

IV. Bioenergy Research and Education

Section IV provides an inventory of bioenergy research and education activities in the South. Appendices C & D include a full list of research centers and education programs.

Research centers

A research center refers to any university, non-government organization (NGO), industry or government entities that conduct research in the field of bioenergy. In many cases, these centers include a training or education component. However, conducting bioenergy research remains their primary activity.

Each Southern state has a bioenergy research center. The centers in the South are mainly located in universities. NGO-run research centers are operational in four states (Florida, Mississippi, Oklahoma and South Carolina). Three states (Florida, Missouri, and Tennessee,) have industry-run research centers. Universities often partner with government or industry to facilitate bioenergy research. One example of an industry-university center is the partnership between BioEnergy International, LLC (“BioEnergy”), a developer of biorefineries and proprietary technologies, and the University of Florida. BioEnergy has an exclusive research agreement with the university to develop technologies to produce certain biorefined specialty chemicals from sugars and cellulose.

Southern centers have a focus on feedstock, technology and/or economics & policy. Almost all Southern states have research centers working in each of these focus areas. Some state’s research centers appear to be stronger in some areas than in others. For example, North Carolina and Missouri centers have strong technology focus, while Alabama and Louisiana centers focus more on feedstock research. Economics and policy research does not stand out as a key focus area in any of the Southern states.

Examples of some of the bioenergy research centers in the South include:

Arborgen (SC)

Arborgen is a South Carolina-based company focused on making working trees and commercial forests more productive. The company is advancing tree genetics that will most ideally suit the cellulosic ethanol industry. The company employs over 100 researchers in the United States, Brazil and New Zealand.

B3I: Biofuels, Biopower, and Biomaterials Initiative (GA)

B3I is a University of Georgia initiative that researches the genetic and molecular structure of potential bioenergy plants and microbes used in the conversion of biomass to fuel. The center also focuses on implementation of technologies to bring bioenergy to market. The initiative includes the Biorefining and Carbon Cycling Program which researches conversion technologies through an integrated biorefinery system.

BioEnergy Science Center (TN)

The BioEnergy Science Center (BESC) at Oak Ridge National Laboratory is one of three bioenergy science centers created by the Department of Energy. The Center's purpose is to develop cost-effective and sustainable means of producing biofuels from plants, and includes partnerships with over ten universities and companies. Researchers are focused on new technologies that can modify plant cell walls to reduce their resistance to breakdown, and the creation of a one-step process of turning biomass into biofuels.

Center for Bioenergy and Bioproducts (AL)

The Center for Bioenergy and Bioproducts at Auburn University is focused on economic development in Alabama by working to establish new bioenergy and bioproducts industries. The Center's research priorities include the development of new technologies to reduce the cost of bioenergy, the pursuit of biopower and biofuels through regionally appropriate feedstocks and technologies, the analysis of the entire bioenergy system, and the creation of partnerships across institutions and sectors.

Oklahoma Bioenergy Center (OK)

The Oklahoma Bioenergy Center is a virtual center initiated by the State of Oklahoma with the University of Oklahoma, Oklahoma State University, and the Samuel Roberts Noble Foundation. With the goal of increased investment in commercial-scale biorefineries, the Center represents a coordinated effort for research in the areas of crop development, crop production, transportation and logistics, and conversion technologies.

Sustainable Energy Research Center (MS)

The mission of the Sustainable Energy Research Center is to generate engineering and scientific knowledge, and to advance sustainable industries in the South and U.S. The Center performs interdisciplinary research on fuels, feedstocks, and economics and policy. Key objectives include promoting sustainable industries in Mississippi and researching new energy technologies.

A full inventory of Southern research centers can be found in Appendix C.

Education & training centers

Education and training centers include all institutions that either provide short/long term courses or degrees/diploma in bioenergy, or train bioenergy practitioners. These centers are also categorized by type of institution namely, university, industry, NGOs and government.

Several of the South's institutions of higher learning are rapidly developing undergraduate and graduate-level educational programs in the field of bioenergy. An example includes Biosucceed, an initiative geared towards developing the bioenergy workforce by the University of Tennessee in partnership with North Carolina State University and North Carolina Agricultural and Technical State University. The University of Tennessee Agricultural Experiment Station is developing a new academic curriculum and a complete Master of Science

degree program that can be delivered by the three University partners. Course work will be delivered through classroom courses or distance education. This program is supported by a USDA grant and aims to develop six graduate level classes, two undergraduate classes, and modules that can be part of individual classes. It is envisaged that these classes will be offered at no cost to the national biomass community for customization by any institution around the country.

Bioenergy training and workforce development is also occurring at community colleges like Central Carolina Community College (CCCC) in North Carolina. CCCC offers workshops, continuing education programs, and curriculum programs to suit the needs of students and industry. It recently developed a two-year biofuels technology training program. In the fall of 2008, CCCC began offering an associate degree in Alternative Energy Technology: Biofuels. CCCC plans to work with new plant developers to train the workforce needed in their projects.

An inventory of education and training centers can be found in Appendix D.