America COMPETES Act and the FY2010 Budget

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Summary

The America COMPETES Act (P.L. 110-69) became law on August 9, 2007. The act is intended to increase the nation's investment in research and development (R&D), and in science, technology, engineering, and mathematics (STEM) education. It is designed to focus on two perceived concerns believed to influence future U.S. competitiveness: inadequate R&D funding to generate sufficient technological progress, and inadequate numbers of American students proficient in STEM or interested in STEM careers relative to other countries.

The act authorizes funding increases for the National Science Foundation (NSF), National Institute of Standards and Technology (NIST) laboratories, and the Department of Energy Office of Science (DOE SC) over FY2008-FY2010. If maintained, the increases would double the budgets of those entities over seven years. The act establishes the Advanced Research Projects Agency – Energy (ARPA-E) within DOE, designed to support transformational energy technology research projects with the goal of enhancing U.S. economic and energy security. A new program, Discovery Science and Engineering Innovation Institutes, would establish multidisciplinary institutes at DOE National Laboratories to "apply fundamental science and engineering discoveries to technological innovations," according to the act.

Among the act's education activities, many of which are focused on high-need school districts, are programs to recruit new K-12 STEM teachers, enhance existing STEM teacher skills, and provide more STEM education opportunities for students. The new Department of Education (ED) Teachers for a Competitive Tomorrow and existing NSF Robert Noyce Teacher Scholarship (Noyce) programs provide opportunities, through institutional grants, for students pursuing STEM degrees and STEM professionals to gain teaching skills and teacher certification, and for current STEM teachers to enhance their teaching skills and understanding of STEM content. The act also authorizes a new program at NSF that would provide grants to create or improve professional science master's degree (PSM) programs that emphasize practical training and preparation for the workforce in high-need fields.

The America COMPETES Act is an authorization act. New programs established by the act will not be initiated and authorized increases in appropriations for existing programs will not occur unless funded through subsequent appropriation acts. The 110th Congress provided FY2008 appropriations to establish ED's Teachers for a Competitive Tomorrow program, and NIST's Technology Improvement Program (TIP), which replaced the existing Advanced Technology Program. The 111th Congress provided FY2009 appropriations, supplemented by the American Recovery and Reinvestment Act (ARRA), to establish DOE's ARPA-E and NSF's PSM program. Although some America COMPETES Act research and STEM education programs received appropriations at authorized levels in FY2009, others did not.

As Congress deliberates the FY2010 budget, an issue for Congress is what level, if any, it will appropriate funds for America COMPETES Act programs. Although the Obama Administration requested FY2010 funding for most America COMPETES Act R&D programs at levels below that authorized, it contends that FY2009 (due to ARRA funding), and if approved as requested, FY2010 appropriations would fund federal R&D programs at the highest levels in U.S. history. Several programs newly authorized in the act have never been appropriated funds and the Obama Administration has not proposed funding them. An issue for these programs is whether or not they will receive the funding necessary to establish them. The America COMPETES Act provides authorization levels only through FY2010.

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Congress passed the America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science Act (P.L. 110-69), known as the America COMPETES Act, in August 2007. In response to concerns about U.S. competitiveness, the act provides for investments in science and engineering research and science, technology, engineering, and mathematics (STEM) education in the present so that the United States can enhance its potential to be more competitive with other nations in the future.

The purpose of this report is to provide information on the President's FY2010 budget request and the status of Congressional budget and appropriation activities regarding that budget relative to the America COMPETES Act. For more general information on the America COMPETES Act, see CRS Report RL34328, *America COMPETES Act: Programs, Funding, and Selected Issues*, by Deborah D. Stine, and for information on the FY2009 budget, see CRS Report RL34396, *The America COMPETES Act and the FY2009 Budget*, by Deborah D. Stine.

Overview of the America COMPETES Act

The America COMPETES Act was a response to concerns that the United States may not be able to compete economically with other nations in the future. Many believe that investments in science and engineering research; science, technology, engineering, and mathematics (STEM) education; and STEM workforce development will enhance U.S. competitiveness. As a result, the act mainly addresses concerns about insufficient investment in those areas.

The America COMPETES Act authorizes an increase in federal science and engineering research funding and support for kindergarten through postdoctoral education. The act authorizes funding increases through FY2010 for the National Science Foundation (NSF), the National Institute of Standards and Technology (NIST) laboratories, and the Department of Energy (DOE) Office of Science (DOE SC). The act also authorizes within DOE the establishment of the Advanced Research Projects Agency-Energy (ARPA-E)[1] and Discovery Science and Engineering Innovation Institutes. In addition, the act authorizes new STEM education programs at DOE, the Department of Education (ED), and NSF, and increases the authorization level for several existing NSF STEM education programs.

The America COMPETES Act is an authorization act. New programs established by the act will not be initiated unless funded through subsequent federal appropriations. Similarly, increases in the authorization level of existing programs may or may not translate into increased federal funding.

Overview of FY2008 and FY2009 Appropriations

The America COMPETES Act was passed after much of the FY2008 appropriations process had already taken place during the 110th Congress. Although America COMPETES Act programs were not funded at authorized levels, the 110th Congress did provide FY2008 appropriations to establish ED's Teachers for a Competitive Tomorrow program, and NIST's Technology Improvement Program (TIP), which replaced the existing Advanced Technology Program.

[1] For more information on ARPA-E, see CRS Report RL34497, *Advanced Research Projects Agency - Energy (ARPA-E): Background, Status, and Selected Issues for Congress*, by Deborah D. Stine.

The 111th Congress passed the Omnibus Appropriations Act, 2009 (P.L. 111-8) and the American Recovery and Reinvestment Act (P.L. 111-5) to supplement FY2009 funds. Although some America COMPETES Act programs were funded at authorized levels, others were not. The following activities were funded at or above authorized levels: NIST Scientific & Technical Research and Services (STRS); NIST Construction and Maintenance; DOE SC; NSF and its Research and Related Activities; Major Research Instrumentation; Major Research Equipment and Facilities Construction; Professional Science Master's; Robert Noyce Teacher Scholarship; and Graduate Research Fellowship programs. Other programs were funded either below authorized levels or not funded. The acts provided funding to establish DOE's ARPA-E and NSF's PSM program. In addition, portions of the P-16 Alignment of Secondary School Graduate Requirements with the Demands of 21st Century Postsecondary Endeavors and Support for P-16 Education Data Systems were funded through the ARRA.

As was the case for the Bush Administration, the Obama Administration contends that the following America COMPETES Act programs correspond to existing DOE programs:

- Summer Institutes (§5003) to the pre-existing DOE Academies Creating Teacher Scientists program (DOE ACTS);
- Early Career Awards for Science, Engineering, and Mathematics Researchers (§5006) to pre-existing High Energy Physics Outstanding Junior Investigator, Nuclear Physics Outstanding Junior Investigator, Fusion Energy Sciences Plasma Physics Junior Faculty Development; Advanced Scientific Computing Research Early Career Principle Investigator; and the Office of Science Early Career Scientist and Engineer Award programs;
- Discovery Science and Engineering Innovation Institutes (§5008) with pre-existing Bioenergy Research Centers, SciDAC Institutes, and the Energy Frontier Research Centers; and
- Protecting America's Competitive Edge (PACE) Graduate Fellowship Program (§5009) to pre-existing Computer Science Graduate Fellowships; Graduate Research Environmental Fellowships; American Meteorological Society/Industry/Government Graduate Fellowships; Spallation Neutron Source Instrumentation Fellowships, and the Fusion Energy Sciences Graduate Fellowships.[2]

If members of Congress agree with this contention, these America COMPETES Act programs were funded as well.

Obama Administration Budget Request

This section provides an overview of the Obama Administration's FY2010 budget request for research and STEM education activities. **Table 1** (located at the end of this report) provides a program-specific comparison of the Obama Administration's FY2010 budget request to America COMPETES Act authorization levels.

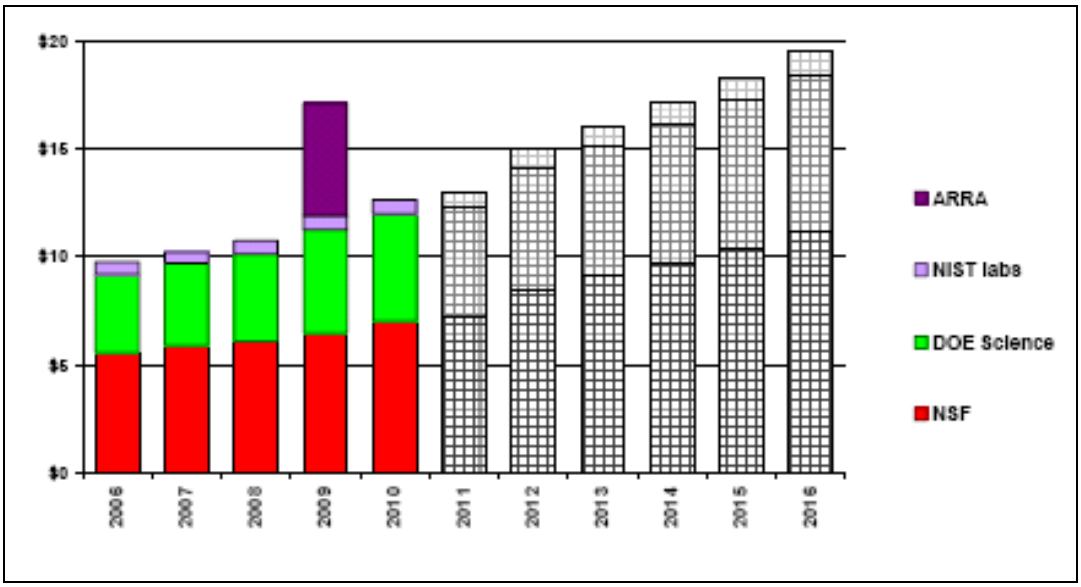
[2] According to an email communication between CRS and the Bush Administration OMB and OSTP received on October 14, 2008, and between CRS and the Obama Administration OSTP on May 19, 2009.

Research

In its budget request to Congress, the Administration states that it plans to double the budget for the NSF, NIST laboratories, and DOE SC between 2006 and 2016 (see **Figure 1**). The Obama Administration's proposed plan would continue the efforts of the Bush Administration's American Competitiveness Initiative (ACI)[3] which had the goal of doubling these agency's budgets over ten years. This differs from the doubling path of the America COMPETES Act which placed these same agencies on a track to double their budgets over seven years.

Figure 1. Obama Administration Plan for Science and Innovation, FY2006-2016

Budget Authority in Billions of Current Dollars



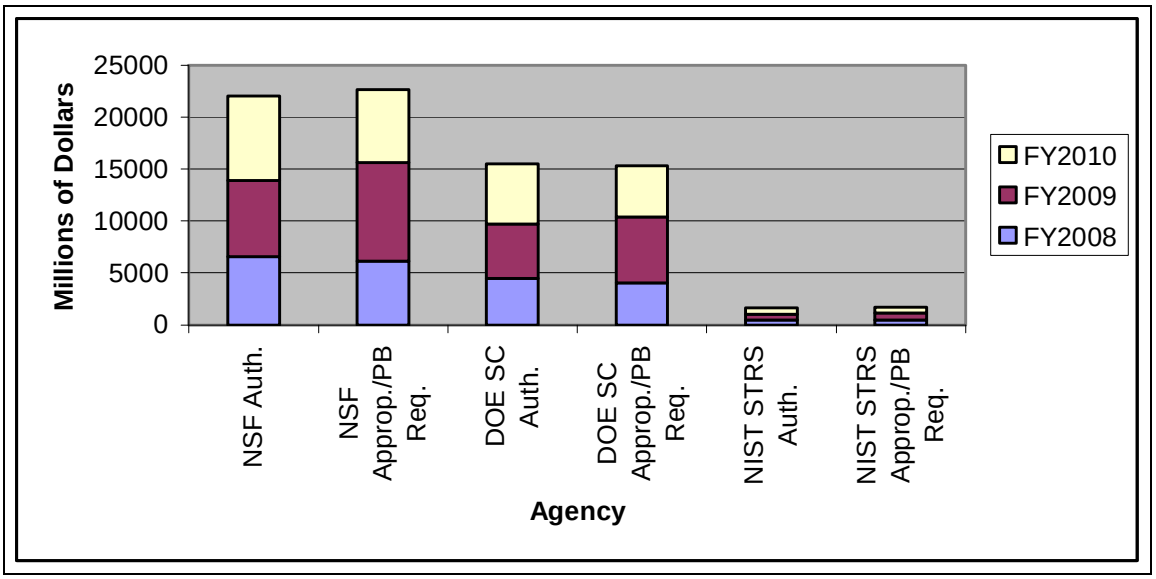
Source: Office of Science and Technology Policy, *A Renewed Commitment to Science and Technology: Federal R&D, Technology, and STEM Education in the 2010 Budget*, May 2009 at http://www.ostp.gov/galleries/budget/FY2010RD.pdf.

Notes: 2006-2009 figures are enacted budget authority; 2011-2016 figures are projections in the 2010 budget.

As a result, the funding requested for these agencies by the Obama Administration are below that authorized in the America COMPETES Act in FY2010. When the total funds authorized and appropriated in FY2008 and FY2009 or requested for FY2010 by the President are compared, however, the funding appropriated/requested for FY2008-FY2010 exceeds that authorized for NSF and NIST STRS. For DOE SC, the funding appropriated/requested is slightly below that authorized. As shown in **Figure 2**, the total authorized for NSF during this time period is $22,058 million, while the total appropriated/requested is $22,665 million—resulting in funding that, if appropriated at this level in FY2010, would be $607 million above the authorized level. For NIST STRS, the total authorized is $1,629 million, the funding appropriated/requested is $1,667 million, so the appropriated/requested funding exceeds that authorized by $38 million For DOE SC, the total authorized is $15,500 million, while the total appropriated/requested is $15,335 million, resulting in $165 million below or 99% of the authorized level.

[3] U.S. President (G.W. Bush), *American Competitiveness Initiative*, Domestic Policy Council/Office of Science and Technology Policy, February 2006, p. 19, at http://www.ostp.gov/pdf/acibooklet.pdf.

Figure 2. Comparison of America COMPETES Act Authorized and Appropriated/Requested funding for NSF, DOE Office of Science (SC), and NIST Scientific and Technical Research and Services (STRS)



Source: Congressional Research Service.

Notes: Auth. = Authorized; Approp. = Appropriated. PB Req. = President's Budget Request. NSF = National Science Foundation. DOE SC = Department of Energy Office of Science. NIST = National Institute of Standards and Technology. STRS = Scientific and Technical Research and Services. FY2008 and FY2009 are as appropriated by Congress. FY2010 is as requested by the President. This analysis does not take into account inflation.

At NIST, funding of $69.9 million is requested for the TIP program, slightly above that received in FY2009 of $65.0 million and half that authorized at $140.5 million. MEP funding is requested at $124.7 million, slightly below that authorized ($131.89 million), and above that appropriated in FY2009 ($110.0 million). Funding for NIST's construction and maintenance account is requested at $116.9 million more than double the authorized level of $49.7 million.

The Obama Administration is requesting $10 million of FY2010 funding for DOE's ARPA-E, which received $415 million in funding in FY2009 ($15 million as part of the regular FY2009 appropriation, $400 million in the ARRA). The Obama Administration is proposing to focus $280 million of its FY2010 funds on new Energy Innovation Hubs. As stated by Secretary of Energy Chu in congressional testimony:

> Specifically, this budget request includes three initiatives designed to cover the spectrum of basic to applied science to maximize our chances of energy breakthroughs. The FY 2010 budget will launch eight Energy Innovation Hubs, while the Energy Frontier Research Centers (EFRCs) and ARPA-E were launched last month. Let me briefly explain the differences and why I believe launching these Hubs is so important.
>
> EFRCs are small-scale collaborations (predominantly at universities) that focus on overcoming known hurdles in basic science that block energy breakthroughs – not on developing energy technologies themselves.

> ARPA-E is a highly entrepreneurial funding model that explores potentially revolutionary technologies that are too risky for industry to fund.
>
> The proposed Energy Innovation Hubs will take a very different approach – they will be multi-disciplinary, highly collaborative teams ideally working under one roof to solve priority technology challenges, such as artificial photosynthesis (creating fuels from sunlight).[4]

At NSF, the Obama Administration is requesting funding at the authorized level of $203.8 million for the Faculty Early Career Development (CAREER) program. Funding for the Experimental Programs to Stimulate Competitive Research (EPSCoR) program is proposed for $147.2 million, similar to the authorized level of $147.8 million. The Research and Related Activities (R&RA) Directorate portion of NSF's Graduate Research Fellowship (GRF) program is proposed for 19.4 million above the authorized level of $15.0 million; however, the Education and Human Resources (EHR) Directorate portion of GRF proposed funding of $102.6 million is below the authorized level of $119.0 million. No FY2010 funding is requested for NSF's Professional Science Master's (PSM) program, newly established in FY2009 through ARRA funding.

Science, Technology, Engineering, and Mathematics (STEM) Education

The Obama Administration is not requesting funding to establish the new STEM education programs authorized in the America COMPETES Act. As shown in **Figure 3**, however, the administration does indicate it is funding other STEM education initiatives. For example, at DOE, the Obama Administration is proposing to establish a new DOE-NSF initiative called "REgaining our ENERGY Science and Engineering Edge" (RE-ENERGYSE) to encourage American students to pursue STEM careers, particularly in clean energy, with DOE funding of $115 million. As a point of comparison, the total FY2010 authorization level for all the DOE STEM education programs authorized in the America COMPETES Act is $117.5 million. As stated by Secretary of Energy Chu during congressional testimony:

> As part of this initiative, the Department will launch a comprehensive K-20+ science and engineering initiative, funded at $115 million in FY 2010, to educate thousands of students at all levels in the fields contributing to the fundamental understanding of energy science and engineering systems. This initiative, which complements the Department's other education efforts, will provide graduate research fellowships in scientific and technical fields that advance the Department's energy mission; provide training grants to universities that establish multidisciplinary research and education programs related to clean energy; support universities that dramatically expand energy-related research opportunities for undergraduates; build partnerships between community colleges and different segments of the clean tech industry to develop customized curriculum for "green collar" jobs; and increase public awareness, particularly among young people, about the role that science and technology can play in responsible environmental stewardship.[5]

[4] Testimony of Secretary of Energy Steven Chu, *FY 2010 Appropriations Hearing*, Senate Committee on Appropriations Subcommittee on Energy and Water Development, and Related Agencies, May 19, 2009 at http://appropriations.senate.gov/Hearings/2009_05_19_-Energy-_Testimony_of_Secretary_Chu_at_May_19_Energy_and_Water_Subcommittee_Hearing.pdf?CFID=3770527&CFTOKEN=27868417.

[5] Testimony of Secretary of Energy Steven Chu, *FY 2010 Appropriations Hearing*, Senate Committee on (continued...)

Figure 3. Obama Administration FY2010 Budget Request for STEM Education Programs

Budget Authority in Millions

	FY 2008 Enacted	FY 2009 Enacted	FY 2009 ARRA 1/	FY 2010 Budget	Change FY 09-10 2/ Amount	Change FY 09-10 2/ Percent
Corporation for Nat'l & Community Service	3	7	0	7	0	0.0%
Agriculture	44	47	0	88	41	87.2%
Commerce	47	50	43	36	-14	-28.0%
Defense	209	218	0	229	11	5.0%
Education	708	850	0	763	-87	-10.2%
Energy	20	24	13	148	124	516.7%
Health and Human Services	837	845	0	853	8	0.9%
Homeland Security	93	99	0	106	7	7.1%
Labor	0	10	0	0	-10	-100.0%
Interior	23	24	0	26	2	8.3%
Transportation	158	159	0	174	15	9.4%
Environmental Protection Agency	10	10	0	11	1	10.0%
NASA	147	169	0	126	-43	-25.4%
National Science Foundation	1,013	1,066	220	1,109	43	4.0%
Total STEM Education	3,312	3,578	276	3,676	98	2.7%

Source: Office of Science and Technology Policy, *A Renewed Commitment to Science and Technology: Federal R&D, Technology, and STEM Education in the 2010 Budget*, May 2009 at http://www.ostp.gov/galleries/budget/FY2010RD.pdf.

Notes: 1/ Based on preliminary allocations of Recovery Act (P.L. 111-5) appropriations. These figures may change. 2/ Excludes Recovery Act appropriations. Change is regular FY2009 appropriations to FY2010 request.

As discussed earlier, the Obama Administration is maintaining the Bush Administration's decision that several existing DOE STEM education programs serve the same purpose as those newly authorized in the America COMPETES Act.

No new funding is requested for America COMPETES Act STEM education programs at ED, although the Obama Administration does request the same funding as that appropriated in FY2009 for ED's Teachers for a Competitive Tomorrow program of $2 million. At NSF, funding at the authorized level of $64.0 million is requested for its Advanced Technological Education (ATE) program. All other requested funding is below authorized FY2010 levels. No funding is requested for the Laboratory Science Pilot program, newly authorized in the act, which has never received funding.

Congressional Activities

Following the Obama Administration's release of its FY2010 budget outline, Congress developed a budget resolution that sets the budgetary spending amounts for each functional category of the

(...continued)

Appropriations Subcommittee on Energy and Water Development, and Related Agencies, May 19, 2009 at http://appropriations.senate.gov/Hearings/2009_05_19_-Energy-_Testimony_of_Secretary_Chu_at_May_19_Energy_and_Water_Subcommittee_Hearing.pdf?CFID=3770527&CFTOKEN=27868417.

budget.[6] The budget resolution does not allocate funds among specific programs or accounts. Major program assumptions underlying the functional amounts, however, are often discussed in the reports accompanying the resolution. These program assumptions and budget functions are not binding, although congressional action has been taken.[7]

Budget Resolution

In April 2009, the House and Senate agreed to the concurrent budget resolution (S.Con.Res. 13), which states the following:

> SEC. 603. SENSE OF THE CONGRESS ON PROMOTING AMERICAN INNOVATION AND ECONOMIC COMPETITIVENESS.
>
> It is the sense of the Congress that—
>
> (1) the Congress should provide sufficient investments to enable our Nation to continue to be the world leader in education ,innovation, and economic growth as envisioned in the goals of the America COMPETES Act;
>
> (2) this resolution builds on significant funding provided in the American Recovery and Reinvestment Act for scientific research and education in Function 250 (General Science, Space and Technology), Function 270 (Energy), Function 300 (Natural Resources and Environment), Function 500 (Education, Training, Employment, and Social Services), and Function 550(Health);
>
> (3) the Congress also should pursue policies designed to ensure that American students, teachers, businesses, and workers are prepared to continue leading the world in innovation, research, and technology well into the future; and
>
> (4) this resolution recognizes the importance of the extension of investments and tax policies that promote research and development and encourage innovation and future technologies that will ensure American economic competitiveness.

Appropriations Committee

Following the budget resolution, the House Committee on Appropriations and the Senate Committee on Appropriations subdivides the budget allocations among the appropriations committees' 12 subcommittees. The committee's jurisdictions[8] for the federal agencies that have programs authorized by the America COMPETES Act programs are divided among at least three Appropriations subcommittees:

[6] CRS Report 97-684, *The Congressional Appropriations Process: An Introduction*, by Sandy Streeter.

[7] CRS Report 98-721, *Introduction to the Federal Budget Process*, by Robert Keith. This process is set forth in the Congressional Budget Act, Titles I-IX of the Congressional Budget and Impoundment Control Act of 1974 (P.L. 93-344; July 12, 1974; 88 Stat. 297-339), as amended and codified at 2 U.S.C. 621-692.

[8] It is important to note that the House and Senate Parliamentarians are the sole definitive authorities on questions relating to the jurisdiction of congressional committees and should be consulted for a formal opinion on any specific jurisdictional question.

- Commerce, Justice, Science, and Related Agencies (CJS): NSF, NIST, NASA, and OSTP;
- Energy and Water Development (Energy-Water): DOE;
- Labor, Health and Human Services, Education, and Related Agencies (Labor-HHS-Education): ED.

Typically, these subcommittees will review the President's budget request and provide their recommendations to the House and Senate Committees on Appropriations.[9] This report will be updated to reflect these recommendations as they are available.

Commerce, Justice, Science, and Related Agencies

On June 9, 2009, the House Committee on Appropriations approved the CJS bill (H.R. 2847) and report (H.Rept. 111-149) for consideration by the House. **Table 1** provides the committee's funding recommendations for NSF and NIST.

At NIST, the House committee recommended funding for STRS and construction at a level less than that requested by the Administration, and funding for MEP and TIP was at the same level as requested. According to the committee, the reduction in the STRS activities funding was in order to support higher priority activities, and those in the construction program were due to the availability of funding from prior years.[10]

The House committee proposed overall NSF funding of $6.9 billion, $108 million less that that requested by the Administration. Funding is less than that requested in the Research and Related Activities (R&RA) directorate, although it is more than that requested in the Education and Human Resources (EHR) directorate. Within R&RA, reductions were made in proposed funding for Major Research Instrumentation due to the availability of prior year funds such that it would receive no new funding in FY2010.[11] EPSCoR funding was specified for the same level as that requested by the Administration. An increase in funding of $14.0 million greater than the request was recommended for the Graduate Research Fellowship (GRF) program to enable support for an additional 2,000 new fellows in FY2010 so that, overall, the agency would be able to fund approximately 3,654 fellows and reach its overall goal of funding 3,000 fellows by FY2013 at a faster pace. The House Committee on Appropriations CJS subcommittee report also supported the proposal in NSF's budget request to set aside a minimum of $2 million in each reach division to explore methodologies that support transformative research.

In NSF's EHR directorate, funding was $10 million higher than that requested for the Robert Noyce program, $2.6 million higher for the STEM talent expansion program, and $2.78 higher for the MSP program. The ATE program funding recommendation was $42 million less that that requested due to the availability of prior year funds.[12] In addition, the committee recommended that future requests for the ATE program be made in a more appropriate department or agency

[9] For additional information on the appropriations process, see CRS Report 97-684, *The Congressional Appropriations Process: An Introduction*, by Sandy Streeter.

[10] House Committee on Appropriations, "Fiscal Year 2010: Commerce, Justice, Science Appropriations Bill, Terminations & Reductions," at http://appropriations.house.gov/pdf/CJS_Cuts_Table_FC2010-06-09-2009.pdf.

[11] Ibid.

[12] Ibid.

such as ED. Funding for MREFC was reduced in response to the availability of prior year funds, and funding for agency operations and award management was reduced to support higher priority programs.[13]

In addition, the House Committee on Appropriations CJS subcommittee notes in its report that missing from the America COMPETES Act investment plan for science and technology are "critical elements of the National Aeronautics and Space Administration (NASA) and the National Oceanic and Atmospheric Administration (NOAA), which equally support the science enterprise of our Nation" and which are "not markedly different or less important than other science disciplines funded by the NSF and NIST," leading the subcommittee to provide "appropriate increases for NSF, and NIST, while also providing appropriate and necessary increases for critical science activities of NASA and NOAA."

Future Activities

A tentative schedule[14] available from the House Committee on Appropriations states that the Energy and Water Development bill may be considered by the relevant subcommittee on June 25, 2009, and voted upon by the House on July 7, 2009. The Labor, Health and Human Services, Education, and Related Agencies bill may be considered by the subcommittee on July 8, 2009, and by the House on July 14, 2009. A schedule of Senate Committee on Appropriations activities is not available.

Issues for Congress

As Congress deliberates the FY2010 budget, an issue for Congress is what level, if any, will it appropriate funding for America COMPETES Act programs. Several programs newly authorized in the act have never been appropriated funds. An issue for these programs is whether or not they will receive the funding necessary to establish them. The America COMPETES Act provides authorization levels only through FY2010.

[13] Ibid.

[14] For more information, see http://appropriations.house.gov/pdf/Tentative_2010_Schedule-06-09-2009.pdf.

Table 1. America COMPETES Act Programs and Appropriations Status

(in millions of dollars)

Programs with Specific Authorized Budgets in the America COMPETES Act	FY2008 Consolidated Appropriations Act, 2008 (P.L. 110-161); Supplemental Appropriations Act, 2008 (P.L. 110-252))	FY2009 Omnibus Appropriations Act, 2009 (P.L. 111-8); American Recovery and Reinvestment Act (ARRA; P.L. 111-5)	FY2010 America COMPETES Act (P.L. 110-69) Authorization of Appropriation	FY2010 President's Budget Request	FY2010 House Committee on Appropriations (NIST and NSF only)	FY2010 Senate Committee on Appropriations
Department of Commerce						
National Institute of Standards and Technology (Sec. 3001)						
—Scientific & Technical Research and Services (STRS) (Sec. 3001)	$440.5	$692.0 (472.0 omnibus + 220.0 ARRA)	$584.8	$534.6	$510.0	
—Construction & Maintenance (Sec. 3001)	160.5	532.0 (172.0 omnibus +360.0 ARRA)	49.7	116.9	76.5	
—Technology Innovation Program (TIP) (Sec. 3001/3012) [NEW]	65.2[a]	65.0	140.5	69.9	69.9	
—Manufacturing Extension Partnership (MEP) (Sec. 3001/3003)	89.6	110.0	131.8	124.7	$124.7	

Programs with Specific Authorized Budgets in the America COMPETES Act	FY2008 Consolidated Appropriations Act, 2008 (P.L. 110-161); Supplemental Appropriations Act, 2008 (P.L. 110-252))	FY2009 Omnibus Appropriations Act, 2009 (P.L. 111-8); American Recovery and Reinvestment Act (ARRA; P.L. 111-5)	FY2010 America COMPETES Act (P.L. 110-69) Authorization of Appropriation	FY2010 President's Budget Request	FY2010 House Committee on Appropriations (NIST and NSF only)	FY2010 Senate Committee on Appropriations
Department of Energy						
DOE Science, Engineering and Mathematics Programs (Sec. 5003)						
—Pilot Program of Grants to Specialty Schools for Science and Mathematics (Sec. 5003) [NEW]	Not Included	Not Included	30.0	Not Included		
—Experiential Based Learning Opportunities (Sec. 5003) [NEW]	Not Included	Not Included	7.5	Not Included		
—Summer Institutes (Sec. 5003) [NEW]	Not Included	Not Included	25.0	Not Included[b]		

Programs with Specific Authorized Budgets in the America COMPETES Act	FY2008 Consolidated Appropriations Act, 2008 (P.L. 110-161); Supplemental Appropriations Act, 2008 (P.L. 110-252))	FY2009 Omnibus Appropriations Act, 2009 (P.L. 111-8); American Recovery and Reinvestment Act (ARRA; P.L. 111-5)	FY2010 America COMPETES Act (P.L. 110-69) Authorization of Appropriation	FY2010 President's Budget Request	FY2010 House Committee on Appropriations (NIST and NSF only)	FY2010 Senate Committee on Appropriations
—National Energy Education Development (Sec. 5003) [NEW]	Not Included	Not Included	Such sums as necessary	Not Included		
Nuclear Science Talent Expansion Program (Sec. 5004)						
—Nuclear Science Program Expansion Grants for Institutions of Higher Education (Sec. 5004) [NEW]	Not Included	Not Included	9.5	Not Included		
—Nuclear Science Competitiveness Grants for Institutions of Higher Education (Sec. 5004) [NEW]	Not Included	Not Included	8.0	Not Included		
Hydrocarbon Systems Science Talent Expansion Program (Sec. 5005)						

Programs with Specific Authorized Budgets in the America COMPETES Act	FY2008 Consolidated Appropriations Act, 2008 (P.L. 110-161); Supplemental Appropriations Act, 2008 (P.L. 110-252))	FY2009 Omnibus Appropriations Act, 2009 (P.L. 111-8); American Recovery and Reinvestment Act (ARRA; P.L. 111-5)	FY2010 America COMPETES Act (P.L. 110-69) Authorization of Appropriation	FY2010 President's Budget Request	FY2010 House Committee on Appropriations (NIST and NSF only)	FY2010 Senate Committee on Appropriations
—Hydrocarbon Systems Science Program Expansion Grants for Institutions of Higher Education (Sec. 5005) [NEW]	Not Included	Not Included	9.5	Not Included		
—Hydrocarbon Systems Science Competitiveness Grants for Institutions of Higher Education (Sec. 5005) [NEW]	Not Included	Not Included	8.0	Not Included		
Office of Science (Sec. 5007) (as act amends the Energy Policy Act of 2005 for FY2010)	4,035.6 (3,973.1 consolidated +62.5 supplemental)	6,357.6 4,757.6[c] omnibus +1,600.0 ARRA	5,814.0	4,941.7		

Programs with Specific Authorized Budgets in the America COMPETES Act	FY2008 Consolidated Appropriations Act, 2008 (P.L. 110-161); Supplemental Appropriations Act, 2008 (P.L. 110-252))	FY2009 Omnibus Appropriations Act, 2009 (P.L. 111-8); American Recovery and Reinvestment Act (ARRA; P.L. 111-5)	FY2010 America COMPETES Act (P.L. 110-69) Authorization of Appropriation	FY2010 President's Budget Request	FY2010 House Committee on Appropriations (NIST and NSF only)	FY2010 Senate Committee on Appropriations
—Early Career Awards for Science, Engineering, and Mathematics Researchers (Sec. 5006)[NEW]	Not Included	Not Included	25.0	Not Included[d]		
Discovery Science and Engineering Innovation Institutes (Sec. 5008) [NEW]	Not Included	Not Included	10.0-30.0[e]	Not Included[f]		
Protecting America's Competitive Edge (PACE) Graduate Fellowship Program (Sec. 5009)[NEW]	Not Included	Not Included	20.0	Not Included[g]		
Distinguished Scientist Program (Sec. 5011) [NEW]	Not Included	Not Included	30.0	Not Included		
Advanced Research Projects Agency—Energy [ARPA-E] (Sec. 5012) [NEW]	Not Included	*415.0 (15.0 Omnibus + 400.0 ARRA)	Such sums as are necessary	10.0		

Programs with Specific Authorized Budgets in the America COMPETES Act	FY2008 Consolidated Appropriations Act, 2008 (P.L. 110-161); Supplemental Appropriations Act, 2008 (P.L. 110-252))	FY2009 Omnibus Appropriations Act, 2009 (P.L. 111-8); American Recovery and Reinvestment Act (ARRA; P.L. 111-5)	FY2010 America COMPETES Act (P.L. 110-69) Authorization of Appropriation	FY2010 President's Budget Request	FY2010 House Committee on Appropriations (NIST and NSF only)	FY2010 Senate Committee on Appropriations
Department of Education						
Teachers for a Competitive Tomorrow: Baccalaureate Degrees (Sec. 6113, 6115, 6116) [NEW]	*0.98	*1.1	151.2	1.1		
Teachers for a Competitive Tomorrow: Master's Degrees (Sec. 6114-6116) [NEW]	*0.98	*1.1	125.0	1.1		
Advanced Placement and International Baccalaureate Programs (Sec. 6121-6123) [NEW]	Not Included	*0.0	Such sums as may be necessary	0.0		
Math Now (Sec. 6201) [NEW]	*0.0	*0.0	Such sums as may be necessary	Not Included		
Summer Term Education Programs (Sec. 6202) [NEW]	Not Included	Not Included	Such sums as may be necessary	Not Included		
Math Skills for Secondary School Students (Sec. 6203) [NEW]	Not Included	Not Included	95.0	Not Included		

Programs with Specific Authorized Budgets in the America COMPETES Act	FY2008 Consolidated Appropriations Act, 2008 (P.L. 110-161); Supplemental Appropriations Act, 2008 (P.L. 110-252))	FY2009 Omnibus Appropriations Act, 2009 (P.L. 111-8); American Recovery and Reinvestment Act (ARRA; P.L. 111-5)	FY2010 America COMPETES Act (P.L. 110-69) Authorization of Appropriation	FY2010 President's Budget Request	FY2010 House Committee on Appropriations (NIST and NSF only)	FY2010 Senate Committee on Appropriations
Advancing America Through Foreign Language Partnership Program[h] (Sec. 6301-6304) [NEW]	Not Included	*0.0	Such sums as may be necessary	Not Included		
P-16 Alignment of Secondary School Graduate Requirements with the Demands of 21st Century Postsecondary Endeavors and Support for P-16 Education Data Systems (Sec. 6401) [NEW]	Not Included	Not Included[i]	Such sums as may be necessary	Not Included		
Mathematics and Science Partnership Bonus Grants (Sec. 6501) [NEW]	Not Included	Not Included	Such sums as may be necessary	Not Included		
National Science Foundation (Sec. 7002)	6,127.5 (6,065.0 consolidated +62.5 supplemental)	9,492.4 (6,490.4 omnibus +3,002.0 ARRA)	8,132.0	7,045.0	6936.5	
Research and Related Activities (R&RA)	4,844.0[i] (4,821.5 consolidated +22.5 supplemental)	7,683.1 (5,183.1 omnibus +2,500.0 ARRA)	6,401.0	5,733.2	5642.1	

Programs with Specific Authorized Budgets in the America COMPETES Act	FY2008 Consolidated Appropriations Act, 2008 (P.L. 110-161); Supplemental Appropriations Act, 2008 (P.L. 110-252))	FY2009 Omnibus Appropriations Act, 2009 (P.L. 111-8); American Recovery and Reinvestment Act (ARRA; P.L. 111-5)	FY2010 America COMPETES Act (P.L. 110-69) Authorization of Appropriation	FY2010 President's Budget Request	FY2010 House Committee on Appropriations (NIST and NSF only)	FY2010 Senate Committee on Appropriations
—Major Research Instrumentation (MRI) (Sec. 7002/Sec. 7036)	Not Included	*300.0 (Not Included omnibus +300.0 ARRA)	131.7	100.0	0.0	
—Faculty Early Career Development (CAREER) (Sec.7002)	Not Included	Not Included	203.8	203.8	Not Included	
—Research Experiences for Undergraduates (REU) (Sec.7002)	Not Included	Not Included	75.9	67.7	Not Included	
—Experimental Programs to Stimulate Competitive Research (EPSCoR) (Sec.7002)	*120.0 (115.0 consolidated +5.0[k] supplemental)	133.0	147.8	147.1	147.1	
—Integrative Graduate Education and Research Traineeship/R&RA (IGERT) (Sec.7002)[m]	Not Included	Not Included	58.3	39.0	Not Included	

Programs with Specific Authorized Budgets in the America COMPETES Act	FY2008 Consolidated Appropriations Act, 2008 (P.L. 110-161); Supplemental Appropriations Act, 2008 (P.L. 110-252))	FY2009 Omnibus Appropriations Act, 2009 (P.L. 111-8); American Recovery and Reinvestment Act (ARRA; P.L. 111-5)	FY2010 America COMPETES Act (P.L. 110-69) Authorization of Appropriation	FY2010 President's Budget Request	FY2010 House Committee on Appropriations (NIST and NSF only)	FY2010 Senate Committee on Appropriations
—Graduate Research Fellowship/R&RA (GRF) (Sec.7002)	Not Included	Not Included	11.1	19.4	*33.4	
—Professional Science Master's Degree Program (Sec. 7002/7034) [NEW]	Not Included	15.0[n] (Not Included omnibus +15.0 ARRA)	15.0	0.0	Not Included	
Education and Human Resources (EHR)	765.6 (725.6 consolidated +40.0 supplemental)	945.3 (845.3 omnibus +100.0 ARRA)	1,104.0	857.8	862.9	
—Mathematics and Science Education Partnership (MSP) (Sec.7002/7028)	Not Included	86.0 (*61.0 omnibus +*25.0 ARRA)	123.2	58.2	*61.0	
—Robert Noyce Teacher Scholarship Program (Sec.7002/7030)	*55.0 (15.0 consolidated +40.0[o] supplemental)	115.0 (55.0[l] omnibus +*60.0 ARRA)	140.5	55.0	65.0	
—Science, Mathematics, Engineering, and Technology Talent Expansion (Sec.7002/7025)	Not Included	Not Included	55.0	31.5[p]	*34.1	
—Advanced Technological Education (ATE) (Sec.7002)	Not Included	Not Included	64.0	64.0	22.4	

Programs with Specific Authorized Budgets in the America COMPETES Act	FY2008 Consolidated Appropriations Act, 2008 (P.L. 110-161); Supplemental Appropriations Act, 2008 (P.L. 110-252))	FY2009 Omnibus Appropriations Act, 2009 (P.L. 111-8); American Recovery and Reinvestment Act (ARRA; P.L. 111-5)	FY2010 America COMPETES Act (P.L. 110-69) Authorization of Appropriation	FY2010 President's Budget Request	FY2010 House Committee on Appropriations (NIST and NSF only)	FY2010 Senate Committee on Appropriations
—Integrative Graduate Education and Research Traineeship/EHR (IGERT) (Sec.7002)[m]	Not Included	Not Included	33.4	29.9	Not Included	
—Graduate Research Fellowship/EHR (GRF) (Sec.7002)	Not Included	*107.0	119.0	102.6	Not Included	
Major Research Equipment and Facilities Construction (Sec.7002)	220.7	552.0 (152.0 omnibus +400.0 ARRA)	280.0	117.3	114.3	
Agency Operations and Award Management (Sec.7002)	281.8	294.0	329.5	318.4	299.9	
National Science Board (Sec.7002)	4.0	4.0	4.3	4.3	4.3	
Inspector General (Sec.7002)	11.4	14.0 (12.0 omnibus +2.0 ARRA)	13.2	14.0	13.0	
Laboratory Science Pilot Program (Sec. 7026) [NEW]	Not Included	Not Included	Such sums as may be necessary	Not Included	Not Included	

Source: America COMPETES Act (P.L. 110-69); Omnibus Appropriations Act, 2009 (P.L. 111-8) and explanatory statement; American Recovery and Reinvestment Act of 2009 (P.L. 111-5); H.Rept. 111-16 and joint explanatory statement. For FY2008, information is from the Consolidated Appropriations Act, 2008 (P.L. 110-161) and joint

explanatory statement; Congressional Record, December 17, 2007; Supplemental Appropriations Act, 2008 (P.L. 110-252); H.Rept. 110-240; S.Rept. 110-124; H.Rept. 110-231; and S.Rept. 110-107. FY2010 budget documents for the following agencies: NIST budget summary at http://www.nist.gov/public_affairs/releases/approps-summary2008-2010.htm; ED budget justification at http://www.ed.gov/about/overview/budget/budget10/justifications/index.html; DOE detailed budget justification (Volume 3 – ARPA-E; Volume 4- Science) at http://www.cfo.doe.gov/budget/10budget/Start.htm#Detailed%20Budget%20Justifications; and NSF budget request at http://www.nsf.gov/about/budget/fy2010/toc.jsp. Information in FY2010 House Committee on Appropriations column is from H.R. 2847 and H.Rept. 111-149.

Notes: Section numbers refer to the America COMPETES Act. "[NEW]" means a program that was not authorized prior to the America COMPETES Act. "Not Included" means that these programs were not specifically identified in the budget request, bill, act, or report, but it does not necessarily mean no funding is being provided for those programs. * = as recommended in the committee's report associated with that bill. All other appropriations are numbers from bill language.

a. The following statement is in the Consolidated Appropriations Act joint explanatory statement: "Of the amounts provided to ITS [Industrial Technology Services], $65,200,000 is for the Technology Innovation Program as authorized by P.L. 110-69 [the America COMPETES Act]. TIP is structured to fund high-risk, high reward research focused on broad national needs such as advanced automotive batteries, aquaculture, novel lightweight materials, and other emerging technologies. The funding provided for TIP will address mortgage obligations relating to projects created under the Advanced Technology Program (ATP). The amended bill also includes language to allow the TIP immediate access to an additional $5,000,000 from deobligations and prior-year recoveries from ATP."

b. According to a personal communication between CRS and OSTP, the Obama Administration contends that Summer Institutes correspond to the pre-existing DOE Academies Creating Teacher Scientists program (DOE ACTS).

c. The P.L. 111-8 explanatory statement provides $4,772.6 million for science at DOE with $15.0 million of that total for the organizationally separate Advanced Research Projects Agency – Energy (ARPA-E) and the remainder for DOE Office of Science Activities.

d. According to a personal communication between CRS and OSTP, the Obama Administration contends that Early Career Awards for Science, Engineering, and Mathematics Researchers correspond to pre-existing High Energy Physics Outstanding Junior Investigator, Nuclear Physics Outstanding Junior Investigator, Fusion Energy Sciences Plasma Physics Junior Faculty Development; Advanced Scientific Computing Research Early Career Principle Investigator; and the Office of Science Early Career Scientist and Engineer Award programs.

e. The Secretary of Energy can decide to establish up to three institutes per fiscal year. Each institute could receive $10 million per year for three fiscal years.

f. According to a personal communication between CRS and OSTP, the Obama Administration contends that Discovery Science and Engineering Innovation Institutes correspond with pre-existing Bioenergy Research Centers, SciDAC Institutes, and Energy Frontier Research Centers.

g. According to a personal communication between CRS and OSTP, the Obama Administration contends that the Protecting America's Competitive Edge (PACE) Graduate Fellowship Program corresponds to pre-existing Computer Science Graduate Fellowships; Graduate Research Environmental Fellowships; American Meteorological Society/Industry/Government Graduate Fellowships; Spallation Neutron Source Instrumentation Fellowships, and the Fusion Energy Sciences Graduate Fellowships.

h. The title for this program in the America COMPETES Act is the Foreign Language Partnership Program. The table uses the title for this program from the ED FY2009 congressional budget justification to help distinguish it from other ED foreign language programs such as the existing Foreign Language Assistance program.

i. P.L. 111-5 indicates that part of the funding provided to States for Institutions of Higher Education as part of the State Fiscal Stabilization Fund (Title XIV) should be used for "IMPROVING COLLECTION AND USE OF DATA.—The State will establish a longitudinal data system that includes the elements described in section 6401(e)(2)(D) of the America COMPETES Act (20 U.S.C. 9871)." In addition, the State "will take steps to improve State academic content standards and student academic achievement standards consistent with 6401(e)(1)(A)(ii) of the America COMPETES Act." No specific appropriation is noted for either purpose. Section 6401 of the America COMPETES Act addresses the "Alignment of secondary school graduate requirements with the demands of 21st century postsecondary endeavors and support for P-16 education systems." With that Section, subsection (e)(2)(D) provides required elements of a statewide P-16 education data system such as demographic information, yearly test records, teacher identification information, and student-level transcripts and college readiness test scores. Section (e)(1)(A)(ii) discusses the use of grant funds for "identifying and making changes that need to be made to the State's secondary school graduation requirements, academic content standards, academic achievement standards, and assessments preceding graduation from secondary school in order to align requirements, standards,

and assessments with the knowledge and skills necessary for success in academic credit-bearing coursework in postsecondary education, in the 21st century workforce, and in the Armed Forces without the need for remediation."

j. The following statement is in the Consolidated Appropriations Act joint explanatory statement: "The Appropriations Committees strongly support increases for the math and physical sciences, computer sciences, and engineering directorates in fiscal year 2008 for research and related activities (R&RA). However, the Committees also believe the Foundation should maintain comparable growth in fiscal year 2008, to the extent possible, for the biological sciences and social, behavioral and economic sciences directorates. Each of the science disciplines is valuable in maintaining U.S. competitiveness. The Committees urge NSF to provide each directorate with funding levels that are consistent with the goals of the America COMPETES Act and look forward to the Foundation's operating plan in addressing these concerns."

k. Although included in the FY2008 supplemental appropriation, the act specifies a section in the America COMPETES Act authorizing funding for the FY2009 EPSCoR program.

l. The explanatory statement indicates that "The increase provided in the bill for the Noyce Program is for the purpose of expanding participation in the grants program established in section10 and section 10A of the National Science Foundation Authorization Act of 2002 (42 U.S.C. 1862n-1) as amended by the America COMPETES Act."

m. Two directorates of the NSF manage the Integrative Graduate Education and Research Traineeship (IGERT) program—the Education and Human Resources Directorate (EHR) and the Research and Related Activities (R&RA) directorate. The America COMPETES Act and the NSF budget request both identify the allocations for each directorate.

n. The America COMPETES Act provides the authorization amount within R&RA; however, the explanatory language for P.L. 111-5 places the program within EHR.

o. Of this $40 million, $20 million is for the general Robert Noyce Teacher Scholarship Program, and $20 million is for the NSF Teaching Fellowships and Master Teaching Fellowships that are part of the Noyce program.

p. An additional $1 million is proposed for the R&RA portion of the program. According to NSF's budget request, "The STEP Program seeks to increase the number of students receiving degrees in established or emerging fields within science, technology, engineering, and mathematics. Awards are made both to provide for implementation efforts at academic institutions and to support research degree attainment in STEM. The America Competes Act authorized the establishment of centers within this program, to be jointly funded with one or more disciplinary directorates, to explore fundamental changes in undergraduate practice that promise to significantly improve recruitment and retention of students, and lead to improvement in their learning. The $1.83 million increase will permit the establishment of two additional centers in FY 2010 in collaboration with the R&RA Directorates."

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