

Appendix C: Glossary

COLD-CLIMATE HEAT PUMPS: Also referred to as air-source heat pumps, mini-splits or ductless heat pumps. These systems are a good option to retrofit existing houses, and can be used to supplement the existing heating system. As explained on the [Efficiency Vermont website](#), “heat is collected from the exterior air, concentrated via an outdoor compressor, and distributed inside through an indoor room unit. Heat pumps require electricity to run, but can deliver more energy than they use.” They also provide air conditioning during the warmer months. See Figure 1.



Figure 1: Illustration of how cold-climate heat pumps work. Source: Efficiency Vermont.

CONSISTENT WITH THE GOALS: Requires substantial progress toward attainment of the goals established in 24 V.S.A. §4302 and §4352(c)(3), unless the planning body determines that a particular goal is not relevant or attainable. If such a determination is made, the planning body shall identify the goal in the plan and describe the situation, explain why the goal is not relevant or attainable, and indicate what measures should be taken to mitigate any adverse effects of not making substantial progress toward that goal. The determination of relevance or attainability shall be subject to review as part of a consistency determination under this chapter.

BIODIESEL: A fuel made from vegetable oils, fats, or greases—such as recycled restaurant grease. Biodiesel fuel can be used in diesel engines without changing the engine. Pure biodiesel is non-toxic, biodegradable, and produces lower levels of most air pollutants than petroleum-based diesel fuel. Biodiesel is usually sold as a blend of biodiesel and petroleum-based diesel fuel. A common blend of diesel fuel is B20, which is 20% biodiesel.

BIOFUELS: Transportation fuels such as ethanol and biodiesel that are made from biomass materials. These fuels are usually blended with petroleum fuels (gasoline and diesel fuel), but they can also be used on their own. Using ethanol or biodiesel means less gasoline and diesel fuel is burned, which can reduce the amount of crude oil imported from other countries. Ethanol and biodiesel are also cleaner-burning fuels than pure gasoline and diesel fuel. (U.S. EIA)

BIOMASS: Biomass is organic material that comes from plants and animals, and it is a renewable source of energy. Biomass contains stored energy from the sun. Plants absorb the sun's energy in a process called photosynthesis. When biomass is burned, the chemical energy in biomass is released as heat. Biomass can be burned directly or converted to liquid biofuels or biogas that can be burned as fuels. Examples of biomass and their uses for energy include wood and wood processing wastes; agricultural crops and waste materials; food, yard, and wood waste in garbage; and animal manure and human sewage. (U.S. EIA)

ETHANOL: Ethanol is an alcohol fuel made from the sugars found in grains such as corn, sorghum, and barley. (U.S. EIA)

FOSSIL FUELS: Fuels such as crude oil, natural gas, and coal that were formed over millions of years by the action of heat from the earth's core and pressure from rock and soil on the remains (or fossils) of

dead plants and creatures like microscopic diatoms. Most of the petroleum products consumed in the United States are made from crude oil, but petroleum liquids can also be made from natural gas and coal. Nuclear energy is produced from uranium, a nonrenewable energy source whose atoms are split (through a process called nuclear fission) to create heat and, eventually, electricity. (U.S. EIA)

GIGAWATT (GW): One GW is equivalent to 1,000 MW. See the discussion under MW.

GIGAWATT HOUR (GWh): One GWh is equivalent to 1,000 MWh. See the discussion under MWh.

GROUND-SOURCE HEAT PUMPS: Also referred to as geothermal heat pumps. Provide space heating and cooling. They work similarly to air-source heat pumps, but instead they pump water or other fluid through pipes buried in the ground to collect heat. A more detailed description for how these systems work can be found on the [US EPA website](#). These are generally a better option for new construction installations. See Figure 2.

KILOWATT (KW): A unit of electrical power equal to one thousand watts. This unit of measurement (along with MW) is used in this plan to represent the installed capacity of power generation facilities.

KILOWATT HOUR (KWh): A measure of electrical energy equivalent to a power consumption of 1,000 watts for 1 hour. (See MWh)

MASONRY HEATER: A solid fuel (typically wood) burning heating appliance constructed of concrete or solid masonry having a mass of at least 500 kg (1,100 lb.), excluding the chimney and foundation. It is designed to absorb and store a substantial portion of heat from a fire built in the firebox by routing exhaust gases through internal heat exchange channels in which the flow path downstream of the firebox includes at least one 180-degree change in flow direction before entering the chimney and which delivers heat by radiation from the masonry surface of the heater, as defined by the Masonry Heaters Association.

MEGAWATT (MW): a unit of electrical power equal to one million watts. A MW is equal to 1,000 kilowatts (kW). This unit of measurement is used in this plan to represent the installed capacity of power generation facilities.

MEGAWATT HOUR (MWh): a unit of measure of electric energy. A MWh is equal to 1,000 kilowatt-hours (kWh). An MWh is the amount of electricity generated by a one megawatt (MW) power generation facility or producing electricity for one hour (i.e. generation output). On an electric bill, electricity usage is commonly reported in kilowatt-hours.

NET-ZERO: A construction method for buildings that generate as much energy as they consume. Also known as a zero-energy building.

NET-ZERO READY: A building constructed in a manner that, with subsequent on-site renewables installed, it can make as much energy as it uses.

RENEWABLE ENERGY RESOURCES: Means energy available for collection or conversion from direct sunlight, wind, running water, organically derived fuels, including wood and agricultural sources, waste heat, and geothermal sources.

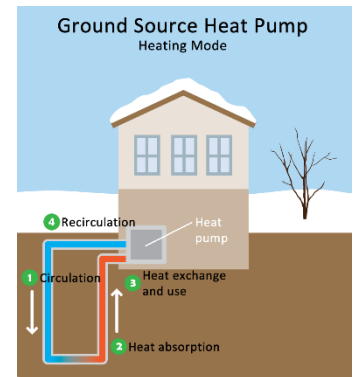


Figure 1: Illustration of how ground-source heat pumps work. Source: US EPA.

SHADOW FLICKER: A flickering effect caused when rotating wind turbine blades periodically cast shadows, such as through the windows of adjacent homes. Shadow flicker is considered by some individuals as a nuisance and may cause headaches. No more than 30 hours per year is commonly used as a limit to reduce nuisance complaints.

STRETCH CODE: A building energy code that achieves greater energy savings than the base Residential Building Energy Standards (RBES). The Stretch Code is required for Act 250 projects and may be adopted by municipalities.

UNDUE ADVERSE EFFECT (IMPACT): An adverse impact that meets any one of the following criteria:

- (1) Violates a clear, written community standard intended to preserve the aesthetics or scenic, natural beauty of the area;
- (2) Offends the sensibilities of the average person (i.e. it is offensive or shocking because it is out of character with its surroundings or significantly diminishes the scenic qualities of the area); or,
- (3) Fails to take generally available mitigating steps that a reasonable person would take to improve the harmony of the proposed project with its surroundings.

WIND TURBINE: a rotary engine in which the kinetic energy of wind is converted into mechanical energy by causing a bladed rotor to rotate.

WIND TURBINE, RESIDENTIAL-SCALE: a wind turbine that is generally used in residential back yard-type applications. For the purposes of this plan, a residential-scale wind turbine is no greater than 30 meters in height, measured at the hub/center of the blades. These systems have a generalized capacity of up to 10 kW.

WIND TURBINE, COMMERCIAL-SCALE: a wind turbine that is generally used in a commercial application. For the purposes of this plan, a commercial-scale wind turbine is no greater than 50 meters in height, measured at the hub/center of the blades. These systems have a generalized capacity of up to 100 kW.

WIND TURBINE, UTILITY-SCALE: a wind turbine that is generally used in a large-scale utility generation application. For the purposes of this plan, a utility-scale wind turbine is greater than 50 meters in height, measured at the hub/center of the blades. These systems have a generalized capacity of approximately 1MW.