

Virginia Biomass and Bioenergy Overview

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GENERAL OVERVIEW

In 2003, Virginia consumed an estimated 2,428.6 trillion Btu (711.7 billion kWh) of energy, ranking 14th nationally.¹ Petroleum accounted for about 47 percent of total consumption, with coal providing another 22 percent. Other major energy sources were natural gas and nuclear, which accounted for approximately 13 and 12 percent of the state's total energy consumption, respectively. Biomass supplied over 95.3 trillion Btu (27.9 billion kWh), or about 5 percent of Virginia's total consumption, ranking it 10th compared to other states nationwide.¹ In 1999, 39 percent of biomass-based electricity came from MSW/landfill gas and 60 percent was from wood waste.²

Virginia's total energy consumption increased by over 747 trillion Btu (218.9 billion kWh) between 1980 and 2001, an average annual increase of 1.9 percent. Electricity consumption increased by over 162 billion Btu (47.5 million kWh), an annual increase of 3.3% over the same period. Annual per capita petroleum use for transportation was estimated to be 17 barrels for 2001, an increase of 1.2 barrels since 1980.³

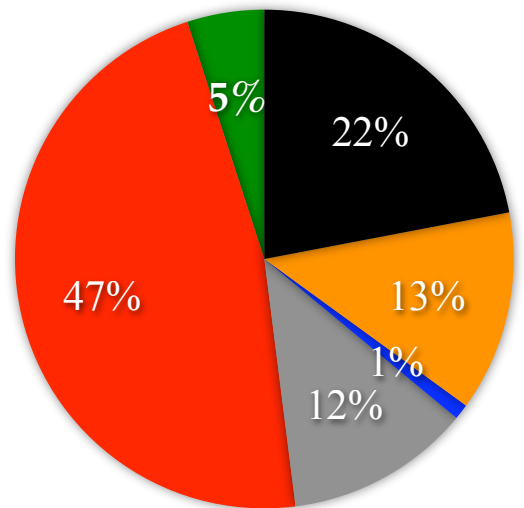
FOREST-BASED RESOURCES

Virginia has over 15.8 million acres of forestland.⁴ It is estimated that over 1.7 million dry tons of harvesting residues are produced each year in the state.⁵ In 2003, the processing of primary wood products in the state generated over 173 million cubic feet of wood and bark residues.⁷ Approximately 42 percent of these residues were used for industrial fuels and another 39 percent of the residues were used for fiber byproducts. An additional 18 percent went toward other products, leaving only 1 percent of the residues unused.⁷ Urban wood residues are estimated to provide an additional 813,000 dry tons of wood residues annually.⁶

AGRICULTURAL RESOURCES

Virginia has 4.2 million acres of cropland.⁸ It has been estimated that Virginia could produce 502,000 dry tons of agricultural residue biomass annually.⁶ It has also been estimated that an additional 1.2 million dry tons of dedicated energy crops could be produced at \$40/dry ton.⁹ One study estimated that on

Virginia Energy Consumption by Source, 2003



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

Source: Energy Information Administration¹

Conservation Reserve Program (CRP) land alone, 297,000 dry tons of switchgrass and 212,000 dry tons of willow and hybrid poplar could be produced each year.⁶ Management of farm animal manure could provide an additional 23,000 tons of methane annually.⁶

CURRENT ACTIVITIES

In the northern Virginia area, the Alexandria/Arlington Resource Recovery Facility processes over 975 tons of solid wastes each year, generating more than 78.4 million Btu (23,000 kWh) of electricity. The electricity is distributed through Dominion Power. It is enough to supply more than 300,000 residents.² The state currently has sixteen landfills producing methane for energy, with 17 more landfills identified as potential program sites.¹⁰

James Madison University is currently conducting research in alternative fuel vehicles, specifically biodiesel. The school recently hosted the Mid-

Atlantic Regional Biodiesel Conference, in Spring 2006, in Harrisonburg, VA. Through the Clean Cities Program, the VA Energy office has granted funds to local school systems, state universities, and businesses to study, handle, make and/or use 5% to 20% biodiesel blends in buses and large vehicles.

Virginia Tech is also heavily involved in research in this area. Research here involves biomass harvesting and transportation, bioprocess engineering, ethanol production, forest products, and a host of other areas. Partnering with the Virginia Energy Office, the Department of Wood Science and Forest Products is completing an assessment of the state's woody recyclable biomass resources and is producing a directory of markets using GIS.

At the state government level, Virginia offers a variety of incentives for developing, installing, and/or using biomass related energy. Once such program is the new Biofuels Production Grant program that begins January 1, 2007.¹¹ Producers must make more than 10 million gallons per year of neat biofuels to qualify for the \$0.10 per gallon payment. Producers are only eligible for 6 years. The state also offers a job creation tax credit of \$700 per full-time employee for businesses that manufacture parts for alternative fuel vehicles. Another incentive, popular in the more congested areas, is the HOV lane exemption for

Virginia's Biomass Resources	
Corn Produced (Silage and Grain)¹²	3,434,200 tons
Soybeans Produced¹²	474,300 tons
Wheat Produced¹²	316,200 tons
Conservation Reserve Program¹³	65,650 acres enrolled
Municipal Solid Waste¹⁴	11,989,925 tons generated
Logging Residues⁵	1.7 million dry tons
Poultry¹²	267,240,500 head
Livestock¹²	2,096,000 head

dedicated alternative fuel vehicles and some hybrid automobiles. These vehicles can get special "Clean Fuels" license plates that allow them to use HOV lanes, regardless of how many passengers are in the car.¹¹

LINKS TO OTHER VIRGINIA RESOURCES

Virginia Department of Agriculture and Consumer Services <http://www.vdacs.virginia.gov/>

Virginia Department of Mines, Minerals and Energy, Division of Energy www.dmme.virginia.gov

Virginia Department of Forestry <http://www.dof.virginia.gov/>

CITATIONS

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- 4) Virginia Department of Forestry. Virginia Forest Facts. July 10, 2006. <http://www.dof.virginia.gov/resinfo/forest-facts.shtml>
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- 7) U.S. Department of Agriculture Forest Service, Forest Inventory and Analysis Unit. Timber Product Output Data 2003. <http://srsfia1.fia.srs.fs.fed.us/php/tpo2/tpo.php>
- 8) U.S. Department of Agriculture, National Agricultural Statistics Service. 2002 Census of Agriculture. Virginia State Data. <http://www.nass.usda.gov/>
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- 13) 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
- 14) 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>