Bioenergy

Cellulosic ethanol
Energy crops
Carbon credits

25 x '25
Wood pellets for co-firing power plants
Net metering
Gasification

This is some of the diverse vocabulary being used in many of the important local, national and global discussions on bioenergy. The SFRC is deeply involved in these discussions because forest biomass is a promising source of energy for electricity, heating and transport fuels. In particular, energy from forests has the potential to help:

• Reduce reliance on traditional energy sources like coal and oil;
• Promote rural economic development by keeping dollars spent on woody biomass and energy in the local economy;
• Sustain forested ecosystems by providing landowners with new markets;
• Improve forest health and reduce fire hazard by creating a market for small trees and understory shrubs;
• Mitigate global warming by reducing greenhouse gas emissions through use of carbon-neutral feedstocks; and
• Promote energy independence from foreign sources.

Economic Analysis of Bioenergy

The feasibility of bioenergy depends largely on the economic availability of woody biomass. Many projects have estimated the total amount of biomass available in a given area but have failed to take into account varying cost of transportation and types of biomass (urban waste vs. forest residues). The School of Forest Resources and Conservation, the USDA Forest Service's Southern Center for Wildland-Urban Interface Research and Information and the Southern States Energy Board coordinated efforts to determine the economic availability of woody biomass in 27 counties across the southeast.

The economic availability of woody biomass considers the total cost of delivered biomass, including: procurement, harvest, and transportation costs. Procurement areas and transportation costs were evaluated using GIS. GIS allowed researchers to assign speed limits and determine road length and to calculate haul times rather than just hauling distances. Haul time calculations were increased by 25 percent to account for operational delays. All of the data were then used to create supply curves that express the price of a resource at a given quantity of demand. The project concluded that electricity could be produced at a particular price as long as the specific types of biomass were transported within a given distance.

The information available through the internet allows this type of analysis to be replicated for any area of the United States and the U.S. Forest Service Inventory and Analysis Program is developing a national biomass dataset that could improve the effectiveness of the analysis.

For full article see http://www.esri.com/news/arcuser/1006/biomass1of2.html

Yet, as with any new, emerging industry there are many questions to be answered both for the industry as a whole and for each new facility that is planned: (1) What are the best feedstocks and will their supply be sustainable in the long term? (2) Under what conditions are new facilities economically viable? (3) What will be the environmental impacts to soils, wildlife, water and air? (4) How will the new industries influence competitiveness of existing industries that depend on the same feedstocks? (5) Do life cycle studies indicate a substantial net savings in energy and carbon emissions compared to traditional sources? (6) Will production of bioenergy result in reduced efforts to conserve energy?

SFRC faculty and staff are conducting research to address some of these questions and are providing information through Extension programs to inform citizens, landowners and policy makers. This issue of the SFRC Newsletter highlights a few of our on-going efforts in this area, and more new projects are planned. Overall, UF/IFAS has more than 100 scientists working on various aspects of renewable energy. It is clear that Florida has the potential to be a major contributor to the production of biomass energy, and it is important to have as much information as possible to help guide policy development and decisions about our energy future. We welcome your comments, questions and suggestions.

Tim White
Global Energy Issues

Global Energy Issues was a new course held last spring on the Plant City Campus. The seminar was led by Michael Andreu as a direct outcome of his research interest investigating biomass to bio-methanol production from small scale mobile conversion processors. Through reading and discussions, the class explored issues related to climate change and potential mitigation effects that renewable energy and specifically biomass can provide. Throughout the semester students were engaged in discussions ranging from the ecological impacts to the policy, economic and social impacts of biomass and bio-energy production. The class supplemented readings and discussions with two field trips including participation in the two day meeting of the Future: The Role of Woody Biomass held in Gainesville as well as visiting Wheelabrator Ridge Energy Inc., a generating facility in Polk County. Florida that uses woody biomass as a feedstock to produce electricity. The course was designed so that students would leave the class with a better understanding of the tradeoffs and barriers associated with energy production worldwide.

Student Jonathan Wright summarized the sentiments of the class well when he stated at the end of the semester evaluation, “When the course began, I had no idea what biomass is, now I can carry on a conversation with professionals in the industry and know what I am talking about.”

It is our hope that we can continue to expose students to new ideas and knowledge about natural resources and the role they play in providing solutions to future energy needs.

Fulfilling Our Mission

The SFRC has approximately 140 undergraduates, which are mostly juniors and seniors studying one of three majors: Forest Resources and Conservation, Geomatics, or Natural Resource Conservation. The SFRC faculty has approximately 90 graduate students pursuing master’s and doctoral degrees.

Research

The SFRC has 41 research faculty that generate over $4 million annually to conduct research in five focus areas: (1) Forest systems biology; (2) Human dimensions broadly defined to include social, economic, environmental, and policy related to forest resources; (3) Agroforestry and tropical forestry; (4) Urban forestry and the wildland-urban interface; and (5) Geomatics.

Janaki R.R. Alavalapati and Wayne H. Smith, University of Florida, Gregory S. Amacher, Virginia Polytechnic Institute and State University, and Sayeed R. Mehmood, University of Arkansas have launched a research project to “determine optimum incentives to promote bioenergy and sustainability of non-industrial private forests in the U.S. south.” This is a $282,019 three-year project funded jointly by the US Department of Energy and US Forest Service. Companies interested in Agroforestry with cost-sharing arrangements from the University of Florida, the University of Arkansas, and Virginia Polytechnic Institute and State University.

Wood to Energy Outreach Program

Woody biomass is a promising source of energy for electricity, heat and power. In many southern communities, where woodlots are common, community leaders are close to openning new communities, there are cost-effective opportunities to use this carbon-neutral form of energy. One barrier, however, is that people aren’t aware of this potential.

Martha Monroe, Associate Professor in SFRC, is oversizing a large project involving educating public awareness about the possibilities of using wood for energy in the southern wildland-urban interface. “Our research on public perceptions of using wood with power suggests that respondents are very concerned about losing nearby forests and the polluting the air, but also very interested in using wood as a power source if it can be economically,” she added. Additional research, led by Doug Carter and Matt Langholtz (Gainesville) and Alan Hedges (UF) identified the communities in the South that are likely to be able to use wood and analyzed their road system, wood supply, and local economy to determine the cost and availability of wood as well as the economic impact of using it (see front page).

This project will determine the optimum mix of policy instruments that can bridge current management and sustainable forest management of non-industrial private forests with wood energy as a product in the U.S. South. Specifically the effect of the following scenarios will be investigated in Arkansas, Florida and Virginia.

- Technical support and cost-sharing or price support for thinning material to improve the health of forest ecosystems.
- Incentives to cover the cost of biomass transportation, a production subsidy for wood energy, and cost-sharing capital investments in building wood fueled distributed plants or retrofitting existing coal fired plants for natural gas plants.
- Investments to advance technologies of biomass production and its use in energy production.
- Price support for bioenergy and a tax on conventional energy to reflect the societal benefits of bioenergy production.
- Households’ willingness to pay a premium for bioenergy reflecting their preferences for green energy.

Extension

The SFRC has 9 extension specialists throughout the state. Extension specialists develop a wide variety of programs and materials to be used by county extension agents. In developing material, the specialists work with state agencies and professional organizations.

Above: Alan Shelby, Jeff Doran, Gail Kimboll (Chief, USDA Forest Service), Jack Vogel (‘69) and Marsha Kearney attend the National Association of Universities with Forest Resource Programs in Washington, D.C.

Elynn Spence passed away in December 2006.

Congratulations to Scott Sager & Julie Helmers (‘02) for the birth of Bennett James on April 28, 2007.

Laura Paterson and Ethan Sadowski (right) were married in Pensacola, FL on March 31, 2007.

Biomass

The seminar was led by Wayne Smith and was pilot tested in Gainesville in a series of events (left): Yarrow Titus, Jared Nobile, and Kathleen Langdon.

The UF Forestry Club held their annual Pollock Challenge in Tennessee March 16-17. Congratulations to the following students who placed in their events (left): Yarrow Titus, Jared Nobile, and Kathleen Langdon.


Alumni News

Without the support of friends we could not maintain our level of academic excellence. Thanks to all our supporters. Thanks to the following for their contributions to the SFRC’s Unrestricted Fund: The Rayonier Foundation, William Bennett (‘54), Greg Driskell (‘88), Paul Matti (‘67), Donna Legare (‘75), Joseph Walthal (‘76), Roger Bollinger (‘61), Andy (‘03) & Julie Ruth, Cierrai (‘86) & Seth (‘03) Ward and Richard Fisher. Thanks to the following for their contributions to Project Learning Tree: Packaging Corporation of America, International Paper Company Foundation, Florida Forestry Association, Plum Creek Timber Company and Smurfit-Stone Container Corporation. Thanks to the following for their contributions to the University of Florida Forest Stewardship Program: Marden Industries, Inc., Farm Credit of North Florida, DuPont, Farm Credit of Northwest Florida and Blanton’s Longleaf Container Nursery. Thanks to Wayne Smith & Mitzi Austin, Larry Harris and Norma Horan-Voge for their contributions to the John Gray Endowment for Excellence in Forest Resources and Conservation. Thanks to Rand & Geraldine Edelstein and Melda Bassett, in memory of Paul Shelley, for their contributions to the William Paul Shelley, Sr. Memorial Fund in Forestry. Thanks to the Florida Surveying and Mapping Society, Inc. for their contribution to the Surveying Fund Support. Thanks to Mr. & Mrs. James H. Lybass, Jr. for their contribution, Chris Jahn & Jim & Joh Lybass Scholarships. Thanks to Muthiah Govindarajan for his support of Dr. Nair’s research in agroforestry. Thanks to Wayne Smith & Mitzi Austin for their contribution to the Wayne Smith Student Leadership Fund. Thanks to Jack & Kathy Evel for their contribution to the Learning Center Fund in memory of Marie Louise Wesley “Mickey” Swindor. Thanks to Wayne Smith and Mitzi Austin for their contribution to the turpentine restoration project.