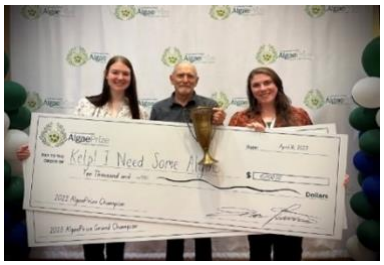
APRIL - JUNE 2023

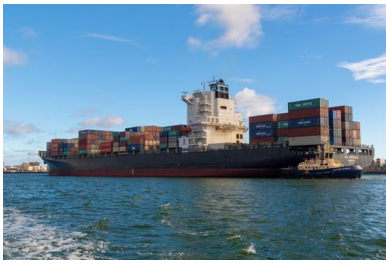
U.S. Department of Energy

Bioenergy Technologies Office

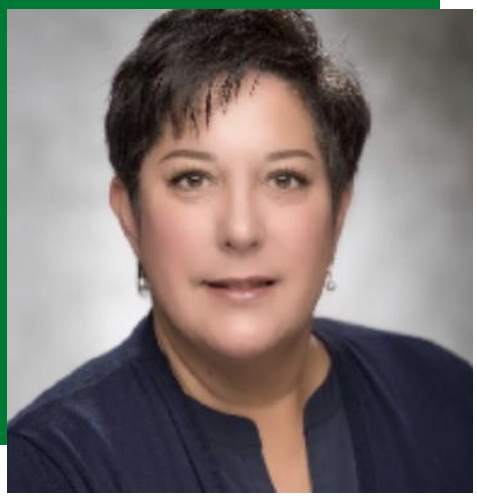
Quarterly Newsletter

IN THIS EDITION





MESSAGE FROM THE DIRECTOR



Dr. Valerie Sarisky-Reed is the director of the Bioenergy Technologies Office (BETO) in the Office of Energy Efficiency and Renewable Energy (EERE). In this role, she manages efforts to improve performance, lower costs, and accelerate market entry of bioenergy technologies. Working with the U.S. Department of Energy's (DOE) national laboratories, academia, and industry, Dr. Reed oversees strategic planning to meet the goals covered by the BETO research and development portfolio.

"Transitioning to a sustainable, net-zero greenhouse gas emissions economy in America will only be possible by embracing the clean energy biofuels provide."

- Dr. Valerie Sarisky-Reed

ABOUT BETO

BETO supports the research, development, and demonstration (RD&D) of technologies aimed at mobilizing domestic renewable carbon resources for the reduction of greenhouse gas (GHG) emissions across the U.S. economy. BETO's overall strategic goals are to:

- Decarbonize the transportation sector through RD&D to produce cost-effective, sustainable aviation and other strategic fuels.
- Decarbonize the industrial sector through RD&D to produce cost-effective and sustainable chemicals, materials, and processes utilizing biomass and waste resources.
- Develop cost-effective, sustainable biomass and waste utilization technologies and innovative approaches contributing to the decarbonization of the agricultural sector, generating carbon-negative power, developing carbon drawdown strategies, or other beneficial uses.

Read about how BETO is impacting the bioeconomy and taking steps to meeting these goals, which require significant and rapid advances in technology development and innovation across the entire biomass-to-bioenergy supply chain.

Learn more about the Bioenergy Technologies Office at energy.gov/bioenergy.

TOP STORIES

Clean Fuels & Products Energy Earthshot Launched

In May, Energy Secretary Jennifer Granholm announced the launch of the Clean Fuels & Products Shot™, the seventh of the Energy Earthshots™ Initiative series. This Shot aims to reduce GHG by eliminating up to 650 million metric tons of carbon dioxide per year by 2050 from fuels and products.

The announcement was held at a ribbon-cutting ceremony for the newly expanded Biomass Feedstock National User Facility at Idaho National Laboratory. The facility is a BETO-funded center for rapid technology development and large-scale commercialization of biofuels and bioproducts. Read more

2023 Project Peer Review Showcased Latest Bioenergy Research & Technology

In April, BETO hosted its annual Project Peer Review in Denver, CO, providing a forum for scientists and researchers to present their findings on more than 280 BETO-supported and funded projects.

Projects were reviewed by more than 50 external subject-matter experts from industry, academia, and federal agencies. Project presentations are available on BETO's website.

BRIDGES Portal Launched to Provide Educators Access to Bioenergy Research Curriculums

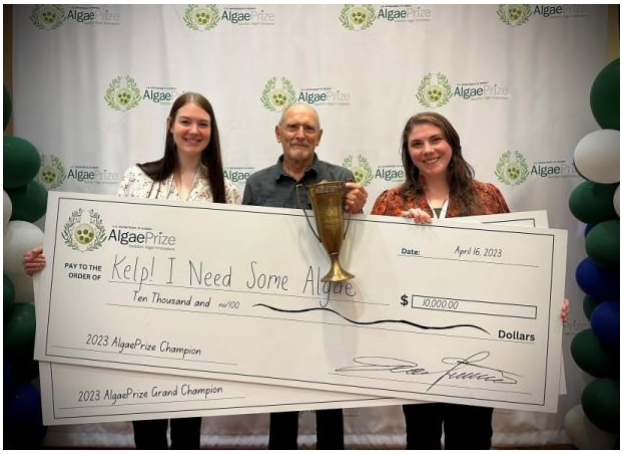
BETO, in collaboration with Argonne National Laboratory and Idaho National Laboratory, released a new case study-based education curriculum program to introduce the bioenergy field to students from high school to university levels. Available case studies include four bioenergy themes: sustainable aviation fuel, plastic upcycling, regional feedstocks, and waste-to-energy. Learn more

Bioenergy Research and Education
BRIDGES
U.S. Department of Energy Bioenergy Technologies Office

TOP STORIES

DOE Announced 2022 - 2023 AlgaePrize Competition Winners

In mid-April, BETO, in partnership with the Algae Foundation and National Renewable Energy Laboratory, completed the first-ever AlgaePrize, a student competition featuring 64 student teams and 307 competitors from high schools, colleges, and universities across the United States to showcase innovative solutions for algal biofuels and bioproducts. Following student presentations, a panel of judges selected the top four finalist teams and a grand champion. Find out which teams won.

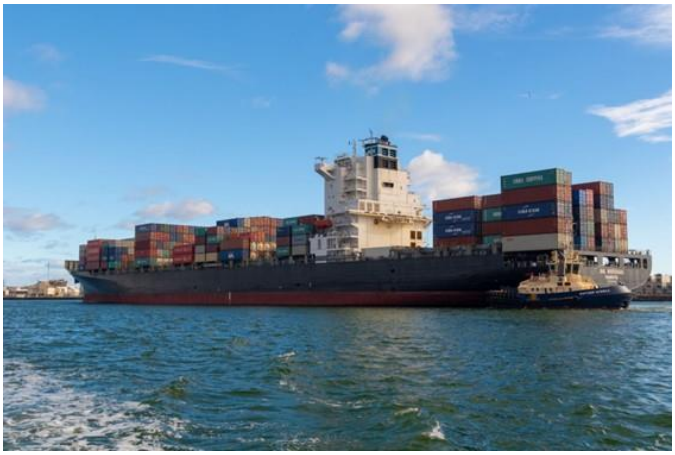


BETO Launched Renewable Carbon Resources Webpages

BETO recently launched new webpages covering background, updates, and activities related to its Renewable Carbon Resources (RCR) subprogram. The RCR subprogram develops strategies and supports technology development to mobilize RCR for the production of biofuels and bioproducts. Learn more

RFI Released on the Progression of Clean Fuels in the Shipping Industry

To advance the decarbonization of worldwide shipping, BETO released a Request for Information (RFI) seeking to understand the maritime industry's current alternative fuels trajectory, the driving forces behind it, and key barriers to achieving the transition to zero-emission fuels. **Response deadline extended to August 18, 2023**. Learn more and respond today.



FUNDING OPPORTUNITY ANNOUNCEMENTS

BETO develops industrially relevant, transformative, and revolutionary bioenergy technologies to enable sustainable, domestically produced biofuels, bioproducts, and biopower that can improve our energy security, reliability, and resilience while creating economic opportunities across the United States.

The office selects research and development (R&D) projects through open and competitive procurements called funding opportunity announcements (FOA), and encourages collaborative partnerships with industry, universities, national laboratories, federal, state, and local governments, and non-government agencies. Current and past funding opportunities include:

Open Funding Opportunities

Department of Energy Announces $4 Million to Reduce Wood Heater Pollutants and Accelerate Innovative Technology

DOE, in partnership with Brookhaven National Laboratory and Lawrence Berkeley National Laboratory, announced $4 million in funding through a Cooperative Research and Development Agreement (CRADA). Up to four projects will be selected that will develop and validate the performance of innovative wood heater technologies over the duration of up to 18 months.

The deadline to submit a concept paper is **August 11, 2023**, and final proposals are due **November 3, 2023**. Learn more

Past Funding Opportunities

DOE Announced $3 Million for Waste-to-Energy Community-Driven Solutions

In May 2023, DOE awarded $3 million in funding for two community waste-to-energy processes and infrastructure projects: National Rural Electric Coop Association Research in Virginia and Upper Salinas – Las Tablas Resources Conservation District in California. Read more

Three Projects Selected for Funding from DOE's Agile BioFoundry & Minority-Serving Institutions STEM Research & Development Consortium

In June 2023, BETO awarded $1 million to three projects at minority-serving institutions (MSI) to accelerate U.S. biomanufacturing sector growth. Selections were made in partnership with the MSI STEM Research & Development Consortium and will be funded by Agile BioFoundry. The selected projects are focused on leveraging novel microbial hosts; augmentations of titer, rate, and yield of bioproducts; and design approaches to the biomanufacturing cycle. Read more

NEW TECHNICAL REPORTS & PUBLICATIONS

Artificial Intelligence and Machine Learning for Bioenergy Research: Opportunities and Challenges

Released in April 2023, this report includes takeaways from an August 2022 workshop on bioenergy artificial intelligence and machine learning. During the workshop, BETO and DOE's Biological and Environmental Research Program brought together 50 scientists with various backgrounds to identify challenges and opportunities associated with artificial intelligence and machine learning in biosystems design and bioprocessing technologies. Read the report

Wood Heater Design Challenge Workshop Report

Released in May 2023, this report includes updates from the Fifth Annual Wood Heater Design Challenge. The three virtual workshops were held throughout 2022 that convened more than 100 national and international wood heater manufacturers, non-profits, and government agencies, as well as researchers, policy makers, and academia. The report summarizes updates on wood heater technologies as a renewable energy source for local communities. Read the report

BIOPROSE: BIOENERGY R&D SUCCESS STORIES

BETO's Bioprose: Bioenergy R&D Blog is a key resource for scientific information on the U.S. bioeconomy. The blog provides technical information on how BETO and its national lab partners sustainably develop biofuels, biopower, and bioproducts, and communicates how researchers are enhancing U.S. energy security and competitiveness. Below are the staff members and projects featured last quarter.

Photo to right: Lawrence Berkeley National Laboratory Advanced Biofuels and Bioproducts Process Development Unit

DOE Collaborative to Establish a Biomanufacturing Hub in Historically Underserved California Region

By Katy Christiansen, Lawrence Berkeley National Laboratory

The National Science Foundation awarded $1 million to the Circular Bioeconomy Innovation Collaborative – led by Lawrence Berkeley National Laboratory; University of California, Merced; and BEAM Circular – to develop actionable and strategic plans to create an innovation campus and ecosystem in the historically underserved Northern San Joaquin Valley of California. The project will focus on biomanufacturing technologies. Read more

Meet Three NREL Scientists Working to Unlock the Full Energy Potential of Algae

By Zia Abdullah, National Renewable Energy Laboratory

Algae turn sunlight and carbon dioxide into biochemical energy. Research and analysis by National Renewable Energy Laboratory (NREL) scientists Jianping Yu, Stefanie Van Wychen, and Tao Dong are advancing how algae are produced and ultimately transformed into the next generation of sustainable fuels and products. Read more

Novel Analytical Workflow Accelerates Biomanufacturing Research

By Gayle Bentley, BETO

As innovations in synthetic biology, genome editing, and DNA synthesis have accelerated biomanufacturing research over the past few decades, demand for faster analytical tools for molecular phenotypic analysis has increased. A new workflow developed by Agile BioFoundry national laboratory researchers and Agilent Research Laboratories combines state-of-the-art analytical technologies with a machine learning-based algorithm. Read more

CONSORTIA NEWS

ChemCatBio: Perspectives on Engineered Catalyst Design and Forming Webinar

On June 14, the Chemical Catalysis for Bioenergy Consortium (ChemCatBio) hosted a public webinar to examine perspectives on engineered catalyst design and forming. Speakers included expert staff from Oak Ridge National Laboratory, National Renewable Energy Laboratory, and Clariant, who addressed critical considerations for the engineered catalyst, industrial perspectives, and industry-formed capabilities that support the transition to more commercially relevant catalyst forms. The webinar recording and presentation slides are available on the ChemCatBio website.

Co-Optima Initiative: Researchers Find New Blends for Greener Gas in DOE Co-Optima Research

DOE's CO-OPTIMIZATION OF FUELS & ENGINES (Co-Optima Initiative) selected and recommended 10 different bio-blendstocks that could be used to make gasoline burn cleaner, more efficiently, and with lower GHG emissions. Researchers found prenol to be the leading candidate, and focused research on its viability as a commercial gasoline. Two papers have since been published on the value and formulation of prenol. Learn more

Bioprocessing Separations Consortium: Three-Year Update

Over the last three years, BETO's Bioprocessing Separations Consortium, has shown that separations technology is critical to converting biomass to low-carbon biofuel. It recently released its three-year project update, which describes their capabilities and activities and summarizes project progress. Learn more

BOTTLE Consortium: Chemists Create 'Dream' Biodegradable Plastics

With support from the Bio-Optimized Technologies to keep Thermoplastics out of Landfills and the Environment (BOTTLE) Consortium, Colorado State University polymer chemists created a polyhydroxyalkanoates (PHA) platform, or chemical recycling method, that addresses pervasive issues with durability, convenience, and recycling. Read more

Creative Chemistry Offers Solutions for Recycling Mixed Plastics

With support from the BOTTLE Consortium, investigators from Colorado State University and Columbia University derived a new chemical recycling method that works by delivering dynamic crosslinkers into mixed plastics streams. Read more

UPCOMING EVENTS

Virtual Workshop: Bioenergy Cybersecurity

September 11, 2023

Learn more and register today to discuss the state of biofuel/ bioproduct cybersecurity practices, including securing bio-based processes, cybersecurity technologies, and research.

Two-Day Webinar Series: Biocarbon Incorporation into Transportation Fuels via Co-Processing in Refineries

September 20 & 27, 2023

BETO-hosted webinar series to highlight the key takeaways from the Bio-oil Co-processing with Refinery Streams project. Learn more and register today.

PAST EVENTS

Webinar: DOE's Progress Towards Meeting the Goals of the Sustainable Aviation Fuel Grand Challenge

February 22, 2023

View recording and download presentations

Biomass Feedstock National User Facility Expansion Ribbon-Cutting Ceremony

May 24, 2023

Read more and download presentations

Workshop: Deploying Purpose-Grown Energy Crops for Sustainable Aviation Fuel

June 6 - 7, 2023

Read more and download presentations

Workshop: Transitioning to a Sustainable, Circular Economy for Plastics

June 8 – 9, 2023

Read more and download presentations

Virtual Workshop Series: Bioprocessing Separations Consortium Bioenergy Bridge to Career Program

July 14 – August 4, 2023

Undergraduate STEM students participated in this event over four consecutive Fridays. Learn more

Workshop: Agile BioFoundry Industry Listening Day

July 31, 2023

Learn more about the Agile BioFoundry's capabilities and potential opportunities to engage in joint research efforts.