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# Florida *Biomass and Bioenergy Overview*

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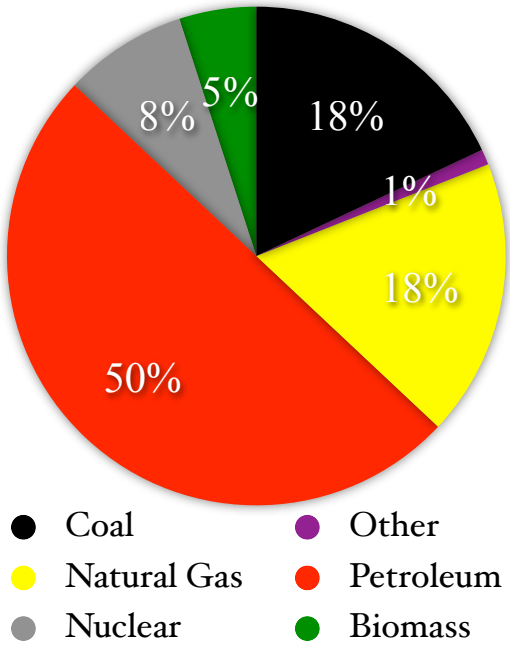
## GENERAL OVERVIEW

Floridians consumed approximately 4,287.8 trillion Btu (1.26 trillion kWh) of energy in 2003, ranking 3rd nationally. Petroleum accounted for 50% of total consumption. Other major sources of energy were coal (18% of total consumption), natural gas (18%), and nuclear electric power (8%).[1] Biomass energy use in the state was 184.5 trillion Btu (54.1 billion kWh), about 5% of the state's total energy use, ranking 1st when compared to states nationwide.[1] Biomass is the leading renewable resource in Florida's electric power sector; in 1999, about 90% of renewable-based electric power generation came from biomass resources.[2] Florida's total energy consumption increased by 1,623 trillion Btu (475.7 billion kWh) from 1980 to 2001, an average annual increase of 2.4 percent. Electricity use in the state increased by 371.5 trillion Btu (108.9 billion kWh) in the same period, an annual increase of 3.8 percent.[3] Per capita petroleum use for transportation was estimated to be 16 barrels for 2001, an increase of 2.2 barrels since 1980.[3] It was estimated that total energy expenditures in 2001 were over $31.5 trillion dollars, $162 million of which went toward biomass-derived energy (wood and wood-waste).[4] In 2000, the state housed more than 13,000 alternative fuel vehicles.[5]

**Florida Energy Consumption by Source, 2003**




Source: Energy Information Administration[1]

## FOREST-BASED RESOURCES

Florida has over 16.5 million acres of forestland.[6] Of this, 13 million acres are in commercial forests. In 2003, it was estimated that 650 million cubic feet of wood was removed and utilized in the forest products industry.[6] Florida produces over 118,000,000 cubic feet of logging residues each year. Logging residues in the state can provide 1.3 million dry tons of woody biomass annually.[7] Urban wood waste is another valuable resource, with over 4.6 million dry tons produced each year.[8]

Over 150.7 million cubic feet of wood residues were produced from wood-using manufacturing processes in Florida in 2003.[9] In tons, this would be 2.6 million dry tons. Bark residues accounted for just over 50 million cubic feet. All but 14,000 cubic feet of bark residues are currently used for other byproducts, such as fiber, energy, and others. Wood residues, including sawdust, accounted for over 100 million cubic feet in 2003.[9] All but 128,000 cubic feet are used for other byproducts. In 1999, 27% of gross energy in non-utility facilities in the state was produced using wood and waste.[11]

## AGRICULTURAL RESOURCES

Florida has 3.8 million acres of crop land. It is estimated that Florida's agricultural community could produce 3.3 million dry tons of residue biomass annually.[10] Another 1.2 million dry tons of dedicated energy crops could be produced at $50/ton.[12] One study estimated that on Conservation Reserve Program (CRP) land alone, 460,000 dry tons of switchgrass and 353,000 dry tons of willow and hybrid poplar could be produced each year.[10] Management of farm animal manure could provide an additional 19,000 tons of methane annually.[10]

Florida's large agricultural industry uses significant quantities of biomass feedstock to produce thermal energy and electric power in the non-utility sector. In

2002, over 436,000 acres of sugarcane was harvested in the state, yielding over 17.3 million tons of stalks. A majority of these stalks (bagasse) were burned in sugar mills as fuel and replaced an estimated 113 million gallons of fuel oil or 7.2 trillion Btu (2.1 billion kWh) of electricity. Excess electricity from these mills is sold to state utilities.

## CURRENT ACTIVITIES

Together, The Common Purpose Institute, University of Florida, energy companies and the Florida Energy Office have built a public-private partnership to study practices for growing and harvesting fast growing trees as a renewable fuel source for electric utilities in the Southeast. Some research has gone toward using mine lands in need of reclamation as sites for these energy crops. Research is also looking at using biomass, woody and switchgrass, for electricity plants, ethanol production from sorghum and sugarcane, and biodiesel production from soybeans. See more on their website at www.treepower.org. Florida utilities offer opportunities for customers to support the use of biomass energy.[13] The city of Tampa offers the Tampa Electric Green Electricity program where customers have the opportunity to purchase electricity from green sources, including landfill gas and biomass, for their needs. All of the green energy in this program is produced in Florida. (http://www.tampaelectric.com)

In 2003, Florida had 65 facilities involved in biopower production, 3 facilities producing biofuels, and 6 involved in the development of bio-based products.[14] There are 11 landfills in Florida producing methane for energy and another 18 sites identified for production of methane.[15]

## LINKS TO OTHER FLORIDA RESOURCES

Alabama Department of Agriculture and Industries
http://www.agi.state.al.us/

Alabama Department of Economic and Community Affairs Biomass Energy Program
http://216.226.178.189/txtlstvw.aspx?LstID=7d865154-617a-495b-afb8-5cf4271b56ed

Alabama Forestry Commission
http://www.forestry.state.al.us/

## CITATIONS

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

| Florida's Biomass Resources |
|---|
| **Corn Produced (Silage and Grain)[16]** |
| 554,880 tons |
| **Soybeans Produced[16]** |
| 4,050 tons |
| **Wheat Produced[16]** |
| 6,300 tons |
| **Conservation Reserve Program[17]** |
| 84,263 acres enrolled |
| **Municipal Solid Waste[18]** |
| 29,203,709 tons generated |
| **Logging Residues[7]** |
| 1.3 million dry tons |
| **Poultry[16]** |
| 89,633,000 head |
| **Livestock[16]** |
| 1,815,000 head |

3) U.S. Department of Energy. Alabama Bioenergy Resources. "Alabama Biomass Power Resources: Recent Studies Indicate that Alabama Has an Excellent Biomass Resource Potential." http://www.eere.energy.gov/state_energy/tech_biomass.cfm?state=AL

4) Alabama Forestry Commission Forest Resource Report. 2004. http://www.forestry.state.al.us/publication/pdfs/Forest%20Resource%20Report%202004.pdf

5) Wood for Energy and bio-Refining, Presentation by Bill Jones, Alabama Forestry Association, at the Status, Trends, and Future of the South's Forest and Agricultural Biomass Conference, Aug. 29-31, 2005.

6) Assessment of Wood-Based Syngas Potential for Use in Combined Cycle Power Plants in Alabama: A Guide For Economic Development Opportunities by Kenneth J. Muehlenfeld. 2003. http://www.tallcbiomass.com/images/muehlenfeld_report.pdf

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9) 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

10) 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

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19) 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/biocycle.htm