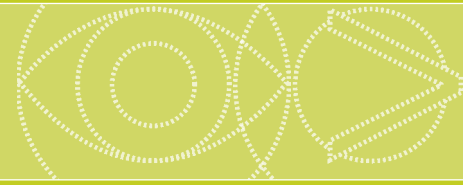


Biomass Energy

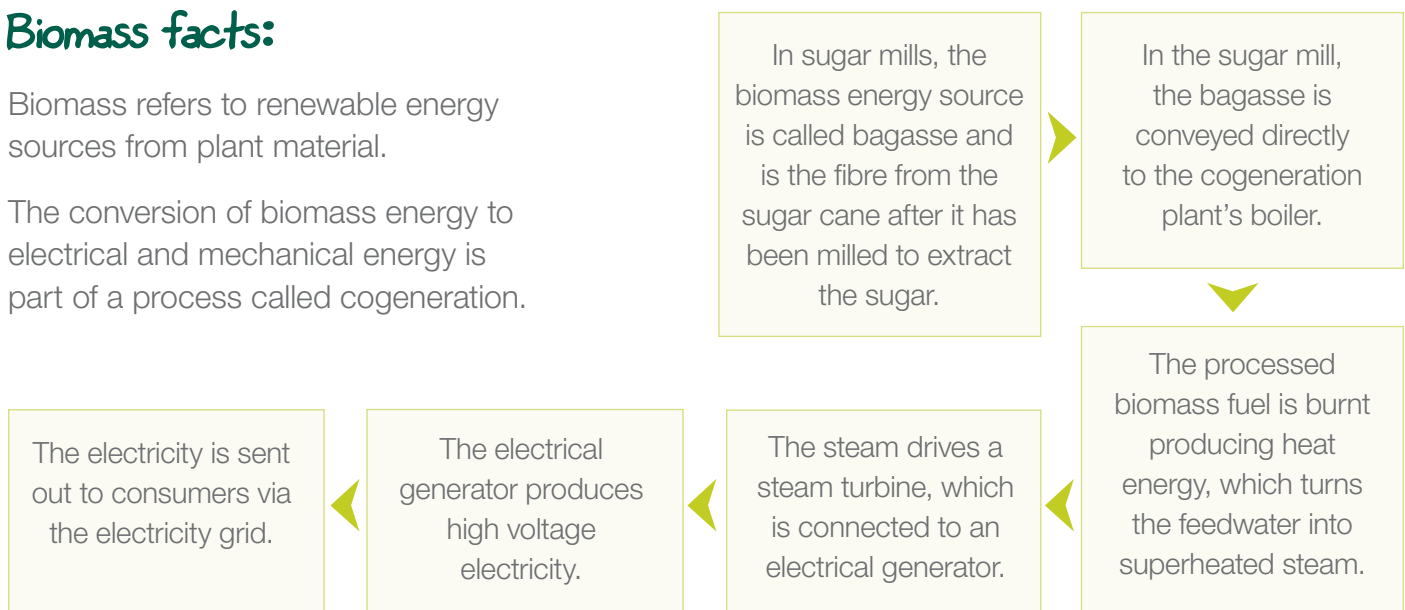


CONVERTING BIOMASS ENERGY INTO ELECTRICAL ENERGY

Biomass facts:

Biomass refers to renewable energy sources from plant material.

The conversion of biomass energy to electrical and mechanical energy is part of a process called cogeneration.



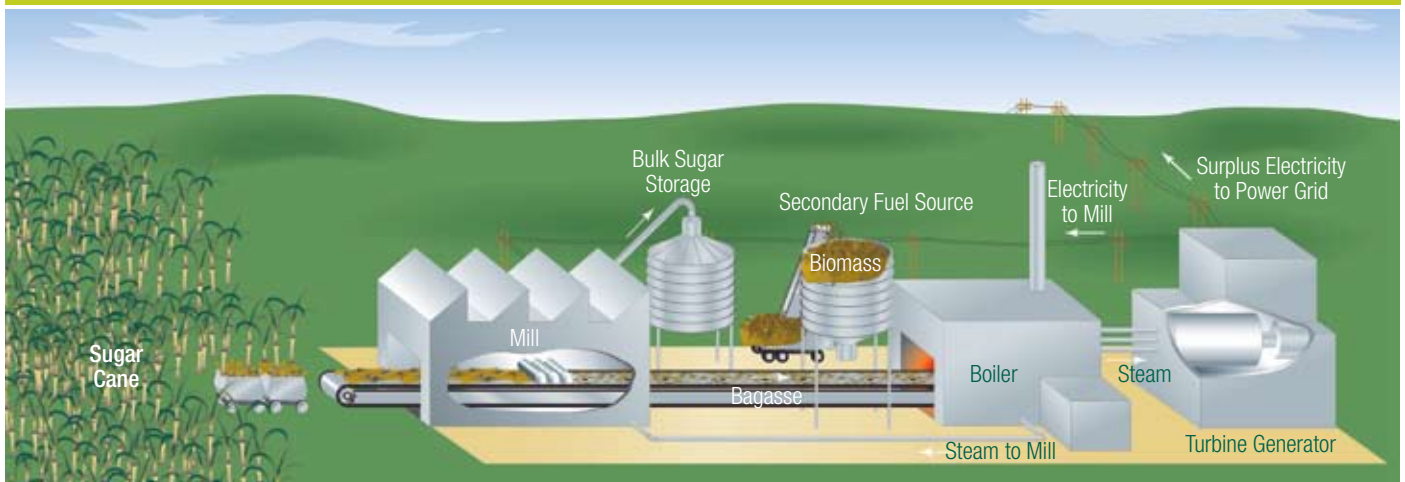
Other agricultural industries use the plant waste of their industry as the biomass energy source, such as rice husks in the rice industry.

Green waste is another source of biomass energy consisting of council garden waste and wood waste left over from pruning trees.

This type of biomass is usually transported to a processing plant, where it passes through a grinding machine and over screens to sift out any dirt and other contaminants.

The different types of biomass can also be blended to create a fuel blend, and then placed in a fuel storage bin where it is then supplied to the boiler.

SUGAR MILL COGENERATION PROCESS



What is cogeneration?

- Cogeneration involves the combustion of fuel sources to produce two forms of energy, usually steam for both heat energy and electricity generation.
- Cogeneration can be used to reduce energy costs for the host industry, such as a sugar mill, because the mill uses some of the steam produced for heat energy and electricity to operate the mill. The surplus steam produced is used to generate electricity for export to the grid.
- There are currently more than 100 cogeneration plants operating in Australia. Most of these are small sized plants that generate less than 10 MW of electricity.
- Biomass cogeneration plants make better use of waste biomass, which would otherwise be dumped or burnt as waste.

Biomass and sugarmills

- As the sugar cane season occurs for only part of the year, green waste can be used in some cases for the rest of the year, to ensure a continuous supply of electricity.
- On average, one tonne of sugar cane yields 250 kg of bagasse.
- The ash, which forms from non-combustible material in the biomass, is removed from the sugar mill to be used as a soil conditioner in landscaping work or added to cane farms to supplement fertiliser.
- The waste water from the cogeneration facility cooling system is passed through treatment systems before being utilised off site, such as for irrigation water for local cane farms.
- Some sugar mills have their own distillery, where alcohol (particularly fuel alcohol or ethanol) is produced from molasses. Ethanol is a renewable energy fuel, which has potential in Australia as a vehicle fuel. This provides another use for molasses, which was considered a waste product used only as stockfeed for cattle.

Biomass energy and other agricultural industries

- Any industry which produces large amounts of waste plant material during its process is suitable for cogeneration.
- Apart from the sugar industry, other suitable industries include the rice industry (rice husk) and macadamia nut industry (nut shells).

THE CYCLE OF CARBON DIOXIDE DURING THE SUGAR MILL COGENERATION PROCESS

