Workforce Development for Teachers and Scientists
Funding Profile by Subprogram and Activity

(dollars in thousands)

	FY 2012 Current	FY 2013 Annualized CR*	FY 2014 Request
Activities at the DOE Laboratories			
Science Undergraduate Laboratory Internships	6,500	—	7,300
Community College Internships	552	—	700
Graduate Student Research Program (formerly Office of Science Graduate Fellowship)	5,000	—	2,000
Visiting Faculty Program	1,179	—	1,300
Albert Einstein Distinguished Educator Fellowship	1,200	—	1,200
National Science Bowl®	2,700	—	2,800
Technology Development and On-Line Application	620	—	550
Evaluation Studies	300	—	300
Outreach	300	—	300
Laboratory Equipment Donation Program	149	—	50
Total, Workforce Development for Teachers and Scientists	18,500	18,613	16,500

*FY 2013 amounts shown reflect the P.L. 112-175 continuing resolution level annualized to a full year. These amounts are shown only at the "congressional control" level and above; below that level a dash (—) is shown.

Public Law Authorizations

Public Law 95-91, "Department of Energy Organization Act of 1977"
Public Law 101-510, "DOE Science Education Enhancement Act of 1991"
Public Law 103-382, "The Albert Einstein Distinguished Educator Fellowship Act of 1994"
Public Law 109-58, "Energy Policy Act of 2005"
Public Law 110-69, "America COMPETES Act of 2007"
Public Law 111-358, "America COMPETES Reauthorization Act of 2010"

Overview

The Workforce Development for Teachers and Scientists (WDTS) program mission is to help ensure that DOE has a sustained pipeline of skilled and diverse science, technology, engineering, and mathematics (STEM) workers. This is accomplished through support of undergraduate internships, graduate thesis research, and visiting faculty programs at the DOE laboratories; the Albert Einstein Distinguished Educator Fellowship for K–12 STEM teachers, which is administered by WDTS for DOE and for a number of other federal agencies; and Nation-wide, middle- and high-school science competitions that annually culminate in the National Science Bowl® in Washington D.C. These investments help develop the next generation of scientists and engineers to support the DOE mission, administer its programs, and conduct its research.

WDTS activities rely significantly on DOE's 17 laboratories, which employ more than 30,000 workers with STEM backgrounds. The DOE laboratory system provides access to leading scientists; world-class scientific user facilities and instrumentation; and large-scale, multidisciplinary research programs unavailable in universities or industry. WDTS leverages these assets to develop and train students and educators, with the intent that they continue the pursuit of work relevant to the DOE mission in their future studies and careers.

Program Accomplishments and Milestones

In FY 2012, the WDTS program initiated improvements to enhance the research experiences of the student interns and visiting faculty it supports at the DOE laboratories, strengthen program management and execution, increase program transparency, and leverage technology to improve program operations. Consistent with the goals described in *Coordinating Federal Science, Technology, Engineering, and Mathematics (STEM) Education Investments: Progress Report,*[a] WDTS programs focus on DOE's unique STEM workforce needs.

Undergraduate Student Internship Programs. In 2012, management and execution processes for the undergraduate student internship programs sited at DOE laboratories (Science Undergraduate Laboratory Internships [SULI] and the Community College Internships [CCI]) were improved in several ways. To help promote the development of skills that interns will need for STEM careers, participant deliverables were revised and made uniform across all participating DOE laboratories; these now include research papers, project reports, posters, and oral presentations. Changes also include clearer eligibility requirements; application essay questions with improved relevance to STEM studies and careers; and new processes by which laboratories select interns from the applicant pool. Program management now also includes a preliminary Federal (WDTS staff) applicant eligibility and compliance review prior to release of applications to host laboratories.

Visiting Faculty Program (VFP). In 2012, the VFP was revised to help ensure that faculty members (largely from colleges and universities traditionally underrepresented in STEM fields) and DOE laboratory researchers engage in important, impactful, and mutually beneficial research projects. The most important change is a new requirement that a faculty applicant and a laboratory principal investigator—who become the co-principal investigators on the research project—develop a research project plan, which becomes part of the faculty member's application. Prior to selection of participants in the VFP, these research plans are merit reviewed using similar processes and criteria to those applied throughout the Office of Science. In July 2012, a VFP workshop was held to review this new application process following the experience gained after the first year of implementation. There was agreement from the laboratory education directors and the VFP participants that the requirement of a short proposal engages both faculty applicants and laboratory investigators early in the process of collaboration and significantly improves the research experiences for both. Effecting early connections between prospective faculty applicants and laboratory principal investigators is one of the most important functions of the laboratory education directors with respect to the VFP. WDTS and the laboratory education directors continue to develop and share best-practices.

Milestone	Date
Peer review of the WDTS activities sited at the DOE Laboratories—SULI, CCI, and VFP—is completed.	2nd Qtr, FY 2013
Phase in of the new online application and review systems for SULI, CCI, and VFP is completed.	2nd Qtr, FY 2013
A Federal Advisory Committee Act Committee of Visitors (COV) review of WDTS program activities is commissioned.	4th Qtr, FY 2013

Program Planning, Evaluation, and Management

Consistent with Office of Science practices for program management and execution and aligned with the President's management priorities[b] WDTS uses evaluation and evidenced-based decision making to improve program management and execution and to set priorities. The 2010 WDTS COV,[c] which reviewed the WDTS activities, recommended enhancing activities that reviewed as Excellent or Very Good and redirecting funds from activities that reviewed as Fair or Poor. As a result, from the time of the COV review to the present, funding for some activities (notably SULI and CCI) was increased; one activity (VFP) was restructured using input from the scientific community and from the DOE laboratories that host the program participants; and six activities were gradually phased out. A second COV review will be held

[a] http://www.whitehouse.gov/sites/default/files/microsites/ostp/nstc_federal_stem_education_coordination_report.pdf

[b] http://www.whitehouse.gov/sites/default/files/omb/memoranda/2012/m-12-14.pdf

[c] http://science.energy.gov/sc-2/committees-of-visitors/

in late 2013. In addition to the standard charge (assess the efficacy and quality of the processes used to solicit, review, recommend, monitor, and document application, proposal, and award actions; and assess the quality of the resulting portfolio), the COV will be asked to comment on the changes that have taken place since the 2010 COV, the new directions of the program, and the plans for data collection and program assessment as they relate to workforce development programs.

In FY 2012, the first peer review of the WDTS laboratory programs (i.e., the offices of the laboratory education directors) provided a comparative assessment of the management and execution of the SULI, CCI, and VFP activities across the DOE laboratory complex. The peer review focused on leadership, management, and best practices at the host DOE laboratories. This includes program planning and execution, resource allocation, fostering synergy with those who serve as student advisors and faculty collaborators, and outreach to prospective participants.

In response to the recommendation of the 2010 COV for increased interaction and cooperation between WDTS staff and Office of Science research program staff, two actions have been taken. First, the Office of Science STEM Working Group of Ph.D. level program managers from the SC program offices was used more extensively to increase interactions with the SC programs. The Working Group coordinates STEM workforce activities across the Office of Science and with the DOE technology programs and also provides a forum for sharing best practices in workforce development program management, particularly management of programs at the DOE laboratories. Second, two Ph.D. level program managers from the Office of Science now serve as team leads for WDTS activities.

The Office of Science, in collaboration with the DOE technology programs, represents the Department of Energy on the interagency Committee on STEM Education (CoSTEM) established under the National Science and Technology Council. In response to the 2010 reauthorization of the America COMPETES Act, CoSTEM was formed to coordinate federal STEM education activities and programs and specifically charged to establish and maintain an inventory of federally sponsored STEM education programs and develop a 5-year STEM education strategic plan. As part of these efforts the federal agencies are identifying and sharing best practices for STEM programs, which will inform processes used by the WDTS programs. In December 2011, CoSTEM released the *Federal Science, Technology, Engineering, and Mathematics (STEM) Education Portfolio*, an inventory and analysis of federally supported STEM education programs across 13 agencies. In February 2012, CoSTEM released the *Coordinating Federal Science, Technology, Engineering, and Mathematics (STEM) Education Investments: Progress Report*, a report to Congress on status of the establishment of a Federal strategic plan on STEM education programs.

In addition to CoSTEM efforts, WDTS coordinates with other Federal agencies such as National Science Foundation, National Aeronautics and Space Administration, and the National Oceanic and Atmospheric Administration to develop interagency efforts in STEM workforce development and education and to carry out jointly funded programs.

Program Goals and Funding

WDTS activities support the following Office of Science performance expectation area:

- *Scientific Workforce:* Contribute to STEM workforce development through the support of undergraduate internships, a graduate student thesis research program, and visiting faculty programs at the DOE laboratories; the Albert Einstein Distinguished Educator Fellowship; and the National Science Bowl®.

Goal Areas

	Research	Facility Operations	Future Facilities	Scientific Workforce
Workforce Development for Teachers and Scientists	0%	0%	0%	100%

Performance Measures

Performance Goal (Measure)	**WTDS Science Undergraduate Laboratory Internship (SULI)**—Percentage of SULI students who report in their exit survey that they have increased their preparedness for a STEM career as a result of the program		
Fiscal Year	**2012**	**2013**[a]	**2014**
Target	N/A	≥ 90%	≥ 90%
Result	N/A		
Endpoint Target	Encourage undergraduate students to enter STEM careers especially relevant to the DOE mission by providing research experiences at DOE national laboratories under the direction of scientific and technical laboratory staff who serve as research advisors and mentors		

[a] 2013 targets reflect DOE's FY 2013 Budget Request to Congress. FY 2013 target updates can be found in the upcoming FY 2012–2014 Annual Performance Plan and Report.

Explanation of Funding and Program Changes

The Graduate Student Research Program (formerly the DOE Office of Science Graduate Fellowship program) has been restructured following experience with the first cohort of the SCGF, the desire to take full advantage of the opportunities afforded by the DOE laboratories, and the need to address the unique future workforce requirements of those laboratories. The program will provide graduate thesis research opportunities at DOE laboratories in collaboration with DOE laboratory scientists.

(dollars in thousands)

	FY 2012 Current	FY 2014 Request	FY 2014 Request vs. FY 2012 Current
Science Undergraduate Laboratory Internships	6,500	7,300	+800
The number of undergraduate students supported increases from 645 in FY 2012 to approximately 700 in FY 2014.			
Community College Internships	552	700	+148
The number of community college students supported decreases from 80 in FY 2012 to approximately 70 in FY 2014; FY 2012 funding was augmented with prior year funds from terminated activities, thus allowing additional students to participate.			
Graduate Student Research Program [formerly DOE Office of Science Graduate Fellowship (SCGF)]	5,000	2,000	-3,000
Funding in FY 2012 continued 70 SCGF Fellows in the third and final year of their Fellowship initiated with the FY 2010 appropriation. Prior year funding from terminated activities was used to fully fund for three years a small FY 2012 cohort. Funding in FY 2014 supports graduate students to perform part of their thesis research at DOE laboratories in collaboration with DOE laboratory scientists. Approximately 100 students will be supported in FY 2014. Actual numbers of students will be determined following peer review of applications.			

(dollars in thousands)

	FY 2012 Current	FY 2014 Request	FY 2014 Request vs. FY 2012 Current
Visiting Faculty Program	1,179	1,300	+121
No significant change. Funding supports approximately 50 faculty and 20 students in FY 2012 and FY 2014. Actual numbers of faculty and students will be determined following peer review of applications.			
Albert Einstein Distinguished Educator Fellowship	1,200	1,200	0
No change; funding supports 6 Fellows.			
National Science Bowl®	2,700	2,800	100
Funding is increased to help defray increased housing, transportation, and other logistical expenses for the national event.			
Technology Development and On-Line Application	620	550	-70
Funding is provided to support modernization of on-line applications systems for application, review, data collection, and evaluation of WDTS programs. Small decrease reflects completion of some activities.			
Evaluation Studies	300	300	0
No change; funding is provided for the collection and analysis of data and other materials, including pre- and post-participation questionnaires, participant deliverables, and longitudinal participant tracking.			
Outreach	300	300	0
No change; funding is provided to support outreach activities to broaden participation in DOE laboratory programs—undergraduate student internships, graduate student thesis research, and visiting faculty programs.			
Laboratory Equipment Donation Program	149	50	-99
Funding is reduced, reflecting efficiencies in program management and termination of the pilot program to provide laboratory equipment to middle schools and high schools. Funding continues support for the transfer of excess laboratory equipment to faculty at higher educational institutions for DOE-related research.			
Total, Workforce Development for Teachers and Students	18,500	16,500	-2,000

Activities at the DOE Laboratories

Overview

Activities at the DOE Laboratories include the Science Undergraduate Laboratory Internships, the Community College Internships, the Graduate Student Research Program (formerly DOE Office of Science Graduate Fellowship), and the Visiting Faculty Program. These activities provide opportunities for participants to engage in research requiring specialized instrumentation; large-scale, multidisciplinary efforts; and/or the scientific user facilities. Undergraduate internships and the Visiting Faculty Program are aligned with the CoSTEM Strategic Federal Coordination Objectives[a] for undergraduate education and for support of those traditionally underrepresented in STEM fields.

The **Science Undergraduate Laboratory Internships (SULI)** program goal is to encourage undergraduate students to enter STEM careers especially relevant to the DOE mission by providing research experiences at DOE national laboratories under the direction of scientific and technical laboratory staff who serve as research advisors and mentors. With its long history, the SULI program places undergraduate students in paid internships in science and engineering research activities at DOE laboratories, working with laboratory staff scientists or engineers on projects related to ongoing research programs. Appointments are for 10 weeks during the summer term and 16 weeks during the fall and spring terms.

The **Community College Internships (CCI)** program goal is to encourage community college students to pursue technical careers relevant to the DOE mission by providing technical training experiences at DOE laboratories under the direction of laboratory staff who serve as advisors and mentors. The CCI program places students in paid internships in technologies supporting laboratory work under the supervision of a laboratory technician or researcher.

The **Graduate Student Research Program** goal is to strengthen and enhance graduate student preparedness for science, technology, engineering, or mathematics (STEM) careers especially relevant to the Office of Science mission by providing graduate thesis research opportunities at DOE laboratories. The program provides research awards for graduate students to pursue part of their graduate thesis research at a DOE laboratory in areas that address scientific challenges relevant to the Office of Science mission. Graduate students pursuing Ph.D. degrees in areas of physics, chemistry, materials sciences, biology (non-medical), mathematics, computer or computational sciences, or specific areas of environmental sciences that are aligned with the mission of the Office of Science are eligible for research awards to conduct part of their graduate thesis research at a DOE laboratory in collaboration with a DOE laboratory scientist. Research award terms will range from 3 months to 1 year. Approximately 100 awards will be made in FY 2014 with the exact number dependent on the distribution of terms requested in successful proposals.

The **Visiting Faculty Program (VFP)** goal is to increase the research competitiveness of faculty members and their students at institutions historically underrepresented in the research community in order to expand the workforce that addresses DOE mission areas. Through direct collaboration with research staff at DOE host laboratories, VFP appointments provide an opportunity for faculty and students to develop skills applicable to programs at their home institutions; this helps increase the STEM workforce in DOE science mission areas at institutions historically not part of the DOE enterprise.

[a] http://www.whitehouse.gov/sites/default/files/microsites/ostp/nstc_federal_stem_education_coordination_report.pdf

Funding and Activity Schedule

Fiscal Year	Activity	Funding (dollars in thousands)
FY 2012	SULI supported 645 students.	6,500
	CCI supported 80 students.	552

Fiscal Year	Activity	Funding (dollars in thousands)
	SCGF supported 70 fellows whose Fellowships were initiated with the FY 2010 appropriation and an additional 80 fellows whose Fellowships were fully funded for three years using the American Recovery and Reinvestment Act. Prior year funds resulting from terminated activities were used to fully fund a cohort of 49 Fellows for FY 2012–2014; SC received Congressional approval prior to the solicitation for this cohort.	5,000
	VFP supported 50 faculty and 25 students.	1,179
FY 2013	The FY 2013 Request proposed $7,300,000 for SULI to support approximately 700 students.	—
	The FY 2013 Request proposed $700,000 for CCI to support approximately 70 students.	—
	The FY 2013 Request proposed no funding for the SCGF program as originally formulated.	—
	The FY 2013 Request proposed $1,300,000 for VFP to support approximately 50 faculty and 20 students.	—
FY 2014	SULI will support approximately 700 students.	7,300
	CCI will support approximately 70 students.	700
	The Graduate Student Research Program will support approximately 100 graduate students for periods of 3 months to 1 year to conduct a part of their thesis research at DOE laboratories.	2,000
	VFP will support approximately 50 faculty and 20 students.	1,300

Albert Einstein Distinguished Educator Fellowship

Overview

The Albert Einstein Distinguished Educator Fellowship Act of 1994 gives the Department of Energy responsibility for administering a program of professional development fellowships for elementary and secondary school mathematics and science teachers. WDTS manages the Einstein Fellowship for the federal government and encourages participation by other federal agencies. Selected teachers spend eleven months in a Congressional office or a Federal agency. Typically, the Office of Science supports 6 Fellows each year; 4 are placed in Congressional offices and 2 are placed in the Office of Science. Other Offices within DOE also participate; other participating agencies include the National Science Foundation, the National Aeronautics and Space Administration, and the National Oceanic and Atmospheric Administration. The Fellows provide their educational expertise, years of teaching experience, and personal insights to these offices and often are involved in the advancement of science, mathematics, and technology education programs.

Funding and Activity Schedule

Fiscal Year	Activity	Funding (dollars in thousands)
FY 2012	The FY 2012 appropriation supported 6 Fellows.	1,200
FY 2013	The FY 2013 request proposed $1,200,000 to support 6 Fellows.	—
FY 2014	The FY 2014 request supports 6 Fellows.	1,200

National Science Bowl

Overview

The DOE National Science Bowl® is a nationwide academic competition testing students' knowledge in all areas of science, including energy. High school and middle school students are quizzed in a fast-paced, question-and-answer format. Since 1991, more than 335,000 students have participated in regional and national competitions.

The number of regional events held annually remains nearly constant, with approximately 70 high school and approximately 40 middle school teams participating in the national competition in recent years. Regional science bowl winning teams receive an all-expenses paid trip to Washington D.C. to compete at the national competition in April or May. Competing teams are composed of four students, one alternate, and a teacher who serves as an advisor and coach.

In 2012, 4,700 middle school and 10,450 high school students participated in the competitions, with 41 middle school and 69 high school teams (550 students) participating in the finals in Washington, DC. More than 5,000 volunteers also participated in the local and national competitions. In 2013, Alaska will host a regional middle school competition, bringing National Science Bowl® events to all fifty states.

In response to a recommendation from the 2010 WDTS Committee of Visitors to seek broader geographic coverage for the NSB, the geographic boundaries of the regional competitions were defined by using state/county/city boundaries for the first time. Formerly underrepresented geographic areas were assigned to a specific regional Science Bowl competition.

The DOE National Science Bowl® is aligned with the CoSTEM Strategic Federal Coordination Objective[a] for STEM engagement.

[a] http://www.whitehouse.gov/sites/default/files/microsites/ostp/nstc_federal_stem_education_coordination_report.pdf

Funding and Activity Schedule

Fiscal Year	Activity	Funding (dollars in thousands)
FY 2012	Funding is provided for travel and housing costs for regional winning teams to attend the national event; for other logistical expenses for the national event; and for upgrades to the NSB online registration system to accommodate increased numbers of participants and out-of-date technologies.	2,700
FY 2013	The FY 2013 Request proposed $2,800,000 for increased travel and housing costs and for other logistical expenses for the national event.	—
FY 2014	Funding is maintained to support a constant number of regional teams each year at the national finals competition.	2,800

Technology Development and On-line Application Systems

Overview

This activity continues modernization of on-line systems to support on-line applications and review, data collection, and evaluation for the WDTS programs. A project to develop, build, and launch new online application and program support systems was initiated to improve program management, execution, and evaluation by WDTS program staff and by DOE laboratory staff. A study of stakeholder needs was completed to determine system requirements, identify optimized views of required elements and data, and define a project plan and build schedule for a 2012 launch—in time for the 2013 summer internship programs. The new online systems will enable better management of application and participant information and the collection and archiving of participant deliverables (research reports, etc.). An important component of the systems is the ability to support regular evaluation of program performance and impact. A phased approach will be used to develop and build the systems. Following completion of the systems for SULI, CCI, and VFP for use beginning in 2013, the systems for the National Science Bowl®, the Albert Einstein Distinguished Educator Fellowship, and the Graduate Student Research Program will be updated or developed.

Funding and Activity Schedule

Fiscal Year	Activity	Funding (dollars in thousands)
FY 2012	Funding in FY 2012 supported a redesign to integrate the on-line applications, participant deliverables, and questionnaires that participants complete; to bring the transactional web properties into alignment with the programmatic procedures, policies and protocols; and to provide users a facile interface.	620
FY 2013	The FY 2013 Request proposed $550,000 to continue on-going work.	—
FY 2014	Funding in FY 2014 continues on-going work.	550

Evaluation Studies

Overview

The Evaluation Studies activity supports work to assess whether WDTS programs meet established goals through the use of collection and analysis of data and other materials, including pre- and post-participation questionnaires, participant deliverables, and longitudinal participant tracking.

The 2010 Committee of Visitors found little evaluation of activities across WDTS but noted that the data collection and evaluation plans under development provided some innovative options for gathering workforce information and for tracking participants. In FY 2014, evaluation plans for each WDTS activity will be completed.

Evaluation Studies is aligned with Congressional recommendations in the GPRA Modernization Act of 2010, the President's management priorities,[a] and the 2008 Congressionally-mandated Academic Competitiveness Council initiative, which emphasized the need for federal programs (including STEM education programs) to demonstrate their effectiveness through rigorous evaluation. WDTS works cooperatively with Office of Science programs, other DOE programs, and other federal agencies through the National Science and Technology Council Committee on STEM Education (CoSTEM) to share best practices for STEM program evaluation to ensure the implementation of evaluation processes that are appropriate to the nature and scale of the program effort.

[a] http://www.whitehouse.gov/sites/default/files/omb/memoranda/2012/m-12-14.pdf

Funding and Activity Schedule

Fiscal Year	Activity	Funding (dollars in thousands)
FY 2012	FY 2012 funding supports the reassessment of the evaluation plans to measure the effectiveness of WDTS investments in STEM workforce development.	300
FY 2013	The FY 2013 Request proposed $300,000 to begin the evaluation plans for all WDTS activities.	—
FY 2014	FY 2014 funding completes the evaluation plans for all WDTS activities and begins data archiving and curation.	300

Outreach

Overview

WDTS engages in outreach activities, some in cooperation with other federal agencies, to broaden participation in and enhance the student internships, the graduate student thesis research program, and the Visiting Faculty Program. The method most widely used by prospective program participants to obtain information about WDTS is the WDTS website (http://science.energy.gov/wdts/). Therefore, in order to facilitate outreach to prospective participants, the WDTS website was completely revised in FY 2012 to allow students and faculty access to current, consistent, and accurate information for all WDTS activities, including program descriptions, opportunities, and eligibility requirements. Website content is now also optimized for mobile devices, such as smart phones, often used by the demographic groups targeted by WDTS programs. Active outreach is also via the web using live webinar virtual meetings to highlight the programs, their opportunities, and the WDTS internship experience.

Funding and Activity Schedule

Fiscal Year	Activity	Funding (dollars in thousands)
FY 2012	FY 2012 funding continued ongoing Outreach activities.	300
FY 2013	The FY 2013 Request proposed $300,000 to continue the ongoing activity.	—
FY 2014	Funding continues the ongoing activity.	300

Laboratory Equipment Donation Program

Overview

The Laboratory Equipment Donation Program provides excess laboratory equipment to faculty at educational institutions. Through the Energy Asset Disposal System, DOE sites identify excess equipment. Colleges and universities can then search for equipment of interest and apply via the website. The equipment is free, but the receiving institution pays for shipping costs.

Funding and Activity Schedule

Fiscal Year	Activity	Funding (dollars in thousands)
FY 2012	FY 2012 funding continued the ongoing program.	149
FY 2013	The FY 2013 Request proposed $50,000 to continue the ongoing program. A reduction in funding reflects increases in efficiency and the elimination of eligibility for middle schools and high schools based on a suggestion by the 2010 Committee of Visitors.	—
FY 2014	Funding continues the ongoing program.	50