The FY 2016 R&D Budget: Review and Context

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for the ASEE Engineering Research Council

AAAS R&D Budget and Policy Program
http://www.aaas.org/spp/rd
Source: AAAS analyses of historical budget and appropriations data. Pre-1994 figures are NSF obligations data from the Federal Funds survey. FY 2016 is the President's request. R&D includes conduct and facilities. © 2015 AAAS
R&D as a Share of GDP by Funder

Source: National Science Foundation, *National Patterns of R&D Resources* series. © 2015 AAAS
R&D Change by Budget Function, 2005-2015

Percent change from FY 2005 in constant dollars

- **Applied Energy Programs**: 52.7%
- **Commerce (includes NIST)**: 51.3%
- **General Science (NSF, DOE SC)**: 19.1%
- **NASA Budget**: -7.3%
- **Environment Agencies**: -9.7%
- **Health (includes NIH)**: -10.6%
- **Agriculture**: -14.2%
- **Defense Activities**: -20.5%
- **Transportation**: -40.3%

*NASA has changed its R&D reporting and classifications multiple times over the years. Total agency budget is shown here rather than R&D. Source: AAAS analysis of historical data and current R&D data, agency budget justifications, and other budget documents. Select DHS programs changed functions over the years; the above data have been adjusted for comparability. © 2015 AAAS*
Composition of the Proposed FY 2016 Budget
Total Outlays = $4.0 trillion
outlays in billions of dollars

- Net Interest $283
- Defense Discretionary $528
  - [Defense R&D] $77
- Nondefense Discretionary $495
- [Nondefense R&D] $69
- Other Mandatory $670
- Medicaid $351
- Medicare $583
- Social Security $938

Source: Budget of the United States Government FY 2016. Projected deficit is $474 billion. © 2015 AAAS
Limits on Discretionary Spending Since FY 2010
billions of constant 2015 dollars

Based on past budget resolutions, the Budget Control Act, and subsequent legislation. Adjusted for inflation using deflators from the FY16 budget request. © AAAS 2015
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FY16 R&D in the Base Budget by Function
percent change from FY 2015, nominal dollars

<table>
<thead>
<tr>
<th>Function</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commerce (includes NIST)</td>
<td>44.8%</td>
</tr>
<tr>
<td>Applied Energy Programs</td>
<td>23.3%</td>
</tr>
<tr>
<td>Agriculture</td>
<td>20.5%</td>
</tr>
<tr>
<td>Transportation</td>
<td>17.8%</td>
</tr>
<tr>
<td>Environment Agencies</td>
<td>12.6%</td>
</tr>
<tr>
<td>Defense Activities</td>
<td>8.1%</td>
</tr>
<tr>
<td>General Science (NSF, DOE SC)</td>
<td>5.0%</td>
</tr>
<tr>
<td>Health (includes NIH)</td>
<td>2.2%</td>
</tr>
<tr>
<td>Space</td>
<td>0.9%</td>
</tr>
<tr>
<td>Justice (DHS)</td>
<td>-35.5%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>6.4%</td>
</tr>
</tbody>
</table>

Source: OMB R&D data, agency budget justifications, and agency budget documents. © 2015 AAAS
Total R&D by Agency, FY 2016
budget authority in billions of dollars

DOD, $71.9
HHS (NIH), $31.0
DOE, $12.5
NASA, $12.2
NSF, $6.3
USDA, $2.9
Commerce, $2.1
All Other, $6.2

Total R&D = $145.3 billion

Source: OMB R&D data, agency budget justifications, and other agency documents and data. R&D includes conduct of R&D and R&D facilities. © 2015 AAAS
Major Funding Priorities

- Advanced Manufacturing
- Low-carbon energy
- Climate research and earth observation
- Agricultural R&D
- Infrastructure R&D
- Antibiotic Resistance*
- Precision Medicine*
- Discovery Science:
  - Life sciences and neuroscience
  - Advanced computing

- COMPETES Agencies R&D: $12.1 billion, +6.6%

*New for FY16
Agency Notes

- NSF: Total Budget: +5.2%
  - Highest relative changes: SBE: +7.1%, Engineering: +6.4%;
  - EHR: +11.2%
  - New priorities: Food/Water/Energy Nexus; climate resilience

- Manufacturing: NNMI proposal revived, again
  - NIST Labs also boosted across an array of areas
  - EERE: Advanced Manufacturing office doubled
  - NSF: CEMMSS cross-agency initiative boosted
Agency Notes (Cont.)

- Defense S&T flat, including DARPA
  - 8.3% cut to basic research

- Energy: Large increases, again, for renewable and efficiency technology offices, ARPA-E

- DOE Science: +5.4%
  - Advanced Computing: +14.8%
  - Domestic fusion research cut 10%, ITER flat
  - Small boost for EFRCS; Hubs funding continues (?)
  - BES?

Source: Historical DOE budget data and FY16 request. © 2015 AAAS
Agency Notes (Cont.)

- NIH: $1 billion program increase (+3.3%)
  - Largest relative increases: Aging, NCATS
  - New priorities: Antibiotic Resistance, Precision Medicine
  - BRAIN Initiative contribution increases to $135 million
  - Success rate: 19.3%

- Other agencies
  - Familiar contours for NASA: gains for technology office, Earth Science
  - USDA $$$: extramural research, intramural facilities
  - Climate research @ USGS, NOAA

Figure 1: NIH Budget
(Constant 2015 dollars in billions)

Source: AAAS data and agency budget documents. Excludes Ebola-related funding in FY 2015. © 2015 AAAS
Looking ahead...

- Size and composition of the discretionary budget? Can R&D stay ahead of the curve?
- Deficits have fallen, but big-picture fiscal challenges remain largely unchanged
  - Debt limit, entitlement growth
  - Reconciliation strategy?
Trends in Federal Spending Since FY 2010
Percent of FY 2010 budget authority, constant dollars

Based on OMB, agency and Congressional budget documents, and GDP deflators from the President's FY 2015 budget.
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Current Estimates of R&D in the FY16 Budget
percent change from FY15, constant dollars

NOAA
NIST
Transportation
DOE Energy Programs
Agriculture
US Geological Survey
DOD Other
Veterans Affairs
National Science Foundation
DOE Science
National Institutes of Health
Environ Protection Agency
NASA
DOE Defense
DOD S&T
Homeland Security
TOTAL

Based on AAAS analyses of OMB, OSTP and agency budget data. The above adjusts for inflation, expected at 1.6 percent. AAAS | Feb. 6, 2015
Thanks!

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http://www.aaas.org/program/rd-budget-and-policy-program