

APPENDIX **C** Resources

This section provides a list of resources including articles, books, Web sites, possible field trips, potential guest speakers, and other ideas and materials that may be helpful as you design outreach programs and answer questions about woody biomass.

Articles and Reports

Assessment of Power Production at Rural Utilities Using Forest Thinnings and Commercially Available Biomass Power Technologies. By C. P. Demeter, D. F. Knowles, J. Olmstead, M. Jerla, and P. Shah, 2003. Landover, MD: Antares Group, Inc., 15-5 through 15-7. (Available at <http://www.antareshgroupinc.com/DOERUSreport.htm>). Provides information to consider in the first part of a feasibility study for a biomass power facility, such as biomass supply, power plant location, technology, and economics.

Availability of logging residues and potential for electricity production and carbon displacement in the U.S. Biomass and Bioenergy. By J. Gan and C. T. Smith. 2006. 30(12): 1011-1020. (Available at http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V22-4M1CYX0-3&_user=655127&_rdoc=1&_fmt=&_orig=search&_sort=d&view=c&_version=1&_urlVersion=0&_userid=655127&md5=385d4ad2326a7701182e7dd6e9205ce6). Assessed the abundance and regional distribution of logging residues and their potential for electricity generation and CO₂ emission displacement in the United States.

Bioenergy: Technologies, Federal and State Incentives. By C. Werner, 2004. Washington, DC: Environment & Energy Study Institute. (Available at <http://www.eesi.org/programs/agriculture/1.23.04%20bioenergy.pdf>). Highlights important aspects of several federal and state incentives related to using biomass for energy.

Biofueling Rural Development: Making the Case for Linking Biofuel Production to Rural Revitalization. By J. Kleinschmit, 2007. Carsey Institute Policy Brief No. 5, University of New Hampshire. (Available at http://www.carseyinstitute.unh.edu/documents/Biofuels_final.pdf). Covers important concepts related to how rural communities can develop biomass resources for use in the energy sector.

Biofuels: Production and Potential. By J. I. Zerbe, Forum for Applied Research and Public Policy, Winter, 1998. (Available at <http://www.fpl.fs.fed.us/documnts/pdf1988/zerbe88a.pdf>). Provides a historical perspective on how U.S. policies have shaped the development and implementation of biobased energy production methods.

Biomass as Feedstock for a Bioenergy and Bioproducts Industry: The Technical Feasibility of a Billion-Ton Annual Supply. By R. D. Perlack, L. L. Wright, A. Turhollow, R. L. Graham, B. Stokes, and D. C. Erbach. 2005. Washington DC: 73. U. S. Department of Energy and U. S. Department of Agriculture, Forest Service. Report number: ORNL/TM-2005/66. (Available at http://www.google.com/url?sa=t&source=web&ct=res&cd=2&url=http%3A%2F%2Fwww1.eere.energy.gov%2Fbiomass%2Fpdfs%2Ffinal_billionton_vision_report2.pdf&ei=DtjjSJnxMI32ugW-4KitBg&usg=AFQjCNGvWqfqKGcpaOrEi2PJOjIJBwdjDw&sig2=xUk1unZvl7693gCR_h3dOA). Analyzes whether the land resources of the U.S. are capable of producing a sustainable supply of biomass

sufficient to displace 30 percent or more of the country's present petroleum consumption--the goal set by the advisory committee in their vision for biomass technologies.

Biomass Cofiring: Economics, Policy, and Opportunities. In *Biomass and Bioenergy*. By E. Hughes. 2000. 19 (2000), pg 457–465. (Available at http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V22-41TN69H-9&_user=655127&_rdoc=1&_fmt=&_orig=search&_sort=d&view=c&_version=1&_urlVersion=0&_userid=655127&md5=26c84228ec011140dd67d43a8de07500). Focuses on the Department of Energy's Electric Power Research Institute and the process of evaluating, testing, and applying technology that can give a new mission to existing coal-fired power plants in terms of co-firing with wood.

Biopower Program: Activities Overview: Biopower Fact Sheet. National Renewable Energy Laboratory, U.S. Department of Energy, 2000. (Available at <http://www.nrel.gov/docs/fy00osti/27980.pdf>). Introduces biomass power generation and the Department of Energy's Biopower Program. It also provides information on the environmental and economic benefits of using biomass and the activities of the Biopower program.

The Carbon Connection. By D. W. Orr, 2007. *Conservation Biology* 21 (2), 289–292. Addresses some of the indirect social and environmental costs of using coal for power production.

Chip Pile Storage. By W. S. Fuller. 1985. *Tappi*. 68(8): 48–51. (Available at <http://frm-consulting.net/articles/storage.pdf>). Provides a review of practices to avoid deterioration and economic losses in a summary that brings past works together into a prescription for wood chip pile management that can be adapted to any mill that stores chips.

Co-Benefits of Utilizing Logging Residues for Bioenergy Production: The Case for East Texas, USA. In *Biomass and Bioenergy*. By J. Gan and T. C. Smith. 2006. (Available at: http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V22-4PBG1D7-1&_user=655127&_rdoc=1&_fmt=&_orig=search&_sort=d&view=c&_acct=C000033918&_version=1&_urlVersion=0&_userid=655127&md5=3572a5cf03ee38c7a99f436b794bbdc5). Describes a study that evaluated the benefits associated with the utilization of logging residues for electricity production in East Texas.

Community-based Forestry Perspectives on Woody Biomass, Briefing Paper, *Rural Voices for Conservation Newsletter*, March 2005. (Available at <http://209.85.165.104/search?q=cache:yT4WijbCwbkJ:www.sustainablenorthwest.org/pdf/policy/biomass/biobrief.pdf+woody+biomass+economic&hl=en&ct=clnk&cd=1&gl=us&client=firefox-a>). Discusses key considerations for biomass utilization policy, forest restoration and potential for woody biomass, the benefits of woody biomass, impediments to its utilization, and the importance of public involvement.

A Comparative Analysis of Woody Biomass and Coal for Electricity Generation under Various CO₂ Emissions Reductions and Taxes. In *Biomass and Bioenergy*. By J. Gan and C. T. Smith. 2006. (Available at: http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V22-4HVDJC8-1&_user=655127&_rdoc=1&_fmt=&_orig=search&_sort=d&view=c&_acct=C000033918&_version=1&_urlVersion=0&_userid=655127&md5=323ce32eae95763d72560dadf5ffba21). Discusses a study that investigated the cost competitiveness of woody biomass for electricity production in the U.S. under alternative CO₂ emission reductions and taxes.

The Contribution of Biomass in the Future Global Energy Supply: A Review of 17 Studies. By G. Berndesa, M. Hoogwijkb, and R. van den Broek. 2003. *Biomass and Bioenergy*: Volume 25. Discusses the contributions of biomass to the future global energy supply. The discussion is based on a review of seventeen earlier studies on the subject. These studies have arrived at widely different conclusions about the possible contribution of biomass in the future global energy supply.

The Economics of Forest-based Biomass Supply. In *Energy and Policy*. By R. A. Sedjo, 1997. Volume 25(6): 559–566. Examines the economics of increasing energy generation from woody biomass and briefly covers the environmental impacts of using biomass versus fossil fuels.

Energy from Wood. By J. I. Zerbe, 2004. *Encyclopedia of Forest Sciences: Volume 2*. (Available at: <http://www.treearch.fs.fed.us/pubs/7120>). Provides descriptions of the various forms of fuel inputs derived from woody biomass and the common uses of biomass as a source of energy.

European Union Common Agricultural Policy. (Available at <http://www.tiscali.co.uk/reference/encyclopaedia/hutchinson/m0037992.html>). Provides a brief description of the European Union's approach to agriculture.

Evolving Forestry and Rural Development Beliefs at Midpoint and Close of the 20th Century. In *Forest Policy and Economics*. By J. J. Kennedy, J. W. Thomas, and P. Glueck. 2001. 3: 81–95.308 (Available at http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VT4-43F8M1W-8&_user=655127&_rdoc=1&_fmt=&_orig=search&_sort=d&view=c&_acct=C000033918&_version=1&_urlVersion=0&_uSERID=655127&md5=67a5f0c0026086fb5db2256fac057c7a). Compares traditional forest values with emerging values and views about the role of forest management and managers in rural economic development.

Forests for Energy and the Role of Planted Trees. In *Critical Reviews in Plant Sciences*. By D. J. Mead. 2005a. 24: 407–421. (Available at <http://www.informaworld.com/smpp/content~content=a737739593~db=all~jumptype=rss>). Discusses the potential wood has as fuels in developed countries, taking into consideration the influence on fossil fuel price increases, as well as on ecological and social issues.

Fuel for the Future. In *Inside Agroforestry*. USDA National Agroforestry Center, 2006. Volume 15, Issue 3. (Available at <http://www.unl.edu/nac/insideagroforestry/vol15issue3.pdf>). Provides an excellent example of how to create attractive and appealing informative materials that encourage communities to pursue biomass resources produced through agroforestry techniques.

Fuel Value Calculator. By Forest Products Laboratory, 2004. Madison, WI: State and Private Forest Technology Marketing Unit. Publication WO-3. (Available at <http://www.fpl.fs.fed.us/documnts/techline/fuel-value-calculator.pdf>). Provides a user-friendly way to compare typical unit costs of various fuel sources, such as comparing the cost of using wood to the cost of using natural gas.

Liquid Fuels from Wood-Ethanol, Methanol, Diesel. In *World Resources Review*. By J. Zerbe. 3(4): 406–414.1992. (Available at <http://www.fpl.fs.fed.us/documnts/pdf1991/zerbe91a.pdf>). Reviews the suitability of a variety of liquid fuels made from wood in today's global economic and international trade situation and provides some estimates of domestic supply and cost of wood for use in production of liquid fuels.

Measuring the Economics of Biofuel Availability. By M. Langholtz, D. R. Carter, M. Marsik, and R. Schroeder. (Available at <http://www.esri.com/news/arcuser/1006/biomass1of2.html>). Based on research done for the Wood to Energy Outreach Program, this article discusses strategies for determining the economic availability or total delivered price for a given quantity of woody biomass in selected counties. This assessment takes into account a number of factors, including biomass type, distance, and transportation infrastructure using ArcGIS Network Analyst.

Opportunities for Improving Plantation Productivity: How much? How quickly? How realistic? In *Biomass and Bioenergy*. By D. J. Mead. 2005b. 28: 249–266. (Available at http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V22-4DDR6CP-1&_user=655127&_rdoc=1&_fmt=&_orig=search&_sort=d&view=c&_version=1&_urlVersion=0&_userid=655127&md5=e684582bdc23ac1ab02ce39559d82ded). Reviews the potential of intensive silviculture to increase productivity of short and longer rotation hardwood and conifer plantations.

Primer on Wood Biomass for Energy, U.S. Forest Service Report. By R. Bergman and J. Zerbe, 2004. U.S. Forest Service, State and Private Forestry Technology Marketing Unit, Forest Products Laboratory, Madison, Wisconsin. (Available at http://www.state.co.us/oemc/programs/waste/biomass/resources/Primer_on_Wood_Biomass.pdf). Summarizes the concepts of wood energy on a residential, commercial, and industrial scale in the U.S.

Renewable Electricity Production Tax Credit, Energy Policy Act of 2005. By the Northeast Regional Biomass Program (NRBP), 2005. Washington, DC (Available at http://www.nrbp.org/pdfs/energy_policy_act_2005.pdf). Summarizes the available tax credits for qualifying resources provided by the Energy Policy Act of 2005.

Short-term Energy Outlook. By the Energy Information Administration, 2006. (Available at <http://www.eia.doe.gov/emeu/steo/pub/contents.html>). Provides market forecasts and trends for coal, electricity, natural gas, and petroleum.

Socio-Economic Drivers in Implementing Bioenergy Projects. In *Biomass and Bioenergy*. By J. Domac, K. Richards, and S. Risovic. 2005. 28: 97–106. (Available at http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V22-4DHXDSN-2&_user=655127&_rdoc=1&_fmt=&_orig=search&_sort=d&view=c&_version=1&_urlVersion=0&_userid=655127&md5=7db210b357e1a49e3b8367e1a89fb733). Provides a descriptive review of literature on employment and other socio-economic aspects of bioenergy systems as drivers for implementing bioenergy projects.

Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies. In *Science*. By S. Pacala and R. Socolow. August 2006. Vol. 305. Examines how current scientific knowledge and technologies could be used to limit atmospheric carbon to a concentration that would prevent most damaging climate change.

Sustainable Production of Woody Biomass for Energy. By the IEA Bioenergy Executive Committee, 2003. (Available at http://www.ieabioenergy.com/library/157_PositionPaper-SustainableProductionofWoodyBiomassforEnergy.pdf). Discusses traditional woody biomass production systems and sustainability issues and indicators; and makes general recommendations for sustainable production.

Thermal Energy, Electricity, and Transportation Fuels from Wood. In *Forest Products Journal*. By J. I. Zerbe, 2006. 56(1). (Available at <http://www.treesearch.fe.fed.us/pubs/22991>). Provides an economic perspective on the potential for energy produced from woody biomass to help satisfy the nation's growing demand for a variety of dependable fuel sources.

Urban Wood Waste Resource Assessment. By G. Wiltsee, 1998. Golden, CO: National Renewable Energy Laboratory. (Available at <http://www.p2pays.org/ref/19/18947.pdf>). Examines wood waste resources in thirty U.S. metropolitan areas in order to develop predictive tools for estimating urban waste wood resources based on an area's demographic and economic variables.

Use of Energy Analysis in Silvicultural Decision Making. In *Biomass and Bioenergy*. By D. J. Mead and D. Pimentel. 2006. 30: 357–362. (Available at http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V22-4J2KTBj-1&_user=655127&_rdoc=1&_fmt=&_orig=search&_sort=d&view=c&_acct=C000033918&_version=1&_urlVersion=0&_userid=655127&md5=2bbaeedbc045f6b8baba8e008801b251). Outlines a study in which selected inputs for hypothetical pine and eucalyptus plantations were evaluated.

Woody Biomass Users' Experiences Offer Insights for Government Efforts Aimed at Promoting Its Use. By United States Government Accountability Office, 2006. Report No. GAO-06-336. (Available at <http://www.gao.gov/new.items/d06336.pdf>). Provides a review of the successes and challenges of thirteen current woody biomass users located in the U.S., including power plants, pulp and paper mills, schools, and hospitals.

Books/Booklets/Periodicals

Bioenergy from Sustainable Forestry. By J. Richardson, R. Bjorheden, P. Hakkila, A. T. Lowe, and C. T. Smith (Eds.). 2002. Boston, MA: Kluwer Academic Publishers. Outlines information needed to design or implement sustainable forest management systems for production of biomass for energy in conjunction with other forest products.

Bioenergy: Realizing the Potential. By S. Silveira. 2005. The Netherlands: Elsevier. Looks at the possibilities that exist for bioenergy from a global perspective.

Biofuels for Transport: Global Potential and Implications for Sustainable Energy and Agriculture. By the Worldwatch Institute. 2008. Discusses new biofuel technologies and crops, key economic and social issues, policy implications, and recommendations for decision makers.

Biomass Magazine. (Available online at <http://www.biomassmagazine.com/index.jsp>). Covers a wide range of topics related to biomass including new technologies, case studies, industry news, and much more. Visit <https://ssl.bbfbiofuels.com/bmm/subscribe-payment.jsp> to subscribe to receive hard copies.

The Brilliance of Bioenergy in Business and in Practice. By R. E. H. Sims, 2002. London, UK: James and James. Covers several aspects of using biomass to generate energy, including business opportunities and technologies. In addition, case studies are provided within the chapters to convey successes and challenges of implanting such systems.

Communication Skills for Conservation Professionals. By S. K. Jacobson, 1999. Washington, DC: Island Press. Covers communication program design and strategies for natural resource professionals.

Conservation Education and Outreach Techniques. By S. K. Jacobson, M. D. McDuff, and M. C. Monroe, 2006. Oxford, UK: Oxford University Press. Discusses relevant theories along with strategies for planning, implementing, and evaluating a wide range of techniques. This book is a practical guide for applying conservation education and outreach programs.

Energy Efficiency Best Practices Workbook for Local Governments. Sponsored by the California Local Energy Efficiency Program (CALeep). Designed to help communities that are looking to reduce energy use, costs, and greenhouse gas emissions. It describes a basic five-step process that communities can follow to increase their level of energy efficiency, whether starting from scratch or building on existing energy efficiency activities.

Energy from Biomass: A Review of Combustion and Gasification Technologies. By P. Quaak, H. Knoef, and H. Stassen, 1999. Washington, DC World Bank. Technical Paper No. 422. Provides a comprehensive review of current biomass combustion and gasification systems, including advantages and disadvantages.

Facilitator's Guide to Participatory Decision-Making, 2nd Edition. By S. Kaner, L. Lind, C. Toldi, S. Fisk, and D. Berger, 2007. San Francisco, CA: Jossey Bass. A valuable resource for learning the skills necessary for group facilitation.

Forest Management to Sustain Ecological, Economic, and Social Values. By L. S. Davis, K. N. Johnson, P. S. Bettinger, and T. E. Howard. New York: McGraw-Hill. Offers an authoritative, up-to-date coverage of broad-scope concepts and ideas for those entering the fields of forest management, forest economics, and forest ecology.

Forest Measurements. By T. E. Avery and H. E. Burkhart. 2002. New York, NY: McGraw-Hill. Provides an introduction to forest measurement, including such areas as the measurement of timber, measuring attributes of standing trees, inventorying volumes of forest stands, and predicting growth of individual trees and stands of trees.

The Hidden Treasure. (Available at <http://forestry.nacdnet.org/comic.htm>). As a teaching tool for late elementary to middle school children, *Hidden Treasure* illustrates how forest renewal improves the health of forests and provides biomass for many productive uses. It also describes how woody biomass will play an important role in our nation's future, including energy security through the production of biofuels, biochemicals, and other sources of energy. You can learn more and request a copy from the Web site.

Short Rotation Forestry Handbook (online). University of Aberdeen, Scotland. (Available at <http://www.abdn.ac.uk/wsrgr/srfhbook/>). Details how to grow short rotation forests, and the various processes involved including for example inputs and economics.

Successful Public Meetings. By E. Cogan, 2000. Chicago, IL: APA Planners Press. Offers details on successful meetings, crucial tasks, how to avoid disasters, and ways to manage difficult participants.

Timber Management: A Quantitative Approach. By J. L. Clutter, J. C. Fortson, L. V., Pienaar, L. V., G. H. Brister, and R. L. Bailey. 1983. New York, New York: John Wiley & Sons. Outlines timber management from a numbers perspective, including treatment of models to predict tree and stand volume and growth; concepts of discounted cash flows, compound interest, internal rate of return and taxes related to timber management; and stand-level and forest-level planning using treatment models.

Organizations and Agencies

Chicago Climate Exchange (CCX). (<http://www.chicagoclimatex.com/>). North America's only and the world's first global marketplace for integrating voluntary, legally binding greenhouse reductions with emissions trading and offsets for all six greenhouse gases.

Energy Information Administration (EIA). (<http://www.eia.doe.gov>). Provides policy-neutral data, projections, and analyses to promote effective policy making, efficient markets, and increased public understanding about energy and its connections with the economy and the environment.

IEA Bioenergy Task 31: Biomass Production for Energy from Sustainable Forestry. (http://www.ieabioenergytask31.org/IEA_Bioenergy_Task_31.htm). Provides shared and synthesized research information, analyzes policy relevance, and disseminates information to help promote the sustainable development goals of national programs such as biomass in participating countries including Canada, Denmark, Finland, Germany, Norway, Sweden, The Netherlands, the United Kingdom, and the United States.

SunGrant Initiative, Southeastern Regional Center. (<http://sungrant.tennessee.edu>). Tennessee Agricultural Experiment Station. Provides university-based research, extension and educational programs for biobased energy technologies.

United States Department of Agriculture (USDA). (<http://www.usda.gov/wps/portal/usdahome>). Provides leadership on food, agriculture, natural resources, and related issues, guiding the development of sound public policy based on the best available science, and promoting efficient management.

U.S. Department of Agriculture Economic Research Service. (<http://www.ers.usda.gov>). A primary source of economic information and research in the U.S. Department of Agriculture.

United States Department of Energy (DOE). (<http://www.energy.gov>). Advances the national, economic, and energy security of the U.S. while promoting scientific and technological innovation in support of that mission; and ensuring the environmental cleanup of the national nuclear weapons complex.

U.S. Forest Service, Forest Products Lab, State and Private Forestry Technology Marketing Unit. (http://www.fpl.fs.fed.us/tmu/wood_for_energy/wood_for_energy.html). Provides technical assistance for improving utilization and marketing of forest products. This Web site provides links to several publications and other materials that may be helpful for understanding the use of wood for energy.

Web sites

Answers to ten frequently asked questions about bioenergy, carbon sinks and their role in global climate change. By Robert Matthews and Kimberly Robertson, 2005. IEA Bioenergy, Task 38. (Available at <http://www.ieabioenergy-task38.org/publications/faq/>). Explains basic concepts of using biomass for energy, carbon dioxide emissions, and carbon sequestration by biomass.

BioMass Energy Concepts (BEC). (<http://www.becllusa.com>). Provides a variety of services related to the sale of biomass energy equipment packages. BEC specializes in creating tailored biomass fueled energy systems that meet the specific needs of their customers and offers engineering assistance.

Biomass Research and Development Initiative. (<http://www.brdisolutions.com/>). Coordinates all federal products, research, and development related to bioenergy. This Web site is a resource for recent news, publications, upcoming events, and links to additional resources.

Biomass Trader Site. (<http://www.ncbiomasstrader.com/home.aspx>). Provides contact information for and resource descriptions of biobased manufacturing products to help biomass energy suppliers connect with prospective buyers in the state of North Carolina. This resource might provide a useful model for other states.

Comprehensive online database of diameter-based biomass regressions for North American tree species. (<http://www.treesearch.fs.fed.us/pubs/7058>). By J.C. Jenkins, D.C. Chojnacky, L.S. Heath, and R.A. Birdsey. 2004. Newtown Square, PA: 45. U. S. Department of Agriculture, U.S. Forest Service, Northeastern Research Station. Report number: Gen. Tech. Rep. NE-319.306. Contains 2,640 equations compiled from the literature for predicting the biomass of trees and tree components from diameter measurements of species found in North America.

Education Web Site on Biomass and Bioenergy. (<http://www.aboutbioenergy.info/>). Provides tools, papers, brochures, links, and other resources about biomass technologies, economics, benefits, and implementation.

Energy Information Administration, Renewables and Alternate Fuels, Wood and Wood Waste. (<http://www.eia.doe.gov/cneaf/solar.renewables/page/wood/wood.html>). Provides data on biomass energy consumption by industry and by source of biomass. Links to additional data on wood and wood waste are also provided.

Eprida, Inc. (http://www.eprida.com/eprida_flash.php4). Provides information on Eprida, Inc., founded in 2002 to provide a commercial vehicle for exploring innovative solutions to global challenges. The Delaware-based corporation's early research focused on addressing global climate change. This work has led to breakthrough innovations in renewable energy, carbon capture, and carbon utilization for sustainable agriculture.

Federal Biomass Policy, Biomass Program, Energy Efficiency and Renewable Energy. (http://www1.eere.energy.gov/biomass/federal_biomass.html). U.S. Department of Energy (U.S. DOE). Provides a comprehensive overview of the major federal laws, executive orders, and reports related to using biomass for energy.

Forest*A*Syst. (<http://www.utextension.utk.edu/publications/pbfiles/PB1679.pdf>). Provides private forest landowners explanations and options as they relate to proper forest management.

Forest Bioenergy. (<http://www.forestbioenergy.net>). Designed for information sharing among natural resource management, extension, and community planning and development professionals. Developed as part of the Southern Forest Research Partnership bioenergy training initiative, the site contains a variety of resources and information related to biomass utilization, including publications, presentations, additional links, events, and images. Materials cover a wide range of topics including southern wood supply, management, harvesting, economics, and forest sustainability.

Forest Encyclopedia Network. (<http://www.forestencyclopedia.net>). Connects scientific results, conclusions, and impacts with forestry management needs and issues.

Fuels for Schools Partnership. (<http://www.fuelsforschools.org>). Promotes the use of woody biomass as a renewable, natural resource that provides a clean, readily available energy source for use in heating systems in public and private buildings. This Web site contains useful assessments, photographs, presentations, and information for those interested in pursuing biomass energy as an efficient and cost-saving heat source in their own facilities.

Georgia Forestry Commission Research Papers (online). (<http://www.gatrees.org/Resources/Publications/ForestMarketing/researchpapers.cfm>). This collection of research papers related to forestry and biomass is provided by the Georgia Forestry Commission.

International Energy Agency (IEA) Bioenergy. (<http://www.ieabioenergy.com>). Provides a global perspective on biomass energy use with event listings, media centre, and well-produced publications and informative materials for promoting the utilization of woody biomass as a sustainable fuel source.

Northeast Sustainable Energy Association, Biopower. (<http://www.nesea.org/energy/info/biopower.html>). Overviews biomass power, including sources and economic and environmental impacts.

Phyllis. (<http://www.ecn.nl/phyllis/>). Contains information on the composition of a variety of fuels including grasses, sugarcane bagasse, husks, algae, fossil fuels, and manure.

Pinchot Institute for Conservation. Outlook Forum 2007 on Climate Change, Forests, and Bioenergy. (http://pinchot.org/outlook_forums/2007). Features a summary of the 2007 forum, presentations, and speaker bios.

Plant Power: Energy and the Environment. (<http://www.treepower.org/>). Features project descriptions and research reports from studies by the Common Purpose Institute, the University of Florida, the U.S. Department of Energy, farmers, power providers, biofuel producers, and others. The organization works to find ways to grow, harvest, and use fast-growing crops and biomass waste streams to fuel power plants and to provide industrial biogas, transportation fuels (ethanol and biodiesel), and steam power.

Power Scorecard, Electricity and the Environment. (http://www.powerscorecard.org/elec_env.cfm). Offers a tool that is useful for comparing types of power generation sources and their effects on the environment.

Renewable Energy Sources: A Consumer's Guide, Energy Information Brochures, Official Energy Statistics from the U.S. Government, Renewable Energy Trends. By the U.S. Department of Energy, Energy Information Administration (U.S. DOE/EIA), 2004. (<http://www.eia.doe.gov/neic/brochure/renew05/renewable.html>). Provides a general overview of all sources of renewable energy and includes figures depicting energy consumption and electricity generation by fuel source.

Smallwood Utilization Network (SUN). (<http://smallwoodnews.com>). Offers a broad network for dealing with the complex set of challenges in supply, production, and marketing for the emerging smallwood industry. You can sign up for the Smallwood Newsletter, which includes up-to-date articles on woody biomass utilization.

State Incentives for Renewable Energy (online database). (<http://www.dsireusa.org/>). A comprehensive source of information on state, local, utility, and federal incentives that promote renewable energy and energy efficiency.

Sustainable Hardwoods Network. (<http://sustainablehardwoods.net/biomass>). Provides information from forum presentations, including the types and properties of biomass materials, small-scale biopower systems, and safeguarding rural communities through fuels utilization.

Timber Buy Sell Site. (<http://www.timberbuysell.com>). Serves as a marketplace for forest resources. Users can search ads from buyers and sellers of forest residue, logs, mill residue, and standing timber.

University of Minnesota Extension Service Biomass Web site. (<http://www.extension.umn.edu/woodlands/biomass#download>). Provides resources from three 2006 workshops (titled "Woody Biomass Harvesting & Utilization") hosted by the University of Minnesota Extension Service. In Grand Rapids, St. Cloud, and Rochester, Minnesota.

University of Minnesota's National Database of State Woody Biomass Utilization Policies. (<http://www.forestry.umn.edu/publications/staffpapers/Staffpaper199.pdf>). Provides a comprehensive guide to biomass legislation for each state in the country as of 2008.

U.S. Department of Energy, Biomass Program. (<http://www1.eere.energy.gov/biomass/>). Provides information about the benefits of biomass utilization, current issues, feedstocks, technologies, and research and development activities, as well as a database of documents on biomass.

U.S. Department of Energy, Energy Efficiency and Renewable Energy, Biomass program: Economic growth. (http://www1.eere.energy.gov/biomass/economic_growth.html). Provides information about the economic impacts of using biomass for energy and provides links to several related reports and documents.

U.S. Department of Energy, Energy Efficiency and Renewable Energy, a Consumer's Guide to Energy Efficiency and Renewable Energy. (http://www.eere.energy.gov/consumer/your_home/electricity/index.cfm/mytopic=10450). Describes the common

technologies behind using biomass to produce energy. Links to a biomass resource map and additional information on bioenergy basics, gasification, and power production are also provided.

U.S. Department of Energy, Energy Efficiency and Renewable Energy, Glossary of Energy-Related Terms. (http://www.eere.energy.gov/consumer/information_resources/index.cfm/mytopic=60001). Provides an easy to use glossary of energy-related terms.

U.S. Department of Energy, Energy Efficiency and Renewable Energy, State Energy Program. (http://www.eere.energy.gov/state_energy_program/projects_state.cfm). Features links to, and information about, state energy programs and special projects, grants, and case studies.

U.S. EPA Clean Energy Program. (<http://www.epa.gov/cleanenergy/epaclean.htm>). Provides links and information about initiatives related to combined heat and power, green power, state energy programs, energy efficiency, and renewable energy.

U.S. Forest Service Woody Biomass Utilization. (<http://www.fs.fed.us/woodybiomass/>). Provides information on the Forest Service program tasked with increasing the amount of America's energy that comes from forests.

WoodFuel.com. (<http://www.woodfuel.com>). Provides an online forum for the growing network of biomass suppliers and consumers to exchange products and services. WoodFuel forms trade alliances with the equipment and transportation industries involved with biomass energy production and uses the latest Internet technologies to complete an efficient supply chain for the entire industry.

Wood to Energy Outreach Program. (<http://www.interfacesouth.org/woodybiomass/>). A program designed to foster community understanding and discussion about the possibility of using wood for energy in the South.

Wood Utilization Solutions to Hazardous Fuels. (<http://www.emmps.wsu.edu/woodutilization/secondary/Proceedings.html>). Provides information from the 2004 "Wood Utilization Solutions to Hazardous Fuels" workshop held in Spokane, Washington, and includes several slide presentations that focus on biomass energy solutions. Presentation topics include small-scale biomass energy production, biomass energy plants, and small-scale gasifiers.

Presentations

Biomass, the Energy Policy Act of 2005 and the President's Biofuels Initiative. By John Ashworth, 2006. Golden, CO: National Renewable Energy Laboratory. (Available at <http://www.nationalbiomassconference.org/presentations/Ashworth.pdf>). Provides an overview of the Energy Policy Act of 2005, the Department of Energy's response to the Act, and the Biofuels Initiative (30 x 30).

Wood Biomass Feedstock for Bioenergy and Bioproducts: A North American Solution slide presentation. By Ed White, Lawrence Abrahamson, Timothy Volk, Lawrence Smart, James Nakas, and Thomas Amidon, SUNY-ESF, Syracuse, NY, 2006. (Available at <http://66.48.22.171/documents/EdWhitePresentation-5December2006.pdf>). Covers national energy issues, federal and state biomass initiatives, and national biomass supply.

Wood to Energy Outreach Presentation Collection. University of Florida. (Available at <http://interfacesouth.org/woodybiomass/presentation.html>). Is a collection of slide presentations from the Wood to Energy Outreach Program and Sustainable Forestry for Bioenergy and Biobased-Products Program on the following topics: basic woody biomass overview; woody biomass products and possibilities; economics; public perceptions; sustainable production, transporting, drying, and storing; public perceptions; and education versus advocacy.

Forest Bioenergy. Southern Forest Research Partnership, Inc. (Available at <http://www.forestbioenergy.net/training-materials/powerpoint-presentations/> and <http://www.forestbioenergy.net/presentations>). A collection of slide presentations from the Sustainable Forestry for Bioenergy and Bio-based Products Program. They cover a variety of woody biomass topics, including understanding bioenergy resources, economics, environmentally sustainable production systems, cellulosic ethanol, and others.

Videos

Energy from the National Forest Video from the Shasta-Trinity National Forest. (Available at <http://www.fs.fed.us/r5/shastatrinity/news/podcasts.shtml>). Running Time: 10:22 (audio version), 5:52 (video version). Another wildfire burns in northern California releasing carbon the trees removed from the atmosphere as they grew. Wildfires have become more intense and destructive due to decades of aggressive suppression allowing fuels to accumulate. A partnership between the U.S. Forest Service and private industry is removing excess biomass from the Shasta-Trinity National Forest and using it to generate electricity resulting in a healthier forest and less reliance on fossil fuel.

Video Tour of New Biomass Gasification Plant at Middlebury College. (Available at <http://blogs.middlebury.edu/biomass/about/video-tour/>). Middlebury's new biomass gasification plant connects climate, energy, and community for a more sustainable energy future. For more than a decade, carbon reduction has been a community driven initiative at the College, and in 2007 Middlebury set a goal of achieving carbon neutrality by 2016. The completion of the biomass gasification facility marks a significant milestone toward that goal. Students, staff, and faculty from many different departments across campus were involved at every stage of this project.

Suggested Field Trips

- Many wood-to-energy facilities will provide tours if you contact them ahead of time.
- A timber plantation that is a certified producer of sustainable forest products
- A tour of a utility or industry that uses wood to produce energy
- A utility or industry that has implemented an innovative technology in their use of wood for energy
- A utility or industry that uses wood for energy and is willing to discuss economic aspects

Suggested Guest Speakers

- Biomass financing consultants
- Certified sustainable forest products producer
- Consulting forester
- Economic development experts
- Energy experts
- Engineers or consultants who specialize in biomass conversion technologies
- Environmental managers from utilities or industries that use wood for energy
- Forester from a state or county forestry agency
- Forestry extension agent or specialist
- Forestry market experts
- Local leaders who have been involved in energy policy issues
- Policy-maker who specializes in energy issues
- Representative from an environmental organization that has expertise in energy, renewable energy, or woody biomass
- State Energy Policy Office members

