

Engineering Research and Development in the FY 2010 U.S. Federal Budget

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for ASME IMECE

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

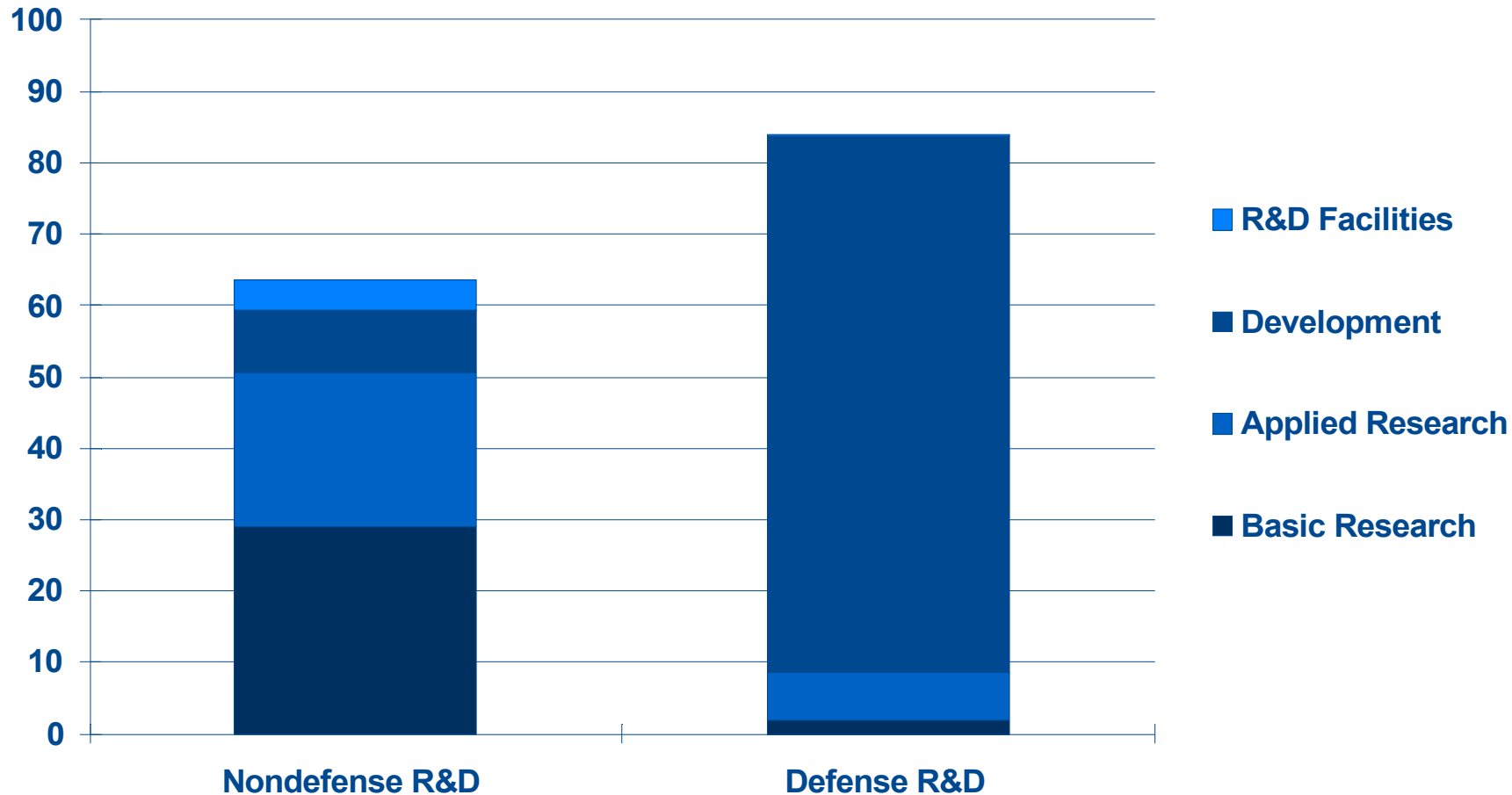
See the “Seminars and Presentations” section for
copies of this presentation.

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 (54.2%)
 - Department of Health and Human Services (21.0%)
- Role of federal R&D
 - Support federal missions
 - Drive U.S. innovation

Character of Defense and Nondefense R&D, FY 2010

Budget Authority in Billions



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

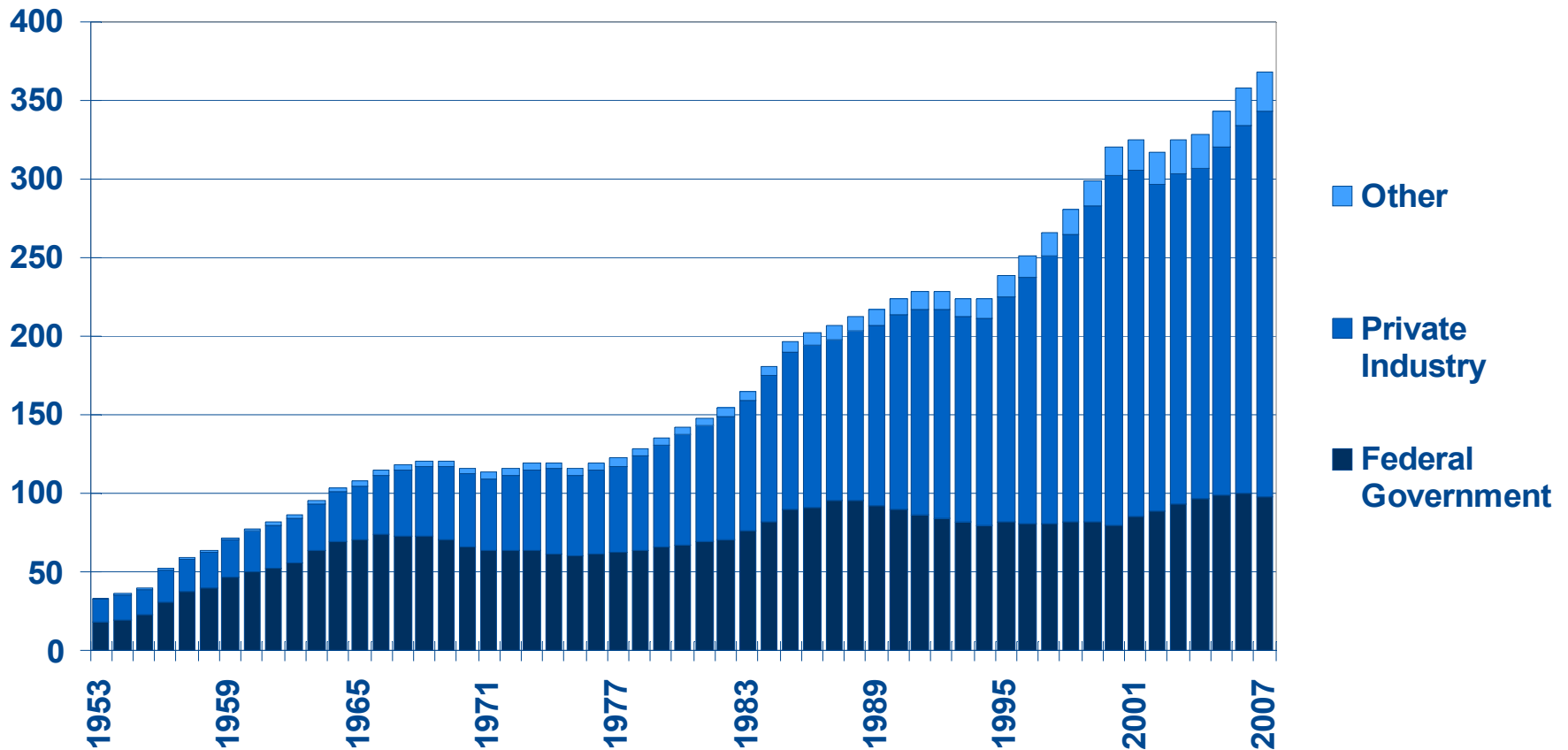
Defense R&D = DOD + DOE defense.

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U.S. R&D Funding by Source, 1953-2007

expenditures in billions of constant 2007 dollars

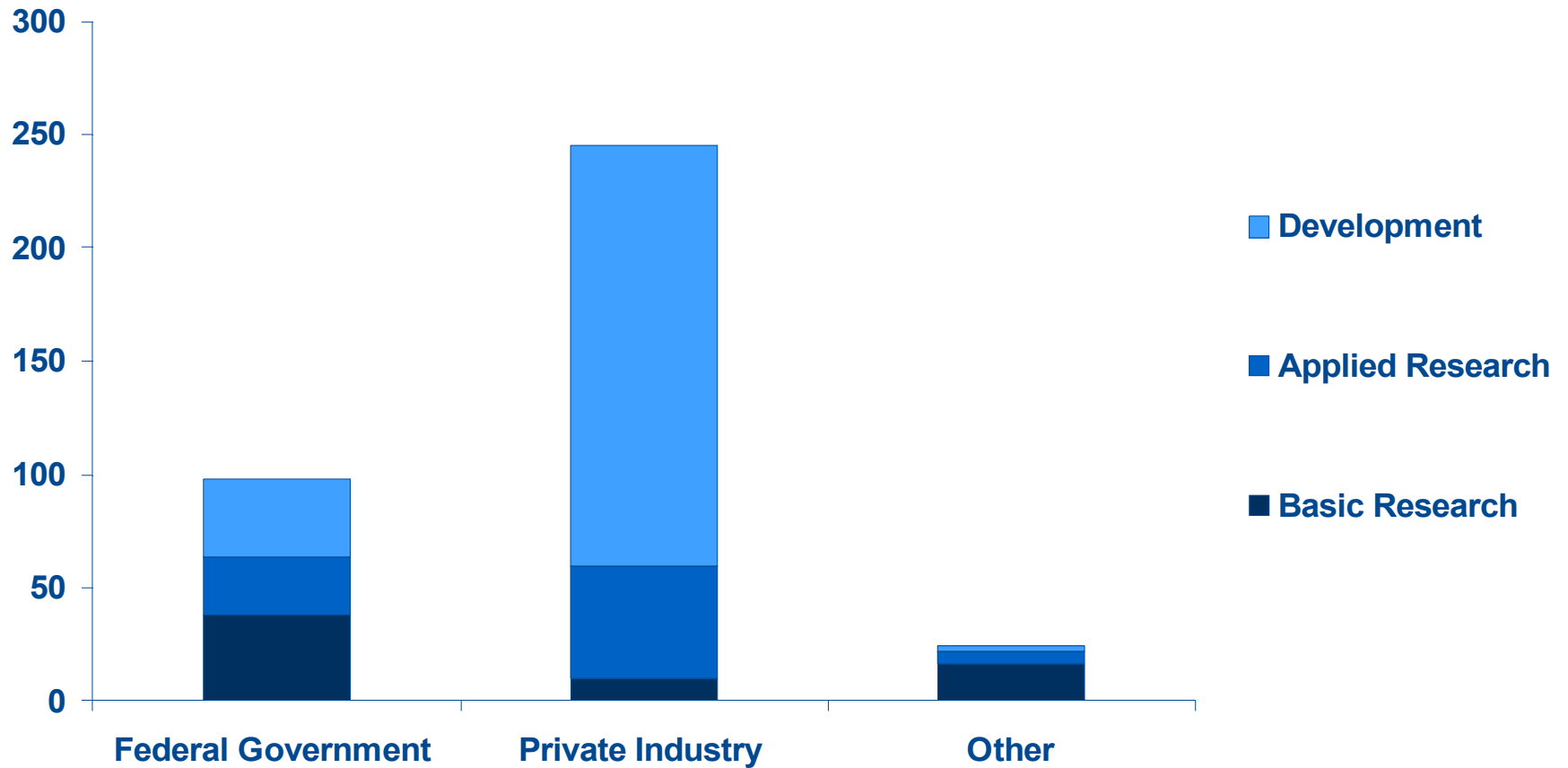


Source: NSF, Division of Science Resources Statistics,
National Patterns of R&D Resources (NSF 08-318)
2007 figures are preliminary.
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Character of R&D, 2007

expenditures in billions of dollars



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

2007 figures are preliminary.

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American Recovery and Reinvestment Act

- \$18.4 billion in R&D (12.5 percent of FY 2009 Investment)
 - National Institutes of Health - \$10.4 billion
 - National Science Foundation - \$3.0 billion
 - DOE Office of Science - \$1.6 billion
 - National Institute of Standards and Technology - \$600 million
- ARRA Obligation Deadline: September 30, 2010
- Different agencies, different mechanisms
- Buoyed the 0.3% increase in R&D investment from FY 09-10

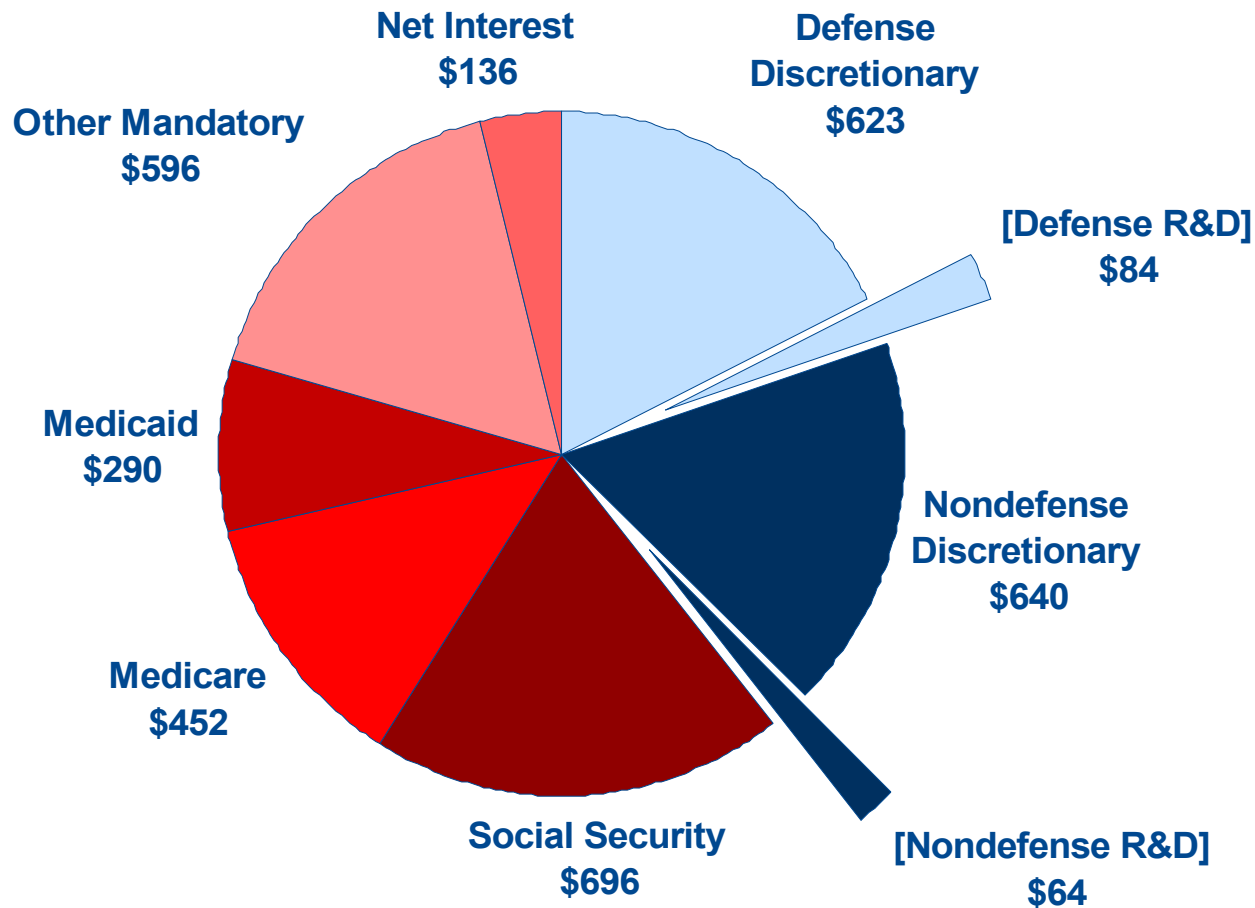
The FY 2010 Budget

- \$3.6 trillion total budget, \$1.3 trillion unified deficit
- \$1.4 trillion discretionary spending (9.1% increase)
 - \$704 billion nondefense spending (16.0% increase)
- \$147.5 million in total R&D (10.5% of discretionary)
 - Defense - \$84.0 million
 - Non-Defense - \$63.5 million
 - 0.3% increase from FY 2009, but 0.7% decrease in real dollars

Composition of the Proposed FY 2010 Budget

Total Outlays = \$3.6 trillion

outlays in billions of dollars



Source: *Budget of the United States Government FY 2010*

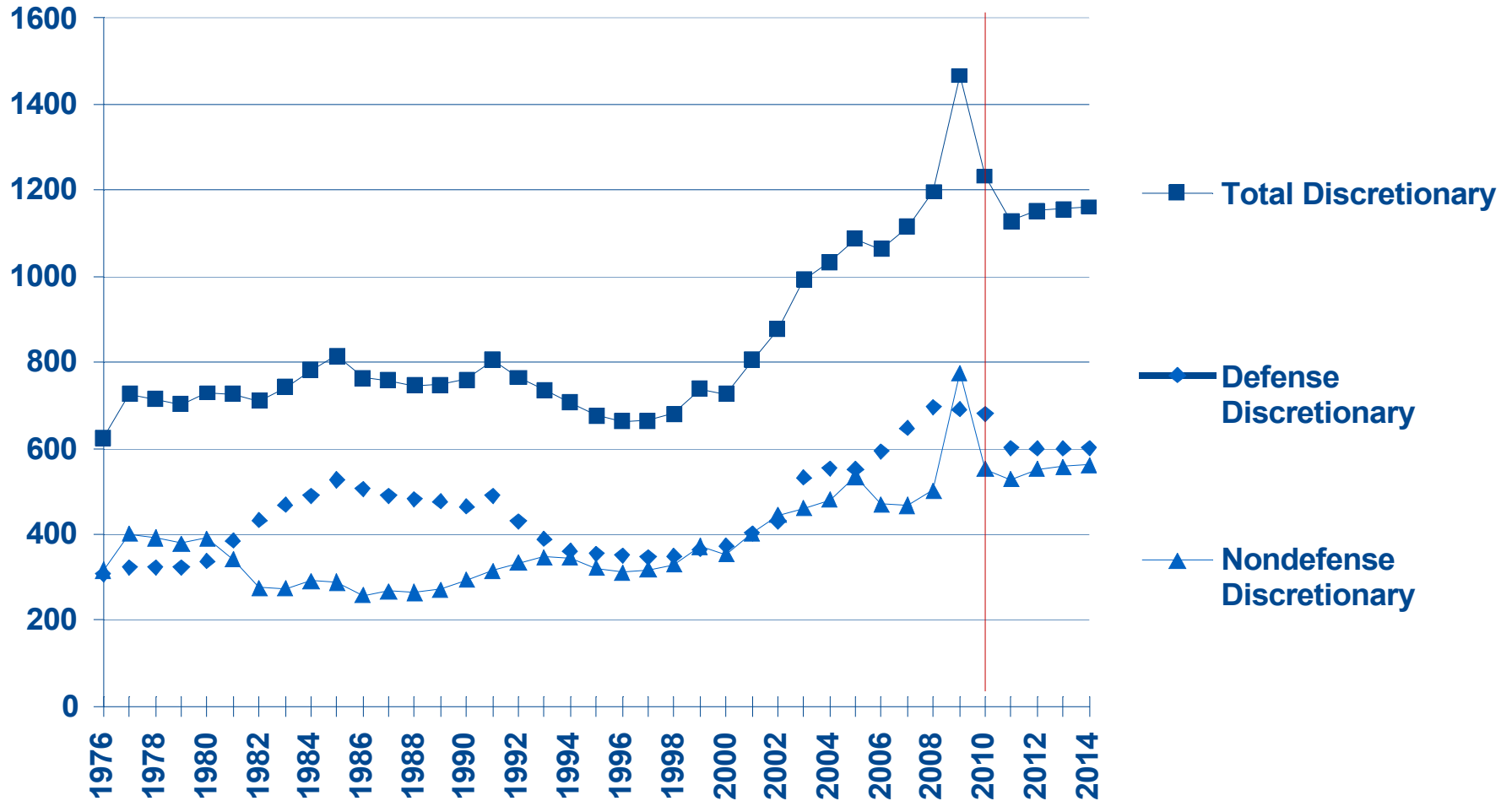
Projected unified deficit is \$1.3 trillion.

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Trends in Discretionary Spending, FY 1976-2014

outlays in billions of constant FY 2009 dollars



Source: *Budget of the United States Government, FY 2010*.

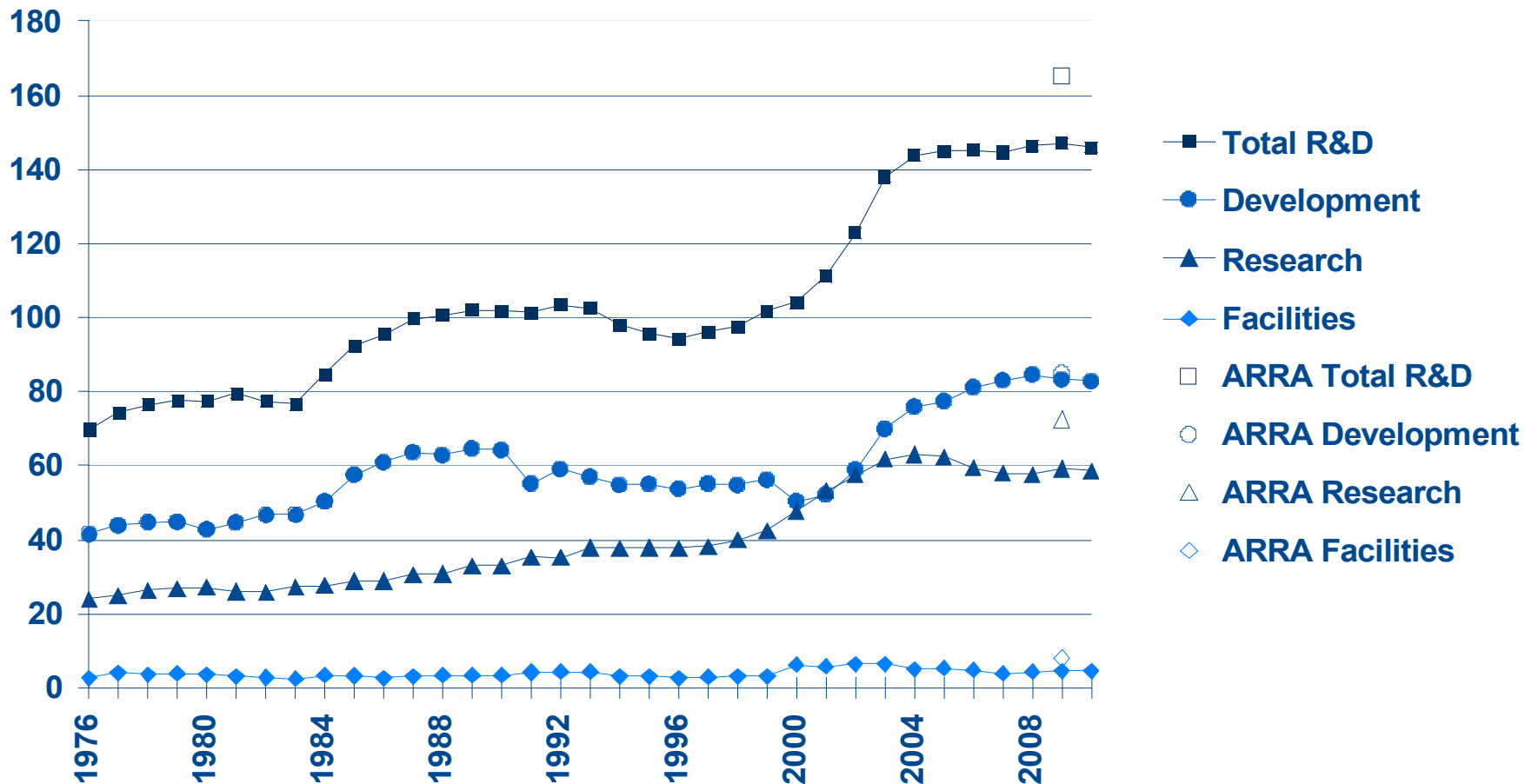
FY 2009-2014 data are budget projections.

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Trends in Federal R&D, FY 1976-2010

in billions of constant FY 2009 dollars

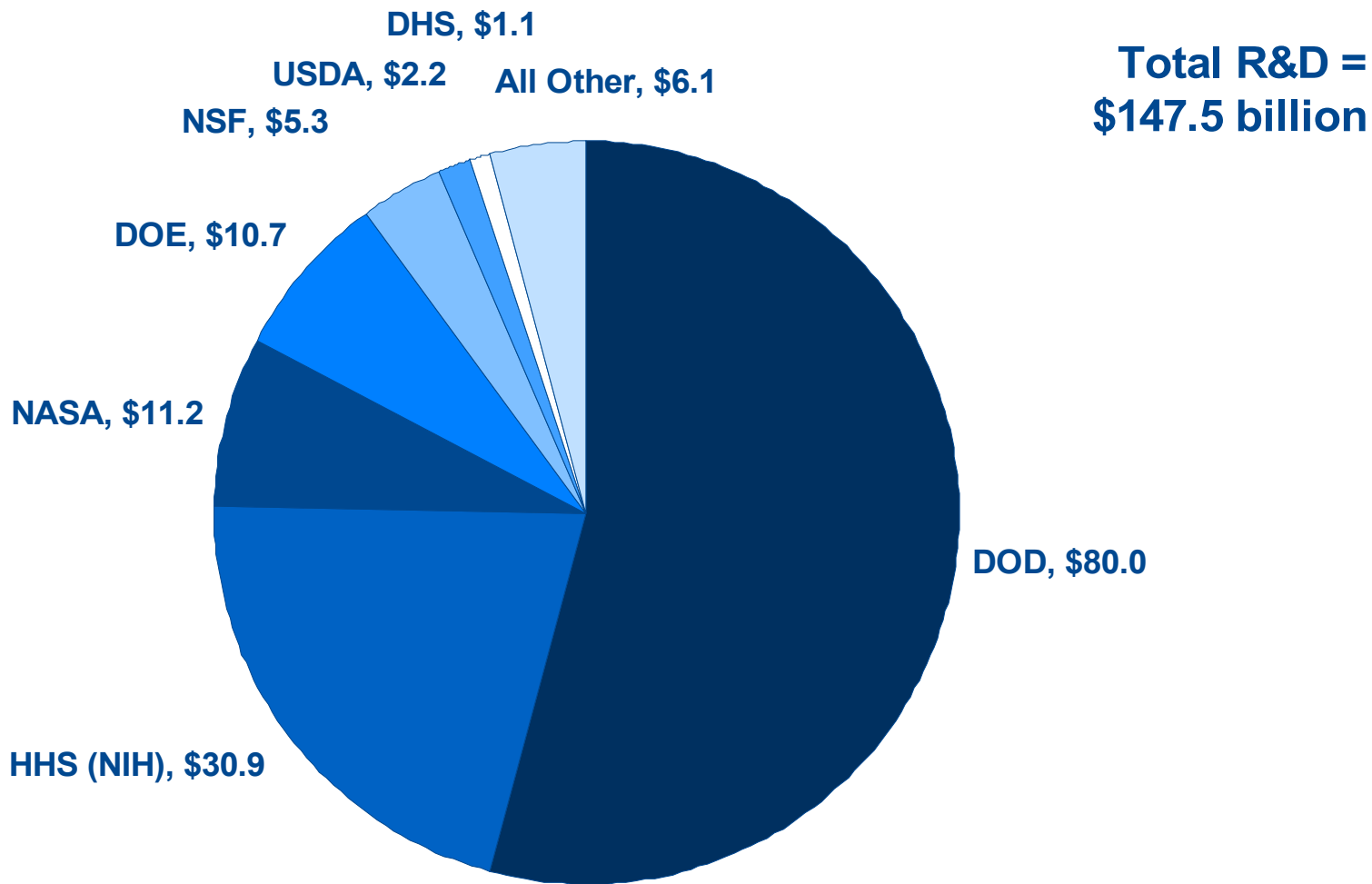


Source: AAAS analyses of R&D in annual AAAS R&D reports.
 * FY 2010 figures are latest AAAS estimates of FY 2010 request.
 R&D includes conduct of R&D and R&D facilities.
 1976-1994 figures are NSF data on obligations in the Federal Funds survey.
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Total R&D by Agency, FY 2010

budget authority in billions of dollars



Source: AAAS Report XXXIV: Research and Development FY 2010.

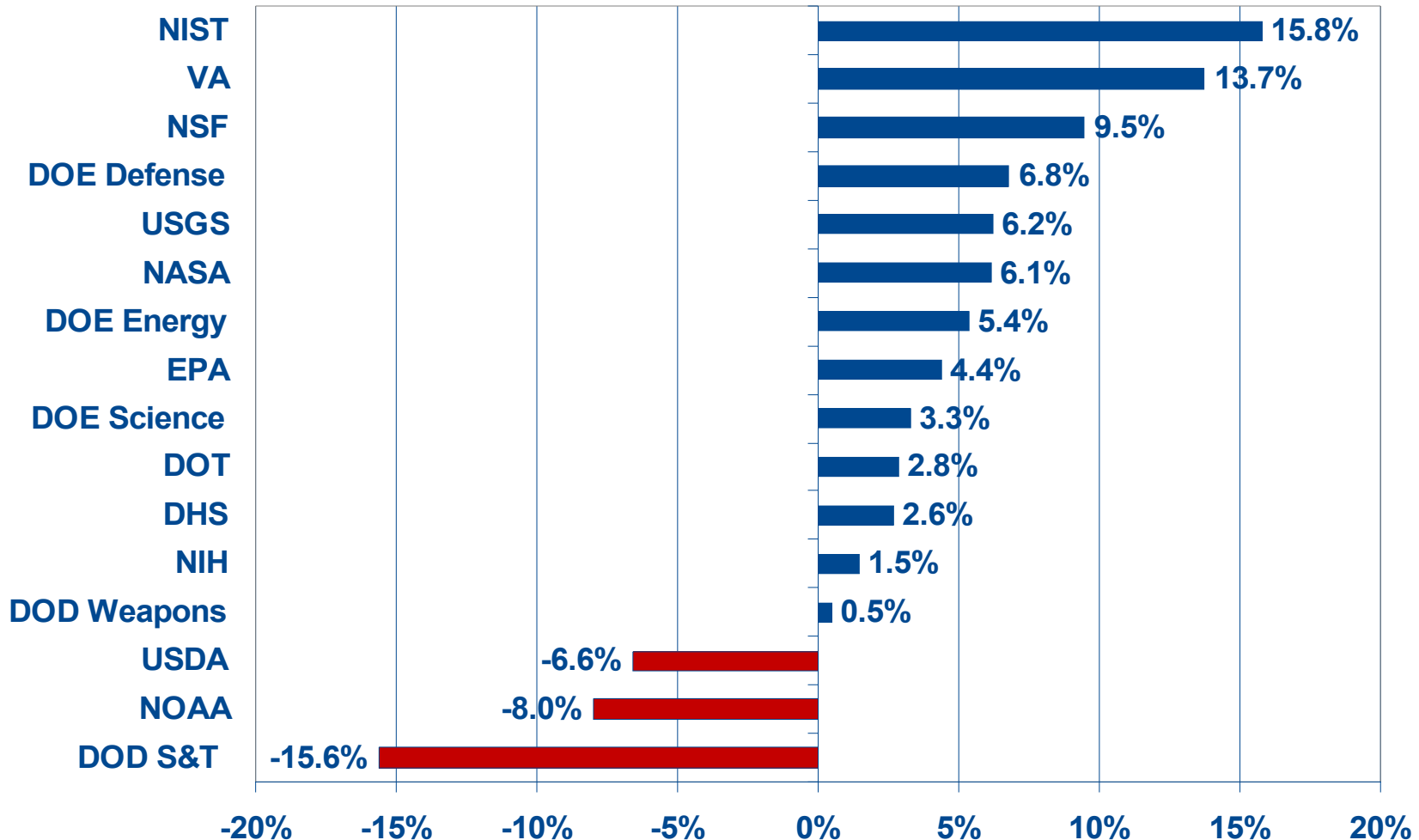
R&D includes conduct of R&D and R&D facilities.

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FY 2010 R&D Budget Request

Percent Change from FY 2009



Source: AAAS Report XXXIV: Research & Development FY 2010 .

DOD "S&T" = DOD R&D in "6.1" through "6.3" categories plus medical research.

DOD weapons = DOD R&D in "6.4" and higher categories.

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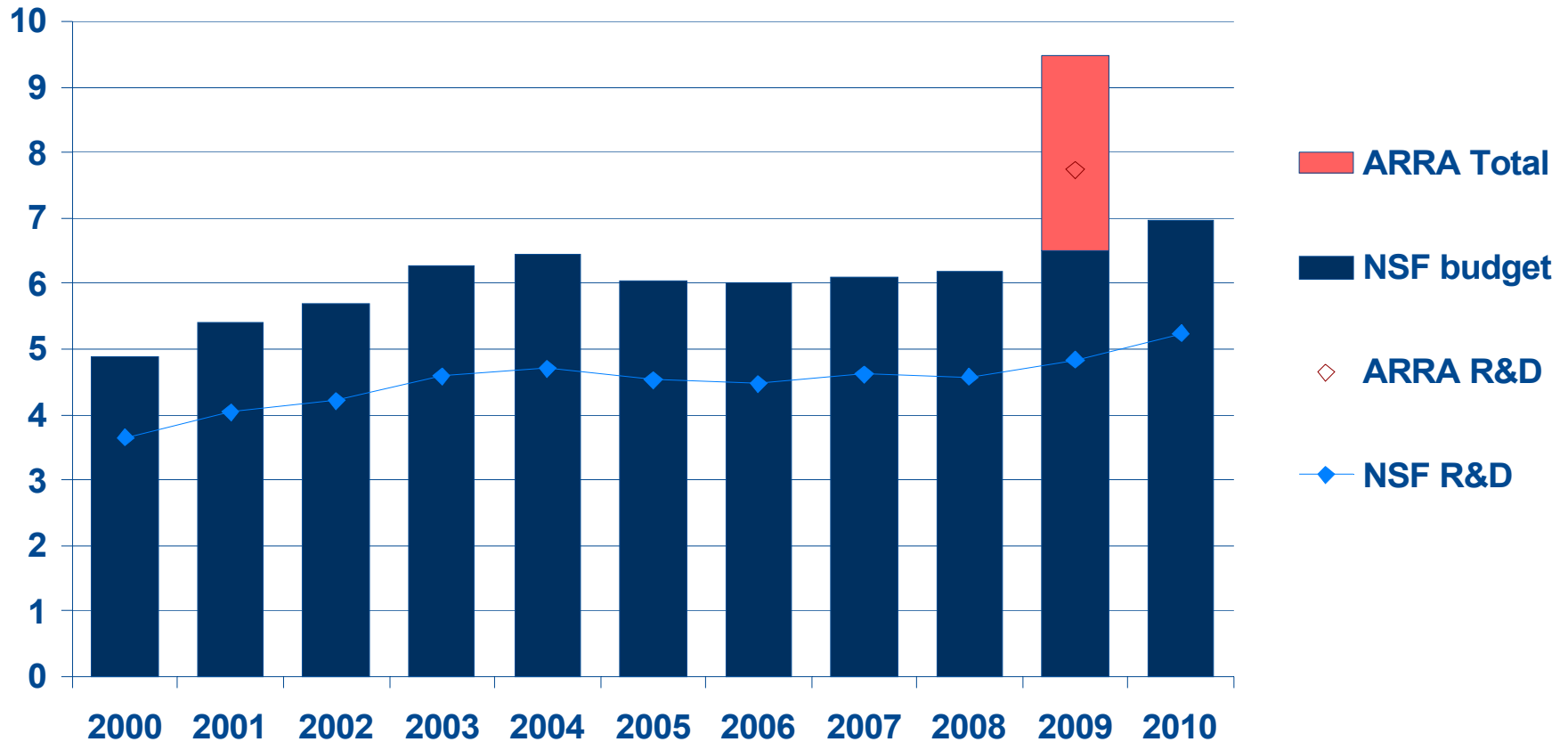


Doubling Funding for Basic Research Agencies

- National Science Foundation
 - 8.5% increase to \$7.0 billion
 - R&D – 9.5% increase to \$5.3 billion
- DOE Office of Science
 - 3.5% increase to \$4.9 billion
 - R&D – 3.3% increase to \$2.2 billion
- National Institute of Standards and Technology
 - 2.4% increase to \$849 million
 - R&D – 15.8% increase to \$637 million

National Science Foundation Budget, FY 2000-2010

budget authority in billions of constant FY 2009 dollars



Source: AAAS Report: Research & Development series.

FY 2009 and FY 2010 figures are latest estimates.

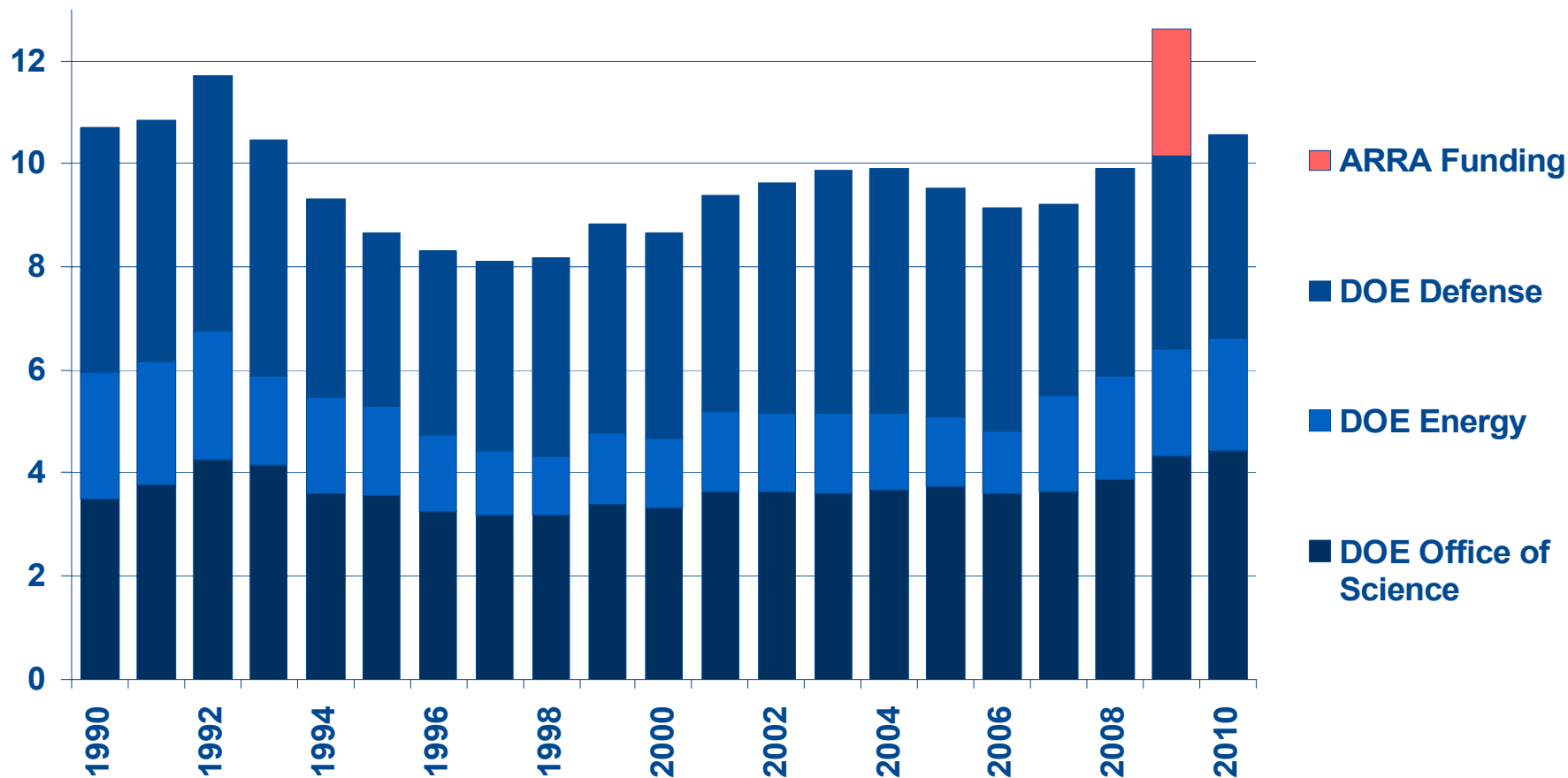
R&D includes conduct of R&D and R&D facilities.

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Trends in DOE R&D, FY 1990-2010

in billions of constant FY 2009 dollars



Source: AAAS Report: Research & Development series.

FY 2009 and FY 2010 figures are latest estimates.

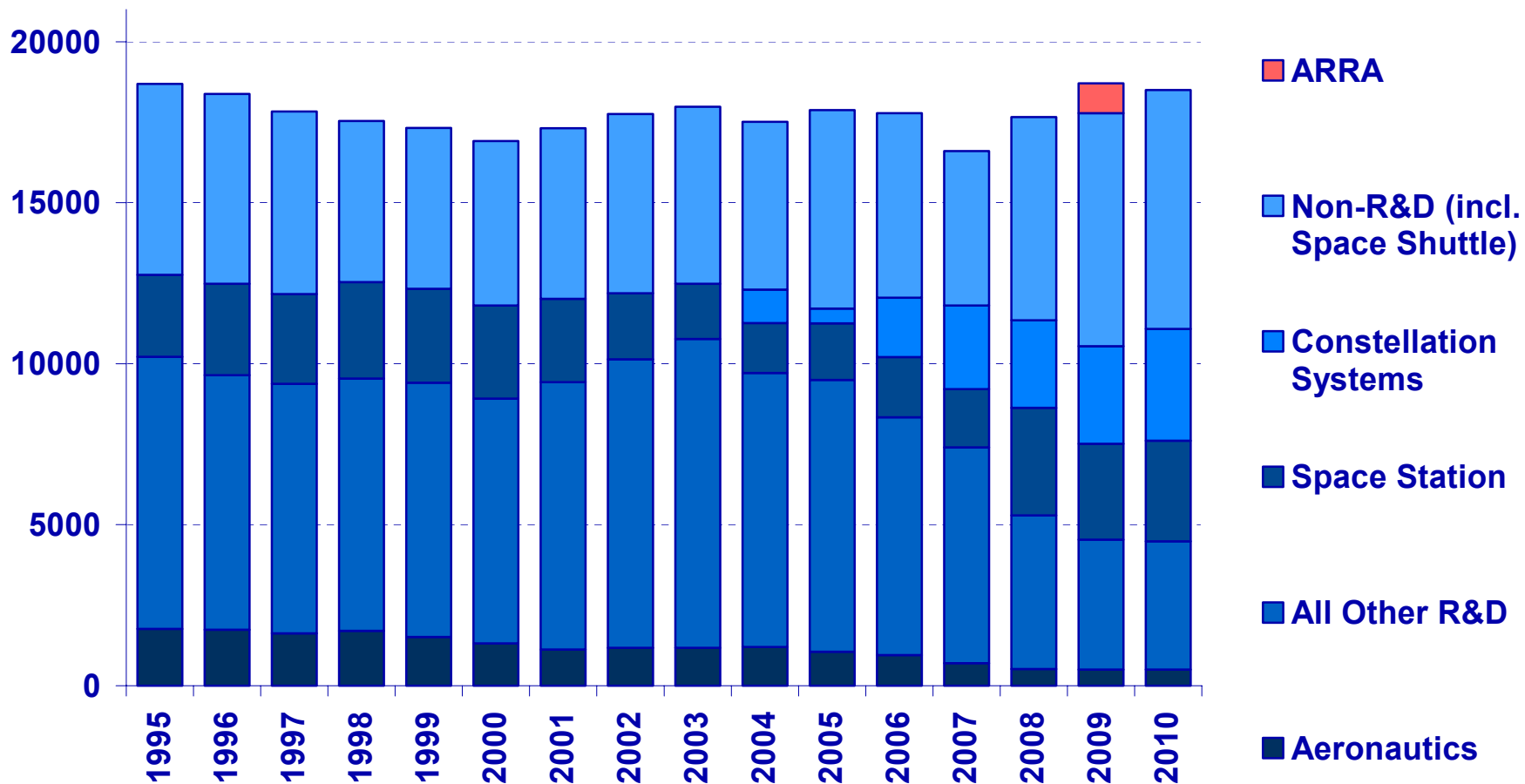
R&D includes conduct of R&D and R&D facilities.

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Trends in NASA R&D, FY 1995-2010

in millions of constant FY 2009 dollars



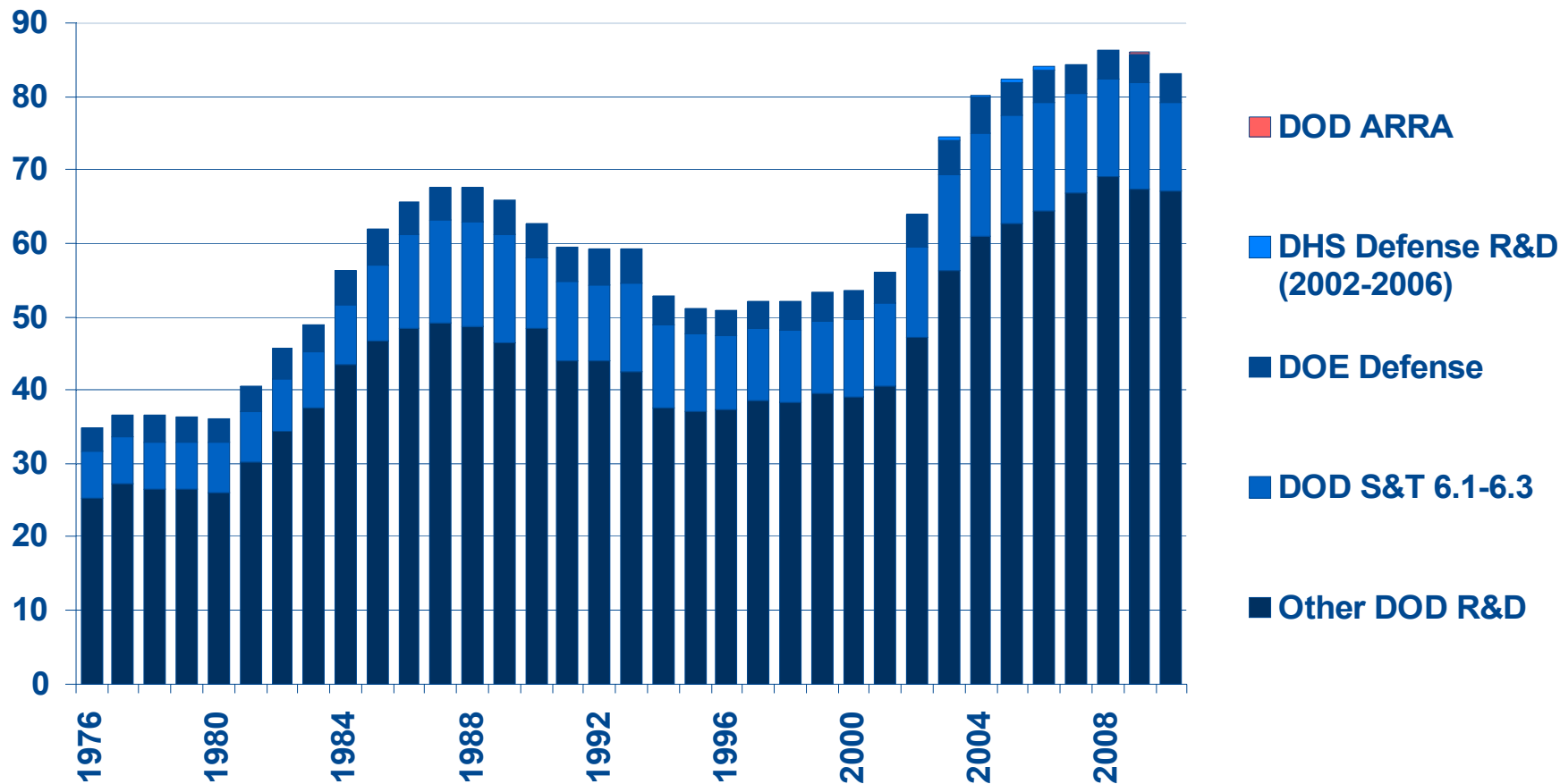
Source: AAAS analyses of R&D in *AAAS Reports VIII- XXXIV*.
 FY 2010 figures are latest AAAS estimates of FY 2010 request.
 Program budgets include associated support costs.
 R&D includes conduct of R&D and R&D facilities.

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Trends in Defense R&D, FY 1976-2010

in billions of constant FY 2009 dollars



Source: AAAS Report: Research & Development series.

FY 2009 and FY 2010 figures are latest estimates.

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

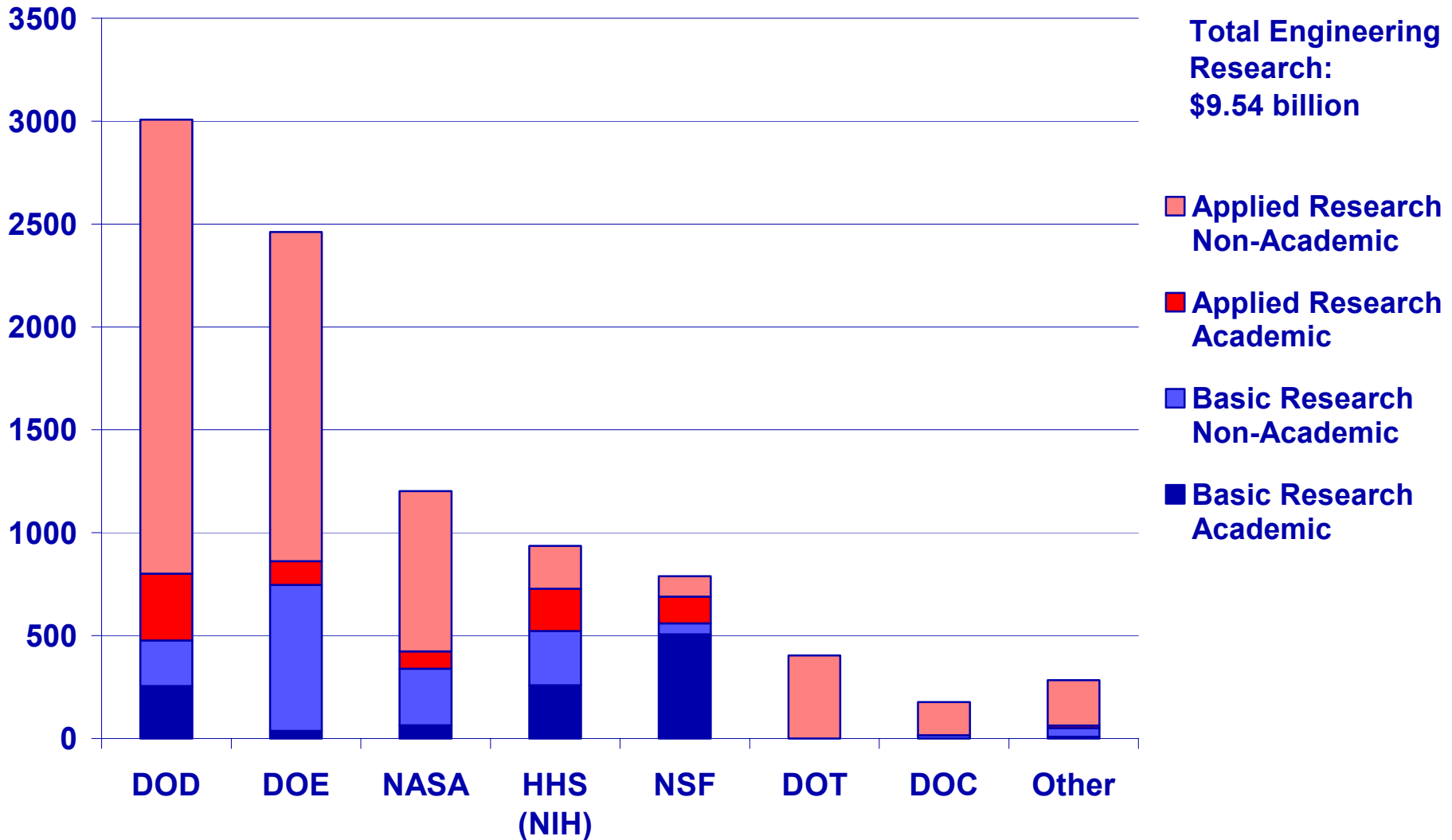
DOD S&T figures are not comparable for all years because of changing definitions.

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Federally Funded Engineering Research: FY 2008

(obligations in millions of dollars)



Source: National Science Foundation, *Federal Funds for Research and Development*.

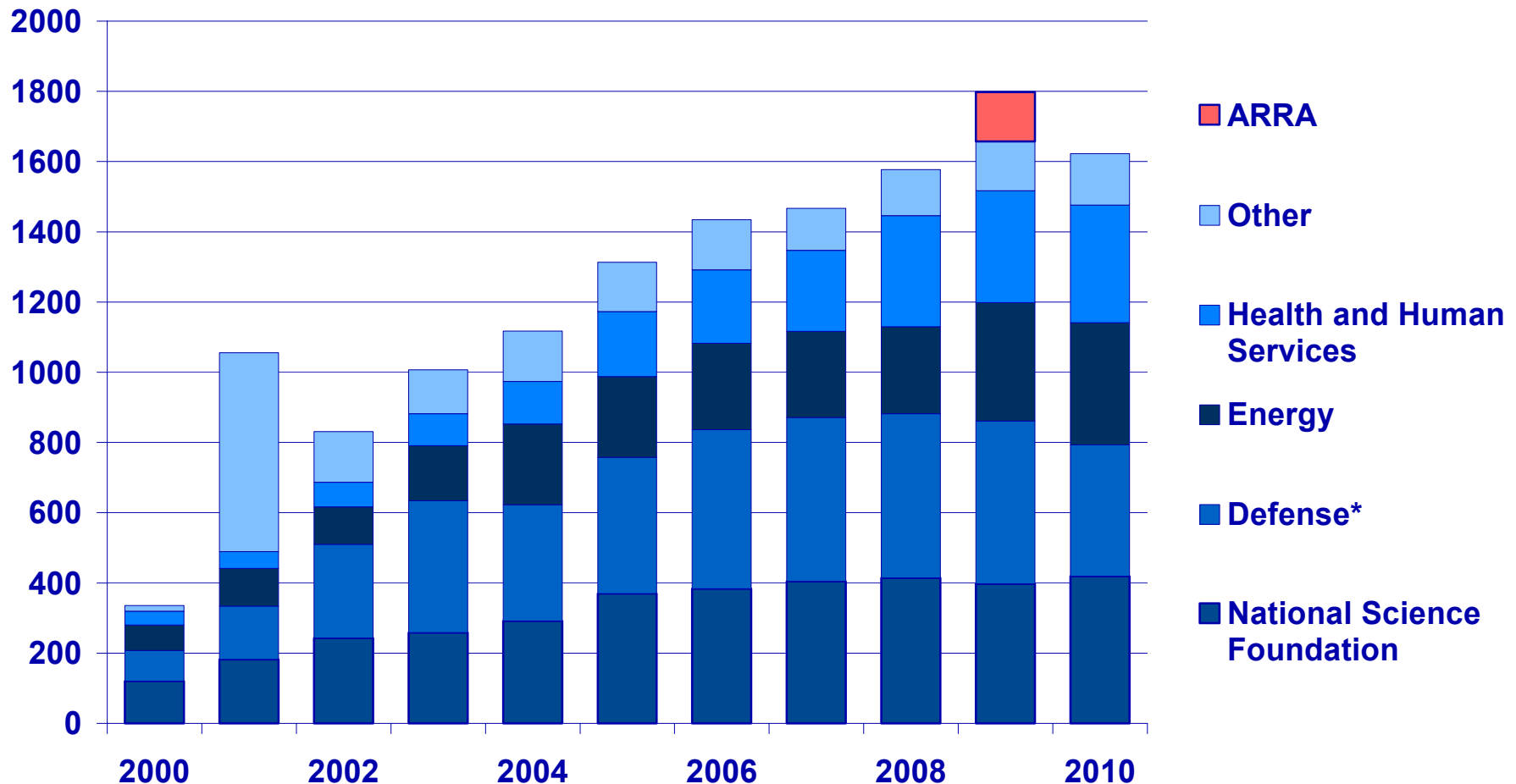
FY 2008 figures are preliminary.

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Federal Nanotechnology R&D, by Agency: FY 2000-2010

(budget authority in millions of constant FY 2009 dollars)



Source: Office of Management and Budget data.

* DOD changed its accounting starting in 2005, resulting in larger totals.

Adjusted for inflation using OMB's GDP deflators.

FY 2010 figures represent President's request.

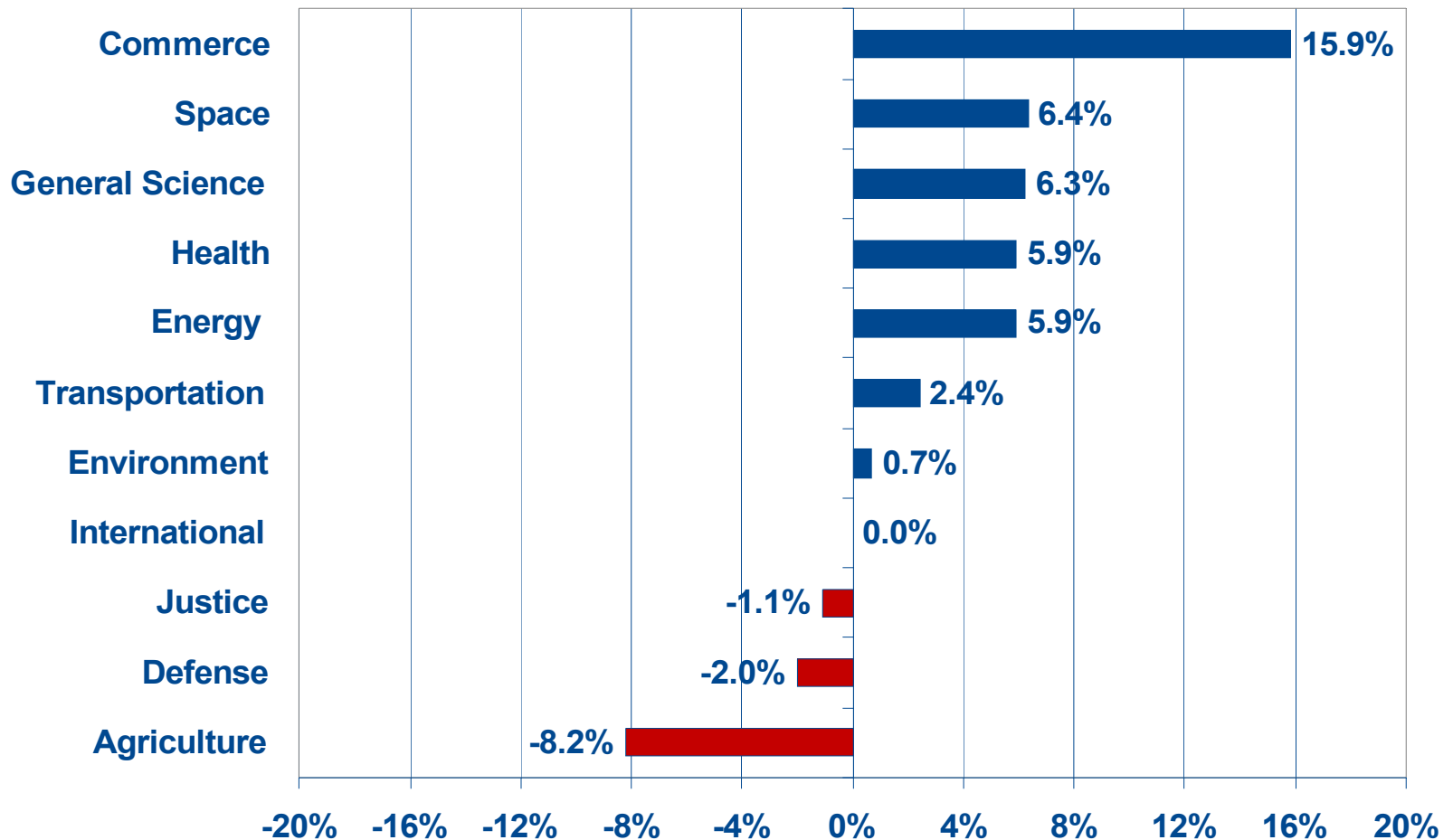
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R&D Investment Priorities

- Investing in the Sciences for a Prosperous America
 - General increases in science funding, especially basic research (3.4% increase, plus ARRA)
- A Clean Energy Future
 - DOE Energy Programs (5.4% increase, plus ARRA)
- Healthy Lives for All Americans
 - National Institutes of Health (1.5% increase, plus ARRA)
- A Safe and Secure America
 - Homeland Security Funding (23.8% increase)
- Interagency Initiatives
 - Nanotechnology, Climate Change, Information Technology

FY 2010 R&D Budget Request by Function

percent change from FY 2009



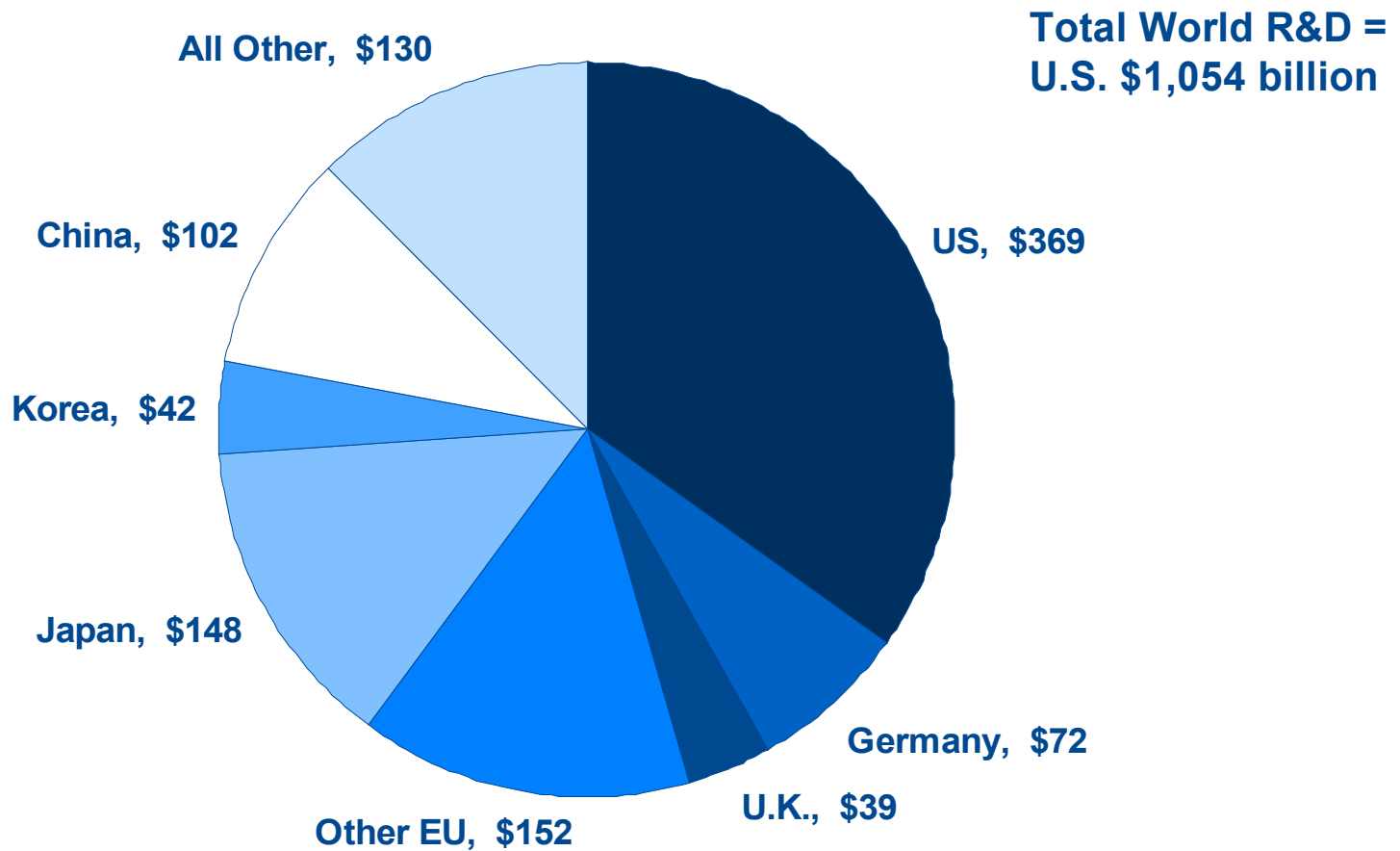
Source: OMB and agency budget data.
Environment includes natural resources R&D
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World Investment in R&D

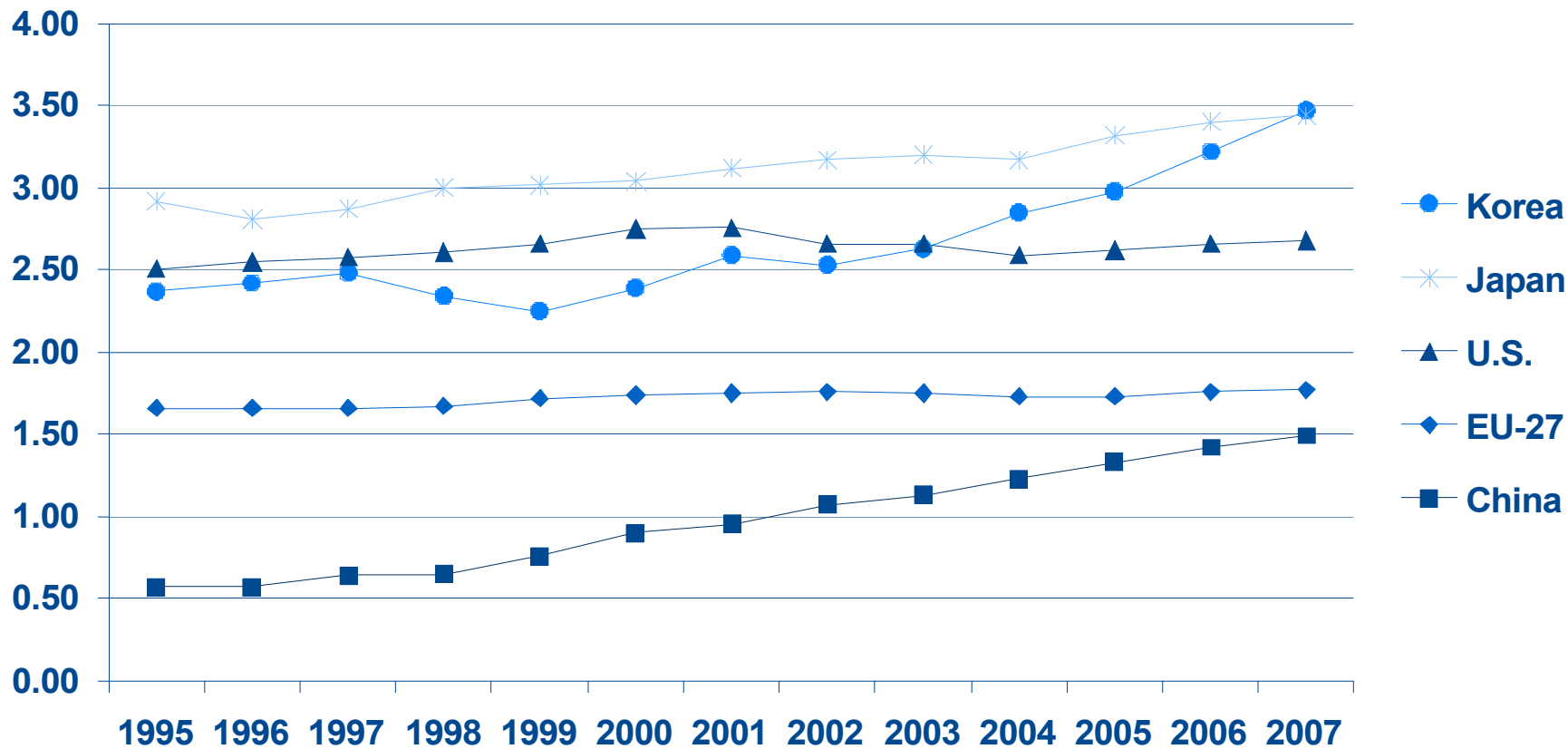
- Just over \$1 trillion in 2007
- 3.0% of GDP in R&D is the goal set by President Obama
 - April 27, National Academy of Sciences Annual Meeting
- 3.0% of GDP also chosen as EU goal in 2000
- Many Asian nations' investment in R&D is increasing
- Significant share of U.S. R&D investment is for defense
 - 57.0% at \$84 billion

Shares of Total World R&D, 2007



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 as % of GDP, 1995-2007



Source: OECD, Main Science and Technology Indicators, May 2009.
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The FY 2010 Federal R&D Investment

- H.R. 1: The American Recovery and Reinvestment Act
- Budget Doubling for Basic Research Agencies by FY 2016
- 3.0% of GDP Investment in R&D
- 4 R&D Investment Priorities
- Next Steps
 - Continuing Resolution through December 18, but only 5 of twelve bills signed.
 - Three waiting for conference after passing the House and Senate.
 - Senate has four appropriations bills to pass.

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

