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Biomass

Biomass includes all of the earth's living matter, plants and animals, and the remains of this living matter. Plant biomass is a renewable energy source that is produced through photosynthesis when plants capture carbon dioxide from the air and combine it with water to form carbohydrates and oxygen under the influence of sunlight. The chemical energy in plants gets passed on to animals and people that eat the plants. Biomass does not include plant or animal matter that has been converted by geologic processes to create fossil fuels such as oil or coal.

Biomass Energy

When biomass is produced by plants as a result of photosynthesis, some of the energy in the sunlight is converted into the chemical energy that binds various atoms to form carbohydrate molecules. Herbivores (animals that feed on plants) eat the plants and make their own biomass by using the energy stored in the plants' biomass. Similarly, carnivores (animals that feed on other animals) consume the biomass of other animals and in the process make their own biomass. When the plants or animals die, the energy captured in their biomass remains until the biomass decomposes through natural mechanisms or is burned or processed by humans.

Part of the chemical energy stored in biomass is released when molecules are destroyed by combustion or are rearranged. The process of respiration, by which animals and plants break up carbohydrate molecules in their body to generate carbon dioxide and water, is an example of how stored molecular energy is released to fuel the function and movement of living organisms. Plants capture more energy from the sun than they need, and the excess energy is stored in their biomass. On the other hand, animals are net consumers of energy and biomass, and the energy they store in their body mass is less than the energy found in the foods they eat. However, the biological matter animals discharge from their body (e.g., animal dung) has a certain amount of energy in it, and, historically, has been used for energy production. When biomass is considered for energy production, it includes both plant matter and animal matter (e.g., manure, animal waste from slaughterhouses, and restaurant grease).

Uses of Biomass Energy

â€¢ Biomass is a renewable energy resource divided from the carbonaceous waste of various human and natural activities. It is derived from numerous sources, including the by-products from the wood industry, agricultural crops, raw material from the forests, household wastes etc.

â€¢ Biomass does not add carbon dioxide to the atmosphere as it absorbs the same amount of carbon in growing as it releases when consumed as a fuel. Its advantage is that it can be used to generate electricity with the same equipment that is now being used for burning fossil fuels.

â€¢ Biomass is an important source of energy and the most important fuel worldwide after coal, oil and natural gas. BioÂ¬energy, in the form of biogas, which is derived from biomass, is expected to become one of the key energy resources for global sustainable development.

â€¢ Biomass offers higher energy efficiency through form of Biogas than by direct burning. Bio-energy is being used for cooking mechanical applications, pumping power generation.

â€¢ Biogas is a clean and efficient fuel, generated from cow-dung human waste or any kind of biological materials derived through anaerobic fermentation process. The biogas consists of 60% methane with rest mainly carbon-dioxide. Biogas is a safe fuel for cooking and lighting.

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