

# The FY 2011 Federal R&D Investment

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for the AAAS Board of Directors

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

See the "Seminars and Presentations"  
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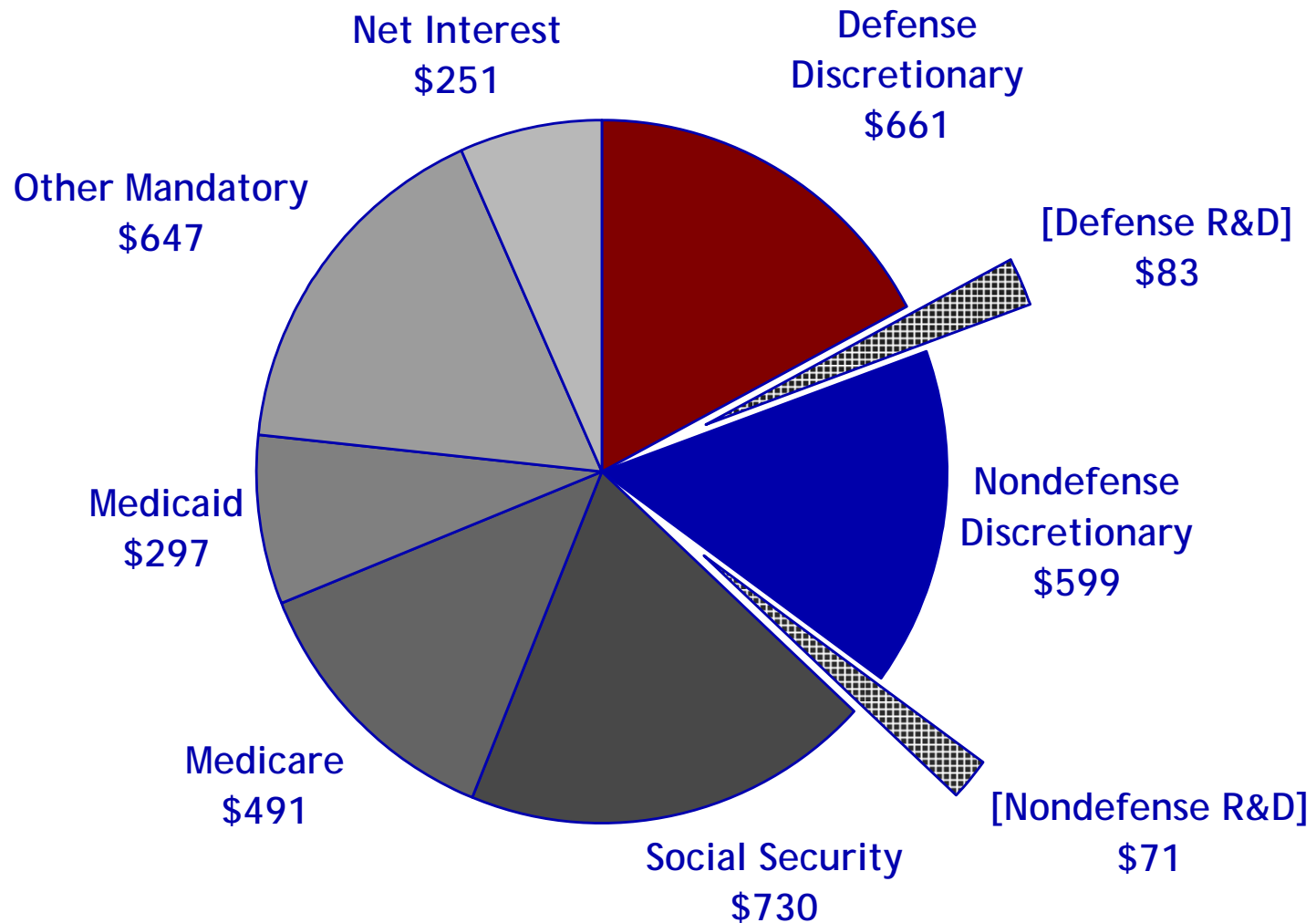
# The FY 2011 Federal Budget

- \$3.8t total budget, \$1.3t unified deficit
- \$1.3t discretionary budget (+0.3%)
  - \$532b nondefense budget (+1.4%)
- Rescuing the Economy
- A Foundation for Economic Growth and Job Creation
  - Small business initiatives
  - Investing in science and basic research
- Restoring Responsibility
  - Three year non-security discretionary funding freeze

# Composition of the Proposed FY 2011 Budget

## Total Outlays = \$3.8 trillion

outlays in billions of dollars



Source: *Budget of the United States Government FY 2011.*

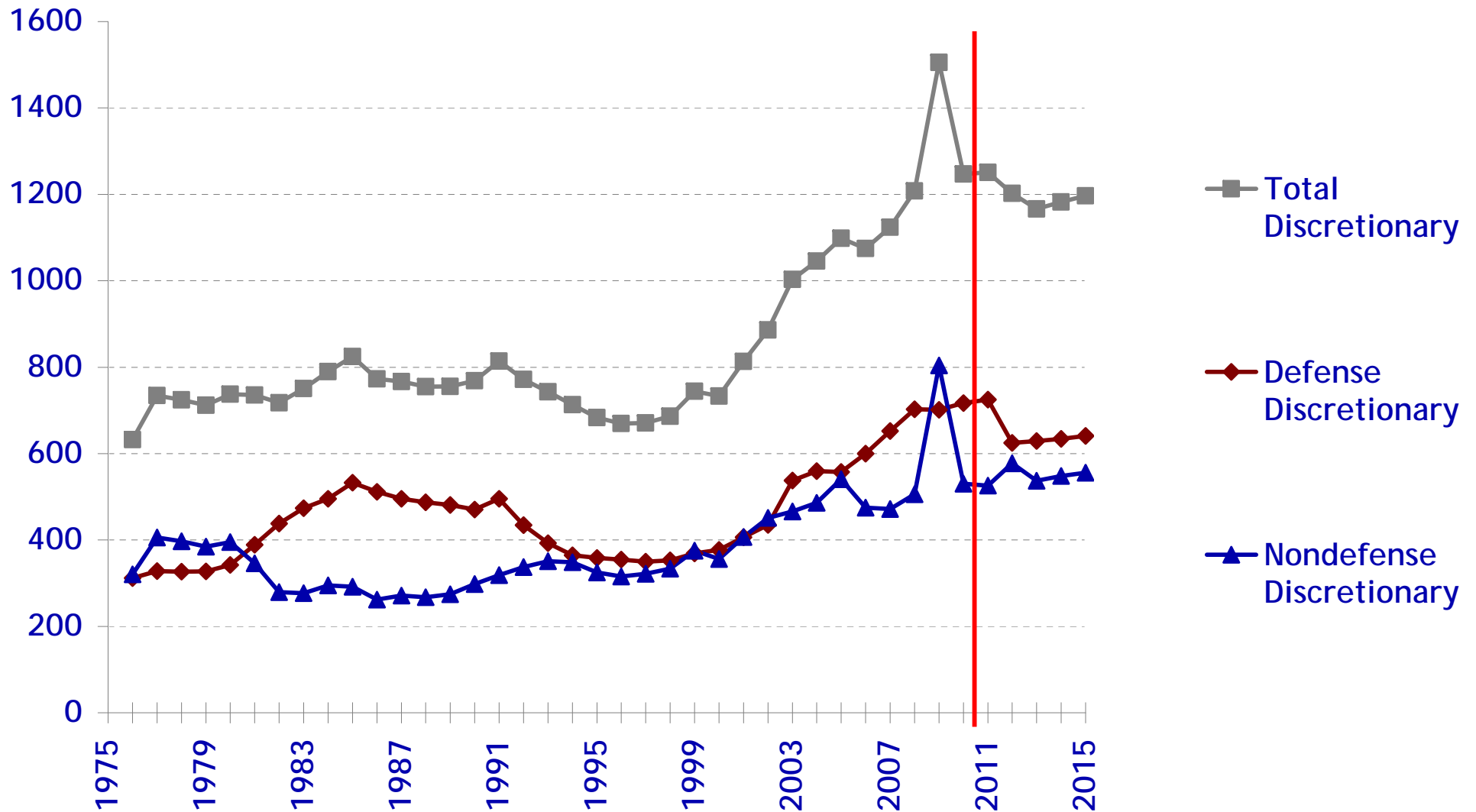
Projected unified deficit is \$1.3 trillion.

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# Trends in Discretionary Spending

budget authority in billions of constant FY 2010 dollars



Source: *Budget of the United States Government, FY 2011.*

FY 2010-2015 data are budget projections.

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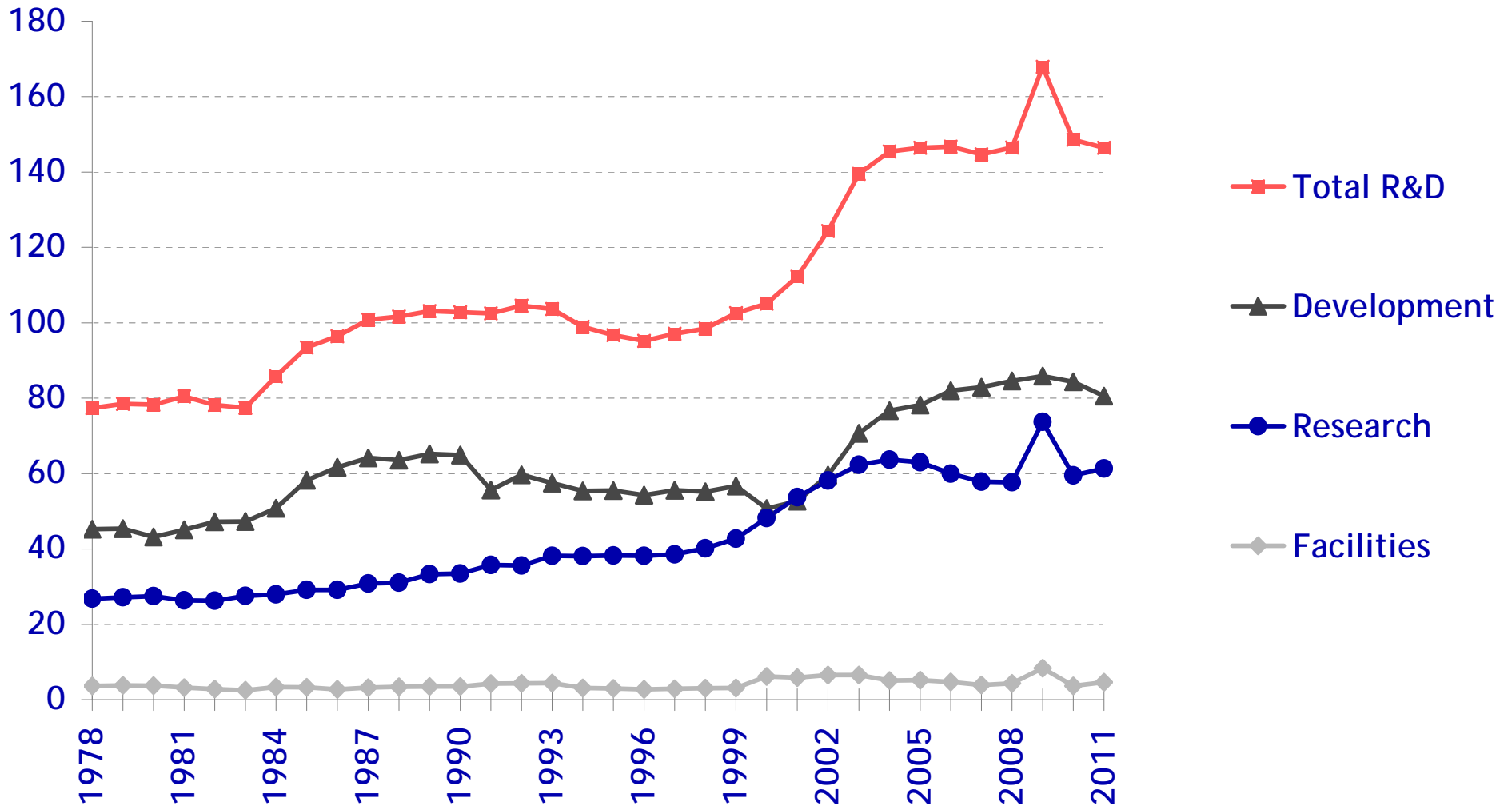


# The FY 2011 Federal R&D Investment

- Total R&D: \$148.1b, -0.3% from FY 2010
  - Basic Research: \$30.4b, +4.3%
  - Applied Research: \$31.6b, +2.1%
  - Development: \$81.5b, -2.9%
  - Equipment and Facilities: \$4.6b, +1.3%
- \$82.2b for defense R&D, -4.8%
- \$65.9b for non-defense R&D, +5.9%
- -1.4% in constant dollars from FY 2010
- +0.7% in constant dollars since FY 2004
  - Peak in FY 2009

# Trends in Federal R&D

in billions of constant FY 2010 dollars



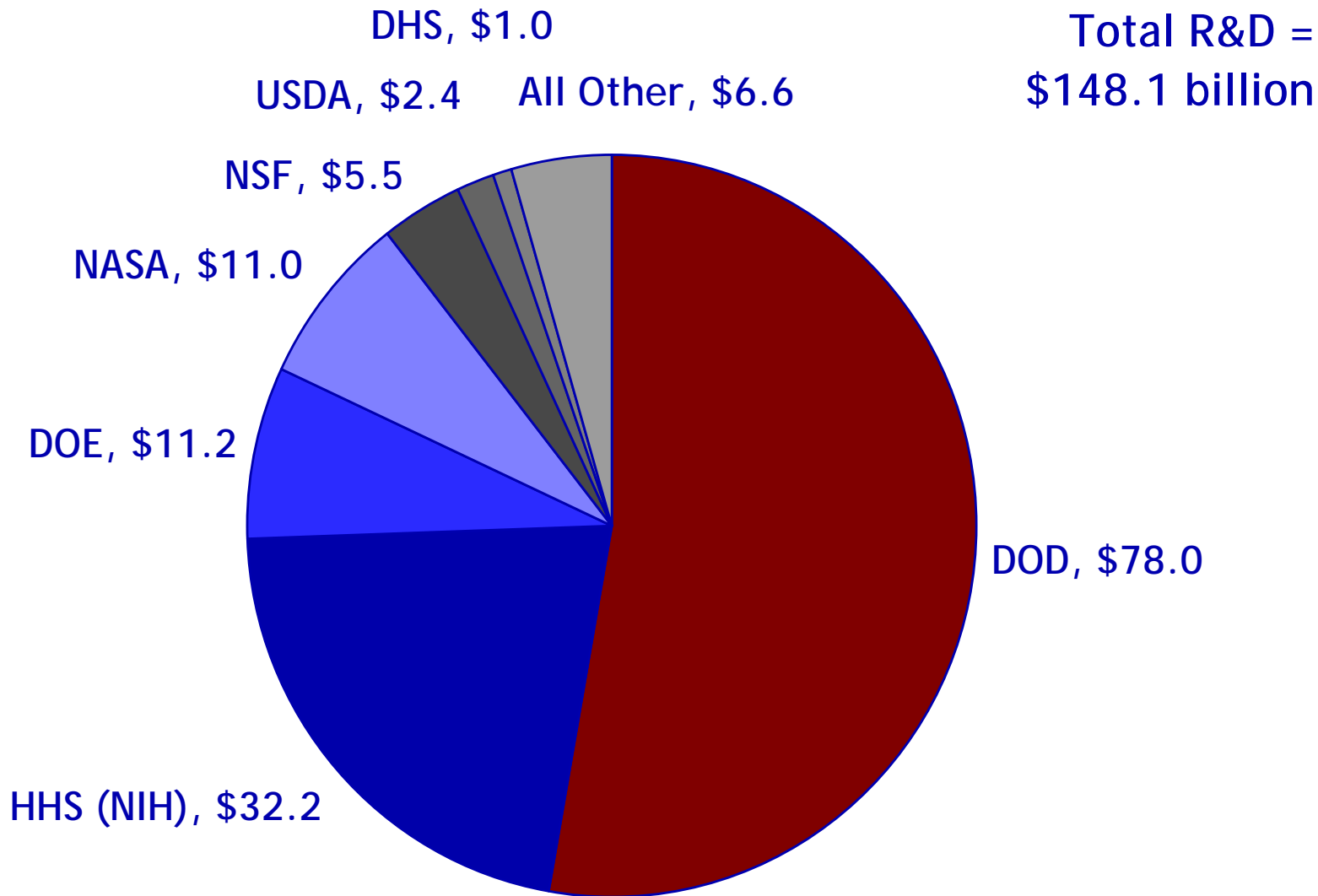
Source: AAAS analyses of R&D in annual AAAS R&D reports.  
FY 2011 figures are latest AAAS estimates of FY 2011 request.  
R&D includes conduct of R&D and R&D facilities.  
1976-1994 figures are NSF data on obligations in the Federal Funds survey.

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# Total R&D by Agency, FY 2011

budget authority in billions of dollars



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

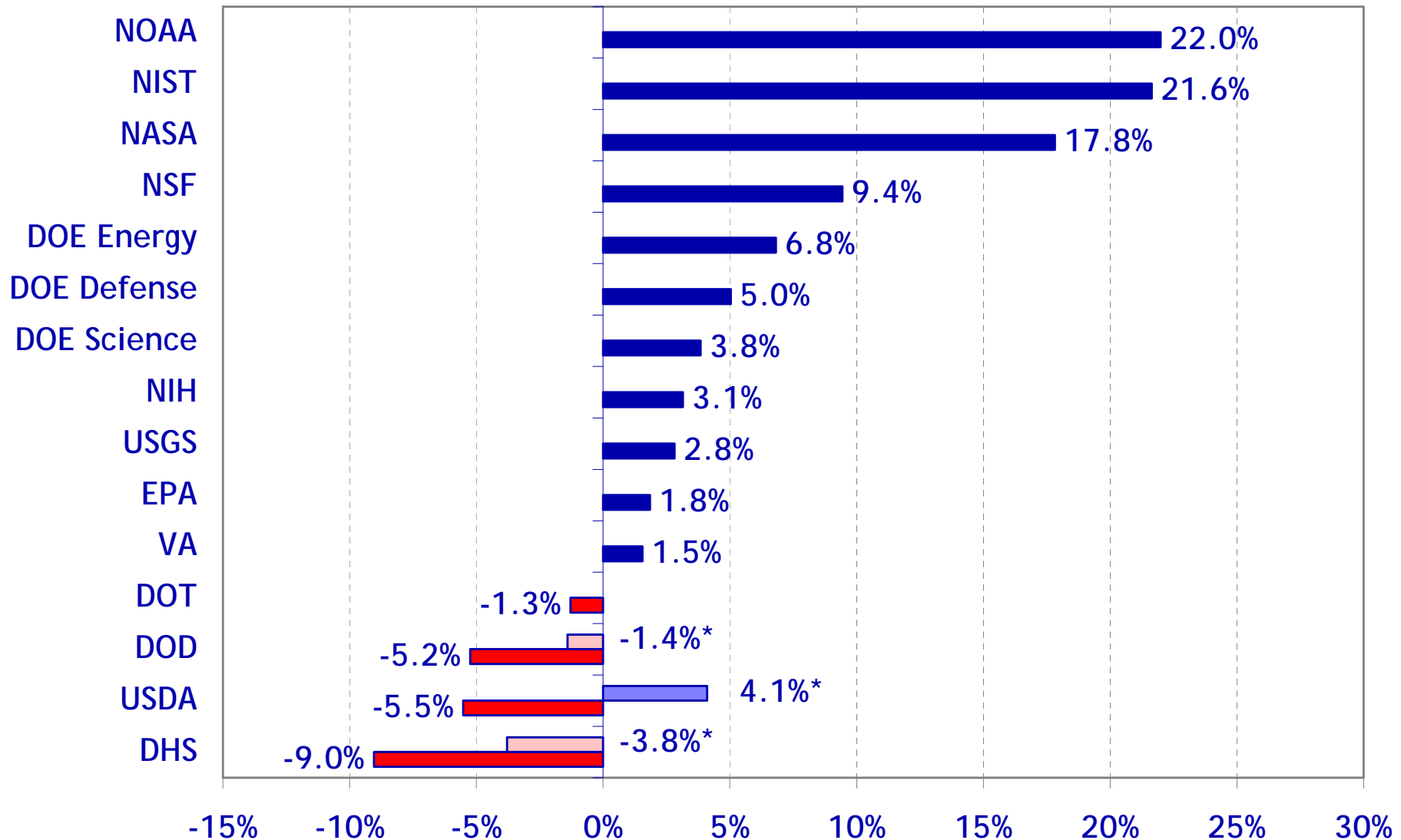
R&D includes conduct of R&D and R&D facilities.

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# R&D in the FY 2011 Budget Request

percent change from FY 2010



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

\* - Lighter colored bars indicate percent change with projected FY 2011 earmarks.

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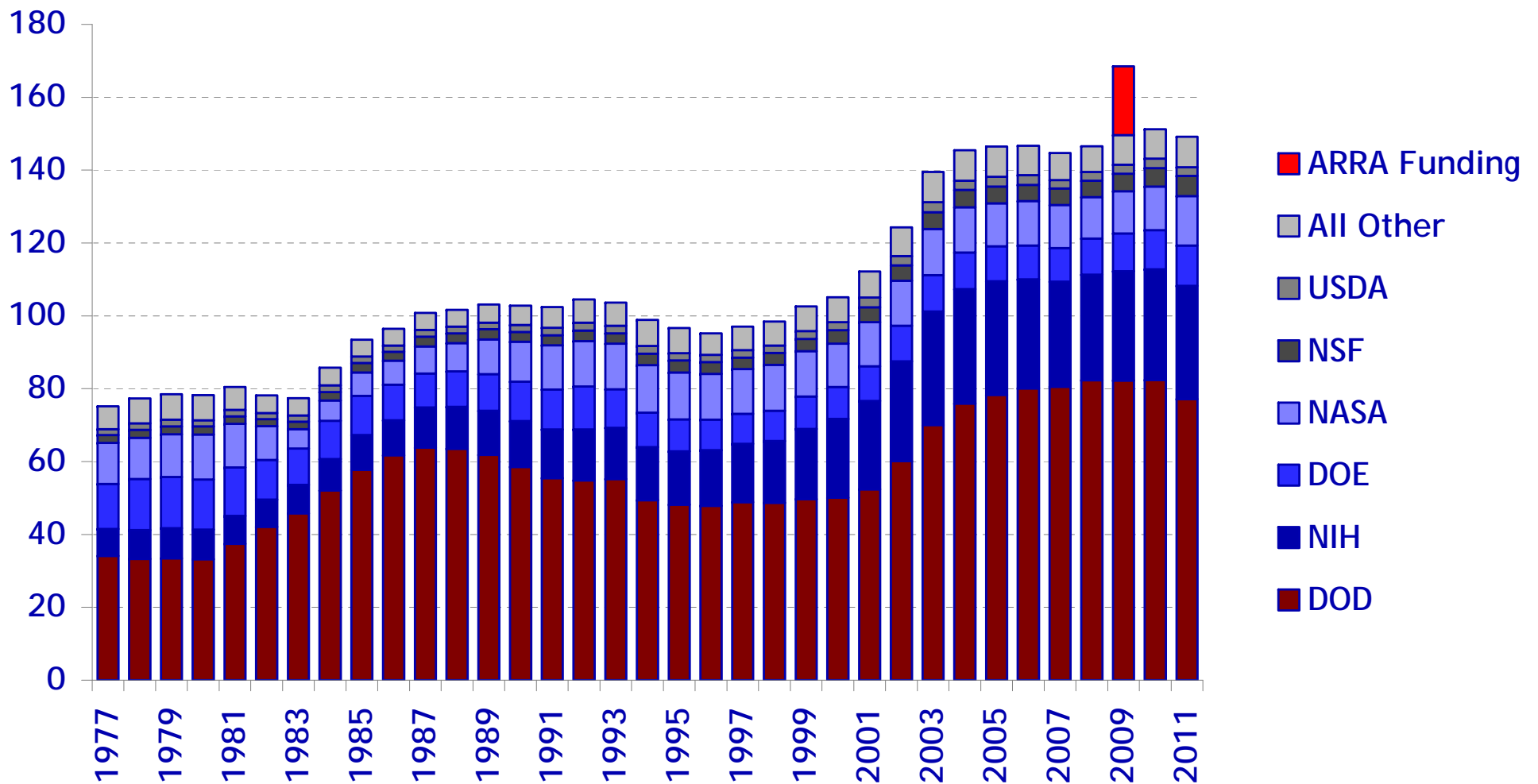


# Earmarks

- Early February - Senate Republicans introduce amendment to make earmarks a point of order requiring 60 votes to overcome
- March 9/10 - House Democrat leaders announce ban on earmarks to for-profit entities
- March 10/11 - House Republicans vote in closed-door session to ban all earmarks
- March 17 - Senate amendment fails
- Early April - Three House Republicans break rank and request earmarks

# Trends in R&D by Agency

in billions of constant FY 2010 dollars



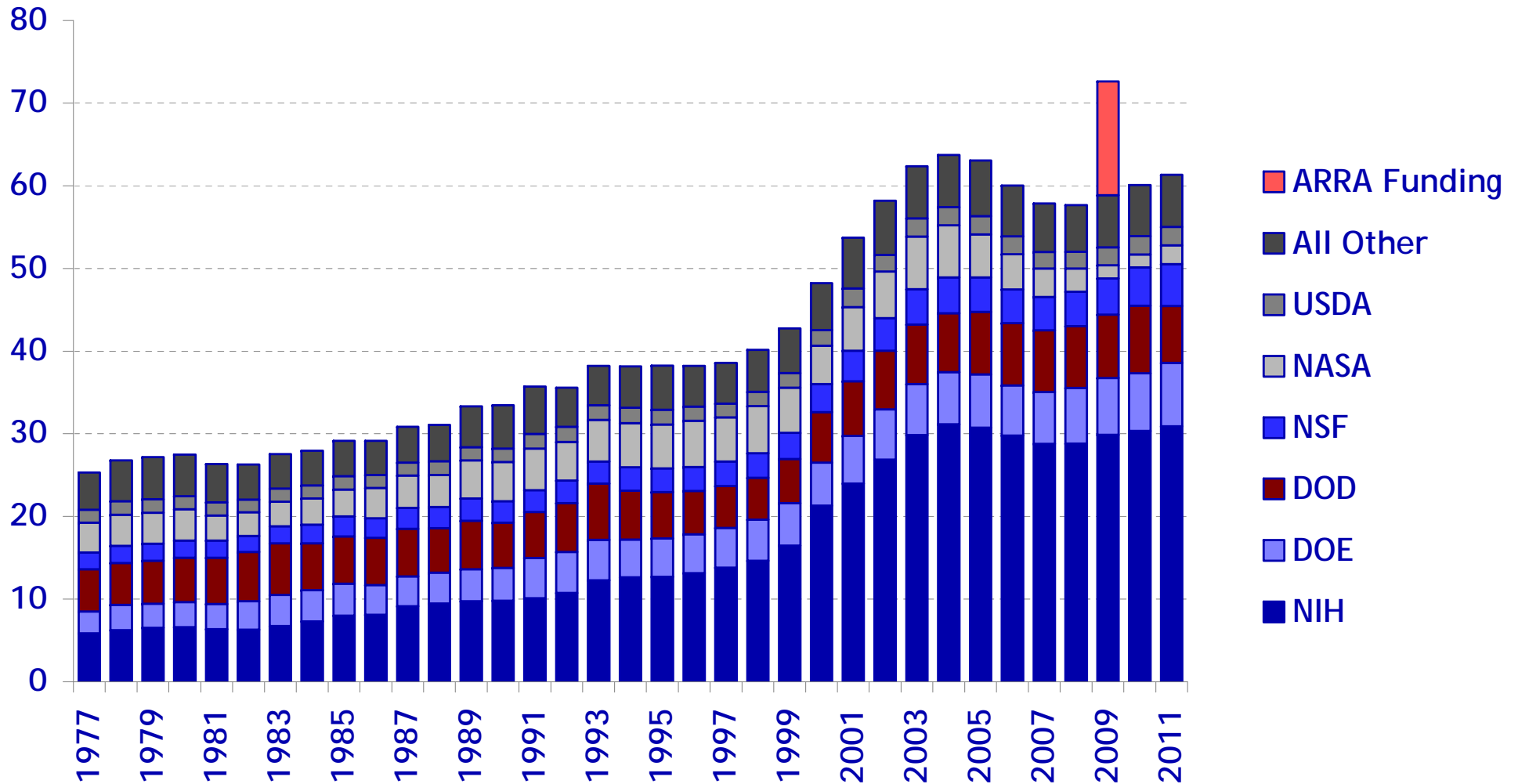
Source: AAAS Report: Research & Development series.  
 FY 2010 and FY 2011 figures are latest estimates.  
 1976-1994 figures are NSF data on obligations in the Federal Funds survey.

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# Trends in Research by Agency

in billions of constant FY 2010 dollars



Source: AAAS Report: Research & Development series.

FY 2010 and FY 2011 figures are latest estimates.

Research includes basic research and applied research.

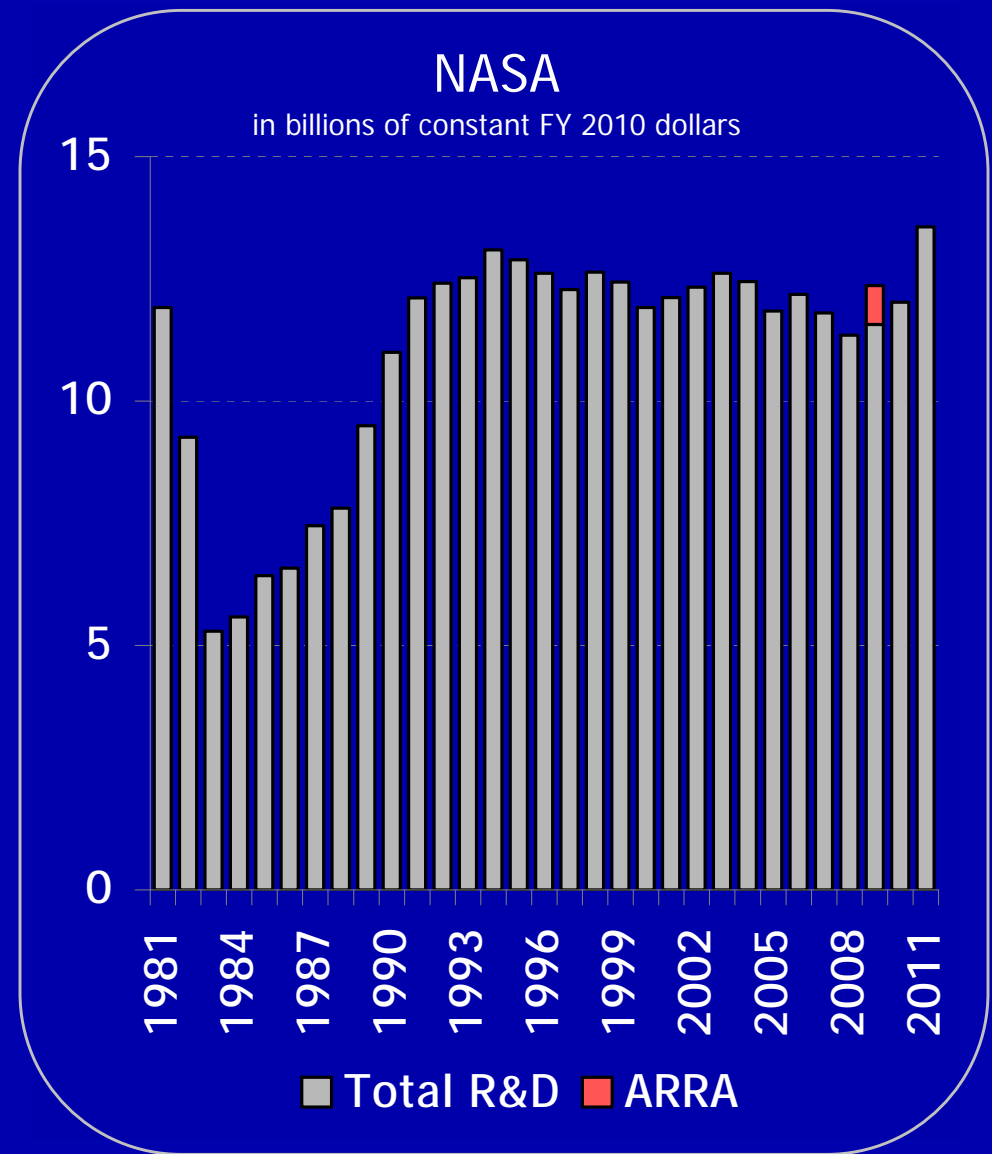
1976-1994 figures are NSF data on obligations in the Federal Funds survey.

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# NASA

- Retire space shuttle and cancel Constellation Program
- Frees \$6.5b over 2 yrs to...
- Near-earth orbit through private industry
  - +\$6.1b over 5 yrs
- Heavy Lift and Propulsion
  - +\$559m
- International Space Station
  - +\$905m to \$3.2b over 4 yrs



# NASA Update

- Congressional Concerns
  - U.S. space leadership
  - Reliance on industry/Russia for near-earth orbit
  - Jobs
- Hutchison (R-TX) Bill - Extends Space Shuttle & Space Station
- Administration Response
  - Use Orion technology for Space Station rescue vehicle
  - Heavy lift and propulsion: \$3b over next few years
    - Final design by 2015
  - Job assistance: \$40m

# Funding Shifts

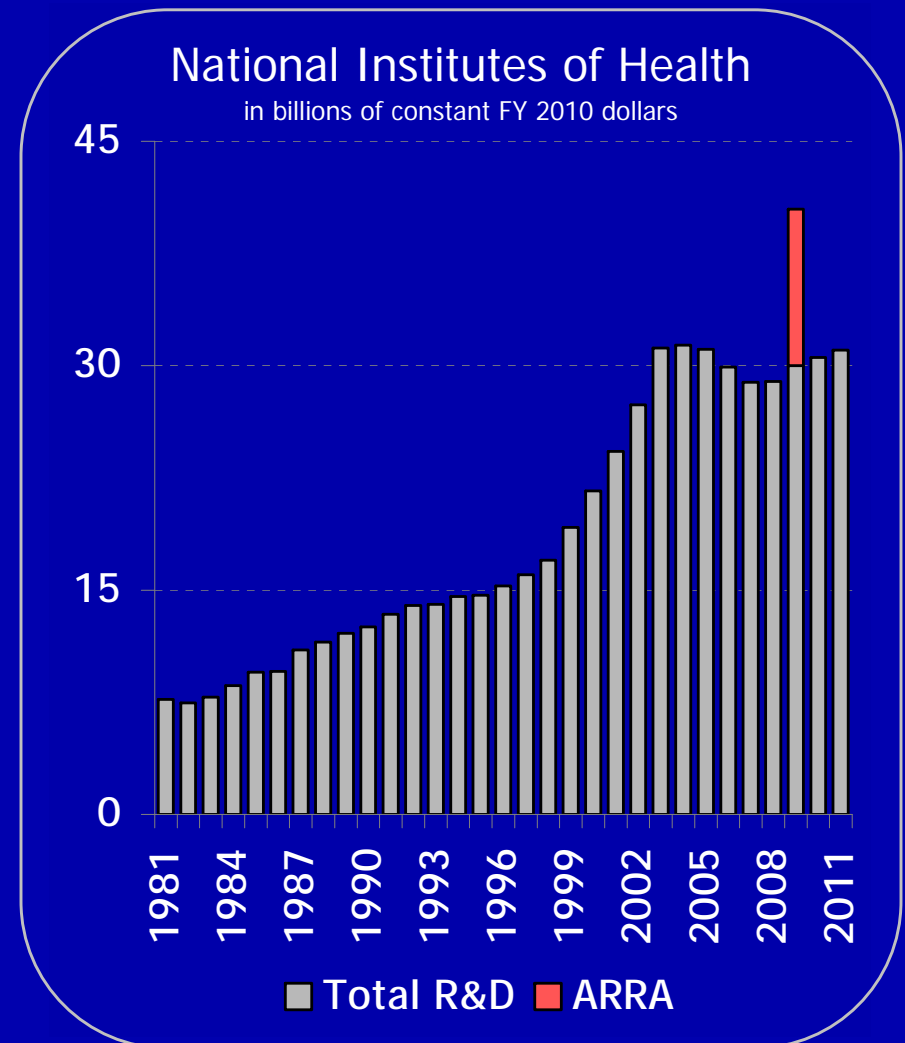
- Department of Defense
  - Basic Research: +6.7% to \$2.0b
  - Development: -5.0% to \$71.0b
  - DARPA: +3.7% to \$3.1b
- US Dept of Agriculture
  - Buildings and Facilities: -\$147m decrease in R&D after rescissions
  - Agriculture and Food Research Initiative (AFRI)
    - +\$166m (63.4%) to \$429m in total budget
- Dept of Energy
  - Decreases: Fossil (-\$53m), Nuclear (-\$122m)
  - Increases: Off of Sci (+\$172m), EERE (+\$35m), Electric Grid (+\$22m)
  - ARPA-E: \$300m (R&D, \$273m)

# Funding Doubling for Basic Research

- DOE Office of Science
  - Total Budget: +4.4% to \$5.1b
  - R&D: +3.8% to \$4.6b
  - New Energy Innovation Hub - Batteries and Energy Storage
- National Institute of Standards and Technology
  - Total Budget: +7.3% to \$919m
  - R&D: +21.7% to \$706m
  - NIST Labs (STRS): +13.5% to \$585m
- National Science Foundation
  - Total Budget: +8.0% to \$7.4b
  - R&D: +9.4% to \$5.5b
  - National Innovation Strategy

# National Institutes of Health

- Total Budget: +2.8% to \$32.2b
- R&D: +2.8% to \$31.4b
- Cancer and autism spectrum disorders
- AIDS research - Global Fund
- National Nanotechnology Initiative: +6.0% to \$382m
- Therapeutics for Rare and Neglected Diseases (TRND)
  - +\$26m to \$50m
- National Synchrotron Light Source-II (NSLS-II): \$33m



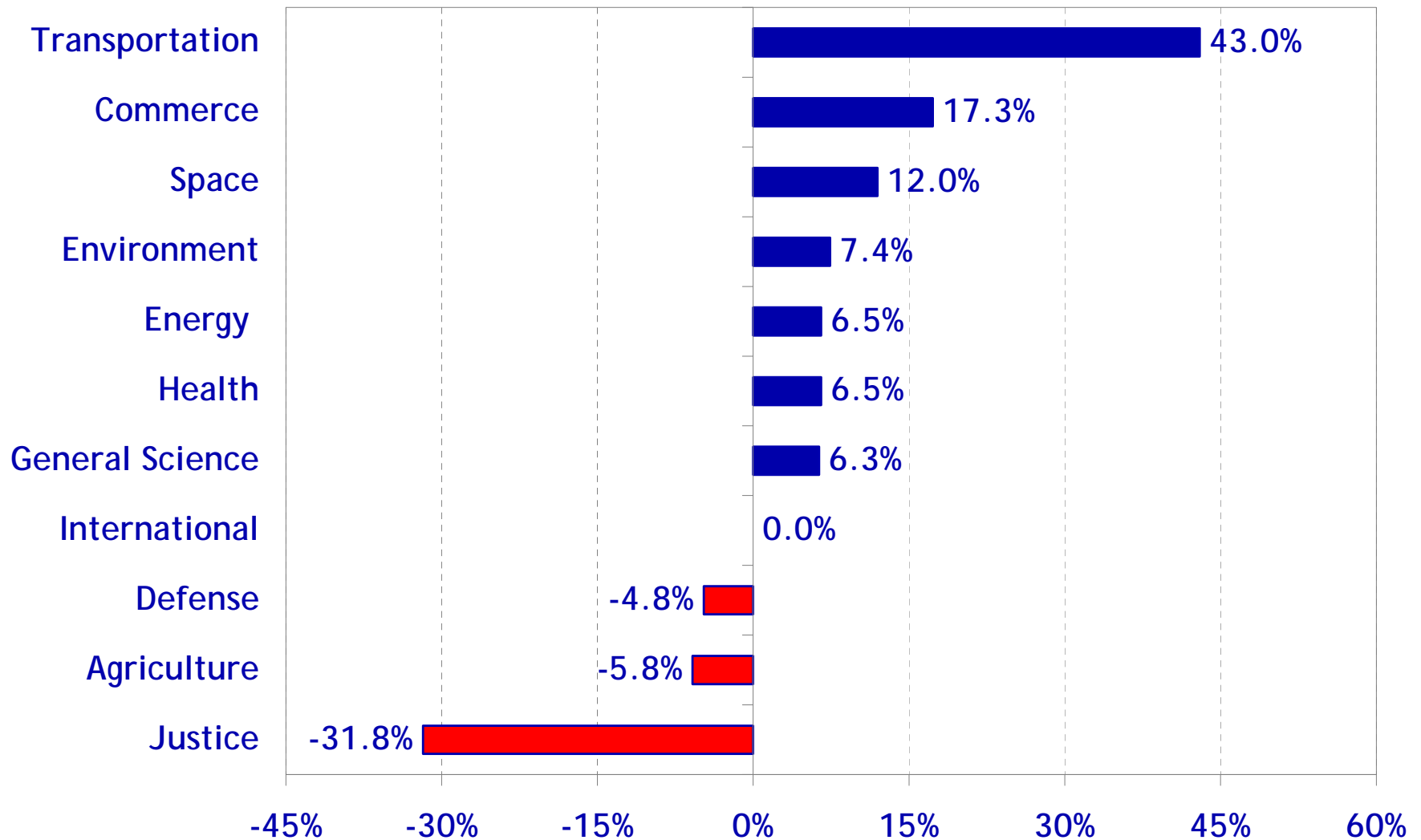


# R&D Investment Priorities

- New Industries and Jobs
  - Advanced materials and manufacturing methods
  - \$6.1b over 5 years for commercial earth orbit
- Cleaner Energy
  - +\$155m (+6.8%) for DOE Energy R&D
- Healthier America
  - +\$956m (+3.1%) for National Institutes of Health R&D
- Enhanced Security
  - DOD Basic Research: +6.7% to \$2.0b

# FY 2011 R&D Budget Request by Function

percent change from FY 2010



Source: OMB and agency budget data.  
Environment includes natural resources R&D  
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# STEM Education

- \$3.7b, +\$32m from FY 2010
- K-12 Education
  - Dept of Ed: \$450m, NASA: \$63m, NSF: \$41m
- RE-ENERGYSE (Undergraduate)
  - NSF: \$19m, DOE: \$55m
- Undergraduate Diversity
  - NSF: +14% to \$103m
- Graduate Fellowships
  - NSF: +16% to \$158m, NIH: +5% to \$824m  
DOD: +4% to \$40m, DOE: +\$10m to \$15m

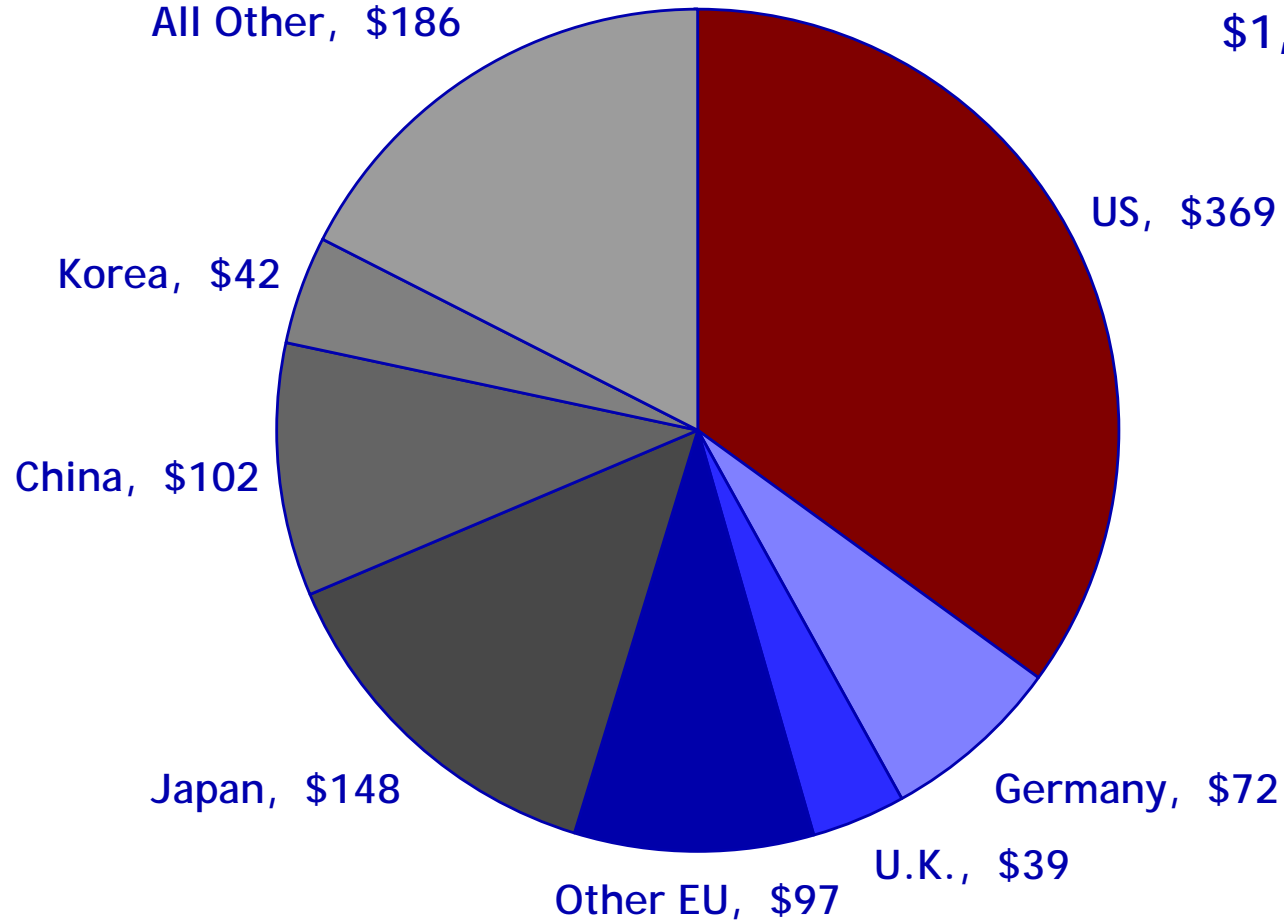
# International R&D Investment

- 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.

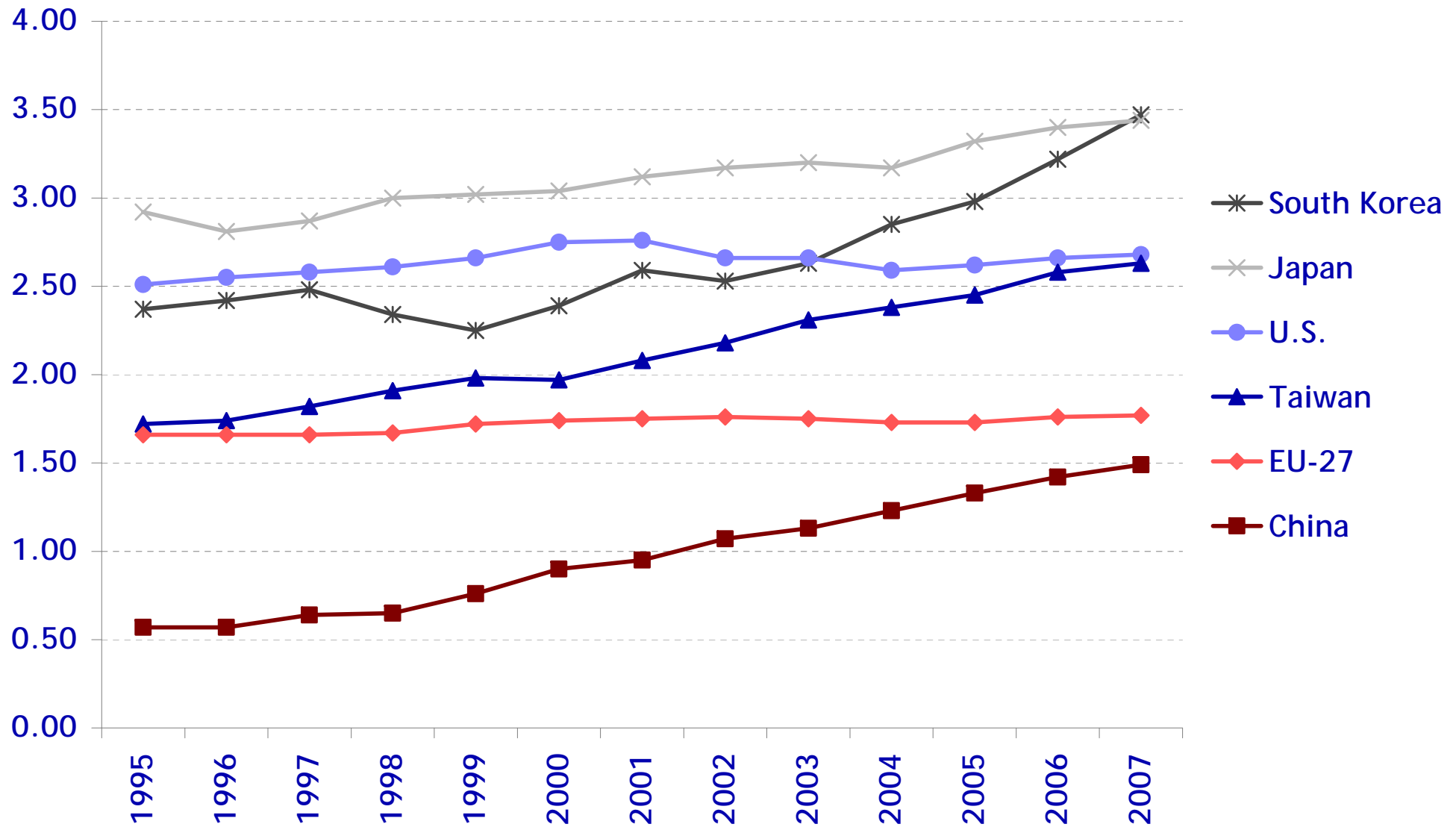
Calculated using purchasing power parities.

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# National R&D Investment

percent of GDP



Source: OECD, Main Science and Technology Indicators, May 2009.

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## Next Steps

- Congress is wrapping up budget briefings for agencies.
- Congress missed the April 15<sup>th</sup> deadline to pass a budget resolution.
  - Congress can start to debate the appropriations bills on May 15 with or without a budget resolution.
- After the budget resolution, Congress determines the 301(b)s, allocating a specific amount to each appropriation subcommittee.
- Congress needs to pass 12 appropriation bills, ideally by Sept. 30, the end of FY 2010.

## For More Information...

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

The AAAS Forum on  
Science and Technology Policy  
is May 13-14, 2010  
in Washington, DC

### AAAS REPORT XXXV Research & Development FY 2011

Intersociety Working Group

