



Our Commitment to Sustainability

The **Biomass Program** is committed to developing biofuels that create a smaller environmental footprint than conventional fuels throughout their lifecycle—from biomass production to end use in vehicles. With our research partners, we are developing the resources, technologies, and systems needed to sustainably produce, harvest, transport, and convert a variety of biomass feedstocks. We honor our commitment to sustainability through our efforts to:



- Understand the relationship between bioenergy production and all aspects of sustainability, including economic, social, and environmental issues
- Determine life-cycle impacts of a major scale-up in biofuels production, from feedstocks to end-use in vehicles, addressing:
 - land use, habitat preservation, and soil health
 - water use and quality
 - air quality
 - impacts on greenhouse gas (GHG) emissions
- Improve understanding of regional climates, soil types, land use, and water issues as they relate to feedstock production
- Support the development of diverse, non-food feedstocks that require less water and fertilizer than conventional feedstocks
- Develop technology to efficiently harvest biomass while maintaining soil nutrients and limiting erosion
- Foster sustainable forestry practices to enhance forest health
- Evaluate environmental impacts of emerging biomass conversion technology and biofuel delivery infrastructure



Current Program Activities

Water: Performing comparative life-cycle assessment (LCA) of water requirements for the production of advanced biofuels, corn ethanol, sugar cane ethanol, and competing petroleum fuels

Feedstock production: Conducting in-field studies in collaboration with the U.S. Department of Agriculture, the Sun Grant Initiative universities, and other regional partners to determine the best locations for energy crops; developing tool to identify the amount of corn stover that should be left on the field to maintain healthy soil

Climate change: Conducting life-cycle assessment (LCA) of the Advanced Energy Initiative and expanding the GREET model to incorporate other pathways including sugar cane ethanol production

Indirect land use: Developing quantitative models of international land use changes associated with increased biofuels production to be used in life-cycle assessment

Biodiversity: Working with Conservation International to:

- Identify land that should not be developed into biofuel crops
- Conduct pilot studies to identify the best lands for biofuel crop production
- Employ standards for biofuel crop production to maintain biodiversity

Standards development:

- Participate in the Council for Sustainable Biomass Production (www.csbp.org) aimed at developing principles and standards for bioenergy feedstocks.
- Participate in the Federal Biomass Research & Development Board Interagency Sustainability working group charged with developing criteria and indicators for sustainable biofuel production

National Bioenergy Knowledge Discovery Framework

A national, GIS-based framework is under development to analyze the economic and environmental impacts of various development options for biomass feedstocks, biorefineries, and infrastructure. The Oak Ridge, Argonne, and Idaho National Laboratories are working in conjunction with university partners to develop this framework, which will support a variety of needs:

- Assess relevant resources and infrastructure at local, regional, and national scales
- Determine best locations for new feedstock production and processing facilities
- Evaluate the potential contribution of biofuels to meeting legislated renewable fuel production targets
- Protect air quality, water, land, and other resources



Our Vision

A viable, *sustainable*, domestic biofuels industry that:

- Produces renewable biofuels, bioproducts, and biopower
- Enhances U.S. energy security
- Reduces our dependence on oil
- Provides environmental benefits, including reduced greenhouse gas emissions
- Creates economic opportunities across the nation

