

California R&D 2011



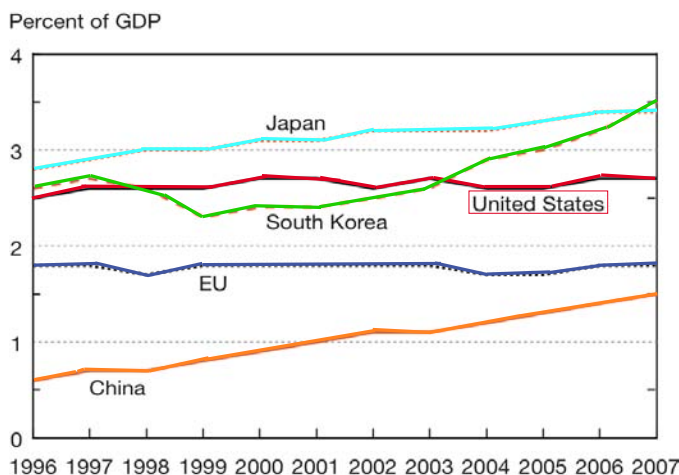
Science & Engineering R&D Fuels U.S. Economic Growth & New Jobs

More than fifty years of experience shows that a strong federal commitment to scientific research is key to building a better America. **Discovery and innovation are proven fuels for economic growth and job creation.** And they are vital elements for achieving energy security and sustaining America's global leadership in science. We must begin to reduce the deficit and begin to live within our means. But we must be smart about how we go about it. **Federal support for science will spur economic growth and help restore a firm fiscal foundation for our nation.**

A National Science Foundation (NSF) study found that 73% of the science papers cited in industry patents were funded by taxpayers through the federal government, especially university research operations.¹

California received \$13.009 billion in federal R&D grants and contracts investment in FY 2010, with approximately 14,001 transactions taking place.² Information and charts on this page demonstrate the importance of federal investment in R&D to California's economy, and its future in the global marketplace.

Federal R&D Expenditures as Percentage of GDP Compared to Strategic Competitors 1996 - 2007³



Fueling California's 21st Century Workforce: Federal R&D Expenditures at California Universities & Colleges FY 2008³

California's colleges and universities received \$7.026 billion in federal R&D spending in FY 2008, making it 1st in the nation.

Key Reports and On-line Resource

- The Science-Engineering-Technology Working Group (SETWG) sponsors the annual Congressional Visits Day Program. See www.aboutastra.org/cvdl/

- Science & Engineering Indicators 2010**, published by the National Science Board, provides a broad base of quantitative information on the U.S. and international science and engineering enterprise. It is created biennially by the National Science Foundation's Division of Science Resources Statistics (SRS). See www.nsf.gov/statistics/seind10/

Top 5 Recipients of Federal R&D Contracts (not Grants)² Performed in California FY 2010*

1.	NORTHROP GRUMMAN	\$2,147,681,657	(17%)
2.	LOCKHEED MARTIN	\$1,665,656,490	(13%)
3.	CALIFORNIA INSTITUTE OF TECHNOLOGY	\$1,642,917,558	(13%)
4.	BOEING	\$1,155,972,867	(9%)
5.	LAWRENCE LIVERMORE NATIONAL SECURITY LLC	\$1,050,171,887	(8%)

* Note: R&D contract & grant amounts do not include management and administrative fees for the operation of Government-Owned, Contractor-Operated (GOCO) facilities under OMB definitions.

Top 5 Federally-Funded R&D Product or Service Types Sold in California FY 2010²

1.	Other R&D -- Basic	\$1,690,562,970	(13%)
2.	Space Science and Applications R&D	\$1,630,865,883	(13%)
3.	Defense Missile and Space Systems -- Adv. R&D	\$1,017,235,762	(8%)
4.	Space Science & Appl. — Op. Syst. Dev. R&D	\$798,898,243	(6%)
5.	R&D - Other Space - Appl. Res/Expl. Dev.	\$687,046,834	(5%)

Top 5 Contracting Agencies for California R&D Investments During FY 2010²

1.	AIR FORCE Department of the (Headquarters USAF)	\$4,523,076,714	(35%)
2.	NASA	\$2,746,946,210	(21%)
3.	NAVY Department	\$1,601,927,193	(12%)
4.	ENERGY Department	\$1,563,667,754	(12%)
5.	ARMY Department of the (except Corps of Engineers Civil Program Financing)	\$729,145,396	(6%)

National Science Foundation (NSF) California Investments During FY 2010

California Statistics

2010 **\$1,043,258,000**
 2009 total awards for
 2008 FY 2010

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Local Research Assets: 50
 2010 NSF Awards: 2851

The 2010 CVD State R&D Sheet State Series are made possible by the American Chemical Society www.acs.org; IEEE-USA www.ieee-usa.org; and SPIE-The International Society for Optical Engineering www.spie.org



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How California Ranks 2011

Rank	Science & Technology in California's Economy ^{3,4,5}	California	Total U.S. **
1	California's Population as of July 1, 2010 (U.S. Census Bureau estimates)	37,266,600	309,050,816
9	High-Technology Share of all Business Establishments 2006 (%)	9.77%	8.35%
12	Net High-Tech Business Formations as Share of All Business Estab. 2006 (%)	.30%	.18%
8	Employment in High-Tech Establishments as % of Total Employment 2006 (%)	13.21%	11.45%
10	Average Annual SBIR Funding <i>per</i> \$1 Million of Gross Domestic Product 2006-2008 (\$)	\$189	\$127
2	Venture Capital Disbursed <i>per</i> \$1,000 of Gross Domestic Product 2008 (\$)	\$7.72	\$2
5	Venture Capital Disbursed <i>per</i> Venture Capital Deal 2008 (\$ millions)	\$9.19	\$7.43
7	R&D as Share of Gross Domestic Product 2007 (%)	4.31%	2.62%
7	2010 State <i>New Economy Index</i> Overall Rank (composite of 26 innovation indicators) ⁵	NA	NA
Rank	Elementary & Secondary Education ³		
46	Fourth Grade Mathematics Performance 2007 (Score out of 500)	230	239
43	Fourth Grade Science Performance 2005 (Score out of 300)	137	149
45	Eighth Grade Mathematics Performance 2007 (Score out of 500)	270	280
42	Eighth Grade Science Performance 2005 (Score out of 300)	136	147
1	Public School Teacher Salaries 2007 (\$) 30.5%	\$63,640	\$50,816
7	Share of Public H.S. School Students Taking Advance Placement Exams 2008 (%)	30.5%	25%
Rank	Higher Education ³		
39	Bachelor's Degrees in Nat. Sciences & Engineering. <i>per</i> 1,000 Indiv. 18-24 Yrs. Old 2007	6.9	8.1
18	S&E Graduate Students per 1,000 Individuals 25-34 Years Old 2007	12.9	12.3
Rank	Workforce Indicators ³		
8	Individuals in S&E Occupations as Share of Workforce 2008 (%)	4.30%	3.75%
7	Engineers as Share of Workforce 2008 (%)	1.31%	1.06%
12	Life and Physical Scientists as Share of Workforce 2008 (%)	.50%	.40%
14	Computer Specialists as Share of Workforce 2008 (%)	2.09%	2.08%
Rank	Financial R&D Indicators ³		
31	State Agency R&D Expenditures per \$1 Million of Gross Domestic Product 2007 (\$)	\$51	\$89
6	Business-Performed R&D as Share of Private-Industry Output 2007 (%)	4.02%	2.20%
22	Academic R&D per \$1,000 of Gross Domestic Product 2008 (\$)	\$3.80	\$3.66
Rank	Academic R&D and Patent Output Indicators ³		
2	Academic S&E Article Output per 1,000 Doctorate Holders in Academia 2006-2008	722	577
31	Academic S&E Article Output per \$1 Million of Academic R&D 2008 (# articles)	2.99	3.24
1	Academic Patents Awarded per 1,000 S&E Doctorate Holders in Academia 2006	24.7	11.6
4	Patents Awarded per 1,000 Individuals in S&E Occupations 2008	24.2	13.4

Sources: 3. *Science & Engineering Indicators 2010*, National Science Board and National Science Foundation / Science Resources Study Division; 4. National Venture Capital Association www.nvca.org; 5. Information Technology & Innovation Foundation www.itif.org

** rankings include the District of Columbia

