

APPENDIX A

Resources and Tools for States

The resources for detailed information that are included at the end of each chapter are also compiled here to serve as a comprehensive snapshot of key reports, tools, and guidance documents.

APPENDIX A CONTENTS

- A.1 Biomass Feedstocks and Conversion Technologies
- A.2 Benefits of Bioenergy (Environmental, Economic, Energy)
- A.3 Assessing Potential Markets for Biomass
- A.4 Tools to Help Estimate Economic, Energy, and/or Environmental Benefits
- A.5 Financing Bioenergy Projects

A.1 BIOMASS FEEDSTOCKS AND CONVERSION TECHNOLOGIES

Resource	Description	URL
Bioenergy		
Woody Biomass Utilization , U.S. Forest Service and Bureau of Land Management.	This U.S. Forest Service and Bureau of Land Management Web site provides links to a variety of resources and reports on woody biomass utilization, including tools and references specifically targeted at state governments.	www.forestsandrangelands.gov/Woody_Biomass/index.shtml
BioWeb , Sun Grant Initiative.	An online catalog of a broad range of resources on bioenergy, including descriptions of biomass resources, biofuels, and bioproducts; explanations of conversion technologies; and summaries of relevant policies. The resources are searchable by both topic and level of detail of information provided. The catalog is a product of the Sun Grant Initiative, a national network of land-grant universities and federally funded laboratories working together to further establish a bio-based economy.	http://bioweb.sungrant.org/
Biomass as Feedstock for a Bioenergy and Bioproducts Industry: The Technical Feasibility of a Billion-Ton Annual Supply , U.S. DOE, USDA, 2005.	Describes issues associated with reaching the goal of 1 billion tons of annual biomass production (see especially pp. 34–37).	www.osti.gov/bridge
Biomass Energy Data Book , U.S. DOE, September 2006.	Provides a compilation of biomass-related statistical data.	http://cta.ornl.gov/bedb/index.shtml
Biomass Feedstock Composition and Property Database , U.S. DOE.	Provides results on chemical composition and physical properties from analyses of more than 150 samples of potential bioenergy feedstocks, including corn stover; wheat straw, bagasse, switchgrass, and other grasses; and poplars and other fast-growing trees.	www1.eere.energy.gov/biomass/feedstock_databases.html
A Geographic Perspective on the Current Biomass Resource Availability in the United States , Milbrandt, A., 2005.	Describes the availability of the various types of biomass on a county-by-county basis.	www.nrel.gov/docs/fy06osti/39181.pdf
Kent and Riegel’s Handbook of Industrial Chemistry and Biotechnology , Kent, 2007.	Detailed, comprehensive, fairly technical explanation of the range of biomass conversion technologies.	
Biopower/Bioheat		
Biomass Combined Heat and Power Catalog of Technologies , U.S. EPA, September 2007.	Detailed technology characterization of biomass CHP systems, including technical and economic characterization of biomass resources, biomass preparation, energy conversion technologies, power production systems, and complete integrated systems. Includes extensive discussion of biomass feedstocks.	www.epa.gov/chp/documents/biomass_chp_catalog.pdf
Combined Heat and Power Market Potential for Opportunity Fuels , U.S. DOE, Resource Dynamics Corporation, August 2004.	Determines the best “opportunity fuels” for distributed energy sources and CHP applications.	www.eere.energy.gov/de/pdfs/chp_opportunityfuels.pdf

A.1 BIOMASS FEEDSTOCKS AND CONVERSION TECHNOLOGIES *(cont.)*

Resource	Description	URL
Biofuels/Bioproductions		
Bioenergy Conversion Technology Characteristics , Western Governors' Association, September 2008.	Investigates the biofuel conversion technologies that are currently available, as well as technologies currently under development that are developed enough to be potentially available on a commercial basis circa 2015.	www.westgov.org/wga/initiatives/transfuels/Task%202.pdf
A National Laboratory Market and Technology Assessment of the 30x30 Scenario , NREL, March 2007.	Draft assessment of the market drivers and technology needs to achieve the goal of supplying 30 percent of 2004 motor gasoline fuel demand with biofuels by 2030.	
From Biomass to BioFuels: NREL Leads the Way , NREL, August 2006.	Provides an overview of the world of biofuels, including the maturity levels of various biofuels, how they are produced, and the U.S. potential for biofuels.	www.nrel.gov/biomass/pdfs/39436.pdf
Research Advances Cellulosic Ethanol: NREL Leads the Way , NREL, March 2007.	Highlights some of NREL's most recent advances in cellulosic ethanol production.	www.nrel.gov/biomass/pdfs/40742.pdf

A.2 BENEFITS OF BIOENERGY (ENVIRONMENTAL, ECONOMIC, ENERGY)

Resource	Description	URL
Bioenergy		
Economic Impacts of Bioenergy Production and Use , U.S. DOE, SSEB Southeast Biomass State and Regional Partnership, October 2005.	Summarizes the benefits of bioenergy production in the U.S., including job creation, reduced demand for fossil fuels, and expanded tax bases.	www.vienergy.org/Economics.pdf
State Energy Alternatives Web Site , U.S. DOE, National Conference of State Legislatures.	Provides information on state-specific biomass resources, policies, and status as well as current biofuels and biopower technology information.	http://apps1.eere.energy.gov/states/
An Assessment of Biomass Harvesting Guidelines , Evans and Perschel, Forest Guild, 2009.	Presents an assessment of existing biomass harvesting guidelines and provides recommendations for the development of future guidelines.	www.forestguild.org/publications/research/2009/biomass_guidelines.pdf
Planning for Disaster Debris , U.S. EPA, 2008.	Provides information and examples for developing a disaster debris plan that will help a community identify options for collecting, recycling, and disposing of debris in the event of a natural disaster.	www.epa.gov/osw/conserve/rrr/imr/cdm/pubs/disaster.htm
Biopower/Bioheat		
Biomass Power and Conventional Fossil Systems with and without CO₂ Sequestration—Comparing the Energy Balance, Greenhouse Gas Emissions, and Economics , NREL, January 2004.	Provides a comparative analysis of a number of different biopower, natural gas, and coal technologies.	www.nrel.gov/docs/fy04osti/32575.pdf
Economic Impacts Resulting from Co-Firing Biomass Feedstocks in Southeastern U.S. Coal-Fired Power Plants , Presentation by Burton English et al., University of Tennessee.	Summarizes the economic impacts in eight southeastern states from using biomass to co-fire power plants that traditionally have only used coal for fuel.	www.farmfoundation.org/projects/documents/english-cofire.ppt projects/documents/english-cofire.ppt
Green Power Equivalency Calculator , U.S. EPA.	Allows any bioenergy user to communicate to internal and external audiences the environmental impact of purchasing or directly using green power in place of fossil fuel derived energy by calculating the avoided carbon dioxide (CO ₂) emissions. Results can be converted into an equivalent number of passenger cars, gallons of gasoline, barrels of oil, or American households' electricity use.	www.epa.gov/grnpower/pubs/calculator.htm
Job Jolt: The Economic Impacts of Repowering the Midwest: The Clean Energy Development Plan for the Heartland , Regional Economics Applications Laboratory, November 2002.	Analyzes the economic and job creation benefits of implementing a clean energy plan in the 10-state Midwest region.	www.michigan.gov/documents/nwlb/Job_Jolt_RepoweringMidwest_235553_7.pdf

A.2 BENEFITS OF BIOENERGY (ENVIRONMENTAL, ECONOMIC, ENERGY) (cont.)

Resource	Description	URL
Biofuels/Bioproductions		
Alternative Fueling Station Locator , U.S. DOE.	Allows users to find alternative fuels stations near a specific location on a route, obtain counts of alternative fuels stations by state, view U.S. maps, and more. The following alternative fuels are included in the mapping application: compressed natural gas, E85, propane/liquefied petroleum gas, biodiesel, electricity, hydrogen, and liquefied natural gas.	www.afdc.energy.gov/afdc/data/geographic.html
Biomass Energy Data Book , ORNL, September 2008.	Describes a meta-analysis of energy balance analyses for ethanol, revealing the sources of differences among the different studies.	http://cta.ornl.gov/bedb/pdf/Biomass_Energy_Data_Book.pdf
Changing the Climate: Ethanol Industry Outlook 2008 , Renewable Fuels Association (RFA), 2008.	Forecasts that 4 billion gallons of ethanol production capacity will come on line from 68 biorefineries being constructed in 2008 and beyond, increasing the 2007 figure by nearly 50%.	www.ethanolrfa.org/objects/pdf/outlook/RFA_Outlook_2008.pdf
Contribution of the Ethanol Industry to the Economy of the United States , RFA, 2007.	Finds that the industry spent \$12.5 billion on raw materials, other inputs, and goods and services to produce about 6.5 billion gallons of ethanol in 2007. An additional \$1.6 billion was spent to transport grain and other inputs to production facilities; ethanol from the plant to terminals where it is blended with gasoline; and co-products to end-users.	www.ethanolrfa.org/objects/documents/576/economic_contribution_2006.pdf
Economic and Agricultural Impacts of Ethanol and Biodiesel Expansion , University of Tennessee, 2006.	Finds that producing 60 billion gallons of ethanol and 1.6 billion gallons of biodiesel from renewable resources by 2030 would likely result in development of a new industrial complex with nearly 35 million acres planted dedicated to energy crops.	http://beag.ag.utk.edu/pp/Ethanolagimpacts.pdf
Ethanol and the Local Community , RFA, 2002.	Summarizes possible effects of ethanol production on local economic development.	www.ethanolrfa.org/objects/documents/120/ethanol_local_community.pdf
Greener Fuels, Greener Vehicles: A State Resource Guide , National Governors' Association, 2008.	Discusses alternative transportation fuels and vehicle technologies.	www.nga.org/Files/pdf/0802GREENERFUELS.PDF
Greenhouse Gas Impacts of Expanded Renewable and Alternative Fuels Use , U.S. EPA, April 2007.	Provides a summary of GHG emissions from a variety of advanced fuel options.	www.epa.gov/oms/renewablefuels/420f07035.htm
New Analysis Shows Oil-Savings Potential of Ethanol Biofuels , National Resources Defense Council (NRDC), 2006.	Describes NRDC's meta-analysis of energy balance papers and its standardized methods.	www.nrdc.org/media/pressreleases/060209a.asp
A Rebuttal to "Ethanol Fuels: Energy, Economics and Environmental Impacts," National Corn Growers Association, 2002.	Refutes the contention in a previous article that more energy goes into producing ethanol than ethanol itself can actually provide, creating a negative energy balance.	www.ethanolrfa.org/objects/documents/84/ethanolffuelsrebuttal.pdf
Renewable Fuel Standard Program , U.S. EPA.	Describes efforts undertaken by U.S. EPA toward a National Renewable Fuels Standard under requirements of the Energy Policy Act of 2005. While these requirements are superseded by more recent legislation, links from this page provide useful background. In particular, the discussion of estimated costs summarizes the expected incremental costs of policies advancing ethanol.	www.epa.gov/oms/renewablefuels/

A.2 BENEFITS OF BIOENERGY (ENVIRONMENTAL, ECONOMIC, ENERGY) (cont.)

Resource	Description	URL
Regulatory Impact Analysis: Renewable Fuel Standard Program , U.S. EPA, 2007.	Examines proposed standards that would implement a renewable fuel program as required by the Energy Policy Act of 2005. It notes, however, that renewable fuel use is forecast to exceed the standards due to market forces anyway.	www.epa.gov/OMS/renewablefuels/420r07004-sections.htm
SmartWay Grow & Go Factsheet on Biodiesel , U.S. EPA, October 2006.	Describes how biodiesel is made, its benefits versus vegetable oil, performance, availability, affordability, and other characteristics.	www.epa.gov/smartway/growandgo/documents/factsheet-biodiesel.htm
SmartWay Grow & Go Factsheet on E85 and Flex Fuel Vehicles , U.S. EPA, October 2006.	Describes E85-fuel and flex-fuel vehicles, including their affordability and benefits.	www.epa.gov/smartway/growandgo/documents/factsheet-e85.htm
State-Level Workshops on Ethanol for Transportation: Final Report .	Summarizes a series of DOE-sponsored, state-level workshops exploring and encouraging construction of ethanol plants.	www.nrel.gov/docs/fy04osti/35212.pdf
TransAtlas Interactive Alternative Fuel Map , U.S. DOE.	Provides user-friendly Google Maps to display the locations of existing and planned alternative fueling stations, concentrations of different vehicle types, alternative fuel production facilities, roads, and political boundaries.	www.afdc.energy.gov/afdc/data/geographic.html
Analysis of Potential Causes of Consumer Food Price Inflation , RFA, 2007.	Asserts that the "marketing bill," not increased ethanol production, is responsible for rising food prices.	www.ethanolrfa.org/resource/facts/food/documents/Informa_Renew_Fuels_Study_Dec_2007.pdf
Ethanol Juggernaut Diverts Corn from Food to Fuel , Raloff, Janet, Science News, 2007.	Makes the case that ethanol is driving up food prices.	www.sciencenews.org/view/generic/id/8179/title/Food_for_Thought__Ethanol_Juggernaut_Diverts_Corn_from_Food_to_Fuel
Food versus Fuel in the United States , Institute for Agriculture and Trade Policy, 2007.	Finds that biofuel production is not diverting food from tables in the U.S. or abroad.	www.iatp.org/iatp/publications.cfm?accountID=258&refID=100001
U.S. Corn Growers: Producing Food and Fuel , National Corn Growers Association, 2006.	Provides the corn growers' perspective that producing food and fuel from corn is working out well, without undue impact on food prices.	www.ncga.com/files/pdf/FoodandFuelPaper10-08.pdf
Aggressive Use of Bioderived Products and Materials in the U.S. by 2010 , A.D. Little, Inc., 2001.	The presentation and report summarize near-term opportunities to dramatically increase the use of biomass to make nonfuel products.	www.p2pays.org/ref/40/39031.pdf
Industrial Bioproducts: Today and Tomorrow , U.S. DOE, July 2003.	The report finds that a bioindustry could harness the energy and molecular building blocks of biomass (crops, trees, grasses, crop residues, forest residues, animal waste, and municipal solid waste) to create products now manufactured from petroleum, making us far less dependent on fossil fuels.	www.brdisolutions.com/pdfs/BioProductsOpportunitiesReportFinal.pdf
Preliminary Screening Technical and Economic Assessment of Synthesis Gas to Fuels and Chemicals with Emphasis on the Potential for Biomass-Derived Syngas , NREL, 2003.	Summarizes opportunities for biomass to be used to manufacture a variety of products beyond fuels alone.	www.nrel.gov/docs/fy04osti/34929.pdf

A.2 BENEFITS OF BIOENERGY (ENVIRONMENTAL, ECONOMIC, ENERGY) (cont.)

Resource	Description	URL
Environmental Life Cycle Implications of Fuel Oxygenate Production from California Biomass – Technical Report , NREL, 1999.	Looks at the costs and benefits of biomass-derived ethanol, ETBE, and E10 as fuel oxygenates across their life cycles.	www-erd.llnl.gov/FuelsoftheFuture/pdf_files/lifecyclecalif.pdf
Quantifying Cradle-to-Farm Gate Life-Cycle Impacts Associated with Fertilizer used for Corn, Soybean, and Stover Production , NREL, May 2005.	Documents the costs, such as eutrophication, and benefits of nitrate and phosphate fertilizers used in production of three crops.	www1.eere.energy.gov/biomass/pdfs/37500.pdf
Life Cycle Analysis of Ethanol from Corn Stover , NREL, 2002.	This comprehensive accounting of ethanol’s flows to and from the environment focuses on ethanol produced from corn stover	www.nrel.gov/docs/gen/fy02/31792.pdf
Life Cycle Inventory of Biodiesel and Petroleum Diesel for Use in an Urban Bus: Final Report , NREL, 1998.	Examines the relative costs and benefits of using biodiesel versus petroleum diesel in an urban bus.	www.nrel.gov/docs/legosti/fy98/24089.pdf
Life Cycle Assessment of Biodiesel versus Petroleum Diesel Fuel , Institute of Electrical and Electronics Engineers, 1996.	The proceedings of the 31st Intersociety Energy Conversion Engineering Conference, held August 11–16, 1996, in Washington, DC.	Accessible by subscription only
Life Cycle Assessment of Biomass-Derived Refinery Feedstocks for Reducing CO₂ , NREL, 1997.	Discusses the two processes for producing 1,4-butanediol. The first process is the conventional hydrocarbon feedstock-based approach, utilizing methane to produce formaldehyde, and acetylene with synthesis under conditions of heat and pressure. The second is a biomass-based feedstock approach where glucose derived from corn is fermented.	Not available online
Life Cycle Assessment of Biomass Cofiring in a Coal-Fired Power Plant , NREL, 2001.	Reports on a cradle-to-grave analysis of all processes necessary for the operation of a coal-fired power plant that co-fires wood residue, including raw material extraction, feed preparation, transportation, and waste disposal and recycling.	Accessible by subscription only
Understanding Land Use Change and U.S. Ethanol Expansion , RFA, November 2008.	Discusses historical agricultural land use and crop utilization trends, explores the role of increased productivity, looks at the contributions of ethanol feed co-products, and examines global agricultural land use projections obtained from Informa Economics.	www.ethanolrfa.org/objects/documents/2041/final_land_use_1110_w_execsumm.pdf
National Biofuels Action Plan , Biomass Research and Development Board, October 2008.	Outlines areas where cooperation between federal agencies will help to evolve bio-based fuel production technologies into competitive solutions for meeting U.S. fuel demands. Seven key areas for action are identified: feedstock production; feedstock logistics; conversion of feedstock to fuel; distribution; end Use; sustainability; and Environment, Health, and Safety.	www1.eere.energy.gov/biomass/pdfs/nbap.pdf

A.3 ASSESSING POTENTIAL MARKETS FOR BIOMASS

Resource	Description	URL
Bioenergy		
Biomass Resource Assessment Tool , U.S. EPA and NREL.	Online mapping tool that takes various biomass resource datasets and maps them, allowing user queries and analysis. For example, users can select a point on the map and determine the quantity of feedstock within a certain radius, and the quantity of energy that could potentially be produced from that biomass.	http://rpm.nrel.gov/biopower/biopower/launch
Coordinated Resource Offering Protocol (CROP) Evaluations , U.S. Forest Service and Bureau of Land Management.	Provides the results of ten CROP evaluations that have been conducted for over 30 million acres of public forestlands potentially vulnerable to wildfires. The evaluations contain detailed resource-offering maps that illustrate the growing fuel load problem within major forest systems and quantify the biomass available for removal within five years.	www.forestsandrangelands.gov/Woody_Biomass/supply/CROP/index.shtml
USFS Forest Inventory Data Online (FIDO) .	Provides access to the National Forest Inventory and Analysis databases. It can be used to generate tables and maps of forest statistics (including tree biomass) by running standard reports for specific states or counties and survey year, or customized reports based on criteria selected by the user.	http://fiatools.fs.fed.us/fido/index.html
Biomass Feedstocks , U.S. DOE.	U.S. DOE Biomass Program Web site	www1.eere.energy.gov/biomass/biomass_feedstocks.html
Dynamic Maps, GIS Data, and Analysis Tools , NREL.	Provides county-level biomass resource maps. The feedstock categories include crop residues, forest residues, primary mill residues, secondary mill residues, urban wood waste, methane emissions from landfills, methane emissions from manure management, methane emissions from wastewater treatment plants, and dedicated energy crops. The maps are derived from data contained in a report, Geographic Perspective on the Current Biomass Resource Availability in the United States (described below). Note that these maps present technical biomass resource data. The economic biomass resource availability will most likely be somewhat less than what is presented in the maps.	www.nrel.gov/gis/biomass.html
Geographic Perspective on the Current Biomass Resource Availability in the United States , NREL, 2006.	Provides the basis for the maps and data presented in NREL's Dynamic Maps, GIS Data, and Analysis Tools Web site described above. The report provides a geographic analysis of biomass resource potential at the county level, and can give state officials a sense of the major biomass resources available within their state and their technical potential relative to other states.	www.nrel.gov/docs/fy06osti/39181.pdf
State Assessment for Biomass Resources (SABRE) , U.S. DOE.	Provides detailed information on biomass resources and utilization throughout the United States. It features state-specific information on conventional fuel and biofuel use, ethanol and biodiesel stations and production plants, and biofuel production capacities. In addition, it offers state-by-state snapshots of available feedstocks, data on potential production capacities, and projections on the future use of biofuels.	www.afdc.energy.gov/afdc/sabre/index.php

A.3 ASSESSING POTENTIAL MARKETS FOR BIOMASS (cont.)

Resource	Description	URL
<p>State Woody Biomass Utilization Policies, University of Minnesota, Department of Forest Resources, Staff Paper 199. Becker, D.R., and C. Lee. 2008.</p>	<p>Documents information on state policies to facilitate comparison of the types of approaches used in certain areas, policy structures and incentives employed, program administration, and relationships to complementary local and federal actions.</p>	<p>www.forestry.umn.edu/publications/staffpapers/Staffpaper199.pdf</p>
<p>Biopower/Bioheat</p>		
<p>Initial Market Assessment for Small-Scale Biomass-Based CHP. National Renewable Energy Laboratory, NREL, January 2008.</p>	<p>Examines the energy generation market opportunities for biomass CHP applications smaller than 20 MW. Using relevant literature and expert opinion, the paper provides an overview of the benefits of and challenges for biomass CHP in terms of policy and economic drivers, and identifies primary characteristics of potential markets.</p>	<p>www.nrel.gov/docs/fy08osti/42046.pdf</p>
<p>Green Power Marketing in the United States: A Status Report, NREL.</p>	<p>Documents green power marketing activities and trends in voluntary markets in the United States.</p>	<p>http://apps3.eere.energy.gov/greenpower/resources/pdfs/38994.pdf</p>
<p>U.S. EPA's Landfill Methane Outreach Program (LMOP).</p>	<p>Promotes the use of landfill gas as a renewable, green energy source. Its Web site contains general information, tools, and links to databases containing specific landfill data.</p>	<p>www.epa.gov/lmop/</p>
<p>U.S. EPA's Landfill Methane Outreach Program (LMOP) Landfill Database.</p>	<p>Provides a nationwide listing of operational and under-construction LFG energy projects; candidate municipal solid waste landfills having LFG energy potential; and information on additional landfills that could represent LFG energy opportunities. The database can be accessed as a series of downloadable Excel spreadsheets, which are updated and posted to the Web site each month. The information contained in the LMOP database is compiled from a variety of sources, including annual voluntary submissions by LMOP partners and industry publications.</p>	<p>www.epa.gov/lmop/proj/index.htm</p>
<p>Landfill Gas Energy Project Development Handbook, U.S. EPA Landfill Methane Outreach Program.</p>	<p>Provides landfill gas energy project development guidance, with individual chapters on the basics of landfill gas energy, gas modeling, technology options, economic analysis and financing, contract and permitting considerations, and selection of project partners.</p>	<p>www.epa.gov/lmop/res/handbook.htm</p>
<p>Market Opportunities for Biogas Recovery Systems, U.S. EPA AgStar.</p>	<p>Assesses the market potential for biogas energy projects at swine and dairy farms in the United States. For the top ten swine and dairy states, the guide characterizes the sizes and types of operations where biogas projects are technically feasible, along with estimates of potential methane production, electricity generation, and greenhouse gas emission reductions.</p>	<p>www.epa.gov/agstar/pdf/biogas%20recovery%20systems_screenres.pdf</p>
<p>U.S. EPA's Combined Heat and Power (CHP) Partnership.</p>	<p>Promotes the use of biomass-fueled CHP and the use of biogas at wastewater treatment facilities.</p>	<p>www.epa.gov/chp</p>

A.3 ASSESSING POTENTIAL MARKETS FOR BIOMASS (cont.)

Resource	Description	URL
Biofuels/Bioproductions		
State Assessment for Biomass Resources , U.S. DOE.	Provides detailed information on biomass resources and utilization throughout the United States. It features state-specific information on conventional fuel and biofuel use, ethanol and biodiesel stations and production plants, and biofuel production capacities. It offers state-by-state snapshots of available feedstocks, data on potential production capacities, and projections on the future use of biofuels. The site is particularly useful for states interested in evaluating resource potential for producing biofuels.	www.afdc.energy.gov/afdc/sabre/index.php
Environmental Laws Applicable to Construction and Operation of Ethanol Plants , U.S. EPA.	This compliance assistance manual, issued by EPA Region 7, serves as a road map of information on federal environmental programs and federal and state agency roles applicable to the construction, modification, and operation of ethanol plants.	www.epa.gov/region07/priorities/agriculture/ethanol_plants_manual.pdf
Environmental Laws Applicable to Construction and Operation of Biodiesel Production Facilities , U.S. EPA.	This compliance assistance manual, issued by EPA Region 7, serves as a road map of information on federal environmental programs and federal, state, and local agency roles applicable to designing, building, and operating biodiesel manufacturing facilities.	www.epa.gov/region07/priorities/agriculture/biodiesel_manual.pdf
State Examples		
California	<i>An Assessment of Biomass Resources in California</i> , 2007, provides an updated biomass inventory for the state along with an assessment of potential growth in biomass resources and power generation that could help to satisfy the state renewable portfolio standard (RPS).	http://biomass.ucdavis.edu/materials/reports%20and%20publications/2008/CBC_Biomass_Resources_2007.pdf
Georgia	<i>Biomass Wood Resource Assessment on a County-by-County Basis for the State of Georgia</i> provides a biomass wood resource assessment on a county-level basis for Georgia.	www.gfc.state.ga.us/ForestMarketing/documents/BiomassWRACountybyCountyGA05.pdf
Hawaii	<i>Biomass and Bioenergy Resource Assessment: State of Hawaii</i> provides an assessment of current and potential biomass and bioenergy resources for the state. Includes animal wastes, forest products residues, agricultural residues, and urban wastes.	www.hawaii.gov/dbedt/info/energy/publications/biomass-assessment.pdf
Mississippi	<i>Mississippi Institute for Forest Inventory Dynamic Report Generator</i> provides a continuous, statewide forest resource inventory necessary for the sustainable forest-based economy. The inventory information is derived from sampling estimation techniques with a presumed precision of +/- 15% sampling error with 95 percent confidence.	www.mifi.ms.gov/
South Carolina	<i>Potential for Biomass Energy Development in South Carolina</i> quantifies the amount of forestry and agricultural biomass available for energy production on a sustainable basis in South Carolina. Also includes an analysis of the economic impacts of transferring out-of-state costs for coal to in-state family forest landowners and biomass processors.	www.scbiomass.org/Publications/Potential%20Biomass%20Energy%20in%20SC.pdf

A.3 ASSESSING POTENTIAL MARKETS FOR BIOMASS (cont.)

Resource	Description	URL
Oregon	<i>Biomass Energy and Biofuels from Oregon's Forests</i> assesses the statewide potential for production of electricity and biofuels from woody biomass, including the available wood supply and the environmental, energy, forest health, and economic effects. Reviews and summarizes efforts underway to promote electric energy and biofuels from woody biomass, and identifies gaps in existing efforts. Assesses constraints and challenges to the development of biomass energy and biofuels from Oregon forests, including economic, environmental, legal, policy, infrastructure, and other barriers and develops recommendations on how to overcome these barriers.	www.oregonforests.org/assets/uploads/Biomass_Full_Report.pdf
Northeastern states (CT, DE, ME, MD, MA, NH, NJ, NY, PA, RI, VT)	<i>Securing a Place for Biomass in the Northeast United States: A Review of Renewable Energy and Related Policies</i> provides a biomass feedstock assessment for northeastern states.	www.nrbp.org/pdfs/nrbp_final_report.pdf
Western states (WA, OR, ID, MT, WY, CO, NM, AZ, UT, NV, CA, TX, OK, ND, SD, NE, KS, AK, HI)	The <i>Western Bioenergy Assessment</i> includes a series of technical reports produced for the Western Governors' Association. These reports extensively evaluate biomass resources in the western states, biofuel conversion technologies, spatial analysis and supply curve development, and deployment scenarios and potential policy interactions.	www.westgov.org/wga/initiatives/transfuels/index.html
Western states (WA, OR, ID, MT, WY, CO, NM, AZ, UT, NV, CA, TX, OK, ND, SD, NE, KS, AK, HI)	The <i>Western Governors' Association Transportation Fuels for the Future Initiative</i> provides seven working group reports and a final report analyzing the potential for the development of alternative fuels and vehicle fuel efficiency in the West.	www.westgov.org/wga/initiatives/transfuels/index.html
Western states (WA, OR, ID, MT, WY, CO, NM, AZ, UT, NV, CA, TX, ND, SD, NE, KS, AK, HI)	<i>Biomass Task Force Report</i> focuses on the use of biomass resources for the production of electricity as part of an overall effort of the Western Governors' Association to increase the contribution of clean and renewable energy in the region.	www.westgov.org/wga/initiatives/cdeac/Biomass-full.pdf

A.4 TOOLS TO HELP ESTIMATE ECONOMIC, ENERGY, AND/OR ENVIRONMENTAL BENEFITS

Resource	Description	URL
Tools for Evaluating Benefits		
AirCRED , Argonne National Laboratory, August 2007.	This tool is used to support local air emission reductions claims associated with alternative-fuel vehicles within the State Implementation Planning process.	www.transportation.anl.gov/modeling_simulation/AirCred/index.html
Biomass Technology Analysis Models and Tools.	Web sites of models and tools that demonstrate biomass technologies and uses, and can be used in life-cycle assessments. Most tools can be applied on a global, regional, local, or project basis.	www.nrel.gov/analysis/analysis_tools_tech_bio.html
Biomass Feedstock Composition and Property Database.	Provides data results from analysis of more than 150 samples of potential biofuels feedstocks, including corn stover, wheat straw, bagasse, switchgrass and other grasses, and poplars and other fast-growing trees.	www1.eere.energy.gov/biomass/feedstock_databases.html
CHP Emissions Calculator , U.S. EPA.	Enables a quick and easy analysis of the criteria air pollutant and GHG emission reductions from incorporating CHP designs into plants and production facilities. It also translates these reductions into “cars” and “trees” to convey their value to a nontechnical audience.	www.epa.gov/chp/basic/calculator.html
Clean Air Climate Protection Software , ICLEI and NACAA.	Helps local governments create greenhouse gas inventories, quantify the benefits of reduction measures, and formulate local climate action plans.	www.cacpsoftware.org/
Emissions & Generation Resource Integrated Database (EGRID) , U.S. EPA.	Provides a comprehensive database of electric-sector emissions at the plant, state, and regional levels. These can be compared to emissions from biopower to estimate emissions' effects.	www.epa.gov/cleanrgy/egrid/index.htm
Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation (GREET) Model , Argonne National Laboratory, August 2007.	Includes full fuel-cycle and vehicle-cycle emissions and energy estimation capability. While not a full life-cycle assessment tool, it allows estimation of upstream emissions and energy effects. For some state policy questions, it may provide sufficient analytic detail on its own. For decisions with greater financial implications, it may be most appropriate to use for initial screening to support development of a more detailed study. States may wish to use GREET directly or to consider analyses that have been done using this tool.	www.transportation.anl.gov/modeling_simulation/GREET/
Job and Economic Development Impact (JEDI) Models.	Easy-to-use, spreadsheet-based tools that analyze the economic impacts of constructing and operating power generation and biofuel plants at the local and state levels.	www.nrel.gov/analysis/jedi
Power Profiler , U.S. EPA.	Provides a quick estimate of electricity emissions rates by location, which could be compared to emissions from biopower to estimate emissions effects.	www.epa.gov/grnpower/buygp/powerprofiler.htm
Standard Biomass Analytical Procedures.	Provides tested and accepted methods for performing analyses commonly used in biofuels research.	www1.eere.energy.gov/biomass/analytical_procedures.html
Theoretical Ethanol Yield Calculator.	Calculates the theoretical ethanol yield of a particular biomass feedstock based on its sugar content.	www1.eere.energy.gov/biomass/ethanol_yield_calculator.html
Thermodynamic Data for Biomass Conversion and Waste Incineration , NREL, National Bureau of Standards.	Provides heat of combustion and other useful data for biopower and biofuels research on a wide range of biomass and non-biomass materials.	www1.eere.energy.gov/biomass/pdfs/2839.pdf

A.5 FINANCING BIOENERGY PROJECTS

Resource	Description	URL
Bioenergy		
Capturing the Full Potential of Bioenergy: A Model for Regional Bioenergy Initiatives , GEN Publishing, Inc., 2007.	Advances a step-by-step approach for advancing bioenergy.	www.liebertonline.com/doi/abs/10.1089/ind.2007.3.120
Clean Energy-Environment Guide to Action: Policies, Best Practices, and Action Steps for States , U.S. EPA, 2006.	This Web site and guide present 16 policies that states use to advance clean energy.	www.epa.gov/cleanrgy/stateandlocal/guidetoaction.htm
Clean Energy Lead by Example Guide , U.S. EPA, 2009.	Describes proven strategies, resources, and tools to help states save money and reduce greenhouse gas emissions by adopting clean energy practices in their facilities, operations, and vehicle fleets.	www.epa.gov/cleanenergy/documents/epa_lbe.pdf
Database of State Incentives for Renewable Energy (DSIRE) .	Searchable database of incentives relevant to bioenergy, by state. Select a renewable energy search, by technology, for biomass, CHP, and/or landfill gas. The database is updated routinely.	www.dsireusa.org/
State Policies for Promoting the Next Generation of Biomass Technologies , Great Plains Institute, November 22, 2006.	Summarizes recommendations on state policies to advance biomass.	www.ef.org/documents/BWG_State_Policy_Menu_Final_v3.pdf
State Incentives and Resources Search , U.S. DOE.	This Web page includes state energy information for biomass, other renewable energy, and fossil energy.	www1.eere.energy.gov/industry/about/state_activities/incentive_search.asp
Developing State Policies Supportive of Bioenergy Development , Southern States Energy Board, 2002.	Analyzes policy options to advance bioenergy, based on regional experiences in the Southeast.	www.osti.gov/bridge/servlets/purl/828971-Pbx12e/native/828971.pdf
Environment and Energy Study Institute (EESI) .	This Web site includes information on bioenergy and federal and state incentives.	www.eesi.org/Sustainable_Biomass_Energy_Program
It All Adds Up to Cleaner Air Resources Toolkit , U.S. Department of Transportation.	While not explicitly designed for bioenergy, this step-by-step guide to implementing a public outreach program provides many tips that would be appropriate to any outreach campaign.	www.italladdsup.gov/tools/how_to.asp
Southern Forest Research Partnership .	Offers numerous publications, presentations, links, images, case studies, activities, videos, and other educational tools that can be used to share woody biomass information with natural resource management and extension professionals as well as community planning and development professionals.	www.forestbioenergy.net/training-materials
State Woody Biomass Utilization Policies , University of Minnesota, Department of Forest Resources, Staff Paper 199. Becker, D.R., and C. Lee. 2008.	A comprehensive database of woody biomass legislation for each state in the United States.	www.forestry.umn.edu/publications/staffpapers/Staffpaper199.pdf

A.5 FINANCING BIOENERGY PROJECTS (cont.)

Resource	Description	URL
Biopower/Bioheat		
Green-e Certification Process.	A voluntary market for renewable energy certificates exists, and some kinds of biopower generation are eligible for Green-e certification. Eligible sources must go through the certification process to be able to sell certified products.	www.green-e.org/docs/Appendix_D-Green-e_National_Standard.pdf and www.green-e.org/getcert_re_6steps.shtml#rec
State Energy Program.	This collaboration of DOE and the states provides joint funding for state formula grant projects and local energy efficiency and renewable energy projects.	http://apps1.eere.energy.gov/state_energy_program/
State Technologies Advancement Collaborative Program, U.S. DOE, National Association of State Energy Officials, Association of State Energy Research and Technology Transfer Institutions.	This collaboration provides funding for state energy efficiency and renewable energy projects.	www.stacenergy.org
Biofuels/Bioproducts		
Alternative Fuels Data Center: All State Incentives and Laws, U.S. DOE, NREL.	The data center is a comprehensive clearinghouse of data, publications, tools, and information related to advanced transportation technologies.	www.afdc.energy.gov/afdc/data/methodology.html
Funding Database – Biomass/ Biogas, U.S. EPA.	This database of financial and regulatory incentives at the state level is updated monthly.	www.epa.gov/chp/funding/bio.html
Understanding and Informing the Policy Environment: State-Level Renewable Fuels Standards, NREL, January 2007.	Summary and analysis of state actions on renewable fuels standards.	www.nrel.gov/docs/fy07osti/41075.pdf
Funding Landfill Gas Energy Projects: State, Federal, and Foundation Resources, U.S. EPA.	This guide from the Landfill Methane Outreach Program details potential sources of funding for landfill gas projects.	www.epa.gov/lmop/res/guide/index.htm
State Examples		
Arkansas	State-Specific Financing Information	http://arkansasenergy.org/solar-wind-bioenergy/bioenergy.aspx
Florida	State-Specific Financing Information	www.floridafarmtofuel.com/Downloads/FTF%20Grant%20Agreement%20Contract%20092507.pdf
Michigan	State-Specific Financing Information	http://michigan.gov/documents/cis/CIS_EO_Funding_Opportunities_192768_7.pdf
Montana	State-Specific Financing Information	www.deq.state.mt.us/Energy/bioenergy/Biodiesel_Production_Educ_Presentations/Combined_Biodiesel_Ethanol_Govt_Incentives_Montana_Jan07_bshh.pdf
Washington	State-Specific Financing Information	http://agr.wa.gov/Bioenergy/