

South Carolina *Biomass and Bioenergy Overview*

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GENERAL OVERVIEW

In 2003, South Carolina consumed an estimated 1,613.6 trillion BTUs (472.9 billion kWh) of energy, ranked 22nd nationally.¹ Nuclear energy sources accounted for about 31 percent of total consumption, with petroleum providing another 30 percent. Other major energy sources were coal and natural gas, which accounted for approximately 24 and 9 percent of the state's total energy consumption, respectively. Biomass supplied over 68.5 trillion Btu (20.1 billion kWh).¹ Approximately 4% of the state's energy needs came from biomass resources, ranking it 16th compared to other states nationwide.¹

South Carolina's total energy consumption increased by over 539 trillion Btu (157 trillion kWh) between 1980 and 2001, an average annual increase of 2.1 percent. Electricity consumption increased by over 128.2 billion BTUs (37,568 million kWh) over the same period, an annual increase of 3.4 percent. Per capita petroleum use for transportation was estimated to be 17 barrels for 2001, an increase of 2.8 barrels since 1980.²

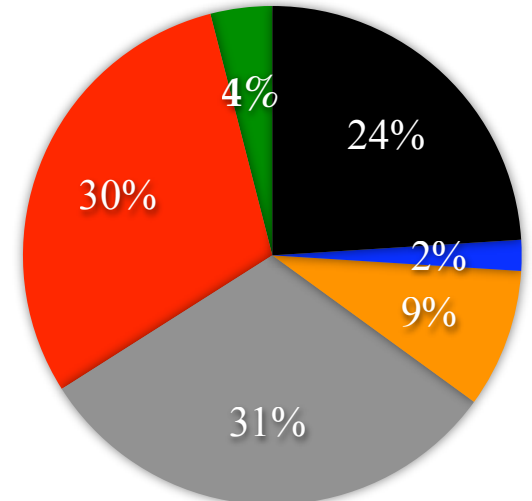
FOREST-BASED RESOURCES

South Carolina has over 12.4 million acres of forestland.³ Approximately 1.6 million dry tons of harvesting residues are produced annually in the state.⁴ In 2002, the processing of primary wood products in the state generated over 2.4 million dry tons of wood and bark residues.⁵ Secondary processing generated another 38,000 dry tons of residues.⁵ In 2003, approximately 52 percent of these residues were used for industrial fuels and 41 percent were used for fiber products. An additional 7 percent went to miscellaneous uses.⁶ Very little went unused, less than 63,000 cubic feet. Urban wood residues contribute over 467,000 dry tons of biomass annually.⁵

AGRICULTURAL RESOURCES

South Carolina has 2.3 million acres of crop land.⁷ It is estimated that the state's agricultural community could produce 331,000 dry tons of residue biomass annually.⁵ Another 1.3 million dry tons of dedicated energy crops could be produced at \$40/ton.⁸ One study estimated that on Conservation Reserve

South Carolina Energy Consumption by Source, 2003



- Coal
- Natural Gas
- Petroleum
- Hydroelectric
- Nuclear
- Biomass

Source: Energy Information Administration¹

Program (CRP) land alone, 1.1 million dry tons of switchgrass and 861,000 dry tons of willow and hybrid poplar could be produced each year.⁵ Management of farm animal manure could provide an additional 30,000 tons of methane annually.⁵

CURRENT ACTIVITIES

Government agencies, such as the South Carolina Energy Office (SECO), private companies, and others in the state have begun investigate the use biomass to make energy related products, such as transportation fuels, electricity, and even natural gas. SECO was recently awarded a Dept. of Energy grant to coordinate a program called the South Carolina Biomass Market Development Project. The project will seek to enhance the energy-related use of biomass resources in the state through research, establishment of biomass-based activities, and through market development.⁹

Clemson University is the recipient of several federal research grants. One recent USDA grant charged the University with conducting research in biodiesel synthesis.

United Energy Distributors, based in Aiken, SC, distributes both ethanol and biodiesel to the public and government agencies. The company also is working the the Alternative Futures project of the States Energy Program to upgrade their facility in Aiken to provide storage for up to 260,000 gallons of biodiesel and ethanol, storage that could provide savings of up to \$0.15 per gallon to consumers.⁹ In Horry County, the cities of Conway, Myrtle Beach, and North Myrtle Beach are all participating in a green power program where electricity generated from landfill gas is purchased as a part of their overall power supply. Santee Cooper provides the Green Power Program.¹⁰ The state currently has four landfills producing methane for energy, with 20 more landfills identified as potential program sites.¹¹ In all, there are 10 facilities in the state producing biopower, with an estimated capacity of 309 MW per year. There are also 2 facilities producing bioproducts.¹²

South Carolina offers a variety of incentives for developing, installing, and/or using biomass related energy. One major incentive is that alternative fuels and alternative fuel blends are exempt from the state sales and use tax.¹⁰

LINKS TO OTHER SOUTH CAROLINA RESOURCES

South Carolina Department of Agriculture
<http://www.scdas.state.sc.us/>

South Carolina Energy Office
<http://www.energy.sc.gov/>

South Carolina Forestry Commission
<http://www.state.sc.us/forest/>

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
- 2) U.S. Department of Energy, Energy Efficiency and Renewable Energy. South Carolina Energy Statistics. 2006. http://www.eere.energy.gov/states/state_specific_statistics.cfm/state=SC
- 3) South Carolina Forestry Association. 2003. Forestry in South Carolina. <http://www.scforestry.org/Downloads/Forestry%20Facts%20Brochure.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>

South Carolina's Biomass Resources	
Corn Produced (Silage and Grain)¹³	1,103,200 tons
Soybeans Produced¹³	339,300 tons
Wheat Produced¹³	184,500 tons
Conservation Reserve Program¹⁴	213,218 acres enrolled
Municipal Solid Waste¹⁵	4,305,345 tons generated
Logging Residues⁴	1.6 million dry tons
Poultry¹³	243,364,600 head
Livestock¹³	740,500 head

6) U.S. Department of Agriculture Forest Service, Forest Inventory and Analysis Unit. 2004. South Carolina's Timber Industry – An Assessment of Timber Product Output and Use, 2001. http://www.srs.fs.usda.gov/pubs/rb/rb_srs089.pdf

7) U.S. Department of Agriculture, National Agricultural Statistics Service. 2002 Census of Agriculture South Carolina 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. Slinisky, and Daryll E. Ray. <http://bioenergy.ornl.gov/resourcedata/index.html>

9) U.S. Department of Energy, Energy Efficiency and Renewable Energy. 2006. State Energy Programs and Projects in South Carolina. http://www.eere.energy.gov/state_energy_program/projects_all_by_state.cfm/state=SC

10) South Carolina Incentives for Renewable Energy. 2006. DSIRE. <http://www.dsireusa.org/library/includes/map2.cfm?CurrentPageID=1&State=SC>

11) Environmental Protection Agency Landfill Methane Outreach Program Active Program Map (July 13, 2006). <http://www.epa.gov/lmop/docs/map.pdf>

12) U.S. Department of Energy, Biomass Research and Development Initiative. 2003. South Carolina Biobased Fuels, Power and Products State Fact Sheet. <http://sungrant.tennessee.edu/factsheets/scarolina.pdf>

13) U.S. Department of Agriculture, National Agricultural Statistics Service. 2006 Statistics by Commodity. Accessed May, 2007. <http://www.nass.usda.gov/>

14) 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

15) Simmons, P., N. Goldstein, S. Kaufman, N. Themelis, and J. Thompson Jr. 2006. The State of Garbage in America. BioCycle. 47(3) April 06. PP. 26-43. <http://www.jgpress.com/biocyycle.htm>