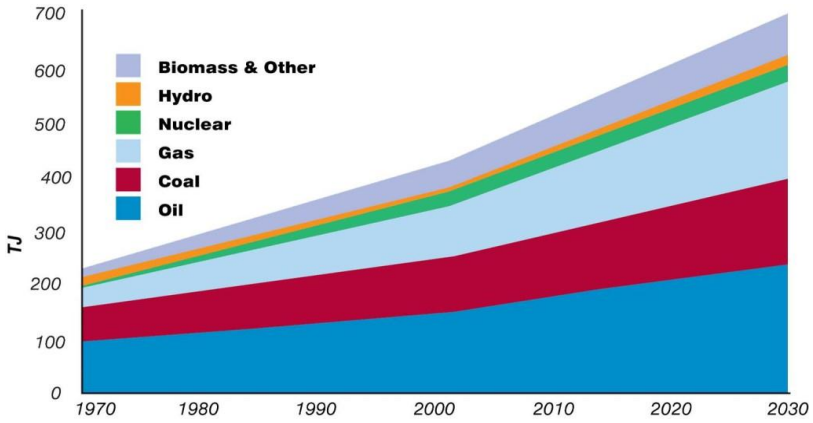
BIOMASS ENERGY

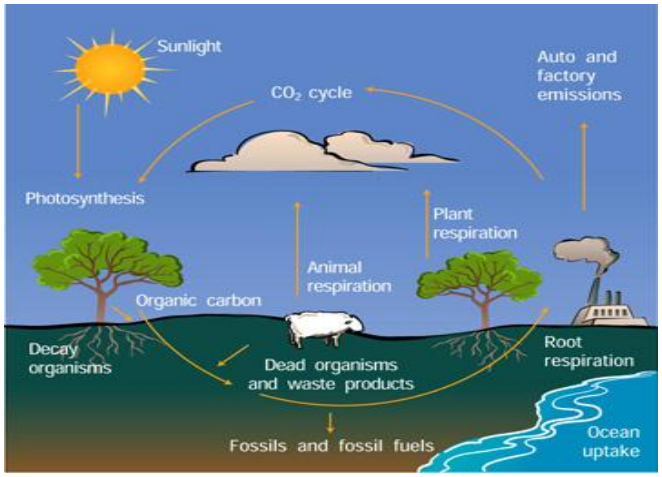
Biomass Energy refers to the total energy contained in organic material, primarily within carbon and hydrogen chemical bonds created mainly by a biological process called photosynthesis in chloroplasts of plants, that are able to use energy from the sun and inorganic matter carbohydrates, of recently living beings in a given location that can be used as energy source.

Biomass energy is one of the most common energy a source in the less industrialized countries (represented by the use of wood, agricultural residues and dung) and the oldest man has used since the discovery of fire.



Biomass energy is considered a renewable energy source because it can grow back in a relatively short period of time.

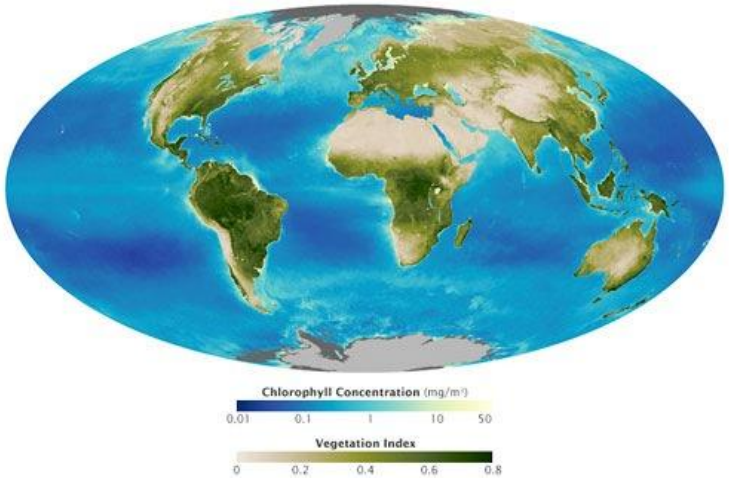
When an organic material is consumed as food, it returns to the atmosphere as CO2 or methane CH4, so by using biomass energy in power generation means to use available carbon in the air for growing crops.



The source of this kind of energy is mainly stored in the process

of photosynthesis in plants which harness solar light and matter present in air, soil

and water to transform the organic material and store this energy in the chemical bonds of carbohydrate molecules.



The biomass consists mainly of carbon (50%), oxygen (40%), hydrogen (5%) and other compounds and trace metals.

The most effective and sustainable sources of biomass resources will always be those available in a given region, in other words, those that should not be transported long distances but which are closer.

Biomass does not conflict with sustainability (as long as it does not compromises human life in the near and long term) and is part of the natural cycle of carbon, which are derived from:

(1) Wood harvested from forest plantations (any wood which not meet the plantations standards), forest, waste in streams, and wood processing material (sawdust, bark and paper process, pulp and paperboard)

(2) Municipal waste (food, bones, landfills, and agricultural waste) and industrial waste (farms, pallets, lumber, food)

(3) Energy crops (perennial grasses) that do not compete with food crops

(4) Portions of food crop residues and not used manure.

The products that can be used from a biomass process can be:

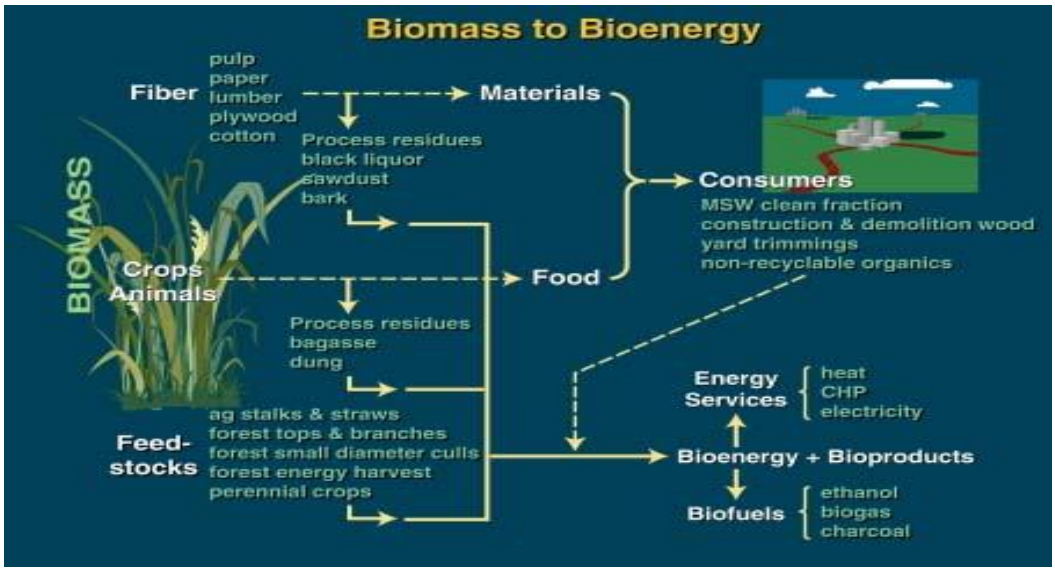
- Heat and steam, from direct combustion of biomass.
- Fertilizer to enrich the soil
- Biomass synthetic gas by heating with controlled amounts of oxygen and pressure.
- Methane gas from anaerobic processes with microorganisms.
- Bioethanol fermentation of sugars and starches.

Usually the biomass feedstock has a low energy density (this is, energy per kilogram lower than fossil fuels).

About 50% of the biomass is water, so that transportation cost is high and must be subjected to pre-processes such as drying, milling, grinding, mixing and press to increase its density. You can also pumped into pulp with water reducing the cost of transportation.

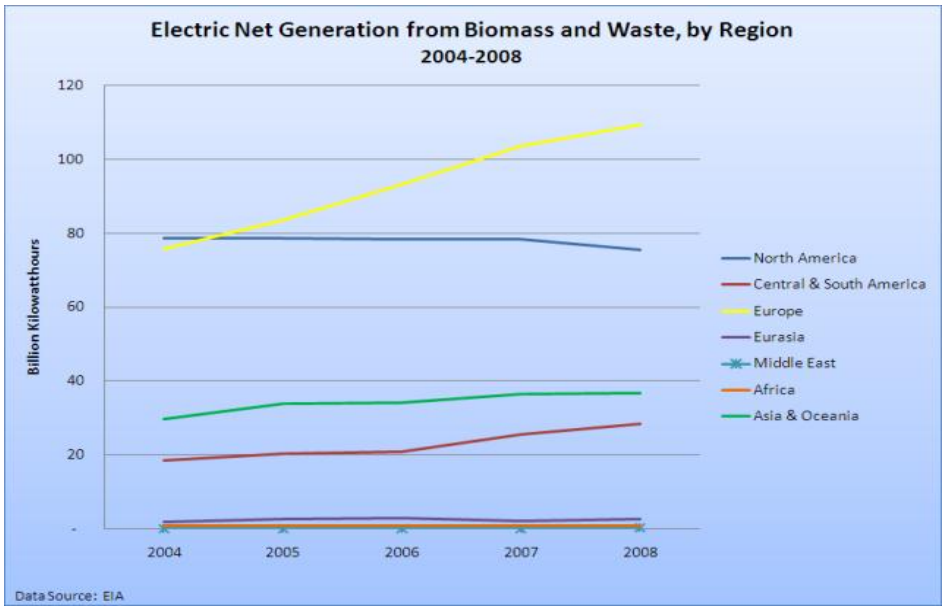
When carbohydrates undergo combustion, they return to the environment into carbon dioxide and water, releasing the captured energy of its chemical bonds. Therefore, biomass energy can be considered by some people as a type of natural electrical battery that can provide a source of indefinite energy with low carbon emissions.

Biomass energy can be recovered through direct combustion, gasification, pyrolysis or chemically converted by microorganisms into fuel.



The heat from direct combustion of biofuels can be useful to drive steam turbines to provide kinetic energy to generate electricity.

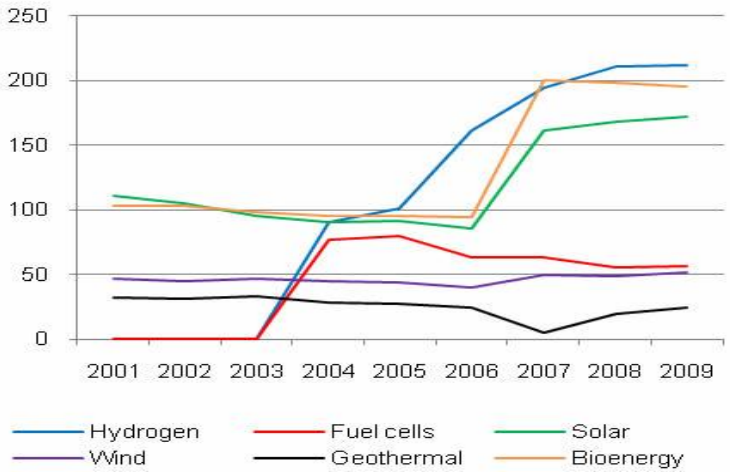
Biomass can also be useful to supplement the use of fossil fuels, such as fertilizer, soil treatment and even food from other organisms.



There are several technology options to use a wide range of types of biomass as a renewable energy source.

To select the most suitable system considerations should be taken regarding the fuel source, storage, delivery, and regulations related to systems of solid fuel heating.

Biomass energy has environmental risks, which can generate unsustainable rates, damage ecosystems and produce air pollution or consume large amounts of water. It is estimated that biomass energy will be twice as expensive as natural gas by 2017, a little more expensive than nuclear energy and more expensive than solar panels.



Source: http://www.artinaid.com/2013/04/biomass-energy/