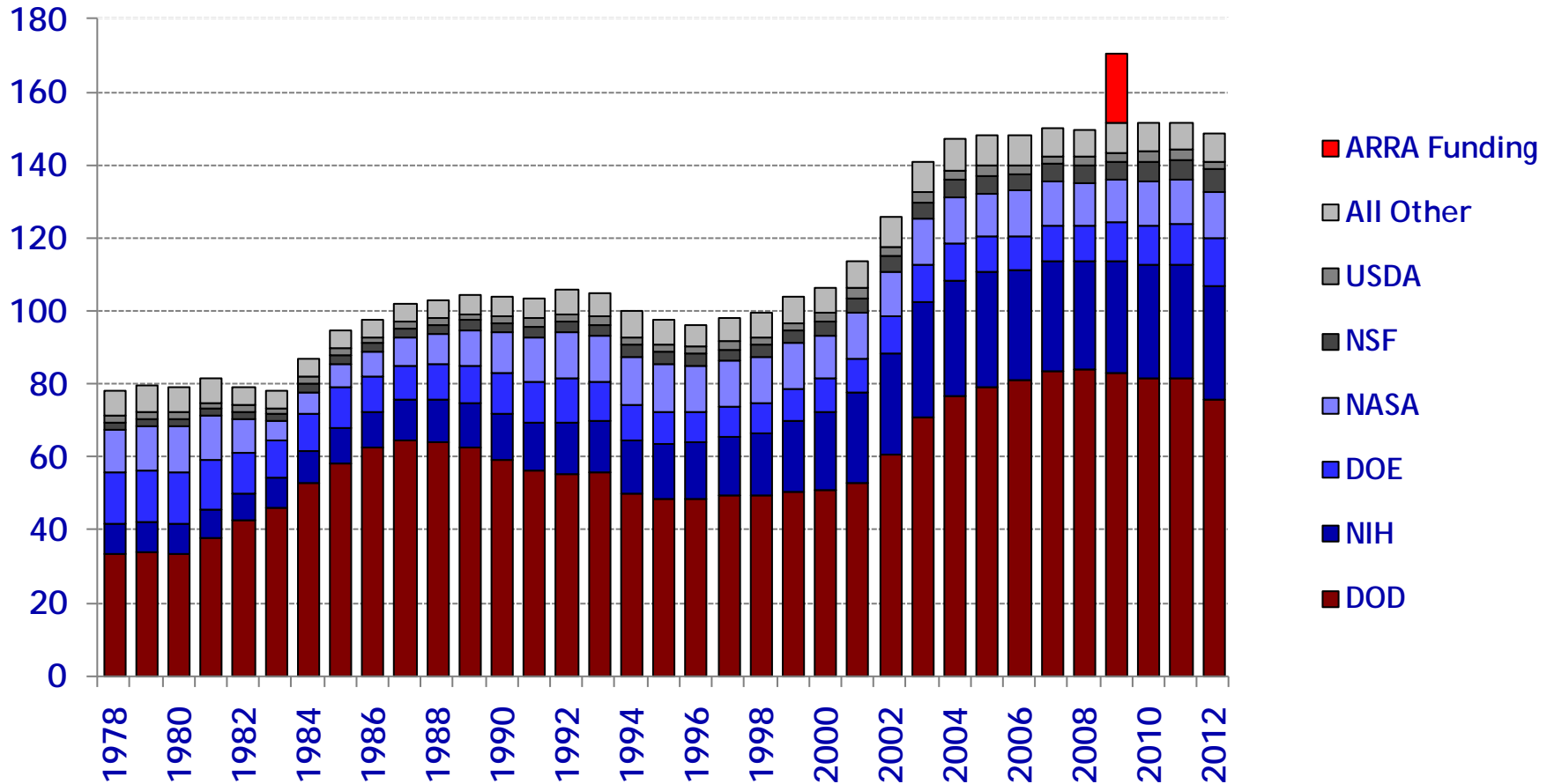
Source: OMB R&D data, agency budget justifications, and other agency documents.
R&D includes conduct of R&D and R&D facilities.

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Trends in R&D by Agency

in billions of constant FY 2011 dollars



Source: AAAS Report: Research & Development series.
 FY 2011 and FY 2012 figures are latest estimates.
 1976-1994 figures are NSF data on obligations in the Federal Funds survey.
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R&D Investment Priorities

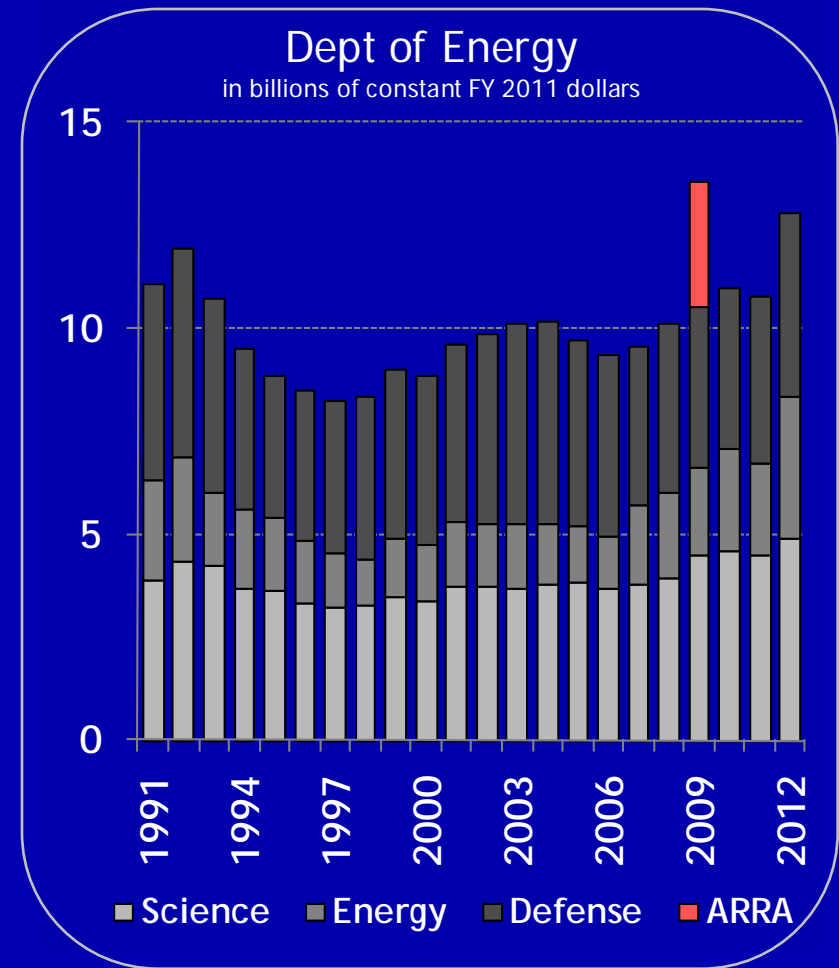
- Jumpstarting Innovation / Scientific Discovery
 - Research Funding: \$66.1b, +11.6% (\$6.9b)
 - \$13.9b combined NSF, DOE SC, NIST, +12.2% (\$1.5b)
- Clean Energy Future / Climate Science
 - DOE Sci and Energy: +\$1.4b (19.7%) to \$8.5b
 - USGCRP: +\$446m (20.4%) to \$2.6b
- Permanent, Expanded and Simplified R&E Tax Credit
- Education
 - \$100m for 100,000 new K-12 STEM teachers
- Infrastructure
 - Wireless Innovation Fund - \$3b

FY 2011 Proposals

- Total Budget
 - House: \$1.029t (H.R. 1)
 - Senate: \$1.079t (H.R. 1 Amendment)
 - Working Compromise: \$1.055t
- Total R&D
 - House: \$140.7b (-\$6.4b from FY 2010)
 - Senate: \$143.4b (-\$3.7b from FY 2010)
- Nondefense R&D
 - House: \$59.5b (-\$3.2b from FY 2010, -\$7.3b from FY 2012 req)
 - Senate: \$62.8b (+\$162m from FY 2010)

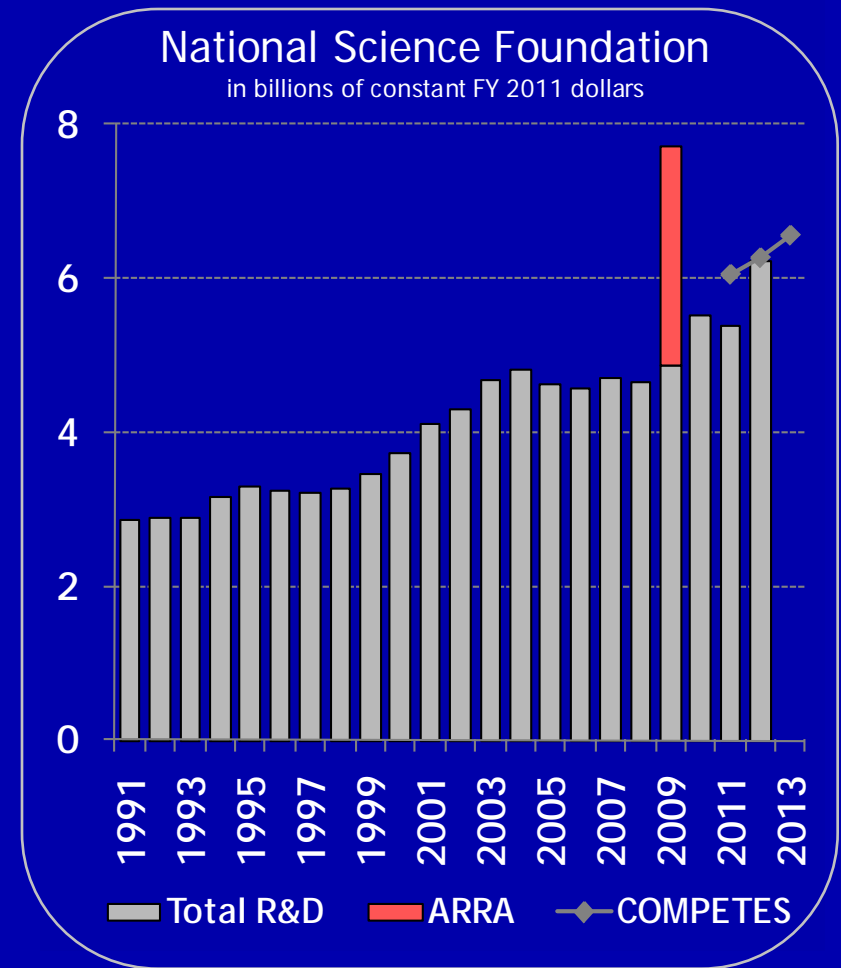
Department of Energy

- Total R&D
 - FY 11 House CR: \$9.3b, -13.9%
 - FY 11 Senate CR: \$10.1b, -6.5%
 - FY 12 Request: \$13.0b, +19.9%
- Energy R&D
 - FY 11 House CR: \$1.7b, -29.7%
 - FY 11 Senate CR: \$2.1b, -12.8%
 - FY 12 Request: \$3.5b, +43.7%
- Office of Science
 - FY 11 House CR: \$3.6b, -19.6%
 - FY 11 Senate CR: \$4.7b, -3.5%
 - FY 12 Request: \$4.9b, +9.1%
- FY 12 Request
 - ARPA-E: \$550m + \$100m WI³
 - Energy Innov Hubs: Doubled to six



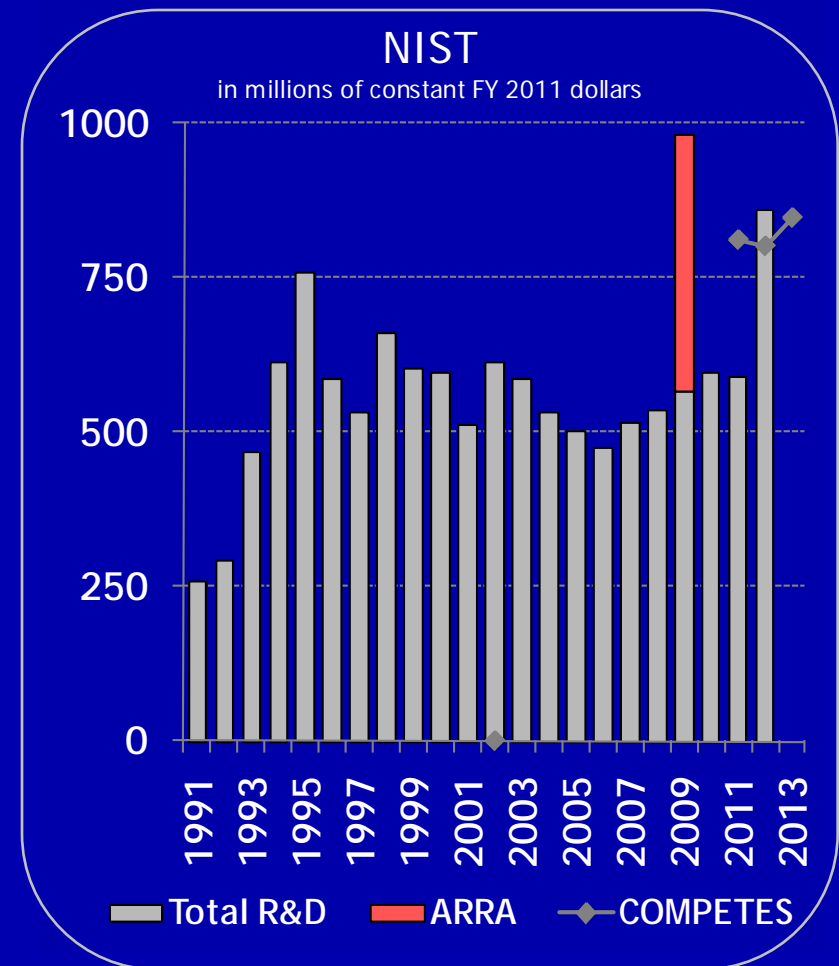
National Science Foundation

- Total Budget
 - FY 11 House CR: \$6.6b, -5.8%
 - FY 11 Senate CR: \$6.9b, +0.0%
 - FY 12 Request: \$7.8b, +13.0%
- Total R&D
 - FY 11 House CR: \$5.2b, -4.1%
 - FY 11 Senate CR: \$5.4b, -1.7%
 - FY 12 Request: \$6.3b, +16.1%
- Clean Energy: \$576m
- Science, Engineering and Education for Sustainability (SEES)
 - \$998m for climate and energy
- Cyberinfrastructure for 21st Century Science and Engineering (CIF21): \$117m



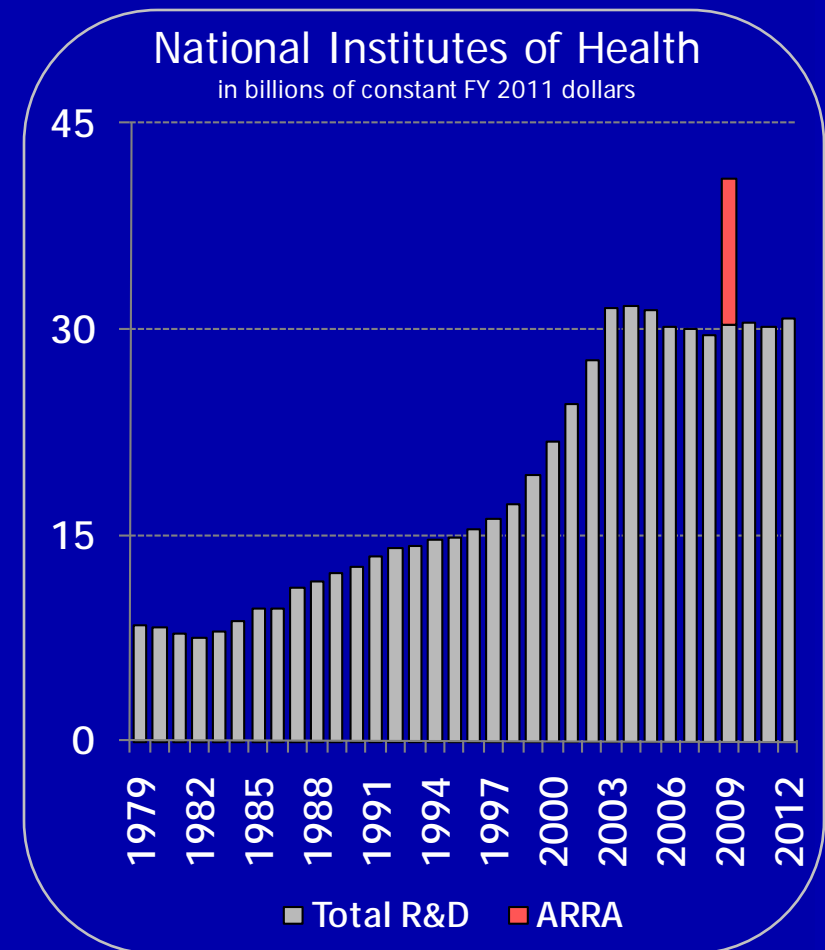
NIST

- Total R&D
 - FY 11 House CR: \$542m, -7.8%
 - FY 11 Senate CR: \$573m, -2.5%
 - FY 12 Request: \$872m, +48.3%
- NIST Labs Total Budget (STRS)
 - FY 11 House CR: \$470m, -8.8%
 - FY 11 Senate CR: \$505m, -2.0%
 - FY 12 Request: \$679m, +31.8%
- Secure and Robust Cyber Infrastructure: +\$43.4m
- 21st Century Manufacturing: Faster, Smarter & Cleaner: +13.3m
- Wireless Innovation Fund: \$100m



National Institutes of Health

- Total Budget
 - FY 11 House CR: \$29.5b, -5.2%
 - FY 11 Senate CR: \$31.2b, +0.0%
 - FY 12 Request: \$31.8b, +2.4%
- FY 11 House CR
 - Proposals to limit grant size
- National Center for Advancing Translational Science (NCATS)
- Tech to accelerate discovery
- Comparative effectiveness and personalized medicine
- New Innovator Award and Early Independence Award



NIH Policy Issues

- Merger of National Institute on Drug Abuse (NIDA) and National Institute on Alcohol Abuse and Alcoholism (NIAAA)
- National Center for Advancing Translational Sciences (NCATS)
 - Merge select programs from NHGRI, NCRR, Common Fund, and contain the Cures Acceleration Network (CAN).
- Stimulus Cliff
 - \$8.2 billion in grants during FY 2009 & FY 2010 in mostly 2 yr grants
- Research Capacity
 - New working group to assess “the current composition and size of the workforce to understand the consequences of current funding policies on the research framework.”
- Stem Cell Research

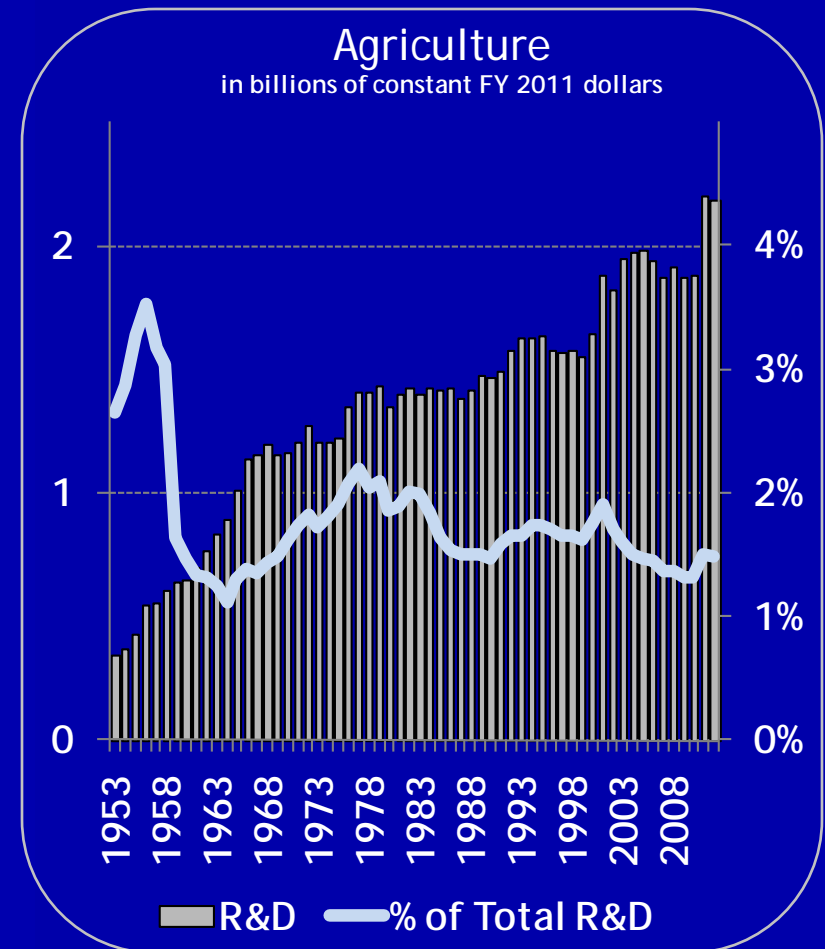
NASA

- Total R&D
 - FY 11 House CR: \$9.8b, +6.0%
 - FY 11 Senate CR: \$10.0b, +7.7%
 - FY 12 Request: \$9.8b, +6.0%
- Guided by NASA Reauthorization (S.3729) - Oct 11, 2010
 - Transition to research and technology development on ISS; Independent NPO management
 - Commercial cargo and crew services for near-earth orbit
 - New space launch system and multi-purpose crew vehicle
 - Space Research and Technology Program: \$1.0b
 - Deeper and more effective partnerships internationally



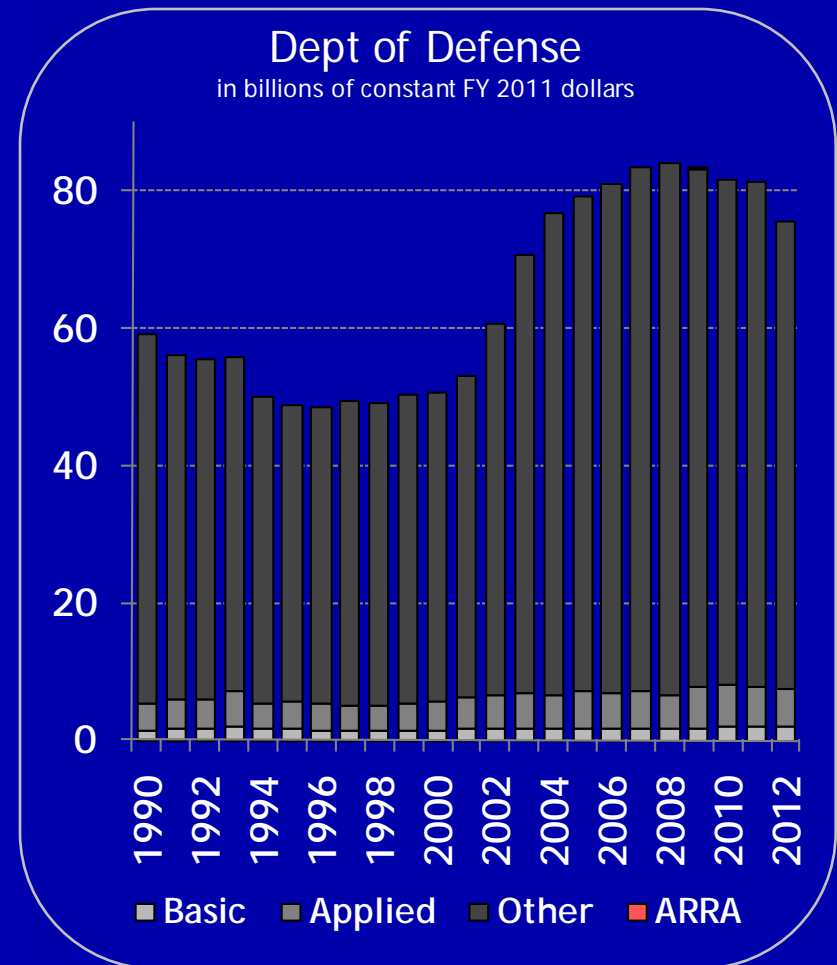
USDA

- Total R&D
 - FY 11 House CR: \$2.2b, -14.2%
 - FY 11 Senate CR: \$2.6b, -2.4%
 - FY 12 Request: \$2.2b, -17.7%
- ARS (Intramural)
 - Buildings and Facilities: -\$71m and cancels \$224m in unobligated balances
 - Directed Projects: -\$42m
 - +\$59m in program increases
- NIFA (Extramural)
 - R&D: \$741m, -11.8% (-\$99m)
 - AFRI: \$325m, +24.0% (+\$62m)
 - Directed Projects: -\$141m



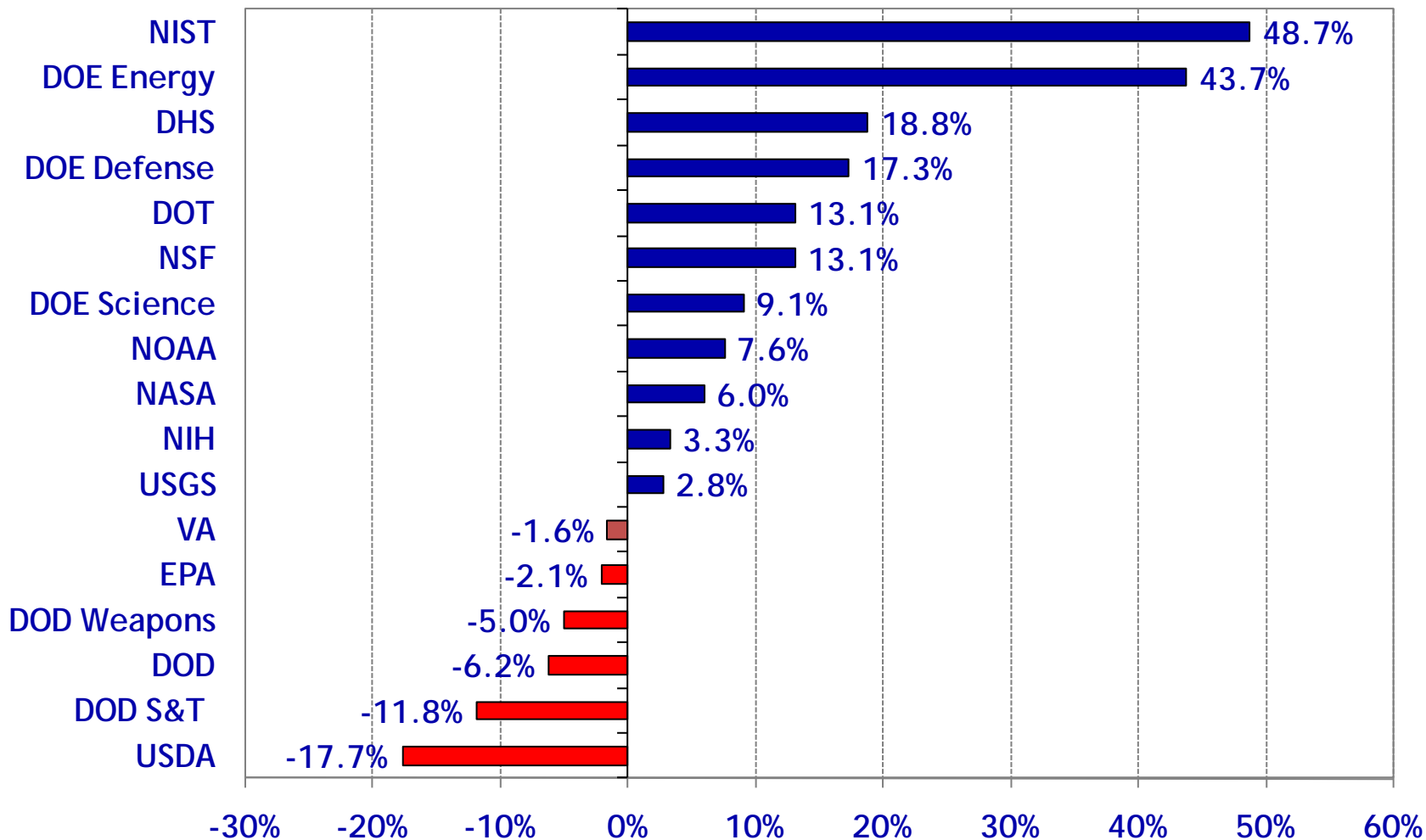
Department of Defense

- Total R&D
 - FY 11 House CR: \$77.2b, -4.2%
 - FY 11 Senate CR: \$76.7b, -4.8%
 - FY 12 Request: \$76.6b, -4.9%
- Basic Research
 - FY 12 Request: \$2.1b, +14.5%
- Total S&T
 - FY 12 Request: \$12.3b, -7.2%
- Defense Efficiencies Initiative: -\$178b over 5 yrs, \$100b reinvested
- UAVs: \$4.8b, Cyber: \$2.3b, F-35: \$9.7b and restructured



R&D in the FY 2012 Budget Request

percent change from FY 2010



Industry Innovation Initiatives

- SBIR/STTR Extended through May 31, 2011
 - Keeps same percentages (SBIR: 2.5%, STTR: 0.3%)
- R&D Tax Credit Proposal
 - Make the tax credit permanent
 - Increase simple formula credit from 14 to 17 percent
- ARRA Report: \$100 billion in innovation
 - \$18.7 billion in R&D
- H.R.5297 - Small Business Jobs and Credit Act
 - \$30 billion small business lending fund
 - \$12 billion in tax breaks
- "Make it in America" Agenda
- "Startup America" Initiative
- Patent Reform

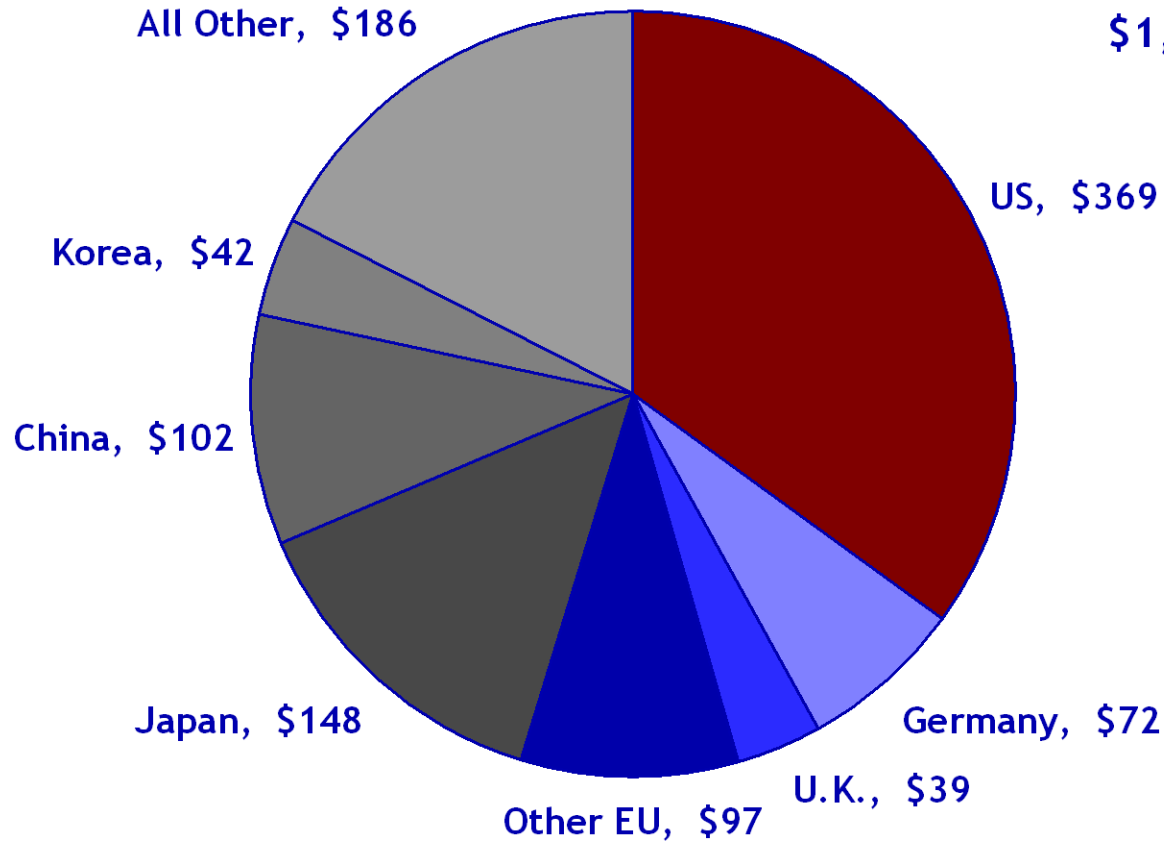
International R&D Investment

- The United States leads the world in R&D investment
 - \$369b PPP, 35.7% of world R&D investment
- But, others are quickly increasing their investment
 - Over 1997 - 2007,
 - South Korea, +0.99% of GDP to 3.47%
 - China, +0.85% of GDP to 1.49%
 - Taiwan, +0.81% of GDP to 2.63%
 - Japan, +0.57% of GDP to 3.44%
 - United States, +0.10% of GDP to 2.68%
- President Obama set goal of 3.0% of GDP investment in R&D

Total World R&D, 2007

in billions of PPP \$

Total World R&D =
\$1,054 billion



Source: OECD, Main Science and Technology Indicators, May 2009.
World = OECD members plus Argentina, China, Israel, Romania,
Russian Federation, Singapore, Slovenia, South Africa, Taiwan.
Calculated using purchasing power parities.

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Next Steps

- FY 2011
 - Current continuing resolution (CR) expires April 8.
 - House Rules Cmte posted a one-week CR through April 15.
 - FY 2011 funding levels are likely to be around \$1.055 trillion, a \$33 billion cut from current spending levels.
- Debt Ceiling Limit Increase
 - \$14.3 trillion limit will be reached no later than May 16.
 - “Extraordinary measures” could delay default until July 8.
- FY 2012
 - Results of FY 2011 appropriations will be the best insight.

For More Information...

The AAAS R&D web site is
<http://www.aaas.org/spp/rd/>

Twitter: @AAAS_RDBudget

The FY 2012 AAAS Forum on
Science and Technology Policy
is May 5-6, 2011
in Washington, DC

AAAS REPORT XXXVI Research & Development FY 2012

Intersociety Working Group



