Workforce Development for Teachers and Scientists

Overview

The mission of the Workforce Development for Teachers and Scientists (WDTS) program is to ensure that Department of Energy (DOE) has a sustained pipeline for the science, technology, engineering, and mathematics (STEM) workforce. Accomplishing this mission depends on continued support for undergraduate internships, graduate thesis research opportunities, and visiting faculty research appointments; administration of the Albert Einstein Distinguished Educator Fellowship for K–12 STEM teachers for the federal government; annual, nationwide middle and high school science competitions culminating in the National Science Bowl® finals in Washington, D.C; and pathway programs to expand training opportunities for broadening participation. These activities support the development of the next generation of scientists, engineers, and technical professionals to address challenges on energy, environment, and national security.

WDTS activities rely significantly on long-standing partnerships with DOE's 17 national laboratories, which employ more than 30,000 individuals with STEM backgrounds. The DOE laboratory system provides access to leading scientific expertise, world-class scientific user facilities, capabilities, and resources, and large-scale, multidisciplinary, interdisciplinary, and transdisciplinary research programs unavailable in universities or industry. WDTS leverages these assets to provide authentic hands-on research and discovery learning opportunities for students and educators in support of the DOE workforce development mission.

Highlights of the FY 2025 Request

The FY 2025 Request of $43.1 million is an increase of $1.1 million over the FY 2023 Enacted. The FY 2025 Request prioritizes funding for workforce training programs that attract and train students and educators for STEM learning and authentic research experiences at DOE laboratories and expands the opportunities to individuals from new emerging research communities in STEM, including Historically Black Colleges and Universities (HBCUs), Tribal Colleges and Universities (TCUs), Minority Serving Institutions (MSIs), and community colleges. The Request continues support for the Reaching a New Energy Sciences Workforce (RENEW) initiative, which will build creative pathways to connect students and educators from new emerging research communities in STEM to DOE workforce training opportunities. The Request continues strong support for undergraduate internships, graduate thesis research, and visiting faculty program to help sustain a skilled workforce pipeline. The Request continues support for the technology infrastructure modernization and evaluation activity, which is critically important for evidence-based management practice to sustain the workforce training programs at DOE laboratories. It also prioritizes support for the DOE National Science Bowl®, a signature STEM competition testing middle and high school students' knowledge in science and mathematics. By encouraging and preparing students to pursue STEM careers, these programs address the DOE's STEM mission critical workforce pipeline needs required to advance science innovation and energy, environment, and national security.

Workforce Development for Teachers and Scientists
Funding

(dollars in thousands)

	FY 2023 Enacted	FY 2024 Annualized CR	FY 2025 Request	FY 2025 Request vs FY 2023 Enacted
Workforce Development for Teachers and Scientists				
Science Undergraduate Laboratory Internship (SULI)	15,700	15,700	14,000	-1,700
Community College Internship Program (CCI)	2,200	2,200	2,300	+100
Visiting Faculty Program (VFP)	2,100	2,100	2,100	–
Office of Science Graduate Student Research (SCGSR) Program	5,000	5,000	5,500	+500
Reaching a New Energy Sciences Workforce (RENEW)	10,000	10,000	12,000	+2,000
Internships and Visiting Faculty Activities at DOE Labs	**35,000**	**35,000**	**35,900**	**+900**
Albert Einstein Distinguished Educator Fellowship	**1,200**	**1,200**	**1,200**	**–**
National Science Bowl	**3,000**	**3,100**	**3,100**	**+100**
Technology Development and On-Line Application	**700**	**700**	**700**	**–**
Evaluation	**600**	**600**	**700**	**+100**
Outreach	**1,500**	**1,500**	**1,500**	**–**
Total, Workforce Development for Teachers and Scientists	**42,000**	**42,100**	**43,100**	**+1,100**

Program Accomplishments

Science Undergraduate Laboratory Internship (SULI) — In FY 2023, approximately 1,111 placements were supported, of which 18.8 percent were from MSIs and approximately 37.8 percent were women. Among the participants, more than 98 percent reported positive impacts to their educational and career goals, more than 92 percent would consider a career at DOE national laboratories, and 99.5 percent would recommend SULI to their peers. As in prior years, participants continue to make notable contributions to research projects as evidenced by co-authorship in peer reviewed journals, patents, and/or presentations at scientific meetings.

Community College Internship Program (CCI) — In FY 2023, WDTS supported 144 CCI placements, with 54.9 percent from MSIs. Among the participants, 100 percent would recommend CCI to their peers and 100 percent reported positive impacts to their educational and career goals. More than 94 percent of participants reported that they would consider a job or career at DOE national laboratories.

Visiting Faculty Program (VFP) — In FY 2023, WDTS supported a total of 85 faculty and 25 student VFP placements, and of these participants, 62.4 percent of the faculty were from MSIs and 26.0 percent from HBCUs. Among the faculty participants, 14.1 percent were Black or African American and 17.6 percent were women. All VFP Faculty participants reported a positive impact on their careers, and all expressed interest in continuing their research collaboration. All participants would recommend VFP to their peers.

Office of Science Graduate Student Research (SCGSR) Program — During FY 2023, the two solicitations from FY 2022 resulted in a total of 131 new awards with 28.6 percent going to female graduate students. The first of the two annual solicitations of FY 2023 produced 60 new awards and the second solicitation was released in August, currently under review and selection. Starting late FY 2022, the SCGSR program implemented an increase of the current monthly stipend of active awardees due to increasing housing and other general living costs, for which the program received positive feedback from its communities. The increased stipend level will enable the SCGSR program to attract more diverse applicants, particularly those from new emerging research communities, and advance SC's diversity, equity, inclusion, and accessibility objectives for the energy sciences workforce.

Reaching a New Energy Sciences Workforce (RENEW) — In FY 2023, WDTS, established the first cohort of five WDTS RENEW Pathway Summer Schools for high school and early undergraduate students at Ames National Laboratory, Argonne National Laboratory, Fermi National Accelerator Laboratory, Brookhaven National Laboratory, Oak Ridge National Laboratory, and Pacific Northwest National Laboratory. WDTS expanded research collaboration opportunities with DOE national laboratories for enhancing research capacity and innovating STEM teaching and learning for faculty from higher education institutions emerging in research and STEM (including all HBCUs). The expansion led to nearly 30 percent increase of faculty participation in the VFP program. Furthermore, in collaboration with SC research programs, DOE national laboratories, and Oak Ridge Institute for Science and Education (ORISE), WDTS successfully led the evaluation and assessment of the RENEW initiative. The above efforts are ongoing and will inform the further development of the RENEW initiative.

Albert Einstein Distinguished Educator Fellowship (AEF) — In FY 2023, one WDTS-sponsored AEF participant held a WDTS office appointment and five were placed in Congressional offices. Nine other teachers were sponsored by the following Federal agencies: Library of Congress, Department of Defense, Department of Homeland Security, U.S. Geological Survey, National Aeronautics and Space Administration, and National Science Foundation. The AEF Program continues to equip teachers with access to a national network of education leaders and programs, a better understanding of the challenges and possibilities in STEM education, and a renewed passion for making a significant contribution to the educational community.

National Science Bowl®(NSB) — In FY 2023, more than 2,700 middle school students (from 504 schools) and 5,200 high school students (from 941 schools) participated in 108 regional competitions. Forty-nine U.S. States, the District of Columbia, and Puerto Rico were represented at regionals. More than 2,000 volunteers also participated in the local and national competitions. In May 2023, 47 middle school teams and 68 high school teams competed in the National Science

Bowl® Championship Finals at William F. Bolger Center in Potomac, Maryland, which featured a live web-streaming broadcast of the event to a broad public audience. The NSB continued to inspire young students nationwide to continue striving for high levels of academic success and to follow their passions in STEM, and hopefully, to consider a career to support the DOE mission.

Technology Development and On-Line Application — In FY 2023, the upgrade of the online platform initiated in FY 2022 continues and the transition of the online application modules for individual programs is mostly complete. The upgrade development for system integration with responsive design consideration is expected to continue into the first quarter of FY 2024. The upgrade will significantly increase cybersecurity and modernization of the online technology supporting all WDTS programs. The phase-one improvement of pre- and post-surveys for SULI, CCI, and VFP is completed; major features are developed to support mentors at DOE national laboratories, including mentor profile, mentor surveys, and a mentor resource center. New modules using the data analysis and visualization capability have been developed and have demonstrated their usefulness in producing annual program data summary reports to all host DOE national laboratories, compiling data for WDTS evaluation projects, and producing information to address inquiries from internal and external stakeholders.

Evaluation — In FY 2023, WDTS, in collaboration with ORISE, made progress towards building a comprehensive evaluation portfolio to support evidence-based management of workforce development programs and initiatives in WDTS and SC. The program completed a set of evaluation projects based on pre- and post-survey of program participants, including assessing how undergraduate internships affected participants on their STEM skills/knowledge, career goals, and diversity and inclusion, and outcome analysis of where they are. The program also completed a study of mentoring based on newly completed mentor surveys, which provided insights on support needed for mentoring. WDTS completed both the internal and external review of a proposed longitudinal evaluation study plan of the impacts of WDTS-sponsored undergraduate internship programs at DOE national laboratories and preparation for implementation is ongoing. An important evaluation activity is to coordinate with SC research programs on the assessment and evaluation of the RENEW initiative, leveraging the knowledge, infrastructure, and capabilities built through the evaluation activity and plan for the current WDTS programs.

Outreach — In FY 2023, in collaboration with ORISE, DOE laboratories, and higher education institutions, WDTS supported and co-hosted a series of virtual events (Application Assistance Workshops, IGNITE Off, Virtual Internship Fair, Virtual Intern Panel and Networking, and Virtual Graduate Student Recruitment Fair) to actively engage HBCUs, TCUs, MSIs, community colleges, and to enable equitable access to workforce training opportunities by all. In addition to virtual events, WDTS conducted in-person workshops or panels at HBCUs and conferences serving large membership of students and faculty from underserved and minority groups. The outcome of the WDTS annual proposal call resulted in a comprehensive set of outreach activities led by DOE host laboratories. They focus on: expanding model outreach practices “mini-semester” over winter break and training past participants to serve as WDTS program “ambassadors” on social media and at in-person events at their home institutions; introducing faculty from institutions - in the research enterprise to unique lab capabilities and facilities; promoting best practices for inclusive mentoring; and raising awareness of DOE, SC, and WDTS opportunities among the professional societies with a strong focus on individuals and institutions from emerging research communities.

Description

Activities at the DOE Laboratories

WDTS supports activities such as the SULI, CCI, VFP, and SCGSR programs, and RENEW. One of the primary goals of these programs is to prepare students to enter STEM careers that are especially relevant to the DOE mission. By providing hands-on research experiences at DOE laboratories under the direction of scientist/engineer mentors, these activities provide workforce training opportunities for participants to engage in authentic research and discovery learning. WDTS activities are aligned with the Administration's goals for preparing a highly skilled and diverse future U.S. workforce.

SULI places students from two- and four-year undergraduate institutions as paid interns in science and engineering research activities at DOE laboratories, working with laboratory staff scientist and engineer mentors on projects related to ongoing research programs. Appointments are for ten weeks during the summer term and 16 weeks during the fall and spring terms.

CCI places community college students as paid interns in technological activities at DOE laboratories, working under the supervision of a laboratory technician or researcher mentor. CCI provides dedicated technical training for community college students who are interested in technical careers and provides a pathway for those who plan to pursue further educational objectives beyond community college.

The original VFP goal was to increase the research competitiveness of faculty members at U.S. institutions of higher education historically underserved in the research community, including all HBCUs. As part of the RENEW initiative, VFP opportunities have been expanded for both enhancing research capacity and innovating STEM teaching and learning at faculty members' home institutions through extended research collaboration with DOE national laboratories. Appointments are for 10 weeks in the summer, fall, and spring terms.

SCGSR's goal is to prepare graduate students for STEM careers critically important to the SC mission by providing graduate thesis research opportunities at DOE laboratories. The SCGSR program provides supplemental awards for graduate students to pursue part of their graduate thesis research at a DOE laboratory or facility in areas that address scientific challenges central to the SC mission, including convergence topics of interest to multiple SC research programs. U.S. graduate students pursuing Ph.D. degrees in physics, chemistry, materials sciences, non-medical biology, mathematics, computer or computational sciences, or specific areas of environmental sciences aligned with the SC mission, are eligible for research awards to conduct part of their graduate thesis research at a DOE laboratory or facility in collaboration with a DOE laboratory scientist. Research award terms range from three months to one year.

As an active participant in the SC-wide RENEW initiative, WDTS coordinates with SC research programs and DOE national laboratories to develop SC mission research focused training opportunities for undergraduate and graduate students from population groups and academic institutions not currently well represented in the U.S. S&T ecosystem. WDTS has a unique role to play by significantly expanding SC reach to students and educators at all levels, especially those from emerging research communities in STEM, and building creative pathways to better prepare them for STEM learning and career based on rigorous evaluation and assessment.

Albert Einstein Distinguished Educator Fellowship

The Albert Einstein Distinguished Educator Fellowship Act of 1994 charges DOE with administering a fellowship program for elementary and secondary school mathematics and science teachers that focuses on bringing teachers' real-world expertise to government to help inform federal STEM education programs. Selected teachers spend 11 months in a Federal agency or a Congressional office. WDTS manages the Albert Einstein Distinguished Educator Fellowship Program for the Federal government. SC sponsors placement opportunities in WDTS and in Congressional offices. Other Federal agencies sponsor placement opportunities in their own offices. Participating agencies include the National Science Foundation, National Aeronautics and Space Administration, the Library of Congress, the Department of Defense, the U.S. Geological Survey, and

the Department of Homeland Security. The Fellows provide educational expertise, years of teaching experience, and personal insights to these offices to advance Federal science, mathematics, and technology education programs.

National Science Bowl®

The DOE National Science Bowl® is a nationwide academic competition testing students' knowledge in all areas of mathematics and science, including energy. High school and middle school students are quizzed in a fast-paced, question-and-answer format. Approximately 325,000 students have participated in the National Science Bowl® throughout its 33-year history, and it is one of the Nation's largest science competitions. WDTS manages the National Science Bowl® and sponsors the National Science Bowl® finals competition. Regional competitions rely upon volunteers and are supported by numerous local organizations, both public and private.

Technology Development and On-Line Application

This activity modernizes on-line systems used to manage application solicitations, review applications, and facilitate data collection, curation, and compilation to support evaluation for WDTS programs. A project to develop, build, and launch new online application and program support systems continues, with evolving new elements that improve accessibility to applicants, advance program oversight and assessment by WDTS program staff, and allow more efficient management and execution of programs by DOE laboratory staff.

Evaluation

This activity supports work to assess whether WDTS programs meet established goals. This is accomplished through triennial reviews of its program performers, of WDTS itself, and of program performance. These reviews involve peer reviews and Federal Advisory Committee-commissioned Committee of Visitors reviews. In addition, as an important part of assessing STEM workforce training programs, activities are supported to measure short-term program outcomes and assess longer-term program impact. The supported activities include the compilation and analysis of data and other materials, including pre- and post-participation surveys, participant deliverables, notable outcomes (publications, presentations, patents, etc.), and longitudinal participant tracking/outcome analysis. WDTS is also tracking and reporting how its programs, and activities at DOE labs and SC scientific user facilities, fulfill program goals and objectives. In support of the RENEW initiative, the knowledge, infrastructure, and capabilities built through the evaluation activity for the current WDTS programs is leveraged to help set the goals and craft strategies for assessing the new activities, in coordination with SC research programs and offices.

Outreach

WDTS engages in outreach activities, some in cooperation with other DOE program offices and select federal agencies, to widely publicize its opportunities. The WDTS website (https://science.osti.gov/wdts) is the most widely used tool for prospective program participants to obtain information about WDTS, and it provides a gateway to accessing the online applications for the WDTS programs. To help diversify the applicant pool and provide equitable access, outreach is conducted via multiple venues, with intentional brand messaging, such as hosting panels for and giving presentations to targeted stakeholder groups, sharing information with professional societies, and using virtual platforms to host internship and career fairs. WDTS leverages SC's social media resources to amplify the program opportunities to a broad range of stakeholders, including SC research grantees, scientific professional societies, HBCUs and other MSIs, and community colleges with a focus on emerging research communities. WDTS annually solicits proposals from DOE host laboratories and facilities to develop and execute outreach activities aimed at recruiting more diverse, equitable, and inclusive applicant and participant pools for WDTS laboratory-based programs, and to encourage WDTS program participants to pursue careers supporting the SC and DOE mission, including staffing needs at DOE national laboratories. The Laboratory Equipment Donation Program (LEDP) is operated under Outreach and provides excess laboratory equipment to STEM faculty at accredited post-secondary educational institutions. Through the General Services Administration Energy Asset Disposal System, DOE sites identify excess equipment, and colleges and universities can then search for equipment of interest and apply via the website. The equipment is free, but the receiving institutions pay for shipping costs.

Activities and Explanation of Changes

(dollars in thousands)

FY 2023 Enacted	FY 2025 Request	Explanation of Changes FY 2025 Request vs FY 2023 Enacted
Workforce Development for Teachers and Scientists **$42,000**	**$43,100**	**+$1,100**
Activities at the DOE Laboratories $35,000	$35,900	+$900
Science Undergraduate Laboratory Internship (SULI) *$15,700*	*$14,000*	*-$1,700*
Funding for SULI supports approximately 1,035 students with an increased allocation per participant. Over the years, the cost of supporting interns at DOE national laboratories has increased and the housing cost has more than doubled in many places. In addition, increased support is necessary to keep the program competitive in terms of the financial support (stipend and allowance for housing/travel) to individual interns in comparison to other internships programs (such as those supported by NSF and other agencies).	The Request for SULI will support approximately 923 students.	Funding will support 112 fewer students due to prioritizing other programs below.
Community College Internship Program (CCI) *$2,200*	*$2,300*	*+$100*
Funding for CCI supports approximately 167 students with an increased allocation per participant. Over the years, the cost of supporting interns at DOE national laboratories has increased and the housing cost has more than doubled in many places. In addition, increased support is necessary to keep the program competitive in terms of the financial support to individual interns in comparison to other internships programs (such as those supported by NSF and other agencies).	The Request for CCI will support approximately 174 students.	Funding will support 7 more students.

(dollars in thousands)

FY 2023 Enacted	FY 2025 Request	Explanation of Changes FY 2025 Request vs FY 2023 Enacted
Visiting Faculty Program (VFP) *$2,100*	*$2,100*	*$ —*
Funding for the VFP supports approximately 66 faculty and 32 students with an increased allocation per participant. Over the years, the cost of supporting visiting faculty members at DOE national laboratories has increased and the housing cost has more than doubled in many places. In addition, increased support is necessary to keep the program competitive in terms of the financial support to individual faculty members in comparison to similar programs.	The Request for the VFP will support approximately 66 faculty and 32 students.	No change.
Office of Science Graduate Student Research (SCGSR) Program *$5,000*	*$5,500*	*+$500*
Funding for the SCGSR program supports approximately 190 graduate students. Targeted priority research areas will be informed by SC's workforce training needs studies.	The Request for the SCGSR program will support approximately 168 graduate students. As the cost of living to conduct graduate thesis research at DOE national laboratories and program administration will continue to increase, increased support will be necessary to keep the program competitive in terms of the financial support to individual graduate awardees in comparison to similar programs. The Request supports a new international research collaboration allowance to provide opportunities for SCGSR awardees to access unique international expertise and/or instrumentation and gain hands-on experience conducting research in an international environment.	Funding will support about 14 more SCGSR participants as well as international research experience to equip U.S. graduate students with the skills and knowledge to succeed professionally in a globally competitive environment.

(dollars in thousands)

FY 2023 Enacted	FY 2025 Request	Explanation of Changes FY 2025 Request vs FY 2023 Enacted
Reaching a New Energy Sciences Workforce (RENEW) *$10,000*	*$12,000*	*+$2,000*
Funding supports continued implementation of the FY 2022 RENEW initiative and a planned growth of the existing workforce training programs/activities. Building upon the core science and technology capabilities at DOE national laboratories, the RENEW Pathway Summer Schools will enable equitable access to the best expertise and tools for discovery science driven learning in STEM. WDTS RENEW Pathways for faculty from underrepresented institutions will include 1) the expansion of the existing VFP program to non-summer terms for extended engagement for faculty capacity building in research and 2) the addition of a new parallel track for VFP with the goal of helping faculty enhance and innovate their STEM teaching at home institution for better STEM learning and preparedness in STEM. WDTS' RENEW pathways will build and strengthen partnerships between DOE national laboratories and MSIs, two-year colleges, and other colleges and universities nationwide.	The Request will support the RENEW initiative and a planned growth of the existing workforce training programs/activities. WDTS will continue support for the evaluation of SC RENEW traineeship programs and WDTS RENEW Pathway Summer Schools for High School and Early Undergraduate Students at DOE National Laboratories as well as the RENEW Pathways for faculty programs.	Funding will support an increase in the number of awards at MSIs and for individuals from emerging research communities, including the evaluation efforts for existing and new SC RENEW traineeship awards, the WDTS RENEW Pathway programs, and about 20 additional faculty to have extended research collaboration with DOE national laboratories for summer, fall, and spring terms.
Albert Einstein Distinguished Educator Fellowship $1,200	$1,200	$ —
Funding supports 6 Fellows.	The Request will support 5 Fellows due to increased cost for hosting Fellows and administrating programs.	The funding will support 1 fewer Fellow.

(dollars in thousands)

FY 2023 Enacted	FY 2025 Request	Explanation of Changes FY 2025 Request vs FY 2023 Enacted
National Science Bowl® $3,000	$3,100	+$100
Funding provides support to sponsor the National Finals and provide central management of over 110 virtual and in-person regional events, involving more than 14,000 students from all fifty states, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands.	The Request will support the National Finals and provide central management of over 110 virtual and in-person regional events, involving more than 14,000 students from all fifty states, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands.	The new venue for the National Finals in Leesburg, Virginia will have increased costs for staging and supply storage for the competitions, lodging, meals, and transportation.
Technology Development and On-Line Application $700	$700	$-
Funding continues development and operation of the on-line systems and support new development to meet the evolving needs of the programs.	The Request will continue development and operation of the on-line systems and support new development to meet the evolving needs of the programs. The online application and review system is the backbone infrastructure for the application, review, laboratory placement, award/participation management, outreach, and evaluation of WDTS workforce training programs at DOE national laboratories.	No change.

(dollars in thousands)

FY 2023 Enacted	FY 2025 Request	Explanation of Changes FY 2025 Request vs FY 2023 Enacted
Evaluation $600	$700	+$100
Funding supports a comprehensive evaluation portfolio with short- and longer-term projects for assessing WDTS program performance and producing knowledge to inform evidence-based management and evaluation practice.	The Request will support a comprehensive evaluation portfolio with short- and longer-term projects for assessing WDTS program performance and producing knowledge to inform evidence-based management and evaluation practice.	An increase of funding will establish and execute a comprehensive evaluation portfolio in support of workforce development programs and activities.
Outreach $1,500	$1,500	$ —
Funding supports outreach activity proposal solicitations from DOE host labs and facilities. WDTS will maintain support of activities such as those that promote diversity, equity, and inclusion; and/or prioritize recruitment of STEM students to DOE research and development workforce mission relevant fields of study, and particularly to fields related to SC research programs. Support continues for the LEDP program.	The Request will support outreach activity proposal solicitations from DOE host labs and facilities. WDTS will maintain support of activities such as those that promote diversity, equity, and inclusion; and/or prioritize recruitment of STEM students to DOE research and development workforce mission-relevant fields of study, and particularly to fields related to SC research programs. Support will continue for the LEDP program.	No change.