Alcoholysis: A process in which oils extracted from wood are combined with alcohol and a catalyst to produce transportation fuels, such as biodiesel.

Anaerobic digestion: A method of converting woody biomass into gas where woody biomass is exposed to bacteria in the absence of oxygen.

Ash: The noncombustible components of fuel.

Best management practices: Standards to protect, maintain, or improve water and soil quality and wildlife habitat during forestry activities.

Biodiesel: A transportation fuel, similar to diesel fuel, which is derived from biomass.

Bioenergy: Heat, power, electricity, or transportation fuels produced from biomass.

Biofuels: Liquid fuels made from biomass, which are usually used for transportation or cooling.

Biogas: A gas that is produced from biomass that is usually combustible.

Biomass: Biological material from plants and animals that is either living or was recently living. Biomass includes forest and mill residues, agricultural crops and wastes, wood and wood wastes, animal wastes, livestock operation residues, aquatic plants, fast-growing trees and plants, and municipal and industrial wastes.

Bio-oil: Liquid oil produced by heating wood at a high temperature in the absence of oxygen (pyrolysis).

Boiler: A vessel or tank where heat produced from the combustion of fuels such as natural gas, fuel oil, or coal, is used to generate hot water or steam for applications ranging from building space heating to electric power production or industrial process heat.

British thermal unit (Btu): A standard unit of energy that is the amount of heat required to increase the temperature of one pound of water one degree Fahrenheit.

Calorie (cal): The amount of heat required to raise the temperature of a unit of water one degree Celsius.

Carbon cycle: The movement of carbon through plants, animals, soils, oceans, and the atmosphere. For example, a plant removes carbon dioxide from the atmosphere, accumulates carbon as it grows, and releases carbon dioxide back into the atmosphere when it naturally decays or is burned.

Carbon sequestration: The uptake and storage of carbon. Trees and plants, for example, absorb carbon dioxide, release the oxygen, and store the carbon. Fossil fuels were at one time biomass and continue to store the carbon until burned.

Carbon-neutral energy source: An energy resource that when utilized does not increase the overall amount of carbon dioxide in the atmosphere.

Cellulose: A primary component of plant cells.

Char: Carbon-rich combustible solids that result from pyrolysis of wood in the early stages of combustion. Char can be converted to combustible gases under certain conditions or burned directly.

Climate change: Significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer).

Co-firing: Burning more than one fuel simultaneously.

Cogeneration: The simultaneous production of heat and mechanical work or electricity from a single fuel (also called combined heat and power).

Combustion: The process of burning; the oxidation of a material by applying heat, which unites oxygen with a material or fuel.

Deforestation: the cutting, clearing, and removal of forests or related ecosystems so the land can be used for purposes other than natural habitat. The major causes of deforestation are agriculture, mining, logging, oil and gas extraction, cattle ranching, and development.

Direct combustion: A method of burning that burns the wood directly in its solid form instead of first gasifying the wood or converting into a liquid fuel before combustion takes place.
Direct effects (economic impact analysis): The initial change that the industry proposes (such as opening a factory or business that provides goods or services not previously available in that community).

Dry ton (of wood): 2000 pounds of wood that contains 10 percent or less moisture content.

Electricity power production: The process of transforming other forms or sources of energy (such as coal, natural gas, wind, or solar) into electrical energy.

Emissions: A substance(s) or pollutant emitted as a result of a process.

Employment multipliers (economic impact analysis): Changes in direct employment or output to total employment effects, and may be stated either as a ratio of total to direct employment, or as a number of jobs per million dollars of output change.

Energy: The ability to do work.

Equity: Treatment, decisions, or actions that are considered fair and just.

Ethanol: A colorless alcohol that results from fermentation of biomass and can be used as a transportation fuel.

Fermentation: The process in which biomass is exposed to microorganisms that produce enzymes used to trigger chemical reactions to produce transportation fuels.

Forest biomass: The accumulated above- and below-ground vegetation, including bark, leaves, and wood, from living and dead woody shrubs and trees.

Forest certification: Ensures that forests are managed according to a set of standards that are designed to improve environmental, social, and economic impacts of forestry practices.

Forest residues: The above-ground residues from pre-commercial thinning and harvesting operations. The leftover materials from harvesting operations are also called logging residues.

Fossil fuels: Fuels formed in the ground, over the course of millions of years, from the remains of dead plants and animals. Oil, natural gas, and coal are fossil fuels.

Fuel: Any material that can be burned to make energy.

Gasification (wood): The process of heating wood in an oxygen-starved chamber until volatile pyrolysis gases (e.g., CO, H2, O2) are released from the wood. The gases emitted are low- or medium-energy-content gases that can be combusted in various ways.

Gasifier: A combustion device that produces biogas from solid biomass.

Global warming: The increase in average global temperatures due to the greenhouse effect, which can contribute to changes in global climate patterns.

Glucose: A form of chemical energy that is a product of photosynthesis and is stored in the cells of plants.

Green ton (of wood): 2000 pounds of wood that contains more than 10 percent moisture content. Usually refers to wood containing 40 to 50 percent moisture content.

Greenhouse effect: Trapping and build-up of heat in the atmosphere (troposphere) near the Earth’s surface.

Greenhouse gases: Gases that are naturally present in small quantities and absorb infrared radiation in the atmosphere. Common greenhouse gases include water vapor, carbon dioxide, methane, and nitrous oxide.

Grid: An electricity transmission and distribution system (also called the electric or power grid).

Indirect effects (economic impact analysis): Represent changes in inter-industry transactions as supplying industries respond to changes in demands from the directly affected industries (such as additional resources needed to operate the factory or business).

Induced effects (economic impact analysis): Represent the impacts on all local industries caused by the expenditures of new household income generated by the direct and indirect effects of final demand changes (such as the purchases made by the people who work in the new factory or business).
Industrial process heat: The thermal energy used in an industrial process.

Input-Output analysis: I-O analysis quantifies the relationships and interactions between industry sectors, households, and governments within a local economy. I-O models are constructed from a transactions table that reflects the value of goods and services exchanged between all sectors of the economy in a one-year base period.

K

Kilowatt (kW): A standard unit for expressing the rate of electrical power output, which is equal to 1,000 watts.

Kilowatt hour (kWh): A common measure for energy supply or consumption, which is equal to 1,000 watts over a one-hour period.

L

Logging residues: Poor quality trees and tree components (i.e., crowns, limbs, stumps, and root systems) that are typically left on-site during commercial harvesting operations.

M

Megawatt (MW): A common measure of power plant electricity generation capacity, which is equal to 1,000,000 watts.

MMBtu: An abbreviation meaning one million British thermal units.

Moisture content: Amount of moisture remaining in wood.

Municipal solid waste (MSW): Nonhazardous waste material from households and businesses in a community.

N

Nonindustrial private landowner: A person owning less than 1,000 acres of forested land who is not directly affiliated with a wood processing plant.

Nonrenewable energy sources: Sources of energy that cannot be replenished in a short period of time, such as oil, natural gas, and coal.

Output multipliers (economic impact analysis): Relate changes in sales to final demand by one industry to total changes in output (gross sales) by all industries within the local area.

P

Particulates: Minute, solid, airborne particles that result from combustion.

Photosynthesis: The process by which plants take CO₂ from the air (or bicarbonate in water) to build carbohydrates, releasing O₂ in the process.

Phytoremediation: The use of trees or other vegetation to remove contaminants (such as heavy metals) and restore degraded land.

Pre-commercial thinning: A forest management technique in which young trees are removed to promote the growth of the remaining trees.

Pulpwood: Small diameter trees (3.6 to 6.5 inches diameter at breast height) that are usually harvested for manufacturing paper, purified cellulose products (such as absorbents, filters, rayon and acetate), and oleoresin products (such as pine oils, fragrances, cosmetics, and thinners).

Pyrolysis: The process of burning fuel during oxygen-starved conditions that involves the physical and chemical decomposition of solid organic matter by heating into liquid, gas, and carbon char residue.

R

Renewable energy sources: Energy sources that are either unlimited or are naturally replenished in a reasonably short period of time. Types of renewable energy resources include moving water (hydro, tidal, and wave power), thermal gradients in ocean water, biomass, geothermal energy, solar energy, and wind energy. Municipal solid waste (MSW) is also considered to be a renewable source of energy.

S

Short rotation woody crops (SRWC): Fast-growing tree species that can produce biomass in a short period of time.

Steam: Water in vapor form; used as the working fluid in steam turbines and heating systems.
Supply curve: A basic economic tool used to express the price of a resource at a given quantity of demand (economic availability).

Sustainable development: Development that meets the needs of the present without compromising the ability of future generations to meet their own needs (United Nations World Commission on Environment and Development, 1987).

Sustainable forest management: A management process that ensures that the goods and services derived from the forest meet present-day needs while at the same time securing continued availability and contribution to long-term development (FAO, 2008).

Thermal energy: The energy developed through the use of heat energy.

Thinning: Removal small, deformed, or unwanted species to improve forest health, restore ecosystems, reduce wildfire risk, or improve economic viability. See also pre-commercial thinning.

Turbine: A device for converting the flow of a fluid (air, steam, water, or hot gases) into mechanical motion.

Urban waste wood: Woody biomass generated from tree and yard trimmings, commercial tree trimmers, thinning to protect utility lines, reduce wildfire risk, or improve forest health; and greenspace maintenance.

Utility: A regulated entity that exhibits the characteristics of a natural monopoly (also referred to as a power provider).

Value added multipliers (economic impact analysis): Relate changes in value added in the industry experiencing the direct effect to total changes in value added for the entire local economy.

Watt (w): The basic measurement of electricity.

Woody biomass: Plant material from trees and shrubs, including branches, limbs, trunks, and vines.

Glossary References

Several of the definitions in this Glossary come directly from the U.S. Department of Energy’s Glossary of Energy-Related Terms, the U.S. Environmental Protection Agency’s Glossary of Climate Change Terms, and the U.S. Forest Service’s Primer on Wood Biomass for Energy. These resources contain additional terminology that may be helpful and can be accessed online using the references provided below.


