

## Glossary of Energy Terms

**Ancillary services.** Ancillary services are functions and services that support the power grid in order to maintain reliable, stable, continuously flowing electric service. Among the ancillary services are and frequency control and voltage support. And spinning reserves which are operating electricity generators that allow a utility to quickly ramp up if more power is needed

**Avoided cost.** Avoided cost is the price that most utilities in Iowa are paying a producer for energy that is put on the grid. It is calculated for each utility and varies from utility to utility. It is also called the marginal cost because it is the cost to the utility of supplying an additional unit of electricity from its current generation sources.

**Backup energy.** A customer who installs renewable energy generation sometimes needs to purchase electricity from a utility; that electricity is called backup energy.

**Baseload.** The utility company needs to be able to generate a certain amount of electricity every day of the year. That level of power is called baseload.

**Battery Energy Storage System (BESS).** Systems that store energy when it is plentiful and release the energy when it is needed. It includes the batteries and the technology to manage the energy flow from the batteries to the grid and from the grid to the batteries.



Switchgrass is used for biomass. Photo credit: Lynn Betts, USDA NRCS

**Behind-the-meter.** Energy production and use that happens on the customer side of the meter. Consumer-owned solar panels would be behind-the-meter.

**Biofuel, Bioenergy, Biopower.** The fuels created from biomass are called biofuels. The fuels can be solid (wood, seeds, plants stems, leaves) or liquid (methane, biodiesel, ethanol)

**Biomass.** Organic material, such as animal fats, seeds, crop waste, tree branches and grasses that can be converted to fuels.

**Biorefinery.** A biorefinery is a manufacturing plant that turns organic material, such as animal fats and plant material, into fuel and plastics.

**Central station.** A large electric power plant that can power many homes and businesses. Traditionally, the power plants are fueled with coal, gas or nuclear materials.

**Combined heat and power.** As electricity is produced, heat is a waste product. Waste heat can be used to heat buildings or to enhance industrial processes and is called combined heat and power.

**Community renewable energy, community wind, community solar.** When a group of individuals or businesses pool their financial resources to purchase and install renewable energy technology, the project is termed community wind, community solar or community renewable energy.

**Congestion.** When the transmission lines are operating at capacity and when the customers are requiring more power, the transmission line is said to be congested.

**Curtailement.** When there is insufficient transmission line capacity to carry the electricity generated by a wind turbine, the turbine is prevented from adding more electricity to the transmission lines in a process called curtailment.

**Distributed generation.** Small electrical generation equipment that is located away from a large central station power plant (large coal plant, large gas plant, nuclear power plant). Distributed generation is generally installed on business properties or homeowner's property.

**Distribution.** The low-voltage lines that connect the transmission lines to the consumer (homes and businesses).

**Energy Conservation.** Conservation involves eliminating the unnecessary use of energy and also using a set of practices that yield the same result, but with less energy. For example, opening a window might provide as much cool air as an air conditioner. A common means of conservation is turning off the lights when no one is in a room.



Insulation being applied to a building.  
Photo credit: National Renewable Energy Laboratory

**Energy Efficiency.** Energy efficiency involves techniques that reduce the amount of energy used to do a task. An example is using a more efficient washing machine, one that uses less electricity to wash a load of clothes.

**Energy efficiency standard.** A requirement that a given percentage of total sales be reduced each year through programs that reduce the consumption of electricity.

**Excess energy.** The amount of energy a renewable energy source puts on the grid. This is the extra energy that the owner does not use himself.

**Energy storage.** Technology, often batteries, to collect and store electric energy for later release and use on the grid.

**Feed-in tariff (also called CLEAN contracts, renewable energy payments, renewable tariff).** A feed-in tariff is a contract between the utility company and the owner of the renewable energy generator. The contract includes a rate schedule that lays out how much money per kilowatt hour the utility pays to the renewable energy generator for a set period of time (years) for the purchase of the renewable energy.

**Federal Energy Regulatory Commission (FERC).** FERC is the federal regulatory body responsible for implementing and managing the federal utility laws.

**Front-of-the-meter.** Energy production and use that happens on the utility side of the meter.

**Generation.** The facility that generates the electricity, such as a wind farm, a coal-fired or gas-fired power plant, a nuclear reactor.



Transmission lines. Photo Credit:  
Warren Gretz, National Renewable Energy Laboratory

**Geothermal.** Geothermal heating and cooling involves using the temperature of the earth to heat and cool a building.

**Grid.** The network of transmission lines and distribution lines as well as substations and other related equipment that supply power to homes, farms and businesses.

**Interconnection.** The mechanism to connect a renewable energy generation facility to the distribution or transmission lines is called interconnection.

**Investor-owned utility.** Utility companies that are owned by shareholders - private investors. There are two operating in Iowa – MidAmerican Energy Company and Alliant (Interstate Power and Light).

**Iowa Utilities Commission.** The state regulator that is responsible for electric, gas, water and telecommunications issues. This was previously called the Iowa Utilities Board.



Solar panels. Photo Credit: National Renewable Energy Laboratory

**Line loss.** When electricity is moved long distances over transmission lines, some of that electricity is wasted or lost and is called line loss.

**Midwest Independent Service Operator (MISO).** MISO is an organization that is responsible for transmission planning and for operation of the transmission system in the upper Midwest.

**Municipal utility.** A utility company that is owned by a city. The municipal may have its own generation facilities, but it may also have contracts with generation and transmission companies.

**Net billing.** Net billing is a scheme where two meters are installed at the site where renewable energy is installed. The first meter keeps track of the electricity used by the customer. The second meter keeps track of the electricity generated by the customer. All electricity used by the customer is purchased from the utility; all electricity generated by the customer is put on the grid and purchased by the utility. At the end of the billing period, the bills are calculated and netted. Without a special contract, this scheme results in the customer purchasing electricity at retail rates and selling excess energy at wholesale rates or avoided cost which might be even less than wholesale rates. For those utilities using time-of-day meters, this scheme more accurately reflects the cost of energy.



Photo Credit: Susan Bilo, National Renewable Energy Laboratory

**Net metering.** Net metering is used with a renewable energy generator where the meter spins forward when the consumer is purchasing power from the grid and spins backward when the consumer is generating electricity and adding it to the grid. Net metering allows the consumer to use the power they generate first. At the end of a billing period or some other agreed-to period of time, the utility pays the customer for any net amount that the customer sends to the grid.

**Office of Consumer Advocate.** In proceedings before the Iowa Utilities Commission, the customers' interests are represented by the Office of Consumer Advocate, a division of the Attorney General's Office.

**Peak load.** The maximum requirement that the customers place on the utility for electrical power at any point in time is called peak load.

**Power Purchase Agreements.** Utility companies will enter into power purchase agreements with electric generation companies that are contracts to purchase quantities of electricity at a set amount for a set period of time.

**Rebate programs.** With a rebate program, a utility will pay customer money when the customer purchases energy efficient appliances, furnaces or light bulbs.

**Renewable energy.** Electricity and heat generated by wind, solar power or geothermal sources. It is renewable in that the energy source is sustainable and will always be present (i.e., the wind always blows and the sun always shines).

**Renewable energy standard.** A requirement the utilities must generate a certain percentage or a certain number of megawatts of electricity each year from a renewable energy source such as wind or solar.

**Rural Electric Cooperative (REC).** Rural electric cooperatives are electric utility companies owned by their members – people and businesses who get their electricity from the REC. RECs usually operate in the rural areas.

**Rural Utilities Service (RUS).** The Rural Utilities Service is a part of the United States Department of Agriculture. Among its initiatives are financing programs for rural electric cooperatives.

**Service territory.** The service territory is the cities, townships and counties that are covered by an individual utility company. The utility does not provide electricity to any customer outside of its service territory.

**Smart grid.** Technologies added to the existing electrical grid that allow for sensing failures of the grid or overloads, that allow the customer to view the current price of electricity and that allow the power company to selectively cycle off customer appliances and other equipment when the peak usage load approaches.

**Solar photovoltaics.** Solar photovoltaics are the technology to convert the sun's rays into electricity.

**Solar thermal.** Solar thermal is the technology to convert the sun's rays into heat that can be used to heat air, water or other fluids.

**Standard interconnection rules.** Standard interconnection rules establish clear, uniform procedures and technical requirements that apply to utilities within a state to connecting distributed generation systems to the grid.

**Tariff.** A document that describes the rates for electricity consumed by a customer and other services offered by the utility company. A tariff can also detail the rates that the utility will pay for electricity generated by a renewable energy generator owned by a homeowner, business or farmer.

**Transmission.** The high voltage wires that move electricity from the location it was generated to the point that lower voltage wires pick up the electricity.

**Virtual power plants.** A network of behind-the-meter battery storage systems that are networked and help support the utility delivery of power to the grid.



Transmission lines. Photo Credit:  
National Renewable Energy  
Laboratory