

America COMPETES Reauthorization Act of 2010

[H.R. 5116 (amended)]

SECTION SUMMARY

TITLE I—OFFICE OF SCIENCE AND TECHNOLOGY POLICY

The OSTP section includes the following activities:

- **Coordination of Federal STEM Education** would require the Director of the OSTP to establish a committee under the National Science and Technology Council (NSTC) that has responsibility for coordinating Federal programs and activities in support of STEM education and requires the Director to report annually to Congress on the STEM education strategic plan.
- **Coordination of advanced manufacturing research and development** would designate a committee under the NSTC to establish goals and coordinate Federal programs and activities in advanced manufacturing R&D. The committee should facilitate the implementation and commercialization of advances in manufacturing developed through university research. The committee would report a strategic plan to Congress within 1 year after enactment, and update the plan every 5 years.
- **Interagency public access committee** would coordinate Federal science agency research and policies related to the dissemination and long-term stewardship of the results of federally supported unclassified research, including digital data and peer-reviewed scholarly publications. The working group would be directed to take into consideration input from non-Federal stakeholders to maximize the benefit of federally supported research
- **Federal scientific collections** would require the OSTP, in consultation with relevant Federal agencies and non-Federal stakeholders, to develop formal policies for the management and use of Federal scientific collections, including policies for the disposal of collections, and to create an online clearinghouse for information on the contents of and access to Federal scientific collections.
- **Prize competitions** would stimulate innovation that advance the mission of Federal agencies.

TITLE II—NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

The NASA section includes the following activities:

- **An Assessment of impediments to space science and engineering workforce development for minority and underrepresented groups at NASA** would direct NASA to arrange for an independent assessment of any impediments and recommendations for improvement concerning space science and engineering workforce

development for minority and underrepresented groups at NASA, with a report to Congress within 15 months.

- **The International Space Station's contribution to national competitiveness enhancement** would be evaluated with report to Congress within 120 days.

TITLE III—OCEAN AND ATMOSPHERIC PROGRAMS

The NOAA section includes the following activities:

- **Oceanic and atmospheric research and development program** would require NOAA to provide a report to Congress within 12 months with a strategy for enhancing transformational research
- **Ocean and atmospheric science education programs** would define the goal of NOAA's education programs by amending Section 4002 of the America COMPETES Act (33 U.S.C. 893a). NOAA's principal competitive environmental education grant programs are the Bay Watershed Education and Training (B-WET) Program and the Environmental Literacy Grants program

TITLE IV—NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

The NIST section includes the following activities:

- **Authorization of appropriations** for NIST's programs for FY 2011, 2012, and 2013 with top-line values match the FY 2011 Presidential Budget Request for 2011 along with the President's projected increases for the out-years.
- **Under Secretary of Commerce for Standards and Technology** would be created. The current Director of NIST would become the Under Secretary until a successor is appointed.
- **Manufacturing extension partnership** would instruct Regional Centers for the Transfer of Manufacturing Technology to provide community colleges with information about job skills needed in manufacturing, create an Innovative Services Initiative.
- **Emergency communication and tracking technologies research initiative** would establish a research initiative to support the development of emergency communication and tracking technologies for use in locating trapped individuals in confined spaces, such as underground mines and other shielded environments, and would require the Director to report to Congress within 18 months on recommendations for improvement and research priorities.
- **Broadening participation** instructs the Director to consider the goal of promoting the participation of underrepresented minorities in research fellowships and post-doctoral fellowships, and would instruct the Director to give special consideration for teacher development to teachers from high-need schools
- **NIST fellowships** would allow NIST to conduct post-doctoral programs with entities other than the National Academy of Sciences, remove the cap for funds used for research fellowships, and eliminate the Commerce, Science, and Technology Fellowship Program.

- **Green manufacturing and construction** would establish a green manufacturing and construction initiative to promote sustainability in manufacturing and improve energy performance, service life, and air quality in buildings.

TITLE V—SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS
SUPPORT PROGRAMS

SUBTITLE A—NATIONAL SCIENCE FOUNDATION

This section both re-authorizes the National Science Foundation (NSF) and amends the National Science Foundation Act of 1950 as follows:

- **Authorization of appropriations** for the NSF would equal \$7,424,400,000 for FY 2011, \$7.8 billion for FY 2012, and \$8.3 billion for FY 2013. The top-line values match the FY 2011 Presidential Budget Request along with the President’s projected increases for the out-years.
- **The National Science Board** would see its professional staffing cap eliminated. This bill would also changed the due date of the Board’s biennial Science and Engineering Indicators report, modify the scope of reports the Board may submit to the President and Congress, and clarify audit requirements for Board adherence to the Sunshine Act.

This section would establish and/or modify the following NSF programs:

- **The National Center for Science and Engineering Statistics** would be established within the NSF as a central Federal clearinghouse for the collection, analysis, and distribution of objective data on the scientific and engineering enterprise and the state of STEM education.
- **The NSF manufacturing research and education program** would support transformative advances in manufacturing technologies and strengthen scientific and technical education in advanced manufacturing.
- **The National Science Board** would be required by the bill to evaluate the need for mid-scale research instrumentation (instrumentation that falls between the Major Research Instrumentation program and the Major Research Equipment and Facilities Construction program), and provide recommendations regarding how the Foundation can best address those needs within one year of enactment.
- **The Partnerships for Innovation program** would strengthen ties between institutions of higher education and private sector entities to promote innovation and increase the impact of the research. The Director would give priority to partnerships that involve one of the top 100 research institutions and either a minority-serving institution, a primarily undergraduate institution, or a community college.

- **The Green Chemistry Basic Research program** would be established by the Director to provide support for sustainable chemistry research, education, and technology transfer.
- **The Experimental Program to Stimulate Competitive Research (EPSCoR)** would be supported in-line with overall NSF funding increases and reviewed regularly by both the EPSCoR Interagency Coordinating Committee and an initial National Academies study examining the effectiveness of the program's ability to develop necessary infrastructure for education and research in EPSCoR states.

This section would establish and/or modify the following NSF education efforts, with a particular emphasis on improving STEM education:

- **Graduate students** would receive support in-line with the Director's decision on funding rates for the Integrative Graduate Education and Research Traineeship (IGERT) program and the Graduate Research Fellowship (GRF) program. The GRF cost of education allowance would be increased by \$1,500.
- **The Robert Noyce Teacher Scholarship Program** would be strengthened by this bill with an emphasis on recipients teaching in a high-need local education agency. The amount of institutional matching for Noyce grants would also be lowered from 50 to 30 percent.
- **Broadened participation** in NSF programs would be supported by this bill separately in the Historically Black Colleges and Universities Undergraduate Program, the Louis Stokes Alliances for Minority Participation program, the Tribal Colleges and Universities Program, and Hispanic-serving institutions. A separate section would address continued support for a program to award grants on a competitive basis to tribal colleges and universities.
- **STEM experiences** would be broadened in several ways by this bill. First, high school students at specialized STEM schools would be encouraged to participate in major NSF data collection initiatives. Undergraduates would also be supported by grants for group research and industry internship opportunities to connect their STEM coursework with field experience. The NSF would also be required to provide grants to support post-graduate research with potential commercial applications, matching to some degree any private sector funding given in support of such research.
- **Improvements in STEM education** would be addressed by the bill with a post-graduate level grant program to implement or expand STEM education research-based reforms. The Director would also be required by the bill to identify ways to use cyber-enabled learning to improve the STEM workforce and laboratory based learning. A sense of the Senate is also included to express support for the STEM Talent Expansion Program, which effectively increases STEM degrees by providing mentoring and tutoring.

This section also supports research infrastructure improvements and commercialization with the following provisions:

- **Technology transfer and commercialization of university research** would be emphasized by the bill with a requirement on all institutions of higher education receiving NSF grants of at least \$25 million to provide a website detailing their commercialization strategy, including researcher contact information, success stories, available technologies for licensing and any other information deemed necessary. The NSF would then disseminate this information, encouraging best practices. The bill would also require a National Academy of Sciences report to set forth metrics by which the NSF can quantify the tangible impact of its research grants on society.
- **The need for collaboration on large-scale research facilities** would be affirmed in the bill, calling on the NSF and the Department of Energy to work together when planning construction activities.
- **Cloud computing research** would be supported by the bill with an NSF and industry-led review. The bill would set forth reporting requirements on this topic and would call for NSF, NIST, and industry collaboration to develop cloud computing standards.

SUBTITLE B—STEM-TRAINING GRANT PROGRAM

- **STEM-training grant program** would require the Director to replicate and implement undergraduate programs designed to produce elementary and secondary teachers in STEM, collaborate with relevant education departments to establish such programs, require field-based courses, maintain a student to teacher ratio no greater than 100 to 1, include scientifically-based instruction methods, limit STEM teaching courses to those participating in such programs, and require a final evaluation of teaching proficiency at the end of such programs. This section would allow for replication of the successful UTeach program, which creates a pipeline of highly qualified K-12 teachers with core science degrees.
- **Grant program standards** would require the Director to establish and set certain standards for a grant program to support the implementation of programs described in the previous section. This section requires a graduated non-federal match that increases from 35% in the first year to 55% in the second year, and finally 75% in the fourth and fifth years of the grant.
- **Grant oversight and administration** would allow the Director to execute a contract with a qualified organization for oversight and fiscal management of the grant program described.

TITLE VI—INNOVATION

The Innovation section includes the following activities:

- **Office of Innovation and Entrepreneurship** would require the Secretary of Commerce to establish an Office of Innovation and Entrepreneurship to foster innovation and the commercialization of new technologies, products, processes, and services, and specify the duties to be carried out by the Office.

- **Federal loan guarantees for innovative technologies in manufacturing** would require the Secretary of Commerce to establish a program to provide loan guarantees to small- and medium-sized manufacturers and define eligible projects as those that reequip, expand, or establish manufacturing facilities in the United States to use an innovative technology or an innovative process in manufacturing, or to manufacture an innovative technology product or an integral component of such product.
- **Regional innovation program** encourages and supports the development of regional innovation strategies, including regional innovation clusters; authorizes the Secretary to award regional innovation cluster grants that require a 50% matching requirements for grant recipients; establish a regional innovation research and information program to determine and distribute best practices and metrics to assess performance; and require a National Academies report within 4 years that evaluates the program and provides a recommendation regarding whether the program should be continued.
- **Study on economic competitiveness and innovative capacity of United States and development of national economic competitiveness strategy** submitted as a report to Congress and the President.
- **Promoting use of high-end computing simulation and modeling by small- and medium-sized manufacturers** would authorize any demonstration or pilot programs deemed necessary for the completion of a study of the barriers to the use of high-end computing modeling by small- and medium-sized manufacturers in the United States.

TITLE VII—NIST GREEN JOBS

- **Findings** would define a finding of the Congress regarding the value of the Hollings Manufacturing Extension Partnership Program throughout the United States and the need to broaden NIST’s competitiveness grant program to support the construction and green energy industries, maximizing the estimated \$100 billion or more in energy savings from advanced factory-built building materials

TITLE VIII—GENERAL PROVISIONS

- **Government Accountability Office review** would require a GAO study detailing the funding, implementation, and effectiveness of the programs authorized under this Act to be transmitted to Congress by May 31, 2013.
- **Salary restrictions** would restrict funds authorized in this Act from being used to pay the salary of any individual who is convicted of possession with the intent to sell obscene matter on Federal property or the use of Federal computers for child pornography or the exploitation of minors.
- **Additional research authorities of the FCC** would allow additional research and development work at the Federal Communications Commission.

TITLE IX—DEPARTMENT OF ENERGY

Re-authorizes several existing programs in COMPETES that are currently funded:

- SEC. 3185. **Summer Institutes** (42 U.S.C. 7381n), this program authorizes placing teachers at national laboratories for several weeks at a time to provide additional training to strengthen the science, technology, engineering, and mathematics teaching skills. The authorization keeps it level at \$25M over the next 3 years through FY13.
- SEC. 5004. **Nuclear Science Talent Expansion Program for institutes of higher education** (42 U.S.C. 16532), this program helps university based R&D in nuclear science and engineering and increase the number of students graduating in nuclear science fields, the total program is increased with inflation (3%) to \$19.1M in FY13.
- SEC. 5005. **Hydrocarbon systems science talent expansion program for institutions of higher education** (42 U.S.C. 16533), this program authorizes a program to increase the number of students in hydrocarbon system science. It is proposed to amend one of the areas of study to include “hydrocarbon spill response and remediation”. The program was not funded in the prior three years but given the event with the gulf coast spill it is proposed not to delete the program and increase it’s funding by inflation (3%) to \$10.4M in FY13.
- SEC. 5006. **Department of Energy Early Career Awards For Science, Engineering, And Mathematics Researchers** (42 U.S.C. 16534), this program gives grants to promising new Ph.D.’s starting their career, it is proposed to be funded at a level \$25M through FY13.
- SEC. 5009. **Protecting America's Competitive Edge (PACE) Graduate Fellowship Program** (42 U.S.C. 16536), this program funds 160 graduate fellowships for eligible students pursuing a graduate degrees in mission areas of the Department and is increased with inflation (3%) to \$21.9M in FY13.
- SEC. 5011. **Distinguished Scientist Program** (42 U.S.C. 16537), this program establishes a program to support the joint appointment of distinguished scientists by institutions of higher education and National Laboratories, it is increased by inflation to \$33M in FY13.
- SEC. 5007. **Authorization Of Appropriations For Department of Energy for Basic Research** (42 U.S.C. 16311(b)), consistent with prior and current administrations, this is the overall authorization that doubles the Office of Science over 10 years from a FY07 baseline of \$4.153 Bn first enacted in the Energy Policy Act of 2005 (section 971(b) of P.L. 109-58, 42 U.S.C.16311). The original COMPETES Act had it doubling over 7 years.
- SEC. 5012. **Advanced Research Projects Agency – Energy (ARPA-E)** (42 U.S.C. 16538), this section performs improvements to the cost effective operation of ARPA-E, such as directing it to advance technology in basic and applied energy fields, advancing domestic energy manufacturing technologies, disclosing prior funding levels in applications and duplication of proposed research with efforts by industry, giving permissive authority to provide contracts, grants, cooperative agreements and other novel methods of encouraging innovation such as prizes, capping staff size to 120, renaming program managers as program directors to accommodate a diverse technology portfolio, encourage where necessary, flexibility in cost matching for small high technology endeavors, correcting exempt hiring authority for technical staff, keeps the authorization level with inflation to that of FY2008 and the FY11 President’s budget request of \$300M for FY12 and FY13 and increasing technology transfer and outreach from 2.5 to 5 percent of funds to ensure the private sector benefits from such research.

Proposes to delete several sections created in COMPETES that were authorized but never received appropriation for the past three fiscal years.

- SEC. 3171. **Pilot Program of Grants To Specialty Schools for Science and Mathematics** (42 U.S.C. 7381h), this program proposed to establish a pilot program of grants to States to help establish or expand public, statewide specialty secondary schools that provide comprehensive science and mathematics (including technology and engineering) education to improve the academic achievement of students in science and mathematics.
- SEC. 3175. **Experiential-Based Learning Opportunities** (42 U.S.C. 7381j), proposed a summer internship program for middle school and secondary school students that provide the students with internships at the National Laboratories; promote experiential, hands-on learning in science, technology, engineering, or mathematics; and be of at least 2 weeks in duration.
- SEC. 3191. **National Energy Education Development** (42 U.S.C. 7381p), proposed a program to coordinate and make available to teachers and students web-based kindergarten through high school science, technology, engineering, and mathematics education resources relating to the science and energy mission of the Department, including existing instruction materials and protocols for classroom laboratory experiments.
- SEC. 5008. **Discovery Science and Engineering Innovation Institutes** (42 U.S.C. 16535), this section proposed to establish distributed, multidisciplinary institutes centered at National Laboratories to apply fundamental science and engineering discoveries to technological innovations relating to (1) the missions of the Department; and (2) the global competitiveness of the United States.

TITLE X—HEALTH, EDUCATION, LABOR, & PENSIONS

- **Teachers for a Competitive Tomorrow Programs** help students working towards bachelor's and master's degrees in science, technology, engineering and mathematics (STEM) earn teaching credentials, so that they learn content knowledge and teaching skills simultaneously. This bill would reduce the authorization level from a total of \$276.2 million a year to a total of \$4 million a year for each of fiscal years 2011 through 2013 (\$2 million a year each for the bachelor's and master's programs for each fiscal year 2011, 2012 and 2013). The programs were funded for a total of \$ 2.184 million (\$1.092 million each) in FY10.
- **Advanced Placement and International Baccalaureate Programs** would help increase the number of teachers teaching and students taking AP/IB STEM and critical foreign languages classes in high-need schools. The program is currently authorized at \$75 million a year, but has not been funded. This bill would continue to authorize the program at \$75 million a year for each of fiscal years 2011 through 2013. It would also reduce the matching requirement for non-Federal sources from 200 percent of the grant to 100 percent of the grant. For high-need LEAs the match would be lowered from 100 percent of the grant to 50 percent of the grant.
- **Alignment of Education Programs and Education P-16 Education Data Systems Program** would provide competitive grants to States to promote better alignment of

elementary and secondary education with the knowledge and skills needed for success in postsecondary education, the 21st century workforce, and the Armed Forces, and grants to support the establishment or improvement of statewide P-16 education longitudinal data systems. Current law authorizes the program at \$120 million for FY08 and such sums as necessary in FY09. It has not been funded, although the American Recovery and Reinvestment Act of 2009's State Fiscal Stabilization Fund indicates that part of the funding to States to improve their collection and use of data should include elements, academic content standards and student academic achievement standards consistent with this section of COMPETES. The bill would authorize the program at \$120 million for each of fiscal years 2011 and 2012.

Repeals the following programs that have not been funded:

- **Math Now for elementary and middle school students** would improve math instruction in elementary and middle grades. The program was authorized at \$95 million in fiscal year 2008 and such sums through fiscal year 2010, but it was not funded.
- **Summer term education program** would support summer learning opportunities for low-income students in STEM fields to be offered by local schools or community organizations. Such sums were authorized for the program for fiscal years 2008 through 2010, but it was not funded.
- **Math skills for secondary school students** would help high schools hire math coaches to provide targeted support for math teachers and students. The program was authorized at \$95 million a year for each of fiscal years 2008 through 2010, but it was not funded.
- **Foreign language partnership program** would increase the number of students from elementary school through postsecondary education who study critical foreign languages and become proficient. The program was authorized at \$28 million for fiscal year 2008 and such sums through fiscal year 2010, but it was not funded.
- **Mathematics and Science partnership bonus grants** would provide bonus grants to elementary and secondary schools in each state that have high concentrations of low-income students and that demonstrate the most improvement in mathematics and science, as measured by States' assessments for these subjects. Sum sums were authorized for the program for fiscal years 2008 through 2010, but it was not funded.