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Biomass Energy and Biomass as A Clean Energy

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ABSTRACT

This paper discusses biomass as a renewable energy source. The world's population continues to grow at a high rate, such that today's population is twice that of 1960, and is projected to increase further to 9 billion by 2050. The paper defines the resources as well as the ways biomass energy is converted into electricity, technologies involved in extracting power from biomass as well as the advantages and the disadvantages of using of biomass as a source of energy. Biomass energy is available at cheaper cost and it does no the environment. In some ways It also controls the pollution of the environment. Biomass energy can be good renewable energy Source for rural areas in India. Production of Biomass energy has huge scope for innovation and Its application in remote & rural areas.

Keywords : BIOMASS Energy, biomass policy and Renewable policy in India.

I. INTRODUCTION

Biomass energy is energy generated or produced by living or once-living organisms. The most common biomass materials used for energy are plants, such as corn and soy, above. The energy from these organisms can be burned to create heat or converted into electricity.

Biomass contains energy first derived from the sun: Plants absorb the sun's energy through photosynthesis, and convert carbon dioxide and water into nutrients (carbohydrates). The potential for application of biomass as an alternate source of energy in India is very wide.

We have plenty of agricultural and forest resources for production of mass.

Biomass is produced in nature through photosynthesis achieved by solar energy conversion. Biomass is organic matter produces by plants. Both terrestrial (those grown on land)

and aquatic (those grown in water) and their derivatives.

Coal, petroleum, oil and natural gas do not come in biomass because. They are produced from dead, buried biomass under pressure and temperature during millions of years. Biomass can be considered a renewable energy source because plant life renews and adds to itself every year.

- **Available agro-wastages in India**

Bagaase
Molases
Jute Stics
Silseed Cakes
Saw dust
Rise huck
Coconut huck and chell
Rise straw
Material;

wood, sawdust, straw, seed waste, manure, paper waste, household waste, wastewater etc.

II. METHODS

1) Direct combustion
2) Gasification
3) Pyrolysis
4) Digestion

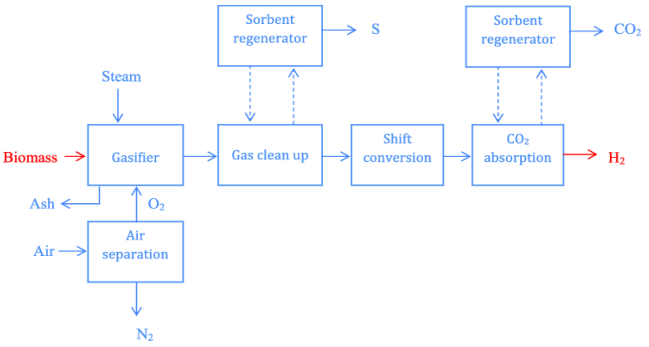
Direct Combustion

This is perhaps the simplest method of extracting energy from biomass. Industrial biomass combustion facilities can burn many types of biomass fuel, include wood, agricultural residues, wood pulping liquor, municipal solid waste (MSW) and refuse-derived fuel.

Biomass is burned to produce steam, the steam turns a turbine and the turbine drives a generator, producing electricity. Because of potential ash build-up(which fouls boilers, reduces efficiency and increases costs), only certain types of biomass materials are used for direct combustion.

Gasification

Gasification is a process that exposes a solid fuel to high temperatures and limited oxygen, to produce a gaseous fuel. The gas produced by the process as is a mix of gases such as carbon monoxide, carbon dioxide, nitrogen, hydrogen, and methane. The gas is then used to drive a high efficiency, combined-cycle gas turbine.

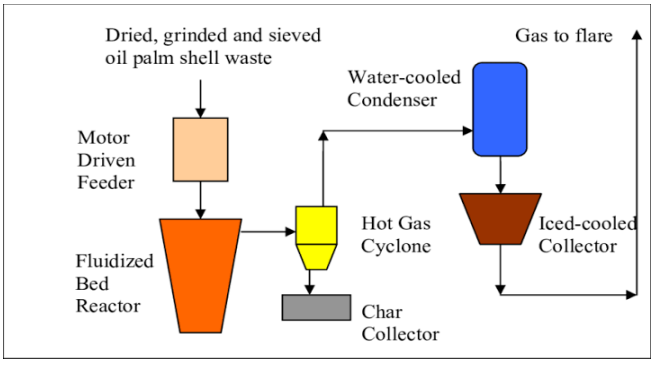


Solar energy converted into photosynthesis then its converted into Biomass and biomass and then energyis generated .

pyrolysis

It is a simple form, Its represents heating the biomass to drive off the volatile matter and leaving behind the charcoal. This process has doubled the energy density of the original material because charcoal, which is half the weight of the original biomass, contains the same amount of energy, making the fuel more transportable. Flash pyrolysis is used to produce bio-crude, a combustible fuel. Heat is used to chemically convert biomass into pyrolysis oil.

Pyrolysis can also convert biomass into phenol oil, a chemical used to make wood adhesives, molded plastics, and foam insulation.



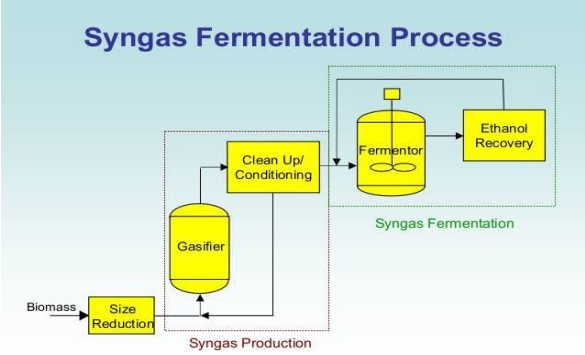
Digestion

Biomass digestion works as anaerobic bacteria . animal dung or human sewage into tanks, called digesters, adding bacteria, we collect the emitted gas to use as an

energy source. This process is a very efficient means of extracting usable energy from such biomass.

Fermentation

The process has vastly increased the efficiency by which waste paper and other forms of wood fiber are fermented with gasoline. Methanol: Biomass-derived methanol is produced through gasification. The biomass is converted into a synthesis gas (syngas) that is processed into methanol. Most of the 1.2 billion gallons of methanol annually produced in the U.S. are made from natural gas and used as solvent, antifreeze, or to synthesize other chemicals into ethanol.



Bio-fuels: Biomass is converted into transportation fuels such as ethanol, methanol, biodiesel and additives for reformulated gasoline. Bio-fuels are used in pure form or blended.

Ethanol: Ethanol, the most widely used Bio-fuel, is made by fermenting biomass in a process similar to brewing beer. Currently, most of the 1.5 billion gallons of ethanol used in the U.S. each year is made from corn and blended with gasoline to improve vehicle performance and reduce air pollution.

Biomass Energy sector India :Problems and Challenges

Biomass power plants in India are based mostly on agricultural wastes. While for providing grid based power 8-15 MW thermal biomass power plants are suitable for Indian conditions, they stand nowhere when compared to power plants being set up in Europe which are at least 20 times larger. Energy from biomass is reliable as it is free of fluctuation unlike wind power and does not need storage to be used in times of non-availability as is the case with solar. Biomass from agriculture is available only after harvesting period which can stretch only for 2-3 months in a year. Biomass from agriculture is available only after harvesting period which can stretch only for 2-3 months in a year.

Installation Capacity and Potential of Biomass

The electricity generation could be cheaper than coal if biomass could be sourced economically but some established biomass power plants tend to misuse the limit of coal use provided to them (generally 10-15% of biomass use) to keep it operational in lean period of biomass supply. The electricity generation could be cheaper than coal if could be sourced economically but some established biomass power plants tend to misuse the limit of coal use provided to them (generally 10-15% of biomass use) to keep it operational in lean period of biomass supply. According to the conservative estimates, only two-third of agricultural residues could be procured for power production.

A robust business model is necessary to motivate local entrepreneurs to take up the responsibility of supplying biomass to processing facilities. Collection centre's covering 2-3 villages can be set up to Facilitate decentralization of biomass supply mechanism.

While transportation in any kind or form from more than 50 Km becomes unviable for a power plant of size 10-15MW.

III. CONCLUSION

BIOMASS it is concluded that Bio Mass is cheap and more efficient energy not in India but also in world. It

provides energy with simpler manner. It removes the burden on the head of farme. starting. Mostly it can be extraction from the wastes. So it is more economically. Biomass systems can be used for village-power applications in the range of 10-250 kW.

It is seen that the emerging technologies of biomass as a renewable source of energy is highly advantageous to promote a greener planet and also cut down on the need for fossil fuels which not only cause pollution in the atmosphere but also are fast depleting.

IV. ACKNOWLEDGEMENT

Alf Malmgren, Lic. Eng. has been working with combustion and quality management of biomass fuels in the UK and Sweden since 1982Recent work has been focussed on co-firing of biomass and conversions to 100% biomass firing in coal fired power station boilers. Dr G Riley: Fuel and combustion expert who has worked in the Power Sector for 25 years. His work has covered a wide range of different fuels and has been carried out at laboratory, pilot scale as well as full scale. For the last 12 years biomass has been an increasing focus. He is currently working on large scale biomass conversion projects in UK. This work is supported by the Beijing Natural Science Foundation, China.

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