

Bioenergy Research and Education Bridge Program Prepares a National Bioenergy Workforce

The U.S. Department of Energy (DOE) Bioenergy Technologies Office (BETO) Bioenergy Research and Education Bridge (BRIDGES) is an education and workforce development program designed to assist educators in teaching bioenergy topics to help prepare a national bioenergy workforce.

BRIDGES creates partnerships with high schools, community/technical colleges, and universities to utilize and develop educational case studies aligned to the needs of the bioenergy industry workforce. The bioenergy-themed case studies are based upon foundational bioenergy research at DOE national laboratories. Specific goals for the BRIDGES program include:

- Translate scientific research for the classroom
- Create awareness of bioenergy topics and careers
- Ease the transition from academics to industry
- Provide equitable access to high-quality bioenergy learning materials.



Signing Ceremony for the Memorandum of Understanding (MOU) establishing the Idaho National Laboratory partnership with the Shoshone-Bannock Tribes setting the stage for the BRIDGES waste-to-energy case study. *Photo from Idaho National Laboratory.*

Delivering Equitable Bioenergy Education through the BRIDGES Program

To support Diversity, Equity, and Inclusion (DEI), the BRIDGES program allows for place-based learning and culturally responsive teaching. The case studies draw inspiration from BETO's science and technology research for long-term adaptation, resiliency, and sustainable practices and policies for historically marginalized U.S. communities.

BRIDGES integrates feedback from minority-serving institution partners in the design and piloting of its case studies through the BETO BRIDGES National Review Board (see below).

BRIDGES case studies include a series of authentic learning experiences developed by the BRIDGES team to provide equitable access to bioenergy education. The case studies can be used as part of a biology, environmental science, or chemistry course in a high school, community/technical college, or university setting.

BRIDGES Case Studies

Explore case study topics below and learn how they are implemented in a classroom.

- **Farm to Flight: Are Sustainable Aviation Fuels Good for The Environment?**
Life cycle analysis of greenhouse gas emissions for biofuels versus petroleum fuel.
- **Upcycling: Could My Plastic Bag Someday Be the Sustainable Alternative?**
Investigate how chemists find new ways to upcycle plastics for a circular economy.
- **Regional Feedstocks: Are They the Answer to Achieving a Net Zero Future?**
Evaluate regional biomass and waste resources for conversion to transportation biofuels.
- **Municipal Solid Waste-to-Energy: Traditional Ecology and Environmental Justice**
Explore how the Shoshone-Bannock Tribes could transform their solid waste stream into biofuels and other products.



Students engaging on coursework at Waubensee Community College. Photo courtesy of Waubensee Community College.

Prepare the Bioenergy Workforce through Authentic Learning Case Studies

As a workforce development tool, the BRIDGES case studies help educate the U.S. bioenergy workforce through equitable and authentic learning—where students explore bioenergy research that solves urgent and relevant societal challenges in energy and the environment.

Students take on a career role and use real data and authentic resources. They apply professional skills to propose solutions to the challenge. Learning experiences include career exploration of science, technology, engineering, and mathematics (STEM) and STEM-adjacent careers in bioenergy.

Students engaging on coursework at Waubensee Community College. Photo courtesy of Waubensee Community College.

Case Study Student and Instructor Guides

BRIDGES case studies include comprehensive student and instructor guides, making it simple for instructors with no prior bioenergy experience to lead students through the learning experience.

Students first learn about bioenergy topics by engaging with provided

resources, then apply this knowledge in an authentic scenario designed by education professionals with the input of scientific and industry advisors.

Bridges National Review Board

Stakeholders are engaged through the BETO National Review Board to provide feedback at many stages, they include:

Education and Community Partners

Education and community board members provide feedback on case study design, appropriateness to courses and diverse students, as well as facilitate piloting materials in classrooms.

- Waubensee Community College
- Moraine Valley Community College
- Northeastern Illinois University
- Allegheny College
- Learning Blade
- Shoshone-Bannock Tribes
- College of Eastern Idaho
- Haskell Indian Nations University

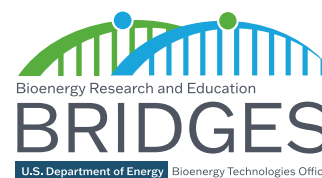
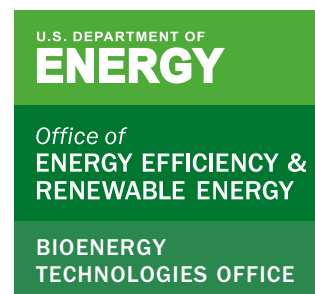
Industry and Government Partners

Industry partners help develop scenarios for the case studies and review materials for authenticity.

- Chevron-Phillips Chemical
- United Airlines
- GTI
- Ecostrat
- Battelle Memorial Institute

More Information

For questions about BRIDGES or if you are interested in partnering, please email Bioenergy_Bridges@ee.doe.gov. ■



For more information, visit: energy.gov/bridges

DOE/EE-2706 • March 2023