

## Appendix 2: Glossary

**Adaptation:** Adjustment in natural or human systems to a new or changing environment. Adaptation to climate change refers to adjustments in response to actual or expected climatic stimuli or their effects, which lessens harm or exploits beneficial opportunities. Various types of adaptation include anticipatory and reactive adaptation, private and public adaptation, and autonomous and planned adaptation.

**Adaptation benefits:** The avoided damage costs or the accrued benefits following the adoption and implementation of adaptation measures.

**Adaptation costs:** Costs of planning, preparing for, facilitating, and implementing adaptation measures.

**Albedo:** The amount of solar radiation reflected by a surface or object. Snow covered surfaces have a high albedo; the albedo of soils ranges from high to low; vegetation covered surfaces and oceans have a low albedo.

**Alternative energy:** Energy derived from nontraditional sources (e.g., compressed natural gas, solar, hydroelectric, wind).

**Anthropogenic:** Made by people or resulting from human activities. Usually used in the context of emissions that are produced as a result of human activities.

**Architecture 2030:** Architecture 2030 is a non-profit, non-partisan and independent organization, established in response to the global-warming crisis by architect Edward Mazria in 2002. 2030's mission is to rapidly transform the US and global Building Sector from the major contributor of greenhouse gas emissions to a central part of the solution to the global-warming crisis. (Description from website: [www.architecture2030.org](http://www.architecture2030.org)). More detail about Architecture 2030 and proposed targets in Appendix 11

**Atmosphere:** The gaseous envelope surrounding the Earth. The dry atmosphere consists almost entirely of nitrogen (78.1% volume mixing ratio) and oxygen (20.9% volume mixing ratio), together with a number of trace gases, such as argon (0.93% volume mixing ratio), helium, radiatively active greenhouse gases such as carbon dioxide (0.035% volume mixing ratio), and ozone.

**Barrier:** Any obstacle to reaching a potential that can be overcome by a policy, program, or measure.

**Biofuel:** A fuel produced from dry organic matter or combustible oils produced by plants. Examples include alcohol (from fermented sugar), black liquor from the paper manufacturing process, wood, and soybean oil.

**Biomass:** When referring to fuel, plant-derived fuel including clean and untreated wood such as brush, stumps, lumber ends and trimmings, wood pallets, bark, wood chips or pellets, shavings, sawdust and slash, agricultural crops, biogas, or liquid

biofuels, but shall exclude materials derived in whole or part from construction and demolition debris.

**BRT: Bus Rapid Transit:** A BRT system emulates the efficiencies and operations of light-rail at a fraction of the costs. Attributes of a BRT system are:

Exclusive right-of-way - guarantees travel time, Signal priority – Giving buses priority through intersections, Level boarding – making boarding easier and quicker, Off-Board Fare Collection – no fumbling with change; boarding at all doors, not just the front, Less frequent stops – improves travel time, Improved stations – station amenities for passenger comfort, Park & Ride connections – Vehicle Image (Source Lane Transit District)

**CAFE:** The federal Corporate Average Fuel Economy program, which sets minimum fuel economy for cars and light trucks, including sport utility vehicles.

**Capacity:** The maximum power capability of a system.

**Carbon Credits:**

**Carbon cycle:** All reserves and fluxes of carbon. The cycle is usually thought of as four main reservoirs—the atmosphere, terrestrial biosphere (usually includes freshwater systems), oceans, and sediments (includes fossil fuels)—of carbon interconnected by pathways of exchange.

**Carbon dioxide (CO<sub>2</sub>):** The major heat-trapping gas whose atmospheric concentration is being increased by human activities. It also serves as the yardstick for all other greenhouse gases. The major source of CO<sub>2</sub> emissions is fuel combustion. Carbon dioxide emissions also result from clearing forests and burning biomass. Atmospheric concentrations of CO<sub>2</sub> have been increasing at a rate of about 0.5 percent a year, and are now more than 30 percent above pre-industrial levels.

**CO<sub>2</sub>e:**

**Carbon intensity:** The amount of carbon emitted for each unit of energy consumed.

**Carbon neutral:** (also climate neutral) when greenhouse gas emissions are net zero. A building is carbon neutral when it doesn't generate any more greenhouse gas emissions than it sequesters. This can also be accomplished by "offsetting" emissions with "carbon credits".

**Carbon Offsets:**

**Carbon sequestration:** The uptake and storage of carbon. Trees and other plants, for example, absorb CO<sub>2</sub> then release the oxygen while storing the carbon.

**Carbon sinks:** The processes or ecological systems that take in and store more carbon than they release. This process is called carbon sequestration. Forests and oceans are large carbon sinks.

**Climate:** The average state of the atmosphere, including typical weather patterns for a particular region and time period (usually 30 years). Climate is not the same as weather, but is rather the average pattern of weather for a particular region. Weather describes the short-term state of the atmosphere; climate describes the longer-term. Climatic events include average precipitation, temperature, wind, and seasonal phenomena such as length of the growing season, among others.

**Climate change:** A significant change from one climatic condition to another, often used in reference to climate changes caused by the increase in heat-trapping gases since the end of the 19<sup>th</sup> century.

**Climate feedback:** An interaction mechanism between processes in the climate system that happens when the result of an initial process triggers changes in a second process that in turn influences the initial one. A positive feedback intensifies the original process, and a negative feedback reduces it.

**Climate model:** A quantitative way of representing the interactions of the atmosphere, oceans, land surface, and ice.

**Climate neutral:** see carbon neutral

**Climate projection:** A projection of the response of the climate system to emission or concentration scenarios of greenhouse gases and aerosols, or radiative forcing scenarios, often based on climate models simulations.

**Climate refugees:** People displaced from their homes or lands by significant changes in climate such as increased drought, sea level rise, or increased storm intensity.

**Climate system:** The climate system is a complex system consisting of five major components: the atmosphere, the hydrosphere, the cryosphere, the land surface and the biosphere, and the interactions between them. The climate system evolves in time under the influence of its own internal dynamics and because of external forcings such as volcanic eruptions, solar variations, and human-induced forcings such as the changing composition of the atmosphere and land-use change.

**Climate variability:** Climate variability refers to changes in the average state and other aspects of the climate over space and time beyond that of individual weather events. Variability can be due to natural climate processes (internal variability), or natural or human-induced external changes (external variability). See also climate change.

**Co-benefits:** The benefits of policies that are implemented for various reasons at the same time – including climate change mitigation. Most policies aimed at mitigating greenhouse gas emissions also have other, often at least equally important, benefits (e.g., related to development, sustainability, and equity).

**Community-scale renewable energy:**

**Concentration:** Amount of a chemical in a particular volume or weight of air, water, soil, or other medium. See also PPM (parts per million).

**Cost-effective:** A criterion that specifies that a technology or measure delivers a good or service at equal or lower cost than current practice, or the least-cost alternative for reaching a given target.

**DSM:** Demand-side management. Includes measures targeting users that conserve electricity such as energy efficient products and design, and load management strategies.

**Deforestation:** Practices or processes that result in the conversion of forested lands for non-forest uses. This is often cited as one of the major causes of the enhanced greenhouse effect for two reasons: 1) the burning or decomposition of the wood releases carbon dioxide; and 2) trees that once removed carbon dioxide from the atmosphere via photosynthesis are no longer present.

**Desertification:** Land degradation in arid, semi-arid, and dry sub-humid areas resulting from various factors, including climatic variations and human activities.

**District energy:** In a district energy system, steam, hot water or chilled water is produced in a central plant and distributed to multiple buildings in a defined area through underground pipes.

**Earth Advantage:**

**Ecosystem:** Any natural unit including living and non-living parts that interact to produce a stable system through cyclic exchange of materials.

**Ecosystem services:** Ecological processes or functions that have value to individuals or society.

**Embodied (greenhouse gas) Emissions:** Greenhouse gas emissions associated with embodied energy (below)

**Embodied energy:** The total expenditure of energy involved in the creation of a product. This includes the energy to extract raw materials (lumber, iron, etc.), process, package, transport, install, and recycle or dispose of products.

**Emissions:** The release of a substance (usually a gas when referring to the subject of climate change) into the atmosphere.

**Energy efficiency:** Ratio of energy output of a conversion process or of a system to its energy input.

**Energy intensity:** Energy consumption per measure of demand for services (e.g., number of buildings, total floorspace, floorspace-hours, number of employees).

**Energy Trust of Oregon:**

**Environmentally Sound Technologies (ESTs):** Technologies that protect the environment are less polluting, use all resources in a more sustainable manner,

recycle more of their wastes and products, and handle residual wastes in a more acceptable manner than the technologies for which they are substitutes and are compatible with nationally determined socio-economic, cultural, and environmental priorities.

**EWEB:** Eugene Water and Electric Board – Eugene’s largest utility.

**EPA:** The United States Environmental Protection Agency.

**EPUD:** Emerald People’s Utility District – Provides electricity to some Eugene residents and businesses.

**Exposure:** The nature and degree to which a system is exposed to significant climatic variations.

**External cost:** The costs arising from any human activity, when the agent responsible for the activity does not take full account of the impacts on others of his or her actions. When the impacts are positive and not accounted for in the actions of the agent responsible they are called external benefits.

**Extreme weather event:** An event that is rare within its statistical reference distribution at a particular place.

**Feedback mechanisms:** Factors that increase or amplify (positive feedback) or decrease (negative feedback) the rate of a process. An example of positive climatic feedback is the ice-albedo feedback. See climate feedback.

**Food insecurity:** A situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life. It may be caused by the unavailability of food, insufficient purchasing power, inappropriate distribution, or inadequate use of food at the household level and can be chronic, seasonal, or transitory.

**Foodshed:**

**Fossil Fuel:** A general term for combustible geologic deposits of carbon in reduced (organic) form. Fossil fuels are of biological origin and include coal, oil, natural gas, oil shales and tar sands. A major concern is that they emit CO<sub>2</sub> when burned, significantly enhancing the greenhouse effect.

**GHG:** Abbreviation for greenhouse gas, the term used for gases that trap heat in the atmosphere. The principal greenhouse gases that enter the atmosphere as a result of human activity are carbon dioxide, methane, and nitrous oxide. Others include, but are not limited to, water vapor, chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), ozone (O<sub>3</sub>), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>).

**Generation:** The process of making electricity. The term may also refer to energy supply.

**Global Warming:** Global warming is an average increase in the temperature of the Earth's atmosphere, which can contribute to changes in global climate patterns. Global warming can occur from a variety of causes, both natural and human induced. In common usage, "global warming" often refers to the warming that can occur as a result of increased emissions of greenhouse gases from human activities. See climate change, greenhouse effect.

**Greenhouse Effect:** The thermal effect that results from heat-trapping gases allowing incoming solar radiation to pass through the Earth's atmosphere, but preventing most of the outgoing infrared radiation from the surface and lower atmosphere from escaping into outer space.

**Greenhouse Gas:** Commonly abbreviated GHG, a term used for gases that trap heat in the atmosphere. The principal greenhouse gases that enter the atmosphere as a result of human activity are carbon dioxide, methane, and nitrous oxide. Others include, but are not limited to, water vapor, chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), ozone (O<sub>3</sub>), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>).

**Greywater:**

**GWh:** Gigawatt-hours (1 million kilowatt-hours).

**HFC:** Hydrofluorocarbon compounds; a human-made greenhouse gas generated by industrial processes.

**IPCC:** Intergovernmental Panel on Climate Change. Established in 1988, the IPCC assesses information in the scientific and technical literature related to all significant components of the issue of climate change. It draws on hundreds of the world's leading scientists to serve as authors, and thousands as reviewers. Key experts on climate change and the environmental, social and economic sciences from some 60 nations have helped the IPCC prepare periodic assessments of the scientific underpinnings of global climate change and its consequences. The IPCC is also looked to as the official advisory body to the world's governments on the state of the science of the climate change issue.

**Implementation:** The realization of an idea, or execution of a plan, by groups or individuals, public or private.

**Implementation costs:** Costs involved in the implementation of mitigation options, associated with the necessary institutional changes, information requirements, market size, opportunities for technology gain and learning, and economic incentives.

**Industrial Revolution:** A period of rapid industrial growth with far-reaching social and economic consequences, beginning in England during the second half of the 18th century and eventually spreading to the United States. The invention of the steam engine was an important trigger of this development. The Industrial Revolution marks the beginning of a strong increase in the use of fossil fuels and emission of, in particular, carbon dioxide.

**Infill compatibility standards:** A City of Eugene planning effort with a stated goal to create and adopt land use code standards and processes that: (a) Prevent residential infill that would significantly threaten or diminish the stability, quality, positive character, livability or natural resources of residential neighborhoods; and (b) Encourage residential infill that would enhance the stability, quality, positive character, livability or natural resources of residential neighborhoods; and (c) So long as the goal stated in (a) is met, allow for increased density, a variety of housing types, affordable housing, and mixed-use development; and (d) Improve the appearance of buildings and landscapes.

**Integrated design:**

**Invasive species:** An introduced species that invades natural habitats.

**LCOG:** Lane Council of Governments, a voluntary association of local governments in Lane County, Oregon. The agency is a regional planning, coordination, program-development, and service-delivery organization. LCOG helps area cities, Lane County, educational districts, and special-purpose districts reach their common goals.

**LTD:** Lane Transit District

**Land use:** Human-determined arrangements, activities, and inputs undertaken in a certain land type, the social and economic purposes for which land is managed (e.g., grazing, timber extraction, and conservation).

**Land-use change:** A change in the use or management of land by humans, which may lead to a change in land cover. Land cover and land-use change may have an impact on the albedo, evapotranspiration, sources, and sinks of greenhouse gases, or other properties of the climate system, and may thus have an impact on climate, locally or globally.

**KWh:** Kilowatt-hour.

**LEED:** Leadership in Energy and Environmental Design, a program of the United States Green Building Council and a commonly used green building standard.

**MMtCOe:** Million metric tons of CO equivalent.

**MW:** Megawatt, a measure of electricity capacity. One MW is sufficient to provide power to 700 to 1,000 homes.

**MWh:** Megawatt-hours (1 thousand kilowatt-hours).

**Maladaptation:** An adaptation that does not lower vulnerability to climatic stimuli but inadvertently increases it instead.

**Market-based incentives:** Measures using price mechanisms (e.g., taxes and tradable permits) to reduce greenhouse gas emissions.

**Methane (CH<sub>4</sub>):** A hydrocarbon that is a heat-trapping gas carrying a global warming potential recently estimated at 24.5. Methane is produced through anaerobic (without oxygen) decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and oil, coal production and incomplete combustion of fossil fuels.

**Metric Ton (Mt):** Common measurement for the quantity of greenhouse gas emissions. A metric ton is equal to 2205 lbs or 1.1 short tons.

**Mitigation:** An intervention to reduce the sources or enhance the sinks of greenhouse gases.

**Natural Gas:** A fossil fuel which occurs as underground deposits of gases consisting of 50 to 90 percent methane (CH<sub>4</sub>) and small amounts of heavier gaseous hydrocarbon compounds such as propane (C<sub>3</sub>H<sub>8</sub>) and butane (C<sub>4</sub>H<sub>10</sub>).

**Net carbon dioxide emissions:** Difference between sources and sinks of carbon dioxide in a given period and specific area or region.

**Net metering:**

**Net Zero Energy Buildings:** A building that achieves maximum energy efficiency so that any remaining energy needs can be met through onsite renewable energy systems, such as solar water and space heating, solar electricity, or wind energy

**Nitrous Oxide (N<sub>2</sub>O):** A powerful greenhouse gas. Major sources include soil cultivation – especially from use of commercial and organic fertilizers – fossil fuel combustion in vehicles, nitric acid production and the combustion of biomass.

**NO<sub>x</sub>:** Oxides of nitrogen, which are important components of ground-level ozone smog, and contribute to acid rain and particulate pollution (how do the N gasses contribute to particulate pollution?).

**Non-point-source pollution:** Pollution from sources such as areas of crop production, timber, surface mining, disposal of refuse, and construction, which cannot be defined as discrete source points. See also point-source pollution.

**NWN:** Northwest Natural Gas

**Occupant behavior:** The behavior of building occupants such as residents and employees. Relevant occupant behaviors include how occupants operate thermostats, open and close windows, and use water and electricity.

**ODOT:** Oregon Department of Transportation

**Oregon DEQ:** Oregon Department of Environmental Quality

**Oregon DOE:** Oregon Department of Energy

**Opportunity costs:** The cost of an economic activity forgone by the choice of another

activity.

**Opportunity Siting:** A City of Eugene planning effort with the stated goal of  
1) Creating a planning process for finding specific sites that can feasibly accommodate high density residential development that is compatible with and has the support of nearby residents. 2 )Facilitate development on those sites.

**PFCs:** Perfluorocarbons; a human-made greenhouse gas generated by industrial processes.

**PPM:** Parts per million.

**Photovoltaic (PV):** A solar power technology that converts sunlight into electricity.

**Peak Oil:** A term used to describe the transition from many decades in which the available supply of oil grew each year to a period in which the rate of oil production enters its terminal decline.

**Photosynthesis:** The process by which plants make sugars, taking carbon dioxide (CO<sub>2</sub>) from the air, and releasing oxygen (O<sub>2</sub>) in the process.

**Point-source pollution:** Pollution resulting from any confined, discrete source, such as a pipe, ditch, tunnel, well, container, concentrated animal-feeding operation, or floating craft. See also non-point-source pollution.

**Product Stewardship:** Calls on those in the product lifecycle—manufacturers, retailers, users, and disposers—to share responsibility for reducing the environmental impacts of products (definition from EPA website). Ideally, this would result in changes in design so that products create less waste, can be re-used or disassembled for easier recycling, or are otherwise redesigned.

**REC:** Renewable energy certificates which are marketable/tradable entities that represent one megawatt hour (1,000 kWh) of power generation from a renewable energy source.

**Radiation:** Energy transfer in the form of electromagnetic waves or particles that release energy when absorbed by an object.

**Reforestation:** Planting of forests on lands that have previously contained forests but that have been converted to some other use.

**Renewables:** Energy sources that are, within a short time frame relative to the Earth's natural cycles, sustainable, and include non-carbon technologies such as solar energy, hydropower, and wind, as well as carbon-neutral technologies such as biomass.

**Resilience:** Amount of change a system can undergo without changing state.

**Setbacks:** Land use code that requires buildings or facilities to be a certain distance back (setback) from a roadway or other defined object.

**Sink:** Removals of carbon from the atmosphere, with the carbon stored in forests, soils, landfills, wood structures, or other biomass-related products.

**Snowpack:** A seasonal accumulation of slow-melting snow

**Solar Radiation:** Radiation emitted by the sun.

**Solar thermal:** A technology that captures solar energy for heat

**Source:** Any process or activity that releases into the atmosphere a greenhouse gas, an aerosol or a precursor to a greenhouse gas.

**Special setback:** (relative to transit route planning)

**Stakeholder:** A person or entity that would be affected by a particular action or policy.

**Streamflow:** Water within a river channel, usually expressed in cubic meters per second.

**SUB:** Springfield Utility Board

**SUV:** Sport utility vehicle, considered under federal gas mileage standards to be a light-duty truck, and subject to a lower average mile per gallon requirement ,( 20.7 mpg)< than other passenger vehicles.

**Sustainable development:** Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

**Urbanization:** The conversion of land from a natural state or managed natural state (such as agriculture) to cities.

**Urban Heat Island:** The increased temperatures experienced in urban areas due to dark-colored pavement, roofs, buildings, etc.

**VMT:** Vehicle-miles traveled. A measurement to determine the amount of automobile traffic – can also be used to calculate greenhouse gas emissions.

**Vector:** An organism, such as an insect, that transmits a pathogen from one host to another. See also vector-borne diseases.

**Vector-borne disease:** Disease that is transmitted between hosts by a vector organism such as a mosquito or tick.

**Vulnerability:** The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes.

**Wastewater:** Water that has been used and contains dissolved or suspended waste materials.

**Weather:** Atmospheric condition at any given time or place. It is measured in terms of such things as wind, temperature, humidity, atmospheric pressure, cloudiness, and

precipitation. In most places, weather can change from hour-to-hour, day-to-day, and season-to-season. Climate is usually defined as the "average weather."

**Whole building design:**

**zero net energy:**

Sources:

Berkeley CAP

Energy Information Administration's Energy Glossary

IPCC Third Assessment Report

NASA's Earth Observatory library