Issues and Opportunities Facing Southern Forests and Forestry

- The South provides:
  - 60% of the nation’s and 18% of the world’s timber supply
  - Habitat sources for 40% of the nation’s hunters, 55% of the nation’s fresh water anglers, and 30% of the nation’s populace engaged in watchable wildlife

- Many rural communities are:
  - richly endowed with forest resources
  - economically dependent on forestry including recreation
  - suffering from recent setbacks in pulpwood markets

- Urgent need to diversify utilization of the south’s forest resources and to quantify the value of its ecological endowment

- Potentially large resource of underutilized biomass
  - small diameter, dense stands, harvest residues
  - stands posing high fire risk in WUI areas
The Southern Forest

- 214 Million acres
  - 201 million timberland
  - 13 million reserved and other forest land
  - 89% privately owned
  - Established harvesting infrastructure
  - Demonstrated sustainable production
Harvest Volumes

- 9 Billion Cubic Feet
  - 6.4 billion softwood
    - 1.4 billion - timber harvesting residues
  - 2.6 billion hardwoods
    - 1.5 billion timber harvesting residues
Tree removal has averaged about 3.3% of total volume since 1982.
Sources of Woody Biomass

- Logging residues
- Thinnings and other stand improvement operations
- Underutilized species
- Stands severely damaged by climatic events, fires, insect or disease
- Bioenergy plantations
Timber Harvesting Residues

- Easier when using even-aged silvicultural prescriptions --- example clearcutting.
  - Whole tree vs. log harvesting followed by residue collection
  - Transpiration drying

- May be less feasible and profitable with uneven-aged silvicultural systems --- example single-tree selection.
  - Group selection is an intermediate option
Potential Benefits to Landowners for Forest Biomass/Bioenergy Production

- Revenue from biomass sales
- Savings on site preparation costs in forest regeneration (removal of logging residues)
- Reduction in the risk of wildfire and disease/pest outbreaks
- Opportunity for stand improvement and restoration of damaged stands
- Potential carbon credits
Potential Disadvantages of Residue Removal

- **Removal of nutrients**
  - Returning ash is often advocated.
  - Retaining leaves and twigs reduces nutrient removals

- **Biological diversity and habitat issues**
  - Can be affected by management

- **Erosion and sedimentation**
  - Site specific; minimize through planning etc

- **Damage to advanced regeneration**
The Spectrum of Wood-Based Bioenergy Technologies:

- New:
  - Bio-refinery

- Not-So-New:
  - Combined Heat and Power
  - Co-generation
  - Gasification
  - Pelletization

- Emergent
  - Bio-refinery
The Southern Woody Biomass Processing Situation

- Combustion Technologies --- especially Combined Heat and Power within the Forest Products Industry very well established.
- Co-generation in electric power industry less well established.
- Biorefinery Technologies emerging
- Animal based biodiesel more in vogue than cellulosic fuels
Sustainability Issues

- Most advanced use of woody fuels is mill waste (99% already utilized --- levels of efficiency in processing facilities reported to be quite high)

- Timber Harvesting Residues --- Low hanging fruit --- 29 million dry tons available at 65% recovery level
  - Harvesting conducted under BMP, State Forest Practice, and Certification Rules/Guidelines --- Mostly Non-Regulatory
Welcome to the Encyclopedia of Southern Bioenergy Resources

The objective of this encyclopedia is to synthesize the available scientific and technical knowledge on improved systems for sustainably managing, harvesting, processing, and utilizing woody biomass in the southern United States.

Getting Started: Before learning about southern bioenergy resources, new users of this site might want to learn more about what an online encyclopedia consists of. A user may return to the home page of the Bioenergy Encyclopedia at any time by placing the cursor over the Encyclopedia Collections link in the upper right-hand corner and selecting it. Background Information is available for those readers unfamiliar with scientific content management systems such as ours and who wish to know more about them. User Help is available for those unfamiliar with how to browse and search our site to find what they need. Author Help is available for those wishing to submit new scientific content. If you wish to know who is developing these encyclopedias, click the CREDITS link at the top of each page. If you have questions or wish to make a comment, please feel free to use the FEEDBACK link at the top of each page to communicate with us. Familiarity with this administrative background material will make using the forest encyclopedia network easier and faster.

The forest ecosystems of the South serve many purposes including the production of bioenergy. This encyclopedia consists of a synthesis of the best available scientific knowledge concerning the ecologically sustainable, economically viable, and socially acceptable production and use of bioenergy products in Southern forest ecosystems. We are certainly not suggesting that all existing forests should be tapped for energy production. Forest biomass for energy can and must be managed as simply one of a large number of goods and services that can be produced (IEA Bioenergy Task 31, 2005).

Worldwide summary data from 1997 show that about 85 percent of global bioenergy consumption is in the form of firewood and charcoal to address heating and cooking needs. Most of the remaining 15 percent is black liquor, a

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Forest Encyclopedia Materials

- 229 Pages of Material
- 282 Images
- 429 Citations
The Southern Bioenergy Resource

Forest Management for Bioenergy Production

Harvesting Biomass for Bioenergy Production

Biomass Utilization

Economics of Bioenergy Production

Environmental Sustainability of Bioenergy Production
Welcome to Forest Bioenergy

The Forest Bioenergy website is designed for information sharing among natural resource management and extension professionals as well as community planning and development professionals. It is one of several products resulting from the Southern Forest Research Partnership bioenergy training initiative. The site is a repository of information related to biomass product use designed such that members can easily upload and the public can easily download relevant biomass-related information. The gateway includes publications, presentations, additional links, events, and images.

Future plans include the addition of case studies, activities, videos, and other educational tools designed to help users of the portal.

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