

The Federal R&D Budget Outlook

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February 28, 2020

For the Council on Government Relations

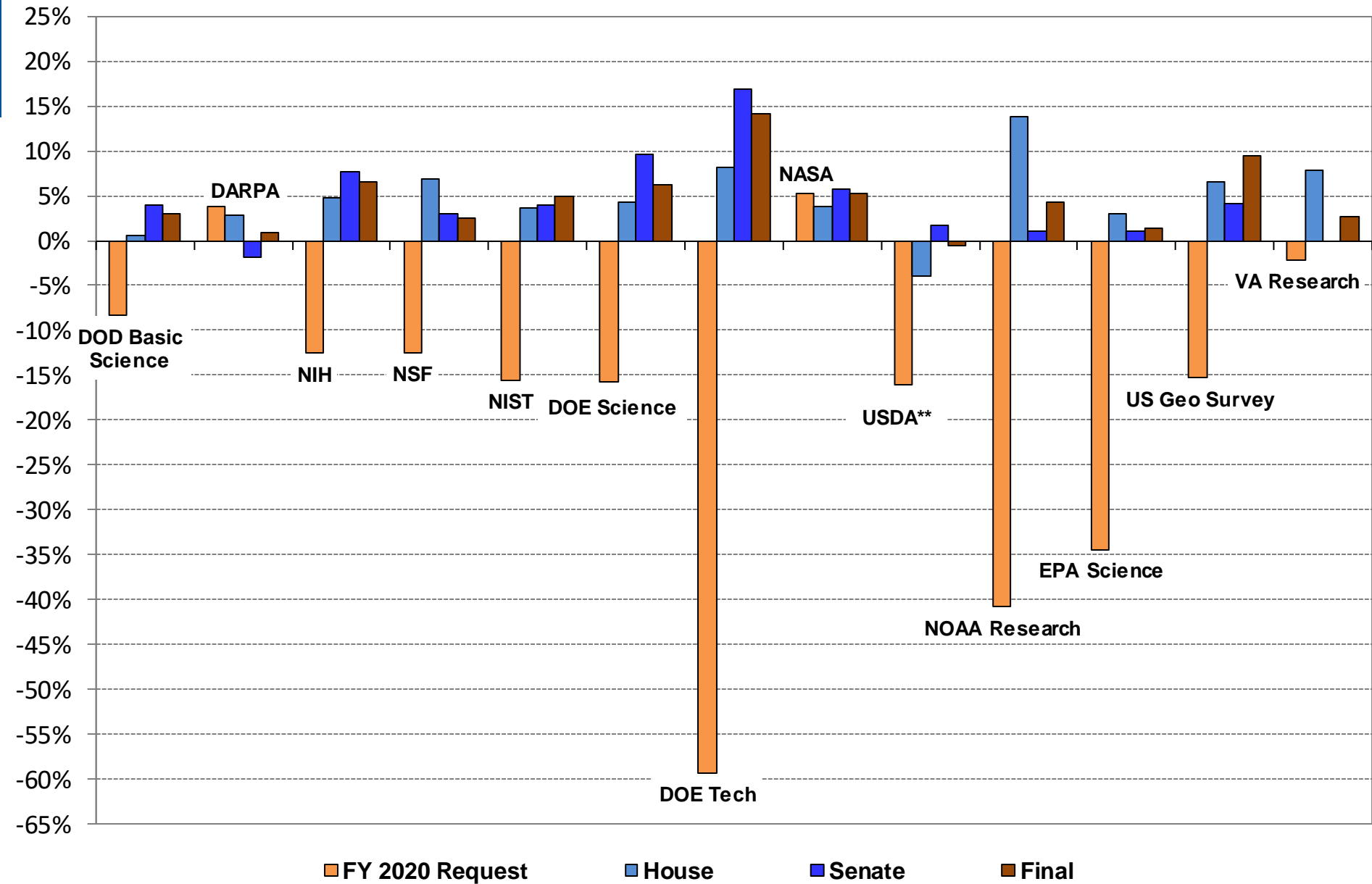
AAAS R&D Budget and Policy Program

<http://www.aaas.org/rd>



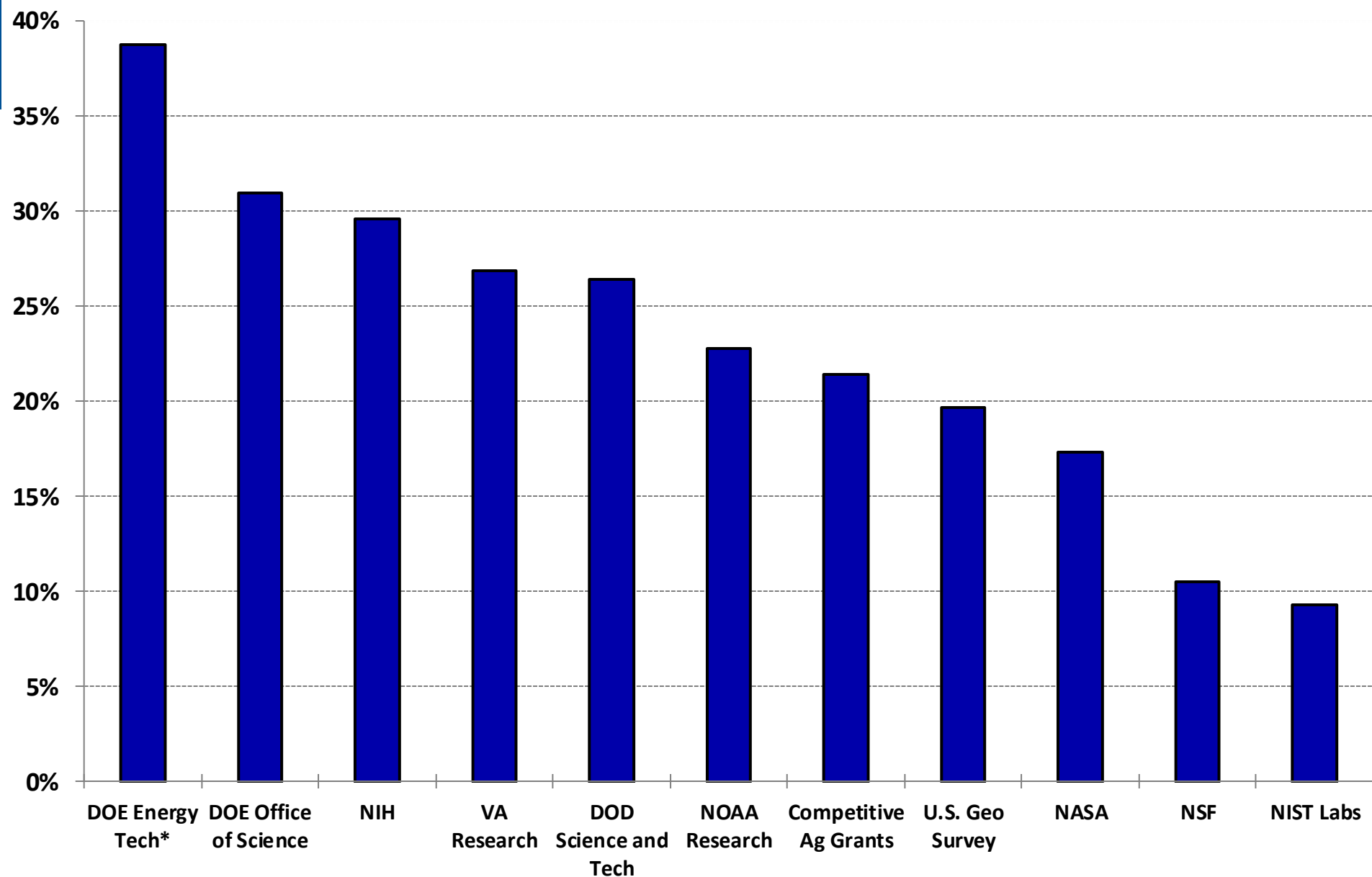
Select Science & Tech Programs in FY 2020 Appropriations

Estimated percentage change from FY 2019, nominal dollars



Science Agency Budget Increases Since January 2017

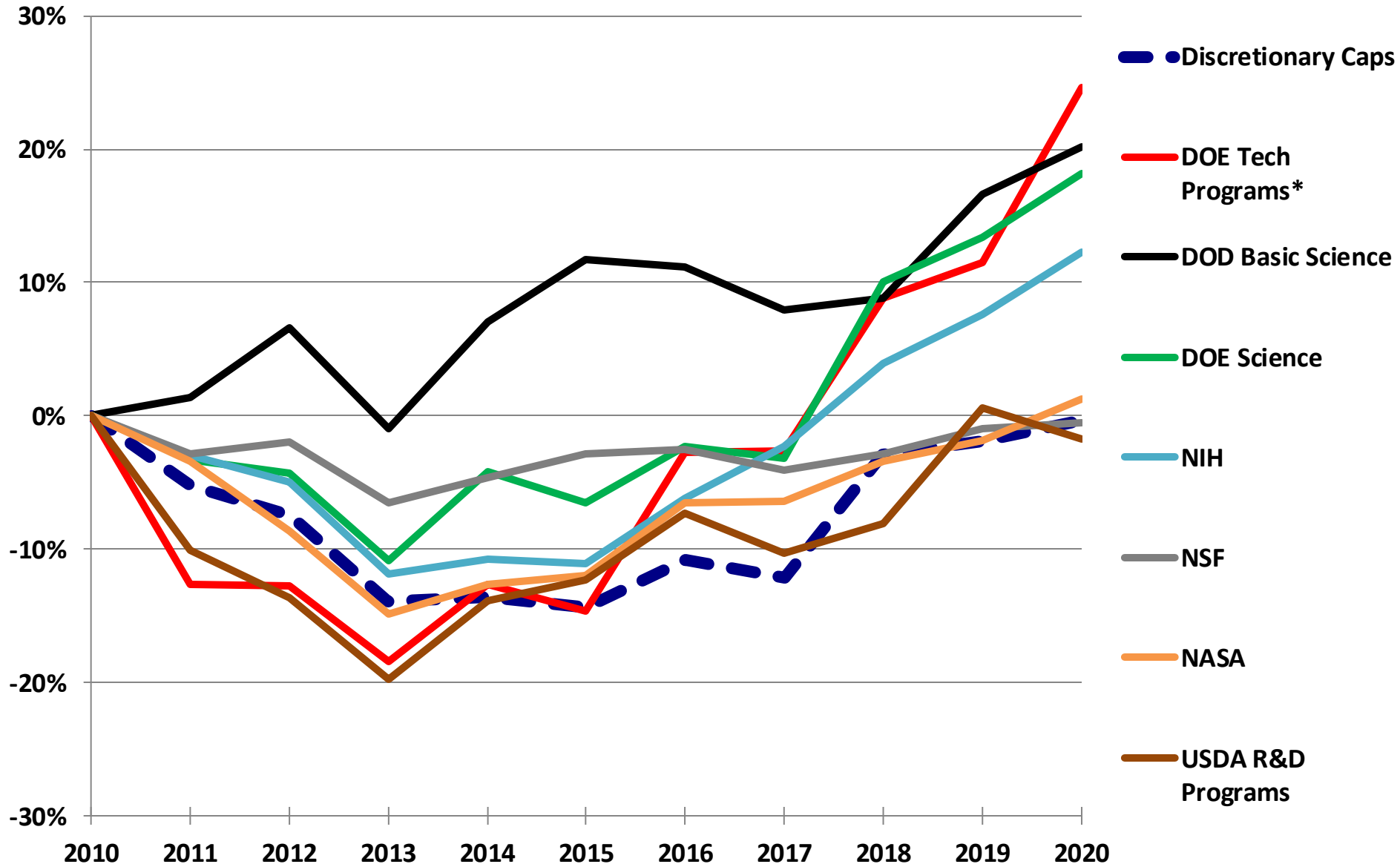
Percent change from FY 2016 - FY 2020, nominal dollars



*Nuclear, fossil, renewables, efficiency, grid, ARPA-E. Source: agency budget documents and appropriations. | AAAS 2020

Select Federal S&T Spending Since FY 2010

Percent change from FY10 levels, constant dollars

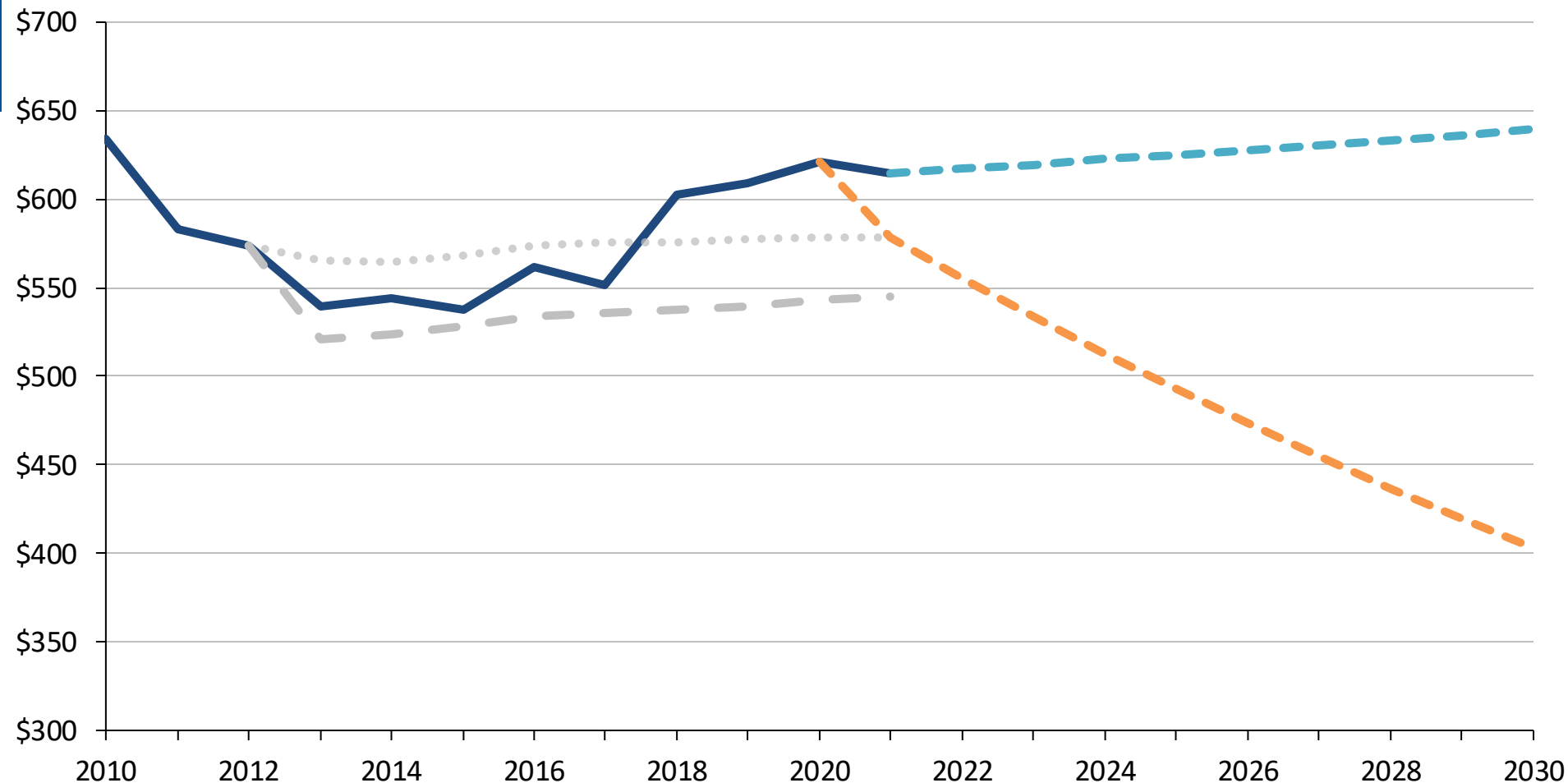


*Includes OE, EERE, Fossil, Nuclear, Cybersecurity, ARPA-E.

Based on AAAS analyses of historical OMB, agency, and appropriations data. © 2020 AAAS

Limits on Nondefense Discretionary Spending, Current and Proposed

Billions of constant 2020 dollars



— Actual Caps w/ Congress Adjustments

— Projected Baseline*

— Sequester Caps

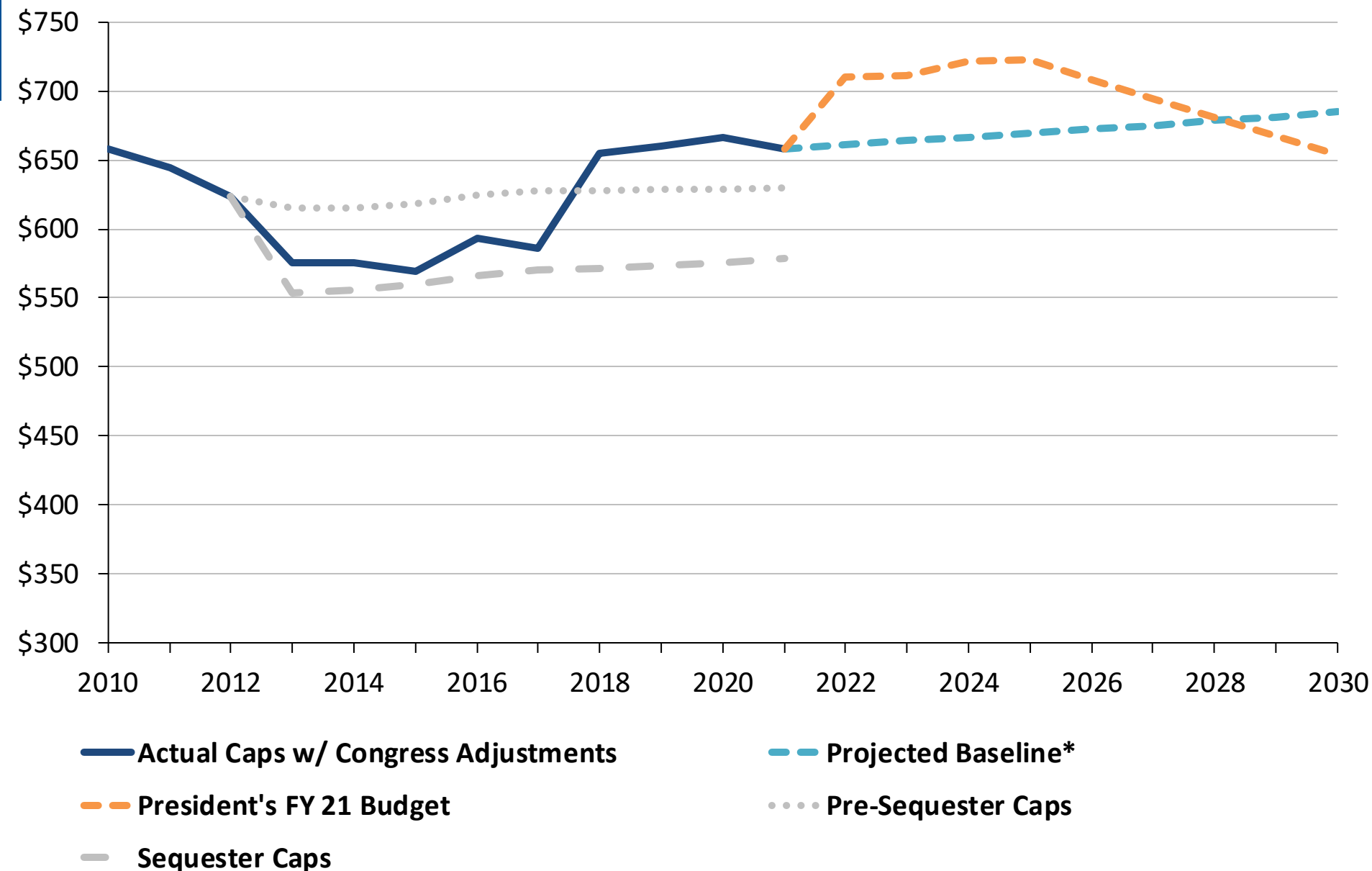
— President's FY 21 Budget

... Pre-Sequester Caps

*OMB current services projections. Based on OMB budget documents and past budget resolutions and other legislation. © AAAS 2020

Limits on Defense Discretionary Spending, Current and Proposed

Billions of constant 2020 dollars. Excluding OCO Funding.

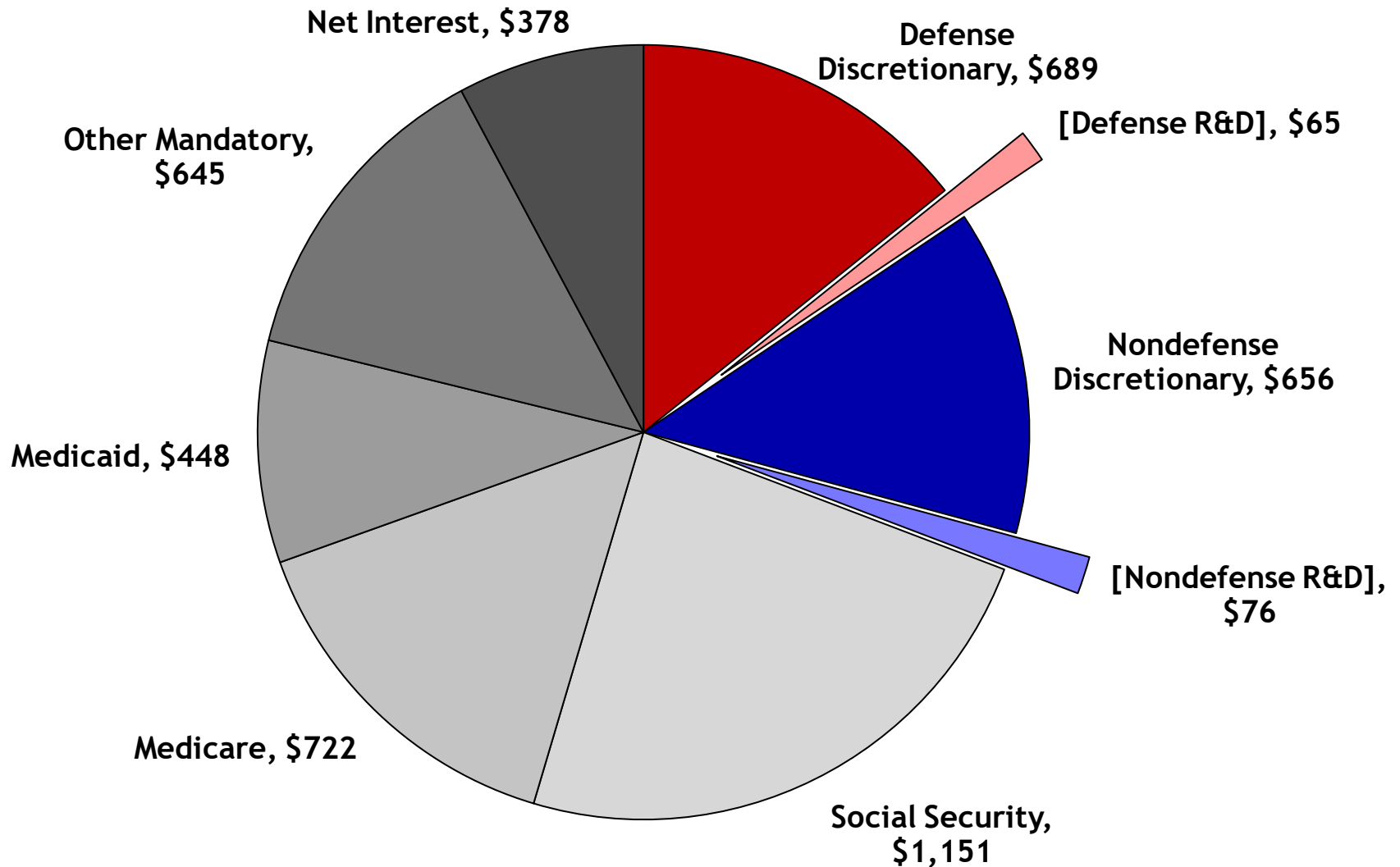


*OMB current services projections. Based on OMB budget documents and past budget resolutions and other legislation. © AAAS 2020

Composition of the Proposed FY 2021 Budget

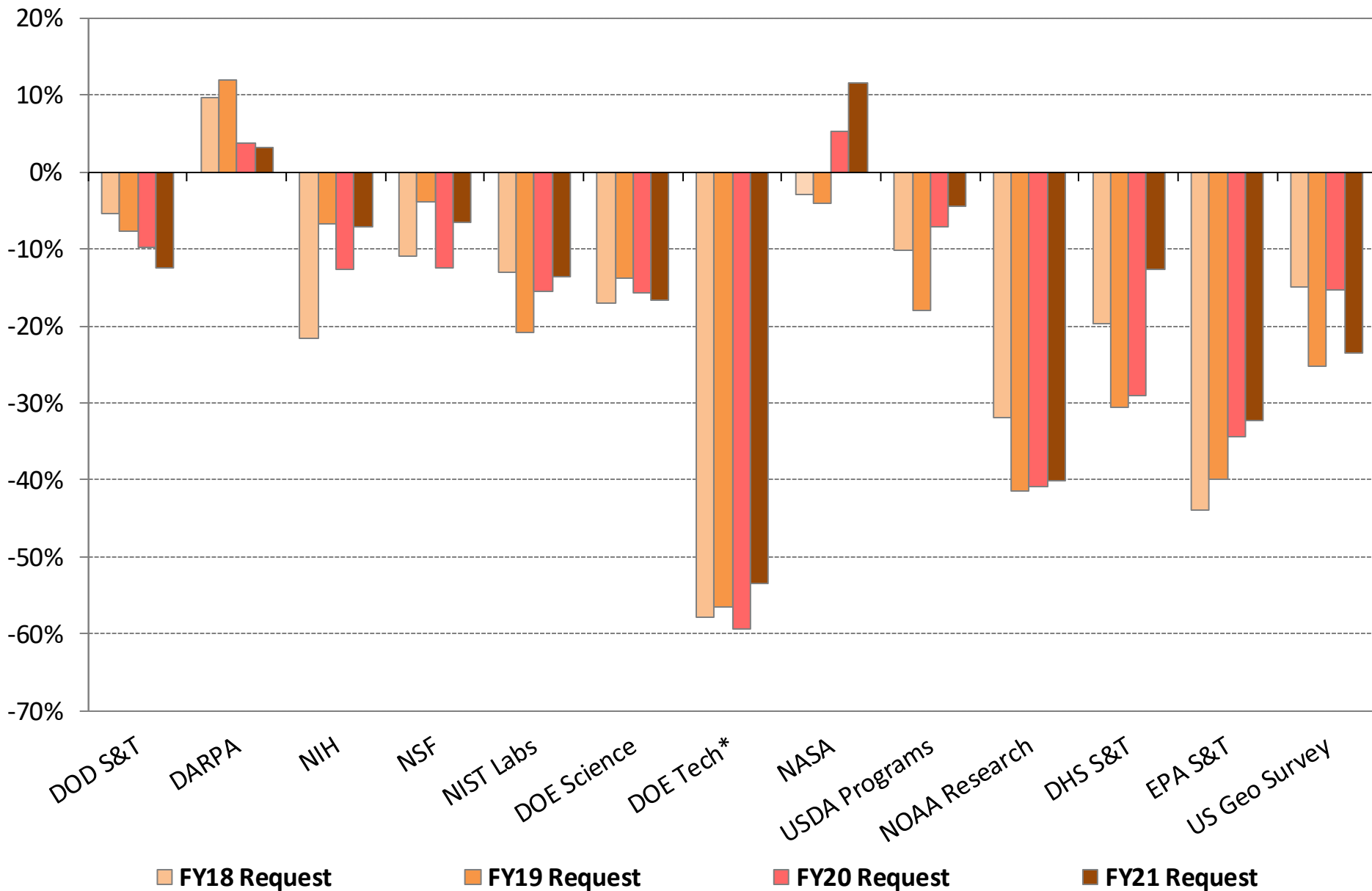
Total Outlays = \$4.8 trillion

Below: outlays in billions of dollars



Science & Tech Agencies in the Trump Administration's Budgets

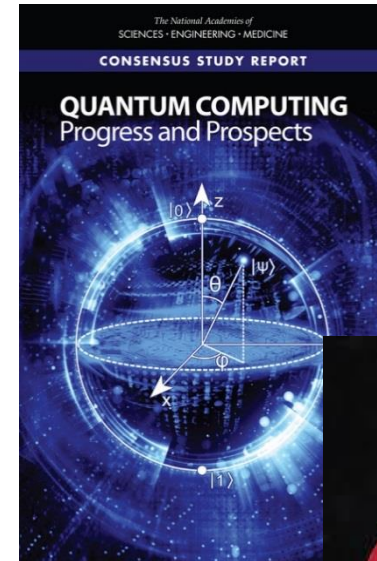
Proposed year-over-year changes, nominal dollars



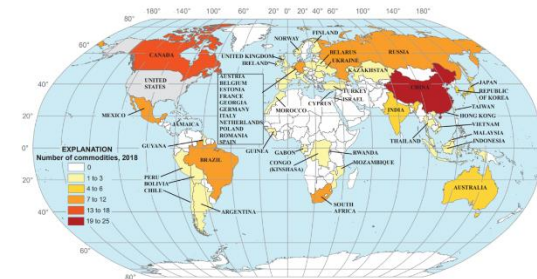
*Includes renewables, efficiency, nuclear, fossil, grid research, cybersecurity, ARPA-E. | AAAS

Major White House R&D Priorities in FY21

- **Artificial Intelligence**
 - NSF: +\$403 million
 - DOE: +\$54 million for AI initiative
 - DARPA: several new or increased projects
 - USDA: +\$100 million for AI competitive grants
 - NIH: \$50 million initiative
- **Quantum Science**
 - NSF: +\$120 million
 - DOE: +\$70 million for QIS Initiative
- **Space Exploration:** +\$3.5 billion for moon/Mars missions, mainly for a human lander
- **Critical Infrastructure:**
 - Increases for DOE cybersecurity office
 - ~\$10 billion for DOD cyberspace activities
 - NOAA Space Weather satellite continues
- **Critical Minerals:** \$131 for million DOE initiative



MAJOR IMPORT SOURCES OF NONFUEL MINERAL COMMODITIES
FOR WHICH THE UNITED STATES WAS GREATER THAN 50% NET IMPORT RELIANT IN 2018



Source: U.S. Geological Survey

But Several Missed/Mixed Priority Areas?*

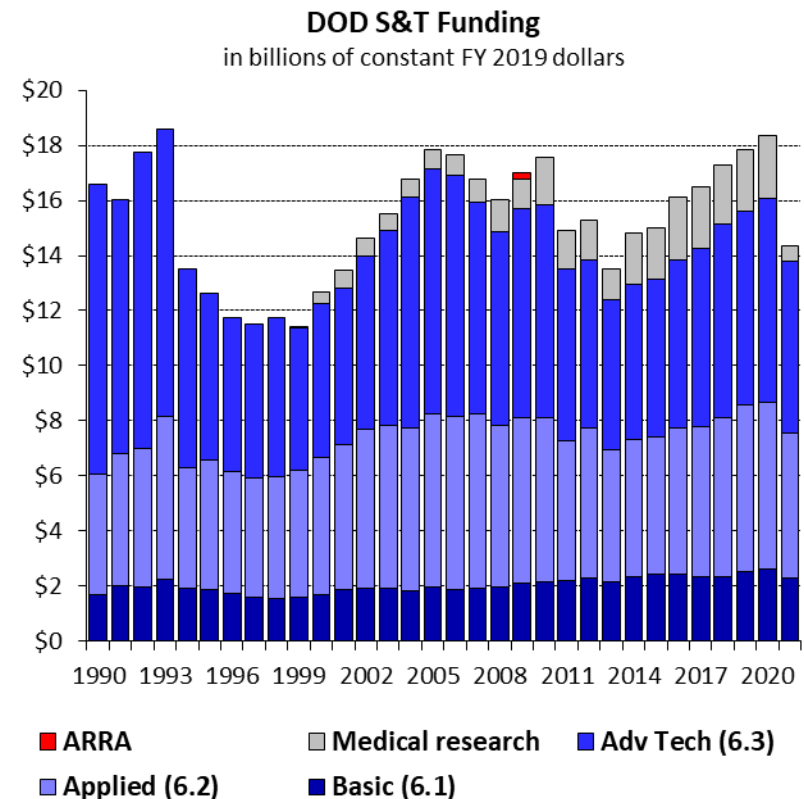


- **Advanced Manufacturing:** New NIST- and DOD-sponsored institutes, but reductions elsewhere
- **Energy R&D:** ARPA-E eliminated, reductions for low-carbon R&D
- **Oceans R&D:** sizable reductions for NOAA research office, Ocean Service
- **Earth Modeling:** reductions for DOE activities, NASA earth observation missions
- **STEM Education:** reductions for certain NIH, NASA, NSF, DOD activities

*As identified in 2019 OSTP/OMB priorities memo: <https://www.whitehouse.gov/wp-content/uploads/2019/08/FY-21-RD-Budget-Priorities.pdf>

Highlights: DOD

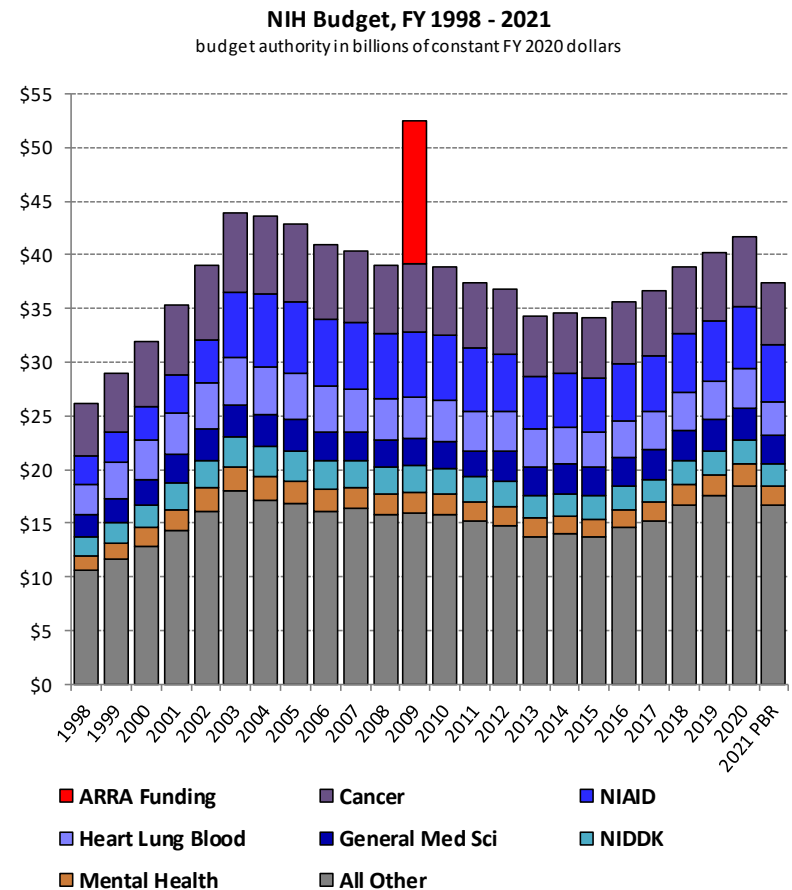
- Basic Research: -\$284 million, -11%
- University Initiatives: -20%
 - But: mixed for instrumentation, multidisciplinary research, fellowship programs
- National Defense Education Program: -30%
 - But: SMART scholarship program funding increased
- Minerva Initiative de-funded
- Medical research: \$1.4 billion for Congressionally Directed Medical Research program in FY 2020
- DARPA: +3.1%



Source: DOD R-1, historical data, and appropriations. Note: Medical Research is appropriated outside RDT&E title. © 2020 AAAS

Highlights: NIH

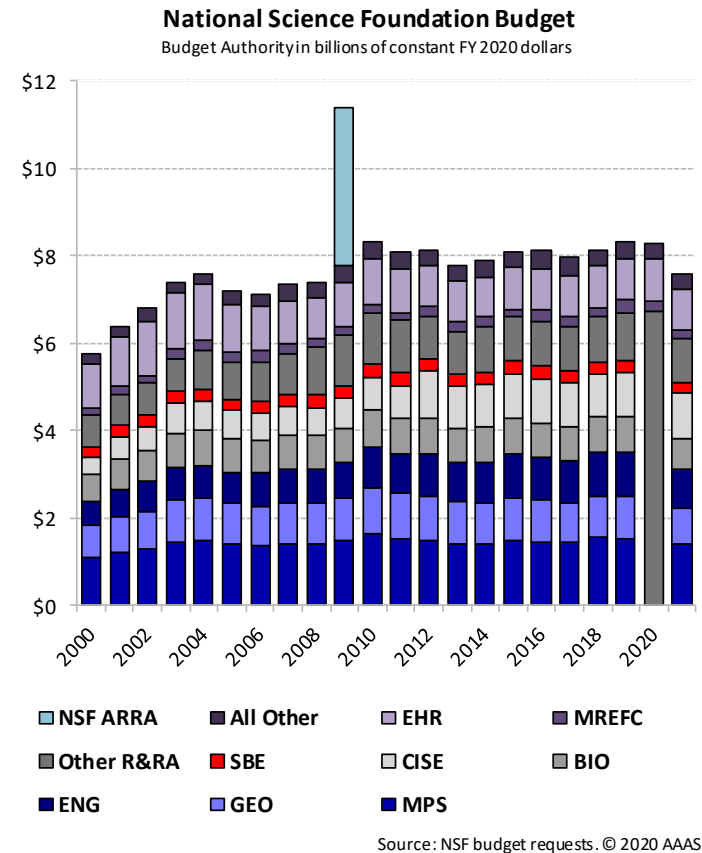
- \$38.7 billion request
 - -\$2.9 billion, -7%
 - Most individual institutes down around 9%
- ~1,900 fewer competing awards
- Success rate drops from 20.3% to **16.5%**
- Attempts to consolidate AHRQ again
- **Select Priorities:**
 - Opioids: \$1.4 billion across NIH
 - \$423 million for influenza research
 - \$50 million for prematurity research
 - \$150 million for extension of Type I Diabetes research program
 - \$300 million to address facilities backlog



Source: Agency budget documents and appropriations. Adjusted for biomedical R&D inflation rate (BRDPI).
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Highlights: NSF

- \$7.7 billion request
 - -\$537 million, -6%
 - ~400 fewer research grants
 - Success rate drops from 25% to 23%
- With AI funding increases:
 - Will fund up to six multi-institutional research institutes in FY21
- Big Ideas: +\$108 million to \$432 million total
- Convergence Accelerator support continues
- STEM Education Programs: -1%
- EPSCoR: -7%
- Innovation Corps trimmed



Highlights: Others

- **NASA:** STEM Engagement office, Space Grant eliminated
- **US Department of Agriculture:**
 - 41% increase for competitive grants, but reductions/eliminations for capacity grants and small grants
 - ERS, NIFA move to Kansas City continues to go forward
- **DHS:** Reduces number of university centers of excellence from 10 to 5
- **Veterans Research:** 5% increase



What's Next

- No budget resolution this year
- House appropriators want to move rapidly
- Election!
- Infrastructure plan? “Industries of the Future?” And coronavirus supplemental?

Congress

For spending bills, now comes the hard part

Both chambers need to reach agreement before Sept. 30 to avoid a repeat of the 35-day partial government shutdown



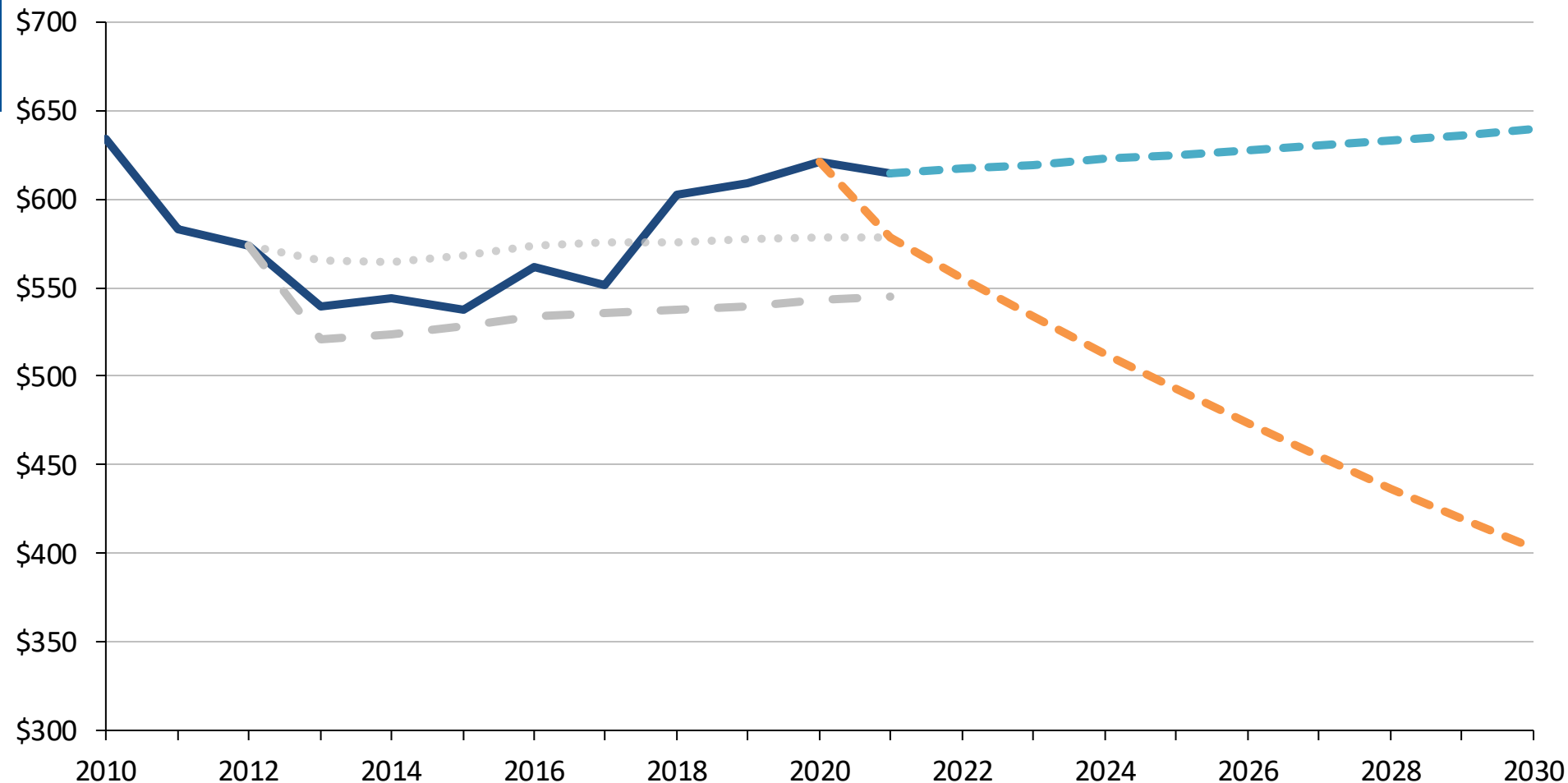
Sen. Shelley Moore Capito, Homeland Security Appropriations chairwoman, said that getting her committee's spending bill enacted will be 'difficult.' (Tom Williams/CQ Roll Call file photo)

Congressional leaders and the Trump administration proved last week that they can work together by reaching an agreement to avoid default on the nation's financial obligations and prevent \$125 billion in spending cuts that could disrupt the longest U.S. economic expansion on record.

(Image source: Roll Call)

Limits on Nondefense Discretionary Spending, Current and Proposed

Billions of constant 2020 dollars



— Actual Caps w/ Congress Adjustments

— President's FY 21 Budget

— Projected Baseline*

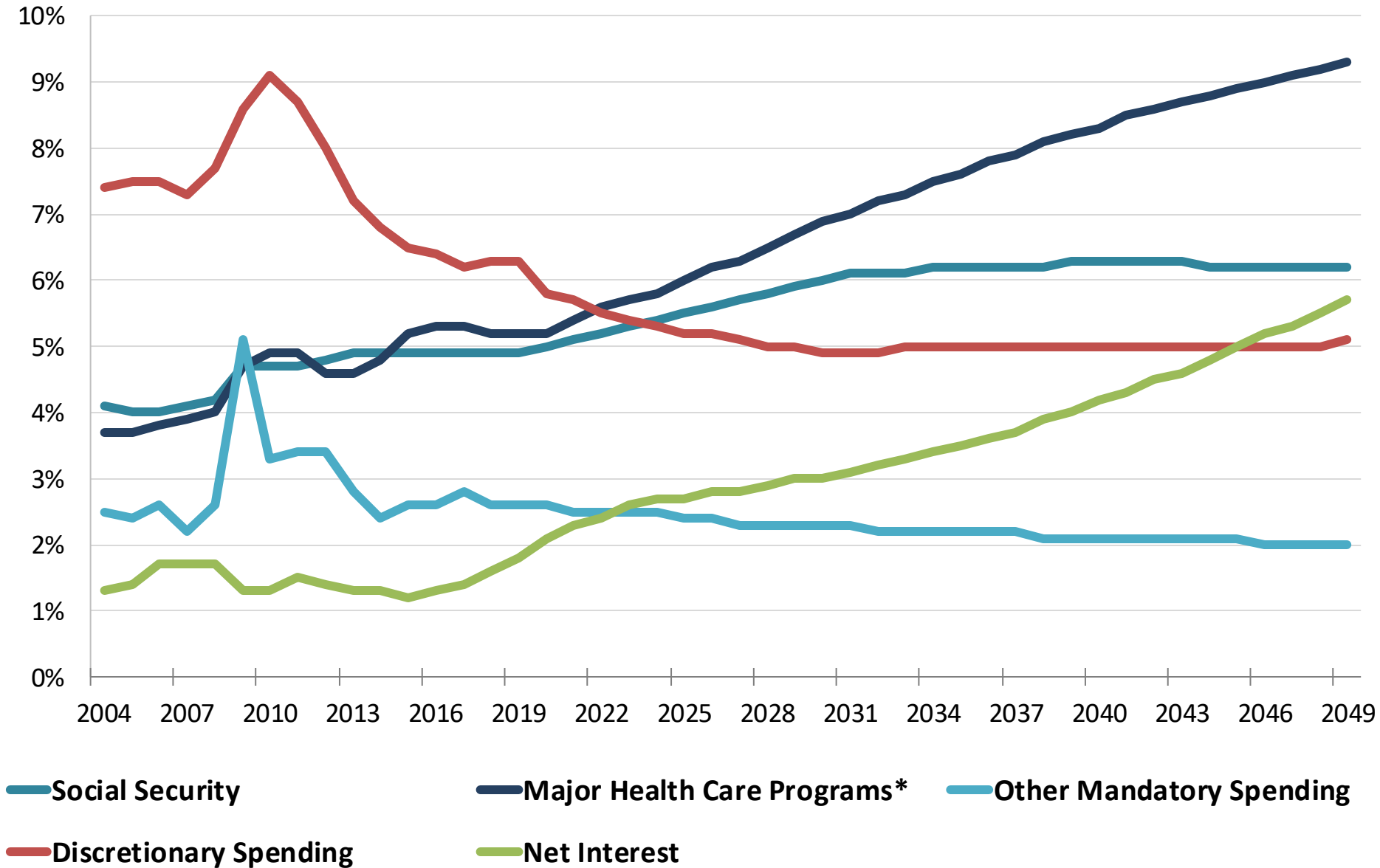
... Pre-Sequester Caps

— Sequester Caps

*OMB current services projections. Based on OMB budget documents and past budget resolutions and other legislation. © AAAS 2020

CBO's Long-Term Budget Projections

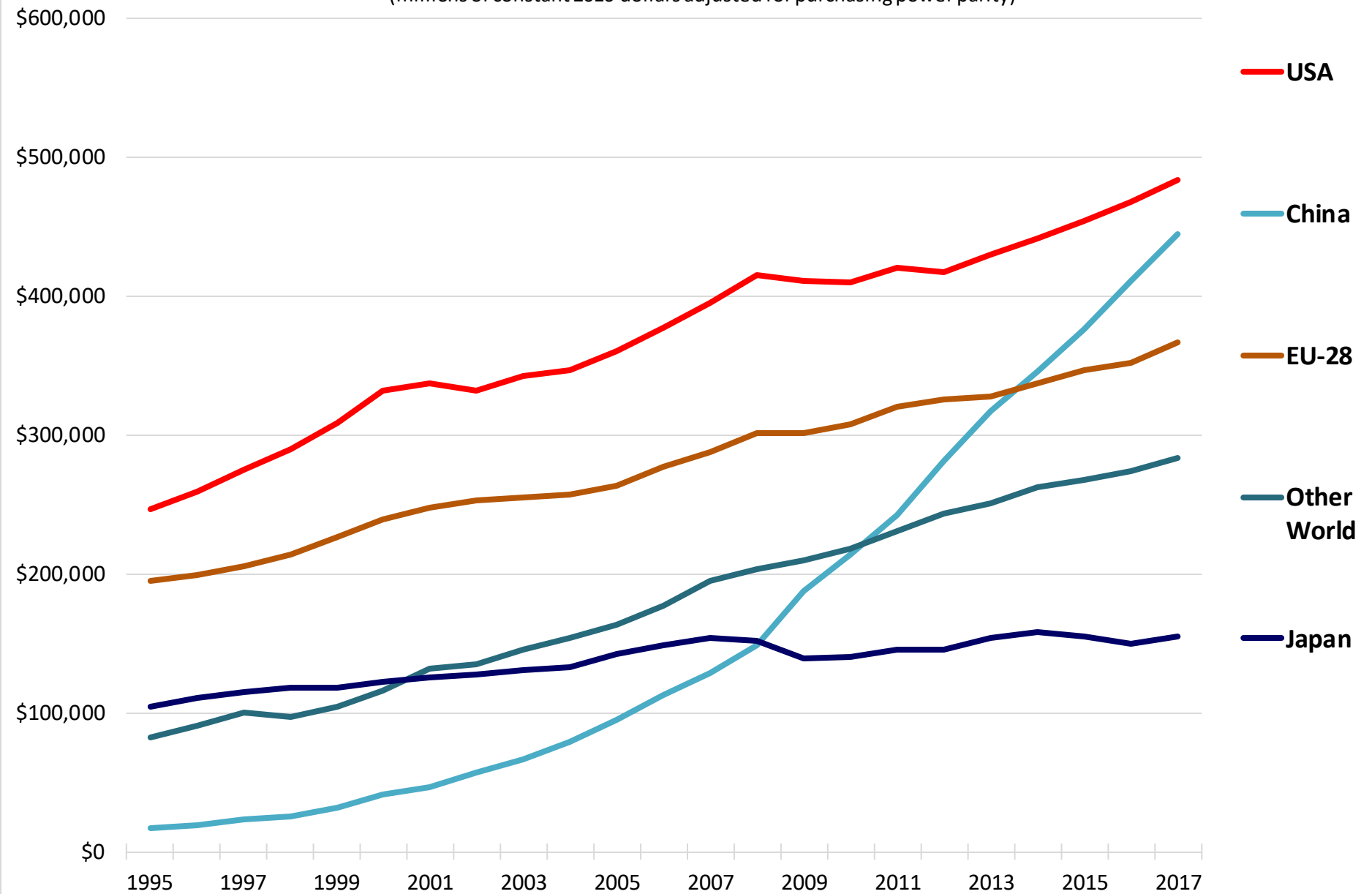
Spending by Category as a Share of GDP



*Includes Medicare, Medicaid, and other spending. Based on CBO Long-Term Outlook data, June 2019. AAAS | 2019

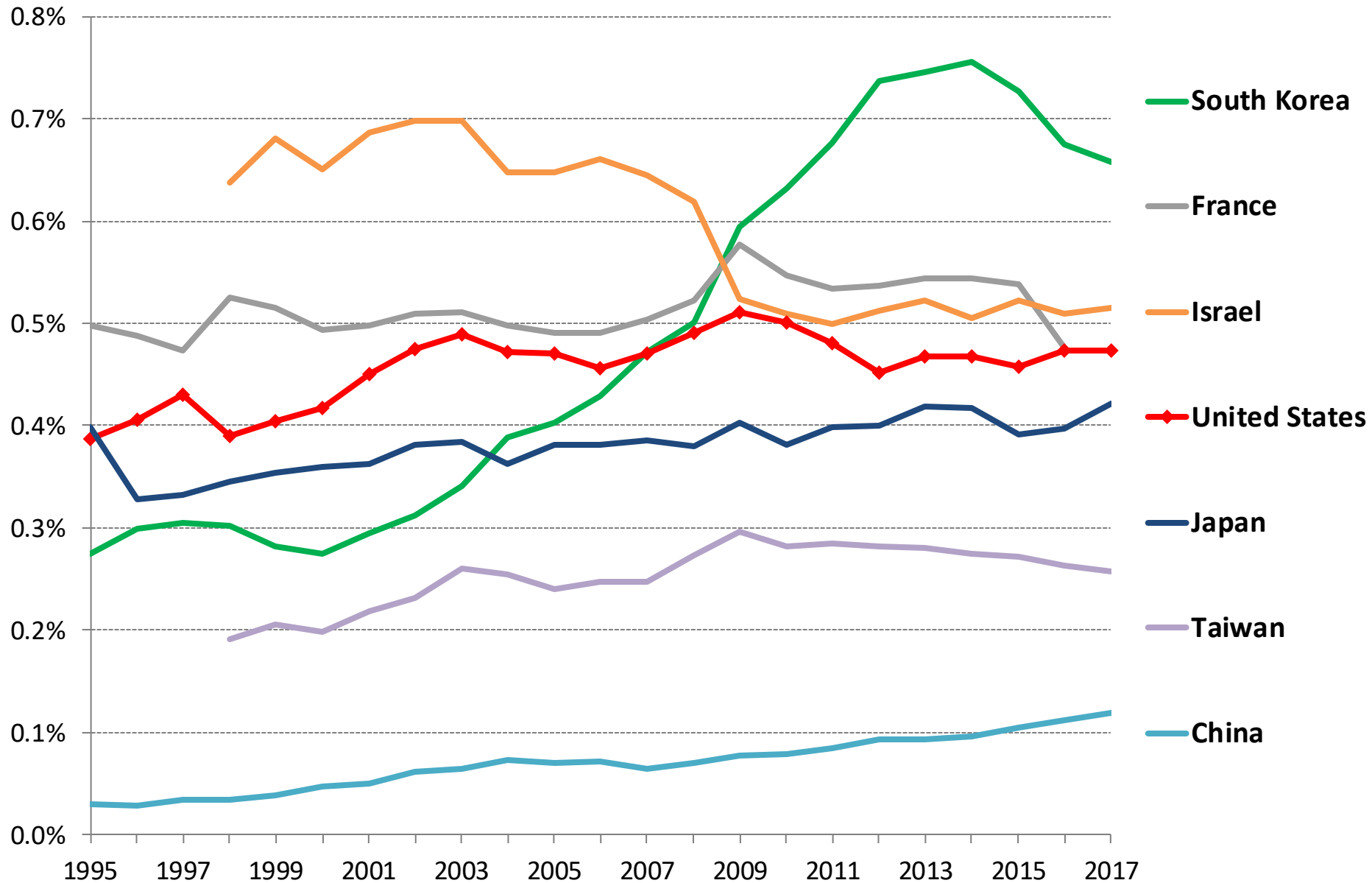
World R&D by Country / Region

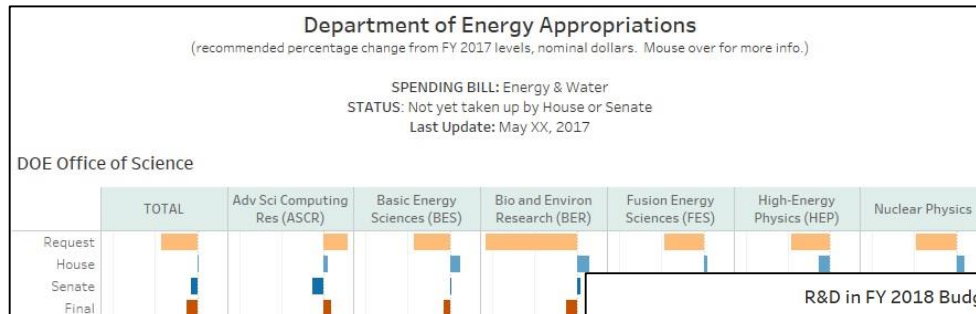
(millions of constant 2010 dollars adjusted for purchasing power parity)



Basic Research Intensity

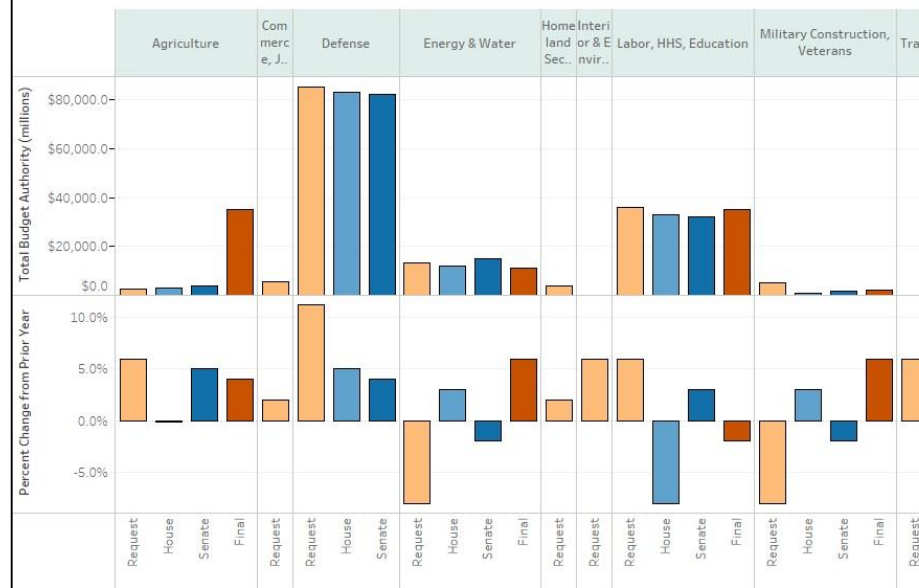
Total basic research as a percent of GDP





Federal R&D funding in Congress is allocated via several spending bills, authored by the appropriations subcommittees. Current AAAS estimates of R&D by select spending bill and subcommittee are shown below.

Last Updated: May XX, 2017



Spending Bill Progress



R&D in FY 2018 Budget and Appropriations

the President's budget request are displayed below; House and Senate estimates will be added once all are available. Mouse over for more info, or use the tabs above to view appropriations by agency or by Congressional subcommittee and spending bill.

Federal R&D Total Estimates*



For more info...



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