

Kentucky *Biomass and Bioenergy Overview*

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GENERAL OVERVIEW

In 2003, the State of Kentucky consumed an estimated 1,877.2 trillion BTUs (550 billion kWh) of energy, 18th in the nation.¹ Coal accounted for 50 percent of total consumption, with petroleum providing another 35 percent. Other major energy sources were natural gas and hydroelectric, which accounted for approximately 12 and 2 percent of the state's total energy consumption, respectively. Biomass supplied over 25.1 trillion Btu (7.4 billion kWh), less than 1% of the state's energy needs, ranking it 29th compared to other states nationwide.¹ Total energy consumption in Kentucky increased by 480 trillion Btu (140.6 billion kWh) between 1980 and 2001, an average annual increase of 1.4 percent. Electricity consumption rose by 103 trillion Btu (30.2 billion kWh) during the same period, an average annual increase of 2.3 percent.² Per capita petroleum use for transportation was estimated to be 20 barrels for 2001, an increase of 4.3 barrels over 1980 consumption.²

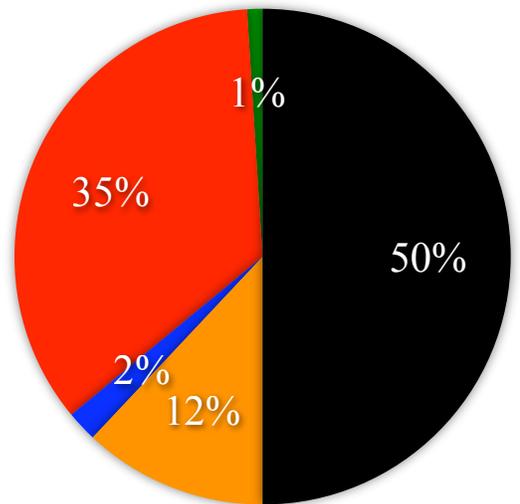
FOREST-BASED RESOURCES

Kentucky has over 12 million acres of forestland, of which 78% is owned by private individuals.³ It is estimated that over 1.2 million dry tons of harvesting residues could be available for energy production in the state each year.⁴ Another 1.4 million dry tons of primary mill residues and 52,000 dry tons of secondary mill residues are also produced annually.⁵ The majority of these residues, 95 percent, are currently used for energy or other by products. Urban wood residues could contribute another 454,000 dry tons of woody biomass annually.⁵

AGRICULTURAL RESOURCES

Kentucky has 8.4 million acres of crop land.⁶ It is estimated that the state's agricultural community could produce over 2.3 million dry tons of agricultural residue biomass annually.⁷ Another 3.6 million dry tons of dedicated energy crops could be produced at \$40/ton.⁷ One study estimated that on Conservation Reserve Program (CRP) land alone, 1.8 million dry tons of switchgrass and 1.4 million dry tons of willow and hybrid poplar could be produced each year.⁵ Management of farm animal manure could

Kentucky Energy Consumption by Source, 2003



- Coal
- Natural Gas
- Hydroelectric
- Petroleum
- Biomass

Source: Energy Information Administration¹

provide an additional 34,000 tons of methane annually.⁵

CURRENT ACTIVITIES

Kentucky is also home to some innovative bio-based energy projects. Three landfills used by the East Kentucky Power Cooperative provide an alternative energy source from which consumers can purchase electricity.⁹ In fact, the state has four active landfill gas projects with an additional 18 potential sites identified.¹⁰ The TVA Green Power Switch is also available to select utility customers.

Kentucky offers several economic incentives to utilize, produce, or develop bio-based energy technologies. One of these is an income tax credit is available for biodiesel producers and blenders at a rate of \$1.00 per gallon, not to exceed a yearly cap of \$1,500,000 for the program.¹² The state has also presented grants for companies to install technologies allowing for the use of biomass. In early 2003, the

state had one biopower production facility, four biofuel production facilities, and one facility make biobased products.⁷ The state also serves as a role model for its citizens. Since 2000, ethanol-enabled vehicles in the Kentucky state fleet has grown to over 1,100 vehicles.⁷ Today, the state’s motor pool offers ethanol blended gasoline exclusively, storing 10,000 gallons of E10 and 5,000 gallons of E85 on site.

The Kentucky Office of Energy Policy is currently funding two bioenergy research projects, one dealing with biodiesel production and the other is looking at a project involving biofuels derived from agricultural residues (corn fiber).¹¹

The Kentucky Rural Energy Consortium (KREC) is a partnership involving the University of Kentucky’s College of Agriculture, College of Engineering, and Center for Applied Energy Research; the University of Louisville’s Kentucky Pollution Prevention Center and J.B. Speed School of Engineering; other Kentucky Universities; the Kentucky Division of Energy and other key state agencies; and agricultural commodities groups and industry partners. The Consortium is strongly supported by a broad assortment of state leaders in agribusiness, government, and universities. The Kentucky Rural Energy Consortium (KREC) seeks to advance comprehensive research on biomass, bioenergy, renewable energy and energy efficiency of importance to Kentucky agriculture, rural communities, and related industries. The research goals for KREC include dramatically reducing our dependency on foreign oil and creating an economically viable bioenergy industry in the

Kentucky’s Biomass Resources	
Corn Produced (Silage and Grain)¹³	5,601,520 tons
Soybeans Produced¹³	1,808,400 tons
Wheat Produced¹³	681,600 tons
Conservation Reserve Program¹⁴	354,149 acres enrolled
Municipal Solid Waste¹⁵	6,212,770 tons generated
Logging Residues⁴	1.2 million dry tons
Poultry¹³	311,299,000 head
Livestock¹³	2,881,000 head

Commonwealth. In addition, KREC will serve as a clearinghouse and networking group to exchange knowledge, programs, and ongoing activities of the Consortium and related state and federal programs, as well as build partnerships throughout the Commonwealth that support stated goals and federal biomass initiatives. KREC was established in 2005, and in March, 2006 the Governor announced awards to 7 competitive research grants in excess of \$1.5M.

LINKS TO OTHER KENTUCKY RESOURCES

Kentucky Department of Agriculture <http://www.kyagr.com/>

Kentucky Office of Energy Policy <http://energy.ky.gov/>

Kentucky Rural Energy Consortium <http://www.kppc.org/KREC/>

Kentucky Division of Forestry <http://www.forestry.ky.gov/>

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. 2006. Kentucky Energy Statistics. http://www.eere.energy.gov/states/state_specific_statistics.cfm/state=KY

- 3) Forest Inventory and Analysis Fact Sheet: Kentucky, 2004. Kentucky Division of Forestry. <http://www.forestry.ky.gov/programs/Forest+Inventory+and+Analysis+Report.htm>
- 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, National Agricultural Statistics Service. 2002 Census of Agriculture Kentucky State Data. <http://www.nass.usda.gov/>
- 7) U.S. Department of Energy, Biomass Research and Development Initiative. 2003. Kentucky Biobased Fuels, Power and Products State Fact Sheet. <http://sungrant.tennessee.edu/factsheets/kentucky.pdf>
- 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) East Kentucky Power Cooperative. 2006. <http://www.ekpc.com/greenpower/index.html>

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

11) Kentucky Office of Energy Policy Seed Grant Program (Accessed July, 2006) <http://energy.ky.gov/rd/seeddatabase.htm>

12) U.S. Department of Energy, Alternative Fuels Data Center. Kentucky Incentives for Renewable Energy. 2006. http://www.eere.energy.gov/afdc/progs/state_summary.cgi?afdc/KY

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 2006. PP. 26-43. <http://www.jgpress.com/biocyclus.htm>