



Cactus Moon Education, LLC.
Understanding Green Technologies

BIO-FUEL ENERGY

How it works:

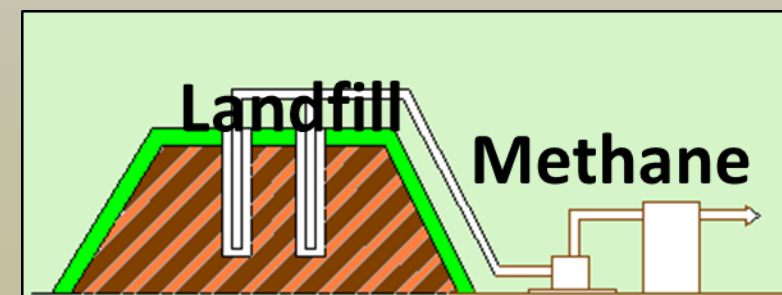
Biomass is material that comes from living or recently dead plants and animals. Some examples are grass, wood from trees, and waste from humans and other animals.

Biomass can be used as a fuel directly or can be converted into bio-gas or liquid fuels which can be burned to provide heat for cooking, to warm our homes, to generate electricity, to power our cars, to create food additives, and to manufacture plastics and other materials.



The five methods of using Bio-Fuel are: Digestion, Gasification and Pyrolysis, Lipid Oil Extraction, Direct Burning, and Fermentation.

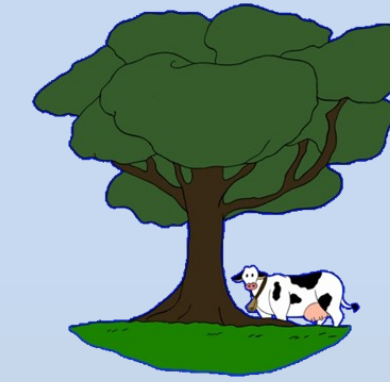
Digestion - Biomaterial such as manure from a Concentrated Animal Feeding Operation (CAFO) is put into a tank and microbes digest the solid material which produces a gas called methane.



Household waste is also digested in a landfill. The methane can be collected and used as a fuel.

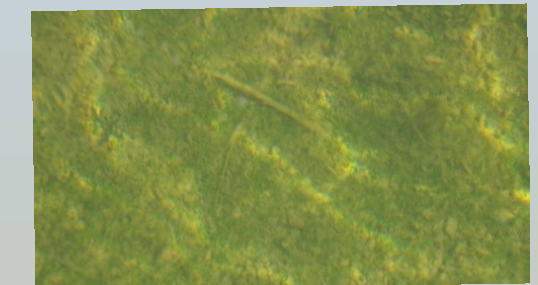
Gasification and Pyrolysis - Dry material is heated and turned into a gas mixture of carbon monoxide (CO) and hydrogen (H₂) called Syn-Gas.

Lipid Oil Extraction - Oil can be



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squeezed from plants such as soy beans and algae. The oil can be processed to make fuels and other chemicals.



ALGAE

Direct Burning - Biomass can be burned in a boiler, where water is boiled to make steam, which can be used to power a turbine/generator to make electricity.



Fermentation - A process in which the sugars in biomass material react with yeasts to produce ethanol. Ethanol can be used as a fuel for automobiles.

