



## Federal Research and Development and R&D Plant Obligations Show Modest Growth in FY 2010

by Michael Yamaner<sup>1</sup>

**C**urrent-dollar federal obligations for research and development and R&D plant (facilities and fixed equipment) increased 1.5% to \$147.0 billion in FY 2010, according to data from the National Science Foundation (NSF).<sup>2</sup> This growth was driven by a \$3.0 billion (81.3%) increase in R&D plant obligations in FY 2010: \$1.1 billion from the American Recovery and Reinvestment Act (ARRA) of 2009 and \$1.9 billion from non-ARRA funds. ARRA funding accounted for 6.2% of the \$147.0 billion FY 2010 total. With all ARRA funds obligated by the end of FY 2010, R&D and R&D plant are estimated to fall 7.2% to \$136.4 billion in FY 2011 and are projected to remain essentially flat in FY 2012 (table 1).

Total inflation-adjusted (or constant) federal obligations for R&D and R&D plant rose 0.6% to \$131.8 billion between FY 2009 and 2010. This follows an increase of \$12.5 billion (10.6%) driven primarily by \$9.1 billion in initial ARRA obligations in FY 2009. Even without the funding provided by ARRA, federal R&D and R&D plant would have risen from

\$121.9 billion in FY 2009 to \$123.7 billion (1.5%) in FY 2010 (table 1).

Figures reported for FY 2010 are actual data, FY 2011 figures are preliminary, and FY 2012 figures are projected. For the remainder of this report, discussions of changes in funding across years are in terms of inflation-adjusted (or constant) dollars unless stated otherwise.

### Total Research and Development by Agency

Total federal R&D obligations decreased 1.4% to \$125.9 billion between FY 2009 and FY 2010, with ARRA funds providing \$5.9 billion of the total (table 2). With all ARRA funds obligated by the end of FY 2010, R&D obligations were estimated to decrease 7.7% to \$116.2 billion between FY 2010 and FY 2011. R&D obligations were projected to further decrease 2.7% to \$113.1 billion between FY 2011 and FY 2012.

In FY 2010, six federal departments and agencies accounted for 95.9% of FY 2010 total federal R&D dollars: the

Department of Defense (DOD) (52.3% of total R&D obligations), the Department of Health and Human Services (HHS) (25.6%), the Department of Energy (DOE) (7.6%), the National Aeronautics and Space Administration (NASA) (5.1%), the National Science Foundation (NSF) (3.6%), and the Department of Agriculture (USDA) (1.7%) (table 2).

### Federal Funding for Research

Total federal research obligations decreased 0.9% to \$57.1 billion between FY 2009 and FY 2010, with ARRA funds providing \$5.1 billion of the total (table 3). With all ARRA funds obligated by the end of FY 2010, research obligations were estimated to decrease 10.5% to \$51.1 billion between FY 2010 and FY 2011. Research obligations were projected to increase 2.5% to \$52.4 billion between FY 2011 and FY 2012.

HHS (56.2% of total research obligations), DOE (11.9%), DOD (10.7%), NSF (7.9%), USDA (3.4%), and NASA (2.4%) accounted for 92.3% of FY 2010 total federal research dollars (table 3).

TABLE 1. Federal obligations for research and development and R&D plant, by character of work: FYs 2008–12

Character of work	2008	2009	2010	2011	2012	2008	2009	2010	2011	2012
	Current \$millions					Constant 2005 \$millions				
All R&D and R&D plant	129,050	144,740	146,968	136,418	135,834	118,471	130,986	131,786	119,960	117,280
ARRA	na	10,081	9,049	na	na	na	9,123	8,114	na	na
Non-ARRA	129,050	134,659	137,919	136,418	135,834	118,471	121,863	123,672	119,960	117,280
Research	53,894	63,695	63,728	58,167	60,712	49,476	57,643	57,145	51,149	52,419
ARRA	na	7,727	5,702	na	na	na	6,993	5,113	na	na
Non-ARRA	53,894	55,968	58,026	58,167	60,712	49,476	50,650	52,032	51,149	52,419
Basic	27,154	32,873	31,795	29,061	30,665	24,928	29,749	28,511	25,555	26,476
ARRA	na	5,116	2,667	na	na	na	4,630	2,391	na	na
Non-ARRA	27,154	27,757	29,128	29,061	30,665	24,928	25,119	26,119	25,555	26,476
Applied	26,740	30,821	31,933	29,106	30,048	24,548	27,892	28,634	25,594	25,944
ARRA	na	2,611	3,035	na	na	na	2,363	2,721	na	na
Non-ARRA	26,740	28,210	28,897	29,106	30,048	24,548	25,529	25,912	25,594	25,944
Development	73,212	77,398	76,627	73,974	70,240	67,210	70,043	68,711	65,049	60,646
ARRA	na	987	918	na	na	na	893	823	na	na
Non-ARRA	73,212	76,411	75,708	73,974	70,240	67,210	84,434	67,887	65,049	60,646
R&D plant	1,944	3,648	6,613	4,277	4,882	1,785	3,301	5,930	3,761	4,215
ARRA	na	1,368	2,428	na	na	na	1,238	2,177	na	na
Non-ARRA	1,944	2,280	4,185	4,277	4,882	1,785	2,063	3,753	3,761	4,215

na = not applicable.

ARRA = American Recovery and Reinvestment Act of 2009.

NOTES: Gross domestic product implicit price deflators for 2005 were used to convert current to constant dollars. Detail may not sum to total due to rounding.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Federal Funds for Research and Development, FYs 2010–12.

## Basic Research

Basic research obligations decreased 4.2% to \$28.5 billion from FY 2009 to FY 2010, with ARRA funds accounting for \$2.4 billion of basic research funding (table 1). With all ARRA funds obligated by the end of FY 2010, basic research obligations were estimated to decrease 10.4% between FY 2010 and FY 2011 to \$25.6 billion. Between FY 2011 and 2012 basic research obligations were projected to increase 3.6% to \$26.5 billion. Basic research obligations accounted for 21.6% of total R&D and R&D plant in FY 2010.

## Applied Research

Federal obligations for applied research increased 2.7% between FY 2009 and FY 2010, with ARRA accounting for

\$2.7 billion of the \$28.6 billion dollar total (table 1). With all remaining ARRA funds obligated by the end of FY 2010, applied research obligations were estimated to decrease between FY 2010 and FY 2011 by 10.6% to \$25.6 billion. Applied research is projected to increase 1.4% between FY 2011 and FY 2012 to \$25.9 billion. Applied research obligations accounted for 21.7% of total R&D and R&D plant in FY 2010.

## Performers of Research and Development

The distribution of ARRA R&D funds differs from the distribution of total R&D funds. Whereas in FY 2010 industry received 42.7% of total R&D obligations, industry received just 14.8% of ARRA obligations (table 4). Universities and colleges were obligated

22.2% of total R&D funds but received about half of ARRA funds. Other nonprofit institutions' (other than educational institutions) ARRA share (14.8%) was three times their share (5.2%) of total R&D funding. Intramural (agencies of the federal government) and federally funded research and development centers (FFRDCs) received 22.0% and 7.2%, respectively, of total R&D funding, and 10.8% and 8.9%, respectively, of ARRA funds.

ARRA provided \$6.6 billion (current dollars) in obligations for R&D performance in FY 2010, down 24.0% from the \$8.7 billion provided in FY 2009 (these totals do not include R&D plant obligations). ARRA funds made up 4.7% of all R&D obligations to performers in FY 2010.

TABLE 2. Federal obligations for research and development, by agency in FY 2010 rank order: FYs 2008–12

Agency	2008	2009	2010	2011	2012	2008	2009	2010	2011	2012
				preliminary	projected				preliminary	projected
Current \$millions					Constant 2005 \$millions					
All agencies	127,106	141,093	140,355	132,141	130,952	116,686	127,686	125,856	116,199	113,065
ARRA	na	8,714	6,621	na	na	na	7,886	5,937	na	na
Non-ARRA	127,106	132,379	133,734	132,141	130,952	116,686	119,800	119,919	116,199	113,065
DOD	71,833	75,857	73,471	71,684	70,869	65,944	68,649	65,881	63,036	61,189
ARRA	na	184	120	na	na	na	167	108	na	na
Non-ARRA	71,833	75,672	73,351	71,684	70,869	65,944	68,481	65,774	63,036	61,189
HHS	29,553	35,584	35,935	31,574	32,073	27,130	32,203	32,223	27,765	27,692
ARRA	na	4,889	4,696	na	na	na	4,424	4,211	na	na
Non-ARRA	29,533	30,695	31,238	31,574	32,073	27,112	27,778	28,011	27,765	27,692
DOE	8,239	9,890	10,686	9,136	10,315	7,564	8,950	9,582	8,034	8,906
ARRA	na	1,393	1,217	na	na	na	1,261	1,091	na	na
Non-ARRA	8,239	8,496	9,469	9,136	10,315	7,564	7,689	8,491	8,034	8,906
NASA	5,827	5,937	7,121	6,570	3,586	5,349	5,373	6,385	5,777	3,096
ARRA	na	315	385	na	na	na	285	345	na	na
Non-ARRA	5,827	5,622	6,736	6,570	3,586	5,349	5,088	6,040	5,777	3,096
NSF	4,135	6,096	5,016	4,924	5,663	3,796	5,517	4,498	4,330	4,889
ARRA	na	1,808	38	na	na	na	1,636	34	na	na
Non-ARRA	4,135	4,288	4,977	4,924	5,663	3,796	3,881	4,463	4,330	4,889
USDA	2,202	2,270	2,364	2,591	2,378	2,021	2,054	2,120	2,278	2,053
ARRA	na	0	0	na	na	na	0	0	na	na
Non-ARRA	2,202	2,270	2,364	2,591	2,378	2,021	2,054	2,120	2,278	2,053
Other	5,316	5,460	5,762	5,660	6,069	4,880	4,941	5,167	4,977	5,240
ARRA	na	125	164	na	na	na	113	147	na	na
Non-ARRA	5,316	5,335	5,598	5,660	6,069	4,880	4,828	5,020	4,977	5,240

na = not applicable.

ARRA = American Recovery and Reinvestment Act of 2009; DOD = Department of Defense; DOE = Department of Energy; HHS = Department of Health and Human Services; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; USDA = U.S. Department of Agriculture.

NOTES: Gross domestic product implicit price deflators for 2005 were used to convert current to constant dollars. Detail may not sum to total due to rounding.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Federal Funds for Research and Development, FYs 2010–12.

## Data Notes

The data presented here are from the NSF Survey of Federal Funds for Research and Development for FYs 2010–12. Actual data are reported for FY 2010, data for FY 2011 are preliminary, and data for FY 2012 are projected. Definitions of *research*, *development*, and *R&D plant* as used in this InfoBrief are provided in the technical notes that accompany the detailed statistical tables report for this survey. For the prior-year report,

see <http://www.nsf.gov/statistics/nsf12318/>.

The 27 federal agencies that report R&D obligations to the survey submitted actual obligations for FY 2010, preliminary data for FY 2011, and projected data for FY 2012. Data were requested from agencies beginning in mid April 2011. Agencies later revise the preliminary data based on actual changes in the funding levels of R&D programs. Further, agencies may provide changes

in prior-year data to reflect program reclassifications or other data corrections.

The full set of detailed tables from this survey will be available in the report *Federal Funds for Research and Development: Fiscal Years 2010, 2011, and 2012* at <http://www.nsf.gov/statistics/fedfunds/>. Individual detailed tables from the FY 2010–12 survey may be available in advance of the full report. For more information, please contact the author.

TABLE 3. Federal obligations for research, by agency in FY 2010 rank order: FYs 2008–12

Agency	2011					2012				
	2008	2009	2010	preliminary	projected	2008	2009	2010	preliminary	projected
	Current \$millions					Constant 2005 \$millions				
All agencies	53,894	63,694	63,728	58,167	60,712	49,476	57,643	57,145	51,149	52,419
ARRA	na	7,727	5,702	na	na	na	6,993	5,113	na	na
Non-ARRA	53,894	55,968	58,026	58,167	60,712	49,476	50,650	52,032	51,149	52,419
HHS	29,459	35,490	35,797	31,440	31,980	27,044	32,118	32,099	27,647	27,612
ARRA	na	4,888	4,694	na	na	na	4,424	4,209	na	na
Non-ARRA	29,459	30,601	31,104	31,440	31,980	27,044	27,693	27,891	27,647	27,612
DOE	6,100	7,188	7,598	6,771	7,854	5,600	6,505	6,813	5,954	6,781
ARRA	na	843	652	na	na	na	763	585	na	na
Non-ARRA	6,100	6,346	6,946	6,771	7,854	5,600	5,743	6,228	5,954	6,781
DOD	6,581	6,792	7,065	6,578	6,680	6,041	6,147	6,335	5,784	5,768
ARRA	na	38	45	na	na	na	34	40	na	na
Non-ARRA	6,581	6,754	7,021	6,578	6,680	6,041	6,112	6,296	5,784	5,768
NSF	4,135	6,095	5,016	4,924	5,663	3,796	5,516	4,498	4,330	4,889
ARRA	na	1,808	38	na	na	na	1,636	34	na	na
Non-ARRA	4,135	4,288	4,977	4,924	5,663	3,796	3,881	4,463	4,330	4,889
USDA	2,020	2,078	2,141	2,372	2,169	1,854	1,881	1,920	2,086	1,873
ARRA	na	0	0	na	na	na	0	0	na	na
Non-ARRA	2,020	2,078	2,141	2,372	2,169	1,854	1,881	1,920	2,086	1,873
NASA	1,406	1,703	1,503	1,575	1,637	1,291	1,541	1,348	1,385	1,413
ARRA	na	25	110	na	na	na	23	99	na	na
Non-ARRA	1,406	1,678	1,393	1,575	1,637	1,291	1,519	1,249	1,385	1,413
Other	4,194	4,347	4,607	4,506	4,731	3,850	3,934	4,131	3,962	4,085
ARRA	na	124	163	na	na	na	112	146	na	na
Non-ARRA	4,194	4,223	4,444	4,506	4,731	3,850	3,822	3,985	3,962	4,085

na = not applicable.

ARRA = American Recovery and Reinvestment Act of 2009; DOD = Department of Defense; DOE = Department of Energy; HHS = Department of Health and Human Services; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; USDA = U.S. Department of Agriculture.

NOTES: Gross domestic product implicit price deflators for 2005 were used to convert current to constant dollars. Detail may not sum to total due to rounding.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Federal Funds for Research and Development, FYs 2010–12.

TABLE 4. Federal obligations for research and development, by performer: FYs 2010–12

(Current dollars in millions)

Performer	2010		2011	2012
	ARRA	Non-ARRA	preliminary	projected
All performers	6,621	133,724	132,141	130,952
Intramural	718	30,194	32,066	29,691
Industry	979	58,889	54,782	55,080
Industry-administered FFRDCs	165	3,781	3,946	4,034
Universities and colleges	3,343	27,849	27,803	28,708
University-administered FFRDCs	184	3,186	3,239	3,117
Other nonprofit institutions	978	6,267	6,307	6,335
Nonprofit-administered FFRDCs	238	2,546	3,103	3,086
State and local governments	16	411	401	398
Foreign	na	610	494	504

na = not applicable.

ARRA = American Recovery and Reinvestment Act of 2009; FFRDC = federally funded research and development center.

NOTE: Detail may not sum to total due to rounding.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Federal Funds for Research and Development, FYs 2010–12.

## Notes

1. Michael Yamaner, Research and Development Statistics Program, National Center for Science and Engineering Statistics, NSF, 4201 Wilson Boulevard, Suite 965, Arlington, VA 22230 (myamaner@nsf.gov; 703-292-7815).

2. *Obligations* represent the amounts for orders placed, contracts awarded, services received, and similar transactions during a given period, regardless of when the funds were appropriated and when future payment of money is required.



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