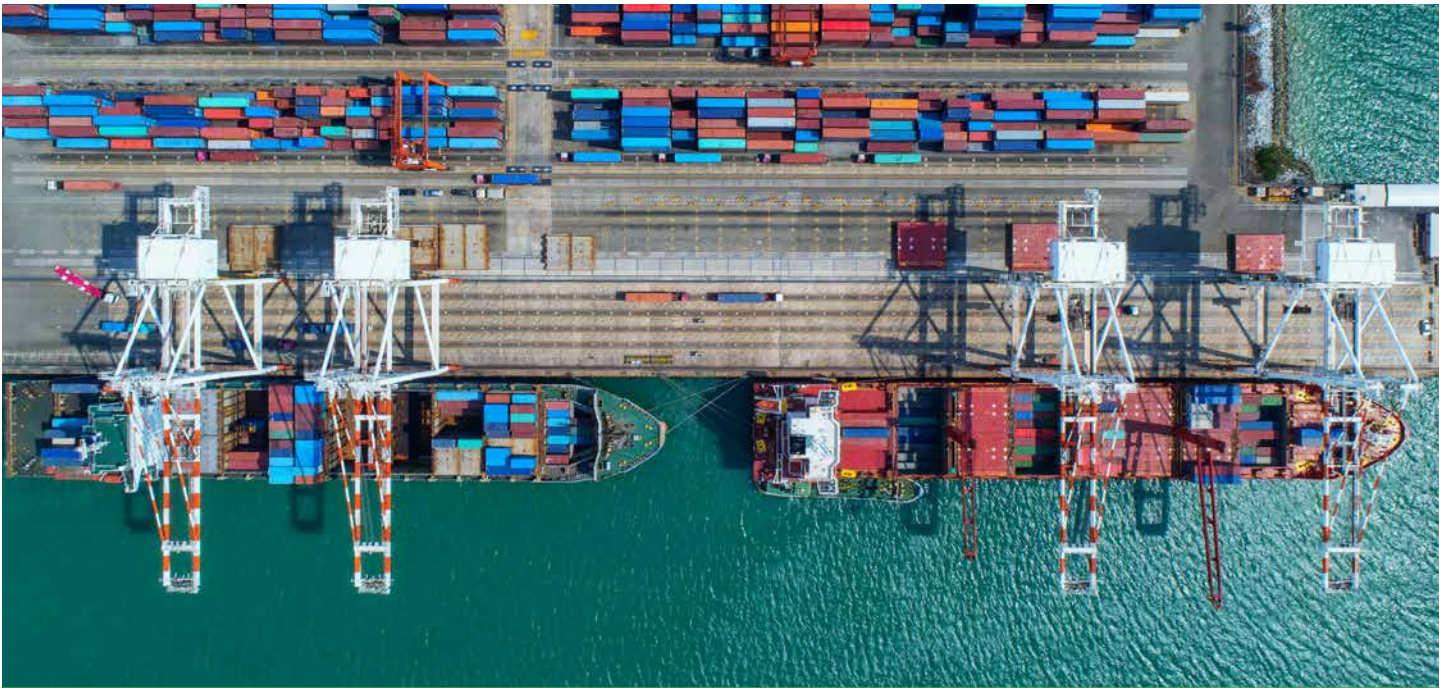# Regional Feedstocks: Are they the Answer to Achieving a Net Zero Future?

Bioenergy Research and Education Bridge (BRIDGES) Program Case Study Fact Sheet

According to the U.S Energy Information Administration (EIA), 28% of total U.S. energy consumption was for transporting people and goods. *Image from iStock 816609192.*

Student Introduction to the Challenges and Benefits of Biofuels for Transportation

In this case study, students will be introduced to the sustainability challenges facing the transportation industry as it meets the rising demands of air and marine travel and increasing fuel costs. Students will explore the potential of transportation biofuels, their impact on greenhouse gas emissions, as well as exciting careers in the bioenergy field.

Students will assume the role of an intern investigating the biomass-to-bioenergy value chain from harvest to conversion. Students will be challenged to research which regional feedstock is best suited for producing the highest quality fuel for the lowest cost and the best location for a biorefinery to help offset production costs and its carbon footprint.

Students will investigate the main types of biomass and waste resource materials and learn the ideal characteristics for conversion to biofuels. They will review biomass regional supply and biomass characterization data from the

BRIDGES Content Advisors

- Energy and Environment Science and Technology Department, Idaho National Laboratory

- U.S. Department of Energy (DOE) Bioenergy Technologies Office (BETO)

- DOE's BETO BRIDGES National Review Board

U.S. Department of Energy Bioenergy Technologies Office, including the Bioenergy Knowledge Discovery Framework (KDF) and Biomass Feedstock National User Facility (BFNUF).

Activity Highlights

- Eligible students and instructors will receive a classroom kit with biomass and waste resource samples and other hands-on learning materials.

- Materials are designed by scientists and industry professionals.

- Students will practice essential skills in synthesizing information, analyzing data, and communicating ideas.

- Students will learn about bioenergy-related career paths.

- No prior knowledge in bioenergy or biochemistry required.

Learning Goals

- Explain the economic, logistical, and scientific challenges of the biomass-to-bioenergy value chain.

- Describe how biofuels can help achieve net zero carbon emissions in transportation.

- Practice using primary sources in research.

- Explain how feedstock variability affects biofuel production.

- Explain how scientists are working to increase the feedstock quality.

- Analyze datasets on regional feedstocks and predict conversion performance.

- Describe the role and necessary skills for a senior research analyst working in the bioenergy industry.

Classroom Implementation

- Designed for use in a high school, community college, technical institute, or university courses.

- Requires approximately 3 hours to complete.

- Students will need computers with internet access.

- Can be taught in-person or online asynchronously.

- All instructional materials for students and instructors are provided.

About the BRIDGES Program

The Bioenergy Research and Education Bridge (BRIDGES) is an education and workforce development program designed to assist educators in teaching bioenergy topics to prepare a national bioenergy workforce. Funded by the U.S. Department of Energy (DOE) Bioenergy Technologies Office (BETO), the BRIDGES Program includes real-world case studies and scenarios with expertise from education and community partners as well as industry and government partners. Learn more at energy.gov/BRIDGES.

More Information

For questions about BRIDGES or if you are interested in partnering, please email Bioenergy_Bridges@ee.doe.gov. ■
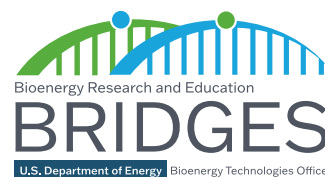
For more information, visit: energy.gov/eere/bioenergy/bioenergy-research-and-education-bridge-program