

Mississippi *Biomass and Bioenergy Overview*

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GENERAL OVERVIEW

In 2003, Mississippi consumed an estimated 1,183.8 trillion BTUs (346.9 billion kWh) of energy, 28th nationwide.¹ Petroleum accounted for about 45 percent of total consumption, with natural gas providing another 25 percent. Other major energy sources were coal and nuclear, which accounted for approximately 16 and 10 percent of the state's total energy consumption, respectively. Biomass supplied over 45 trillion Btu (13.2 billion kWh).¹ Approximately 4% of the state's energy needs came from biomass, ranking it 21st compared to other states nationwide.¹ Mississippi's total energy consumption increased by over 342 trillion Btu (100.2 billion kWh) between 1980 and 2001, an average annual increase of 1.7 percent. Electricity consumption increased by over 71.7 billion Btu (21 million kWh) over the same period. Per capita petroleum use for transportation was estimated to be 20 barrels for 2001, an increase of 4.5 barrels since 1980.²

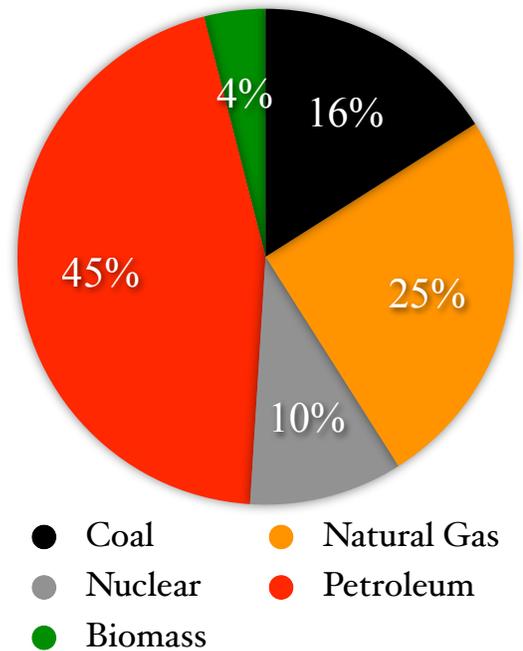
FOREST-BASED RESOURCES

Mississippi has over 19.8 million acres of forestland.³ In 2002, it was estimated 3.6 million dry tons of harvesting residues were produced in the state each year and could be made available for energy use.⁴ Primary mill residues totaled over 4.5 million dry tons and secondary mill residues added another 33,000 dry tons.⁵ Approximately 50 percent of these residues were used for industrial fuels and 34 percent were used for fiber products. An additional 15 percent went toward other products, leaving only 1 percent of the residues unused.⁶ Urban wood residues contribute over 307,000 dry tons of biomass annually.⁵

AGRICULTURAL RESOURCES

Mississippi has 5.8 million acres of crop land.⁷ It is estimated that the state's agricultural community could produce 2.2 million dry tons of residue biomass annually.⁵ Another 5.3 million dry tons of dedicated energy crops could be produced at \$40/ton.⁸ One study estimated that on Conservation Reserve Program (CRP) land alone, 4.9 million dry tons of switchgrass and 3.8 million dry tons of willow and hybrid poplar could be produced each year.⁵

Mississippi Energy Consumption by Source, 2003



Source: Energy Information Administration¹

Management of farm animal manure could provide an additional 72,000 tons of methane annually.⁵

CURRENT ACTIVITIES

Government agencies, private companies, and others in Mississippi have begun investigate the use biomass to make energy related products, such as transportation fuels, electricity, and even natural gas. Begun as the Mississippi Alternative Energy Enterprise, the Mississippi Technology Alliance has broadened its efforts and established the Strategic Biomass Initiative to aid in developing viable commercial enterprises based on Mississippi's biomass resources and promote the development of near-term technologies through university based applied research. Their efforts include the use of poultry litter for energy, the capture of methane gas from animal wastes, the use of soybean oil as a feedstock for biodiesel, ethanol production and use, and other biomass.⁹

The Mississippi Biomass Council serves as a forum for assessing available biomass resources in the state, supports the utilization of new technologies, and encourages biomass related economic development. In 2003, they produced a feasibility study on the use of biodiesel in the state.¹⁰ In early April, 2006, the group hosted the Fifth Annual Southern Bioproducts Conference where leaders in research and industry gathered to present and discuss research on biomass utilization.

Mississippi State University (MSU) has a Biomass-Based Energy Group that has projects in several areas (<http://www.abe.msstate.edu/Biomass/>). One focus is on the production of syngas. Other projects include switchgrass production and harvesting, downdraft gasification, and syngas fermentation. The University's Department of Forest Products is also working in the area. Two example projects are the bio-oil research being conducted in the Forest Product Laboratory and the joint effort with TimTek where small diameter trees are utilized for fiber-based products.

The United States Department of Agriculture, Agricultural Research Service maintains a Research Center in Stoneville, MS. Biomass related research conducted at this facility relates to cotton, soybean, and other crop resources.

Some private companies, such as Mississippi Ethanol LLC., are developing bio-based enterprises in Mississippi. Mississippi Ethanol LLC., in conjunction with MSU and a grant from the Department of Energy, is developing an ethanol production system using wood wastes as a feedstock in stead of corn. Southern Biodiesel, located in Jackson, MS, is a leading producer of biodiesel. The primary feedstocks used in this facility are soybean oil and poultry fat.

LINKS TO OTHER MISSISSIPPI RESOURCES

Mississippi Department of Agriculture and Commerce <http://www.mdac.state.ms.us/>

Mississippi Division of Energy, Renewable & Alternative Energy <http://www.mississippi.org/content.aspx?url=/page/3091&>

Mississippi Forestry Commission <http://www.mfc.state.ms.us/>

CITATIONS

1) U.S. Department of Energy, Energy Information Administration, "Table S3. Energy Consumption Estimates by Source, 2003." http://www.eia.doe.gov/emeu/states/sep_sum/html/pdf/sum_btu_tot.pdf

Mississippi's Biomass Resources	
Corn Produced (Silage and Grain)¹⁴	1,141,000 tons
Soybeans Produced¹⁴	1,287,000 tons
Wheat Produced¹⁴	129,210 tons
Conservation Reserve Program¹⁵	951,341 acres enrolled
Municipal Solid Waste¹⁶	3,170,149 tons generated
Logging Residues⁴	3.6 million dry tons
Poultry¹⁴	834,108,000 head
Livestock¹⁴	1,334,400 head

Overall, the state currently has 12 facilities producing some type of biopower.¹¹ Mississippi currently has one landfill producing methane for energy, with 11 more landfills identified as potential program sites.¹²

At the state government level, Mississippi offers a variety of incentives for developing, installing, and/or using biomass related energy. These include low-interest loans for renewable energy and energy efficiency projects as well as a biofuels production incentive where producers of biodiesel and ethanol would receive \$0.20 per gallon of annual production (up to 30 million gallons) for a period of ten years. The TVA Green Power Program is also available through most Mississippi electrical utilities.¹³

2) U.S. Department of Energy, Energy Efficiency and Renewable Energy. 2006. Mississippi Energy Statistics. http://www.eere.energy.gov/states/state_specific_statistics.cfm/state=MS

3) Mississippi Forestry Association. 2005. Mississippi Forest Facts Flyer <http://www.msforestry.net/pdf/forestryfactsflyer.pdf>

4) U.S. Department of Agriculture, Forest Service Forest Inventory and Analysis Unit Timber Product Output Data 2003. <http://srsfia1.fia.srs.fs.fed.us/>

5) Milbrandt, A. A Geographic Perspective on the Current Biomass Resource Availability in the United States. 2005. U.S. Department of Energy, National Renewable Energy Laboratory. <http://www.nrel.gov/docs/fy06osti/39181.pdf>

6) U.S. Department of Agriculture Forest Service, Forest Inventory and Analysis. Mississippi's Timber Industry – An Assessment of Timber Product Output and Use, 1999. Unit http://www.srs.fs.usda.gov/pubs/rb/rb_srs080.pdf

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- 7) U.S. Department of Agriculture, National Agricultural Statistics Service. 2002 Census of Agriculture Mississippi State Data. <http://www.nass.usda.gov/>
- 8) Biomass Feedstock Availability in the United States: 1999 State Level Analysis. Marie E. Walsh, Robert L. Perlack, Anthony Turhollow, Daniel de la Torre Ugarte, Denny A. Becker, Robin L. Graham, Stephen E. Slinsky, and Daryll E. Ray. <http://bioenergy.ornl.gov/resourcedata/index.html>
- 9) Mississippi Technology Alliance, Strategic Biomass Initiative. 2006. <http://www.technologyalliance.ms/strategic-biomass-initiative/index.php>
- 10) State of Mississippi. Mississippi Biodiesel Feasibility Study. 2003. <http://www.mississippi.org/content.aspx?url=/page/2756&>
- 11) U.S. Department of Energy, Biomass Research and Development Initiative. Mississippi Biobased Fuels, Power and Products State Fact Sheet. <http://sungrant.tennessee.edu/factsheets/mississippi.pdf>
- 12) Environmental Protection Agency Landfill Methane Outreach Program Active Program Map (July 13, 2003). <http://www.epa.gov/lmop/docs/map.pdf>
- 13) Mississippi Incentives for Renewable Energy, DSIRE. 2006. <http://www.dsireusa.org/library/includes/map2.cfm?CurrentPageID=1&State=MS>
- 14) U.S. Department of Agriculture, National Agricultural Statistics Service. 2006 Statistics by Commodity. Accessed May, 2007. <http://www.nass.usda.gov/>
- 15) U.S. Department of Agriculture, Farm Service Agency. Conservation Reserve Program Summary and Enrollment Statistics, FY 06. http://www.fsa.usda.gov/Internet/FSA_File/06rpt.pdf
- 16) Simmons, P., N. Goldstein, S. Kaufman, N. Themelis, and J. Thompson Jr. 2006. The State of Garbage in America. BioCycle. 47(3) April 2006. PP. 26-43. <http://www.jgpress.com/biocyclus.htm>
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