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Opinion Article

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Methods to produce energy from biomass

Cong Jian*

Department of Energy Resources, Hunan University of Technology and Business, Hunan, China.

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DESCRIPTION

Biomass is a renewable energy source. Plant-based biomass is used as a fuel to generate heat or electricity. Examples include wood and it's by products, energy crops, agricultural trash, and household, farm, and industrial garbage. Plant material grown primarily for heat or electricity is known as biomass. In this respect, living biomass is also relevant because living plants may also produce electricity. However, direct incineration remains the most traditional method of using biomass. For instance, yard waste, wood chips, and forest wastes like dead trees, branches, and tree stumps are frequently utilised for this. However, biomass also includes plant or animal material that is utilised to make chemicals or textiles. Additionally, biodegradable trash that can be burned as fuel may be included in biomass.

TYPES OF BIOMASS

Organic resources produced in a renewable manner are used to make biomass fuels. The great bulk of biomass fuels are classified into two groups: woody fuels and animal wastes. As a source of biomass fuel, Municipal Solid Waste (MSW) is another option. The energy density of biomass fuels is lower than that of fossil fuels. To put it another way, a lot more biomass fuel is needed to produce the same amount of energy as a little bit of fossil fuel. Waste that degrades naturally and can be used as fuel.

Woody fuels

All kinds of wood debris can be used in a wide range of biomass technologies and generate great biomass fuels. The most popular biomass-to-energy method is the combustion of woody fuels to produce steam or electricity. Woody fuels of various sorts may typically be blended together to form a single fuel, albeit the total conversion rate or efficiency of a biomass project might be impacted by variations in moisture content and chemical composition. The various subcategories of woody fuels number at least six. The key factors that distinguish these subgroups are cost and availability. Woody debris and slash left over from logging and other forest management activities are known as forestry residues.

Agricultural residues

Agricultural waste products can supply a sizable volume of biomass fuel. Harvests are followed by large residue quantities, but residues are scarce the rest of the year. Facilities that rely heavily on agricultural waste must be able to either alter production to match seasonal variance or have the space to store a sizable volume of fuel.

Animal wastes

Manures, renderings, and other waste products from cattle finishing operations are examples of animal wastes. Although animal wastes include energy, the main goal of processing animal wastes for biomass is to reduce a disposal problem rather than to produce energy. Particularly in the case of animal manures. Typically, farmlands receive animal manures through land application.

BIOMASS CONVERSION METHODS

There are four different conversion methods that could produce certain energy and future renewable products:

Thermochemical conversion

This technique creates producer gas and charcoal

through a controlled partial combustion at high temperatures, followed by chemical reduction. Agriculture waste used in gas turbines is one of the main applications for biomass. Production of diesel, jet fuel, and chemicals are examples of advanced usage.

Biochemical conversion

Anaerobic digestion and fermentation are two processes that entail using enzymes, bacteria, or other microbes to break down biomass into liquids and gaseous feed stocks. These raw materials can be transformed into fuels for transportation, renewable chemicals, and energy.

Chemical conversion

It involves using chemical agents to transform biomass into liquid fuels, most commonly biodiesel.