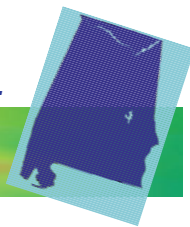




Federally funded research is the Nation's foundation for the future ...

Federal Science R&D & Alabama

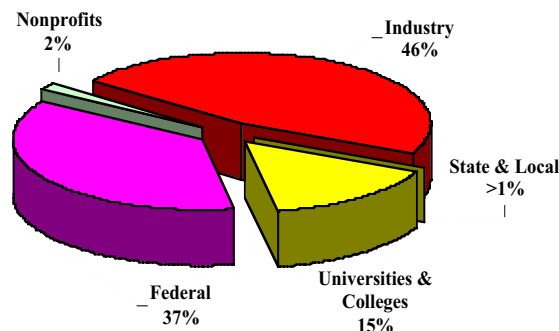


The return on scientific research & development (R&D) investments to the economy and to society is remarkable. Over the last 50 years, advances in science and engineering have produced more than half of the nation's economic growth. Prominent economists agree that *no other investment* generates a greater long-term return to the economy than science R&D.

R&D and the Alabama Economy

Alabama ranked 14th among the 50 states in federal R&D spent within the state, with more than \$1.8 billion spent in FY 2000. Overall R&D expenditures from all sources were more than \$1.7 billion in FY 2000, making **Alabama** 27th nationwide. With a gross state product (GSP) of \$120 billion in 2000, **Alabama** ranked 25th in the nation. With a GSP *per capita* of \$26,940 in 2000, **Alabama** ranked 46th in the nation. **Alabama** had an R&D intensity (the ratio of R&D to GSP) of 1.44% for 2000, making it 31st in the nation.

Alabama Recipients of Federal R&D Funding by Sector FY 2000



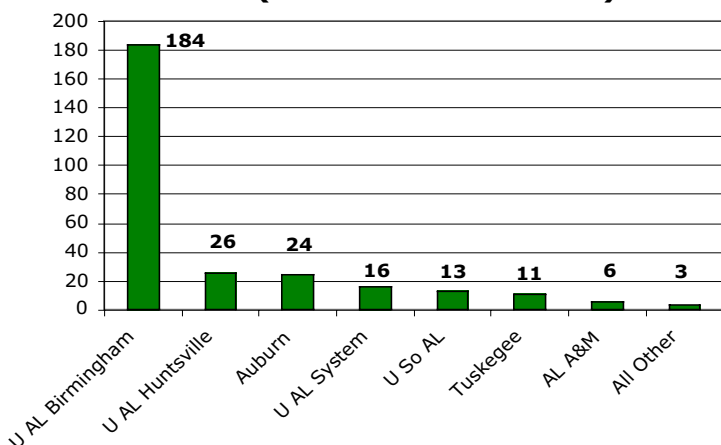
Federal R&D in Alabama

Approximately 23 % of all federal funds spent in **Alabama** (not including direct support of individuals) goes toward R&D. Most major federal agencies provide funding for **Alabama** R&D, foremost of which is the Department of Defense (DOD), which accounts for approximately 56 percent of all federal R&D dollars spent in **Alabama**. Much of the funding reported by DOD and NASA probably does not remain in Alabama and is probably spent on out of state contracts, thus explaining the discrepancy between reported funds and actual expenditures. The **Redstone Arsenal** in **Huntsville** is a division of the **U.S. Army Missile Command**. NASA funds mostly go to the **George C. Marshall Space Flight Center** in **Huntsville**. **Birmingham's Southern Research Institute** is a major independent research institution.

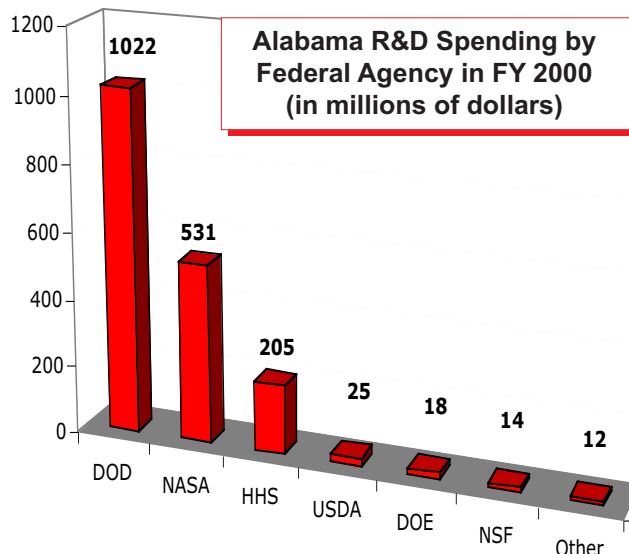
R&D and a Skilled Work Force in Alabama

Of the 10.1 million scientists and engineers working in the US, more than 3.1 million were employed in S&E occupations including 194,930 in high tech jobs in **Alabama** in the year 2000. **34 of every 1,000 private sector workers in Alabama** are employed by high-tech firms. Yet despite the continuing demand, universities are awarding fewer technical degrees nationwide. As the primary source of funding for university research, the federal government is critical to the production of the nation's future scientists and engineers.

Federal R&D to Alabama Universities & Colleges FY 2000 (in millions of dollars)



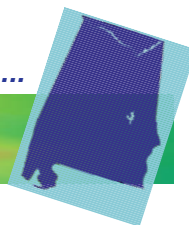
Alabama R&D Spending by Federal Agency in FY 2000 (in millions of dollars)





Federally funded research is the Nation's foundation for the future ...

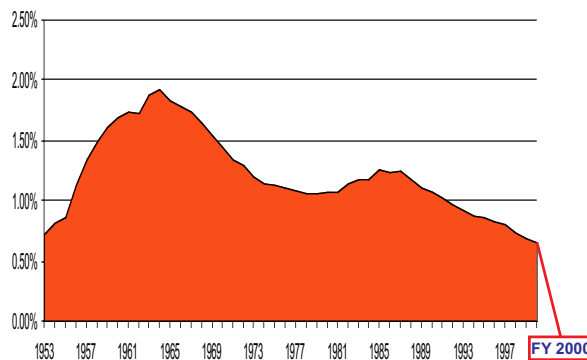
Federal Science R&D & Alabama



Federal Support for Scientific Research Continues Its Long Term Decline & Threatens Productivity Growth ...

Productivity growth in **Alabama** is driven largely by investment in scientific research & development. Federal support for science R&D as a percentage of U.S. GDP reached an all-time low in FY 2000 and it continues. There is overwhelming evidence that underfunding creates imbalance in the scientific research portfolio, disrupts academic recruiting and grant making, stymies faculty development and infrastructure investment. This deterioration, in turn hampers the educational “pipeline” which provides qualified science & engineering (S&E) workers for U.S. industry, academe and other research institutions. Of all citations in U.S. industry patents, approximately 73% originate from research conducted through federally-funded institutions — about 5 citations per patent.

Federal R&D As a Percentage of U.S. GDP



HOW ALABAMA RANKS

- 23rd** in Population (2000)
- 30th** in R&D per Capita
- 27th** in Doctoral Scientists (1999)
- 26th** in Doctoral Engineers (1999)
- 27th** in S&E Doctoral degrees awarded, 2000
- 33rd** in Civilian scientists and engineers as a percentage of the workforce 2002
- 38th** in Industry investment in R&D as a percentage of Gross State product
- 36th** in patents awarded to state residents, 2000 (337 total)
- 47th** in patents awarded to companies or individuals per 1,000 workers
- 19th** in total Federal Expenditures 2000
- 23rd** in Fed. R&D Obligations, 2000
- 28th** in Venture Capital invested as a percentage of GSP
- 35th** in High Tech Employment as % of total employment (2001)*
- 38th** in High Tech Average Wage 2000
- 47th** in Online Population 2001
- 47th** in State New Economy Index 2002*
- 44th** in Workforce Education (a weighted measure of advanced degrees, bachelor's degrees, etc.) *
- 28th** in percentage of workforce employed by foreign companies

Sources: U.S. Census Bureau, U.S. Bureau of Labor Statistics, National Science Foundation, National Venture Capital Association, NASDAQ, American Electronics Association, * Progressive Policy Institute, 2002

Federal R&D Spending is Highly Concentrated in a Small Number of States — Alabama was 14th in FY 2000

67% of all federal R&D funds were spent in only 10 states and D.C. in 2000. **Alabama** ranked 14th in overall federal R&D dollars obligated for that year.

Alabama ranked 9th in percentage of manufacturing employment (16% of its work force) in 1999. **Alabama** had 51,668 high tech jobs in 2000, an increase of 22% (+9,500 jobs) from 1994.

Of the 3.1 million scientific and engineering workers in the U.S., 74% received their highest degree in the physical sciences, engineering, or mathematics. Since 1986, the number of bachelors degrees awarded in the physical sciences has dropped 29%, mathematics is down 19%, and engineering is down 21.1%. Many analysts attribute these declines largely to reduced federal support for university research in these fields.

Although industry has increased its R&D spending in recent years, industry allocates 70% of its R&D to product development and only 6% to basic science research. Because 60% of all U.S. basic research comes from federal sources, there is growing concern that reductions in long-term federal research in the physical sciences, math, and engineering will ultimately harm innovation in industries heavily reliant on these sciences — including aerospace and information technology.

34 of every 1,000 private sector workers in Alabama are employed by high-tech firms.

