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Biomass Energy

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Solar collectors, solar panels and solar cells are known to trap the sun's energy. Green plants do much the same thing. They trap the solar energy in a process called photosynthesis. It is the chemical reaction by which plants make food from carbon dioxide and water in the presence of light. In the action, solar energy is changed into stored chemical energy in the food. This energy is passed on to animals when the plants are eaten.

Biomass includes plants, animal wastes, and all other organic matter that can be used as a source of energy.

The amount of garbage produced all over the world is staggering. The average person produces more than 1,500 grams each day. This garbage is actually a treasure chest of energy. It contains much animal waste and other forms of biomass. The solid wastes of large cities are said to contain enough energy to light homes and businesses across the country for an entire year. The problem is how to get the energy from solid waste.

One way to release energy from solid wastes is to burn them. Before solid wastes can be burned, however, they must be processed and dried. In some countries, farmers have been processing such wastes for use as fuel for centuries. They simply dry solid animal wastes in sunlight.

In a modern waste treatment plant, solid wastes are processed so that they can be burned. Then the energy from the wastes is used to produce steam for an electric generator. The

process releases waste gases that pollute the air. However, the plant helps dispose of the wastes by scrubbing. The latter is a way of cleaning waste smoke by using water. Water is sprayed into the smoke, dissolving some of the polluting gases.

Much solid waste material is dumped into landfills. Here bacteria take in and digest the waste. The bacteria then give off natural gas, which is made largely of methane.

Methane is a greenhouse gas. Some farmers collect methane gas from animal waste. The methane can be pumped into the mains gas system, where it goes to houses for cooking and heating. Scientists are looking for ways to obtain more methane from landfills and dump sites. Doing so would also help solve a waste-disposal problem.

The People's Republic of China has experienced an energy shortage for many years. People there have found a way to combat the shortage. They put organic wastes into hole called a "biopit." There, bacteria change the biomass into methane. The methane is collected and used as fuel [1].

Alcohol is a clean fuel that burns with a bright, hot flame. The source of alcohol is biomass.

Ethanol (ethyl alcohol) is an alcohol being tested for use in fuel for cars. It is produced by fermentation. It is a process by which living yeast cells change sugar into alcohol and carbon dioxide. The sugars in corn and other grains are used in the process. They give ethanol its common name, "grain alcohol" [2].

Ethanol is mixed with gasoline in a fuel called gasohol. It has been used in gasoline engines to help conserve fossil fuel. However, the alcohol used must be very pure. Purifying the alcohol takes energy. As a result, gasohol is expensive.

Farming is becoming an important step in energy production. For example, if you visit Brazil, you may see its "fuel farms", fields of sugar cane with fermentation plants and storage tanks. Brazil has only a small oil supply. Cars in that

country run on gasohol. The ethanol used in the gasohol comes from the fermentation of sugar cane on the fuel farms.

Water crops are becoming important as energy sources. For example, scientists are considering harvesting kelp for energy. Kelp is a fast-growing water plant. Kelp plants grow well in the ocean. Under good conditions, a giant kelp can grow 60 to 90 cm in one day. Kelp plants are sources of biomass. The action of bacteria on the remains of these plants yields methane gas. A research test farm with giant kelp is in operation off the coast of southern California. Scientists are trying to learn more about the effects of kelp farming on the environment [3].

The water hyacinth is another fast-growing water plant that is being studied as a source of biofuel. These plants are especially interesting to scientists because of their unique diet. Water hyacinths feed on raw sewage. As they feed, they clean up the water around them. So these plants are valuable on two accounts. They may be sources of fuel. And they are agents in the fight against pollution.

References:

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