RWFI E-NOTE MONTHLY

REGIONAL WORKFORCE INITIATIVE • NOVEMBER 2021

Welcome Message

Greetings NETL RWFI stakeholders,

This month's funding in focus is a funding opportunity from the National Science Foundation with a focus of increasing and broadening the participation of students in careers in engineering. Also included in this month's E-note is a link to the latest *NETL Edge Magazine*, with an article describing how "NETL is taking an active role to ensure the next generation of energy workers are prepared to sustain the industries of tomorrow." And finally, as mentioned in last month's E-note, NETL RWFI hosted a webinar briefing of the regional and national results from the 2021 U.S. Energy and Employment Report (USEER). The presentation slides and a YouTube recording of the webinar can be found by visiting the NETL *RWFI Webinar Archives* site. The full 2021 USEER report can be found in the Reports and Resources section of this month's E-note.

As always, feel free to reach out to us at *NETL.RWFI@netl.doe.gov* if you have any suggestions for information to present in future E-notes.

Attached to this email is a hyperlinked PDF version of this note. If you would like to unsubscribe, please reply "unsubscribe" to this email.

– Sincerely, The NETL RWFI TEAM

Workforce Funding Announcements

FUNDING SPOTLIGHT

Broadening Participation in Engineering

National Science Foundation, Deadline, Jan. 28, 2022

Through the Broadening Participation in Engineering (BPE) Program, The National Science Foundation (NSF) seeks to strengthen the future U.S. engineering workforce by enabling and encouraging the participation of all citizens in the engineering enterprise. The BPE Program seeks to support not only research in the science of broadening participation and equity in engineering, but also collaborative endeavors which foster the professional development of a diverse and well-prepared engineering workforce. These synergetic efforts also facilitate innovative, if not revolutionary, approaches to building capacity through inclusivity and equity within the engineering academic experience.

FY22 Guidelines for Brownfield Assessment Grants

Environmental Protection Agency, Deadline, Dec. 1, 2021

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Brownfields Utilization, Investment, and Local Development (BUILD) Act (P.L. 115-141), requires the U.S. Environmental Protection Agency (EPA) to publish guidance for grants to assess and clean up brownfield sites. EPA's Brownfields Program provides funds to empower states, communities, tribes, and nonprofit organizations to prevent, inventory, assess, clean up, and reuse brownfield sites. This guidance provides information on applying for Assessment Grants.

FY22 Guidelines for Brownfield Revolving Loan Fund Grants

Environmental Protection Agency, Deadline, Dec. 1, 2021

The CERCLA, as amended by the BUILD Act (P.L. 115-141), requires the U.S. EPA to publish guidance for grants to assess and clean up brownfield sites. EPA's Brownfields Program provides funds to empower states, communities, tribes, and nonprofit organizations to prevent, inventory, assess, clean up, and reuse brownfield sites. This guidance provides information on applying for Revolving Loan Fund (RLF) Grants. Only eligible entities who do not have, or are not a part of (i.e., a coalition member), an open cooperative agreement for a Brownfields RLF at the time of application may apply for funding under this solicitation.

FY22 Guidelines for Brownfield Cleanup Grants

Environmental Protection Agency, Deadline, Dec. 1, 2021

The CERCLA, as amended by the BUILD Act (P.L. 115-141), requires the U.S. EPA to publish guidance for grants to assess and cleanup brownfield sites. The EPA's Brownfields Program provides funds to empower states, communities, tribes, and nonprofit organizations to prevent, inventory, assess, cleanup, and reuse brownfield sites. This guidance provides information on applying for Cleanup Grants. Entities applying for a FY22 Cleanup Grant may not apply for an FY22 RLF Grant (EPA-OLEM-OBLR-21-05).

Centers of Research Excellence in Science and Technology (CREST) and HBCU Research Infrastructure for Science and Engineering (HBCU-RISE)

National Science Foundation, Deadline, Dec 3, 2021

The Centers of Research Excellence in Science and Technology (CREST) program provides support to enhance the research capabilities of minority-serving institutions (MSIs) through the establishment of centers that effectively integrate education and research. MSIs of higher education denote institutions that have undergraduate enrollments of 50% or more (based on total student enrollment) of members of minority groups underrepresented among those holding advanced degrees in science and engineering fields:

African Americans, Alaska Natives, American Indians, Hispanic Americans, Native Hawaiians, and Native Pacific Islanders. CREST promotes the development of new knowledge, enhancements of the research productivity of individual faculty, and an expanded presence of students historically underrepresented in STEM disciplines. CREST Postdoctoral Research Fellowship (PRF) awards provide research experience and training for early career scientists at active CREST Centers. HBCU-RISE awards specifically target HBCUs to support the expansion of institutional research capacity, as well as the production of doctoral students, especially those from groups underrepresented in STEM at those institutions.

Industry-University Cooperative Research Centers Program

National Science Foundation, Deadline, Dec. 8, 2021

The IUCRC program catalyzes breakthrough pre-competitive research by enabling close and sustained engagement between industry innovators, world-class academic teams, and government agencies. IUCRCs help industry partners and government agencies connect directly and efficiently with university researchers to achieve three primary objectives:1) Conduct high-impact research to meet shared and critical industrial needs in companies of all sizes; 2) Enhance U.S. global leadership in driving innovative technology development, and 3) Identify, mentor and develop a diverse, highly skilled science and engineering workforce

University Based Cybersecurity Centers

National Energy Technology Laboratory, Deadline, Dec. 8, 2021

This funding opportunity announcement seeks to establish a network of university-based, regional electric power cybersecurity centers. These centers should address interrelated research and development challenges of cybersecurity and critical energy infrastructure, while considering the distinctive characteristics of each region's electricity system, network of infrastructure, and workforce expertise. NETL envisions that this initiative will result in multiple new tools and training for the energy sector.

Improving Undergraduate STEM Education: Education and Human Resources (IUSE:EHR)

National Science Foundation, Deadline, Jan. 19, 2022

The STEM fields hold much promise as sectors of the economy where we can expect to see continuous vigorous growth in the coming decades. STEM job creation is expected to outpace non-STEM job creation significantly, according to the Commerce Department, reflecting the importance of STEM knowledge to the US economy. The NSF plays a leadership role in developing and implementing efforts to enhance and improve STEM education in the United States. Through the NSF IUSE initiative, the agency continues to make a substantial commitment to the highest caliber undergraduate STEM education through a Foundation-wide framework of investments. The IUSE: EHR is a core NSF STEM education program that seeks to promote novel, creative, and transformative approaches to generating and using new knowledge about STEM teaching and learning to improve STEM education for undergraduate students.

Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (INCLUDES)

National Science Foundation, Deadline, Jan. 25, 2022

In 2016, the NSF unveiled a set of "Big Ideas," 10 bold, long-term research and process ideas that identify areas for future investment at the frontiers of science and engineering (see *here*). The Big Ideas represent unique opportunities to position our nation at the cutting edge of global science and engineering leadership by bringing together diverse disciplinary perspectives to support convergence research. As such, when responding to this solicitation, even though proposals must be submitted to the EHR Directorate/ Division of Human Resource Development (HRD), once received, the proposals will be managed by a cross-disciplinary team of NSF Program Directors. The NSF INCLUDES Big Idea is a comprehensive national initiative to enhance U.S. leadership in STEM discoveries and innovations focused on NSF's commitment to diversity, inclusion, and broadening participation in these fields. The vision of NSF INCLUDES is to catalyze the STEM enterprise to work collaboratively for inclusive change, resulting in a STEM workforce that reflects the population of the nation.

Environmental Convergence Opportunities in Chemical, Bioengineering, Environmental, and Transport Systems

National Science Foundation, Deadline, Jan 31, 2022

Creating effective solutions to our most pressing environmental and sustainability challenges requires imaginative thinking - the kind that evolves when researchers from disparate fields, expertise, or perspectives fully immerse themselves in work toward a common goal. The National Academies of Sciences, Engineering and Medicine (NASEM), in their report "*Environmental Engineering for the 21st Century: Addressing Grand Challenges*," identified five critical challenges we must address as a society: sustainably supply food, water, and energy; curb climate change and adapt to its impacts; design a future without pollution and waste; create efficient, healthy, and resilient cities; and foster informed decisions and actions. The report further states, "The challenges provide focal points for evolving environmental engineering education, research, and practice toward increased contributions and a greater impact. Implementing this new model will require modifications in educational curriculum and creative approaches to foster interdisciplinary research on complex social and environmental problems." This solicitation will support projects that tackle these grand challenges using a *convergent research model* that seamlessly integrates fundamental knowledge and expertise from the fields of chemical process, transport, and biological science and engineering with that of the sustainability and environmental engineering fields.

NETL News

NETL Releases Fall Edition of Water-Energy Nexus News

NETL's ongoing water-energy research projects, including efforts to extract critical minerals (CMs) from water and other waste streams in support of the Administration's work to revitalize coal, oil and gas, and powerplant communities impacted by the transition to clean energy, are highlighted in the latest edition of Water-Energy Nexus News. The newsletter recaps a presentation by Mengling Stuckman, Ph.D., in which she discussed the Lab's research to support sustainable, domestic CM recovery from energy production waste streams. In remarks at a Pennsylvania Independent Oil and Gas Association water and waste management seminar, Stuckman explained how NETL's efforts could help the U.S. end its reliance on foreign countries to obtain CMs.

U.S. Department of Energy (DOE) Announces $14.5 Million Supporting Direct Air Capture and Storage for Low Carbon Energy Sources

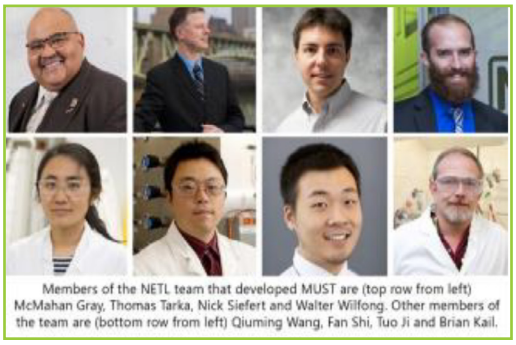
Funding Addresses Urgent Need for Global Leadership and Collaboration on Deployment of Durable Carbon Dioxide Removal. The U.S. DOE today announced $14.5 million in available funding to leverage existing low-carbon energy to scale-up direct air capture (DAC) technology combined with reliable carbon storage. DAC, a carbon dioxide removal approach, is a process that separates CO_2 from ambient air. The separated CO_2 can then be safely and permanently stored deep underground or converted into products. DAC is considered a growing and necessary field that still requires significant investments to create a cost-effective and economically viable technology that can be deployed at scale in the commercial CO_2 market. Advancing the deployment of DAC approaches is critical to combatting the current climate crisis and achieving net-zero emissions by 2050 — a key priority for the Biden-Harris Administration.

Helping to Ensure Successful Geologic Carbon Storage with CO_2-SCREEN

To meet aggressive decarbonization goals set by the Biden Administration in the fight against climate change, NETL has developed toolsets such as the Lab's CO_2- Storage prospeCtive Resource Estimation Excel aNalysis (SCREEN) to advance carbon capture and storage (CCS) technology development and deployment. CO_2-SCREEN provides reliable and accurate CO_2 storage estimates for a wide variety of geological formations, allowing governments, industries and other stakeholders, including local communities, to confidently explore geologic carbon sequestration (GCS) options that will help achieve net-zero carbon emissions in the electric sector by 2035 and the broader economy by 2050.

NETL's Energy Data eXchange Sees 10 Years of Excellence

The Energy Data eXchange (EDX), an NETL-developed virtual library and data laboratory built to advance fossil energy and environmental research and development (R&D), celebrates its 10th anniversary this month. EDX supports the entire lifecycle of data by offering secure, private collaborative workspaces to help scientists maximize their research potential and further critical technology advancements. The virtual tool has seen wide success since its inception and is in a prime position to support the artificial intelligence and machine learning big data revolution currently under way


Members of the NETL team that developed MUST are (top row from left) McMahan Gray, Thomas Tarka, Nick Siefert and Walter Wilfong. Other members of the team are (bottom row from left) Qiuming Wang, Fan Shi, Tuo Ji and Brian Kail.

.*NETL Researchers Earn R&D 100 Award for Sorbent Technology*

The NETL research team behind the development of Multi-functional Sorbent Technology (MUST) has earned a prestigious R&D 100 Award for its game-changing suite of low-cost, versatile sorbents that is

highly effective in cleaning contaminated waterways and removing metals from electronic and pharmaceutical production processes. The MUST team, which was named a winner in the Mechanical/Materials category during a virtual awards ceremony held Wednesday, Oct. 20, is led by NETL's McMahan Gray, a physical scientist in the Materials Engineering & Manufacturing directorate. Other team members are Walter Wilfong, Qiuming Wang, Fan Shi, Tuo Ji, Thomas Tarka, Nicholas Siefert and Brian Kail. Click *here* to watch a video about their revolutionary technology.

Latest Edition of NETL Edge Is Now Available

NETL presents the latest edition of its publication that showcases research on emerging energy technologies. NETL Edge shares the latest developments the Lab's mission to drive innovation and deliver solutions for an environmentally sustainable and prosperous energy future. In this issue, we feature key research and technology development in decarbonization. Check out the newly released edition of NETL Edge to learn more about the Lab's proposed Direct Air Capture Test Center, how NETL is supporting efforts to address regional worker shortages and climate simultaneously, and our work to develop efficient, cost-effective technologies to convert carbon dioxide into chemical building blocks, such as formic acid that can function as a liquid hydrogen carrier. See more here.

Reports and Resources

Good Jobs That Pay Without a BA

Georgetown Center on Education and the Workforce

The blue-collar economy conjures images of shuttered factories and the disappearance of good jobs. Those images reflect the suffering among blue-collar workers left behind by the shift away from an economy based in manufacturing, but they do not tell the whole story. In fact, we find that there are still 30 million good jobs that do not require a bachelor's degree.

Three Educational Pathways to Good Jobs

Georgetown Center on Education and the Workforce

In the post-World War II period, workers with a high school diploma or less were able to attain jobs with middle-class wages in American industry. Good jobs1 were available in manufacturing and other blue-collar industries that employed large numbers of high school educated workers. But as automation, globalization, and related phenomena have led to major structural changes in the American economy, economic opportunity has shifted toward more educated workers with higher skill levels.

Appalachia Envisioned: A New Era of Opportunity

Appalachian Regional Commission

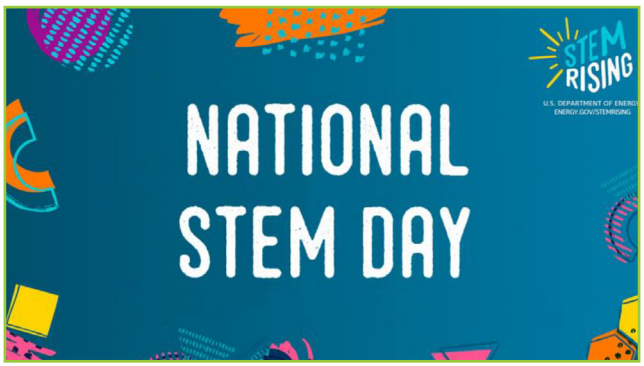
Throughout 2021, the Appalachian Regional Commission (ARC) hosted community conversations, focus groups, and a public survey to gather input and affirm an investment framework to meet Appalachia's economic needs. Approximately 2,000 participants shared insights on the strengths, challenges, and opportunities facing communities, along with ideas to advance economic prosperity. This feedback has been transformed into ARC's new strategic plan, *Appalachia Envisioned: A New Era of Opportunity*, and will guide ARC's work to innovate, partner, and invest in the Appalachian Region.

U.S. Energy and Employment Report (USEER) 2021

Department of Energy

The USEER began in 2016 at the recommendation of the first DOE Quadrennial Energy Review to better track and understand employment within key energy sectors that have been difficult to impossible to follow using other publicly available data sources. The study combines surveys of businesses with public labor data to produce estimates of employment and workforce characteristics. Since 2016, when DOE first began tracking energy employment in the United States, the sector grew more than six percent by the end of 2019, responsible for 8.4 million jobs. Prior to the coronavirus pandemic, the energy sector had been one of the country's fastest growing job markets. From 2015 to 2019, the annual growth rate for energy employment in the United States was 3% — double compared to 1.5% in the general economy.

DOE STEM Rising



Eight Awesome STEM Programs You Might Not Know About

You hopefully have some of our STEM programs on your radar, such as our *Solar Decathlon*, *National Science Bowl*, *Science Undergraduate Laboratory Internships* and *Community College Internships*. However, there are hundreds more programs out of the national laboratories and program offices. At the link above, please find a list of eight of these programs.

DOE's National Labs are Shining a Light on Dark Matter, One Particle at a Time

The Milky Way is just one galaxy of an estimated hundreds of billions of others in the Universe. Yet, the combination of stars, exoplanets, comets, asteroids, and space dust within these galaxies is believed to make up only 5% of total matter and energy in the Universe. The other 95%? Dark energy and *dark matter* — an obscure substance only identified through its gravitational interactions with ordinary matter.

ABOUT NETL

NATIONAL ENERGY TECHNOLOGY LABORATORY

NETL, owned and operated by DOE, is one of the Department's 17 National Laboratories. NETL supports DOE's mission to advance the national, economic, and energy security of the United States.

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