

## Biomass Energy and its Contribution to Achieving Net Zero Emissions

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### DESCRIPTION

The drive to reach net zero emissions has emerged as an essential worldwide objective as the world struggles with the pressing need to cut greenhouse gas emissions and fight climate change. Biomass energy is becoming more widely acknowledged as a useful instrument in this shift, even if renewable energy sources like wind, solar, and hydropower have drawn a lot of attention. Utilizing organic resources like plant and animal waste to generate heat, electricity, or biofuels is known as biomass energy, and it has the potential to be a key component in helping nations meet their net zero goals.

Reducing the carbon impact of conventional fossil fuels is one of the primary benefits of biomass energy. Since the carbon dioxide (CO<sub>2</sub>) absorbed by plants during their growth balances the CO<sub>2</sub> emitted during the combustion of organic components, biomass is regarded as a carbon neutral renewable energy source. Biomass energy contributes to the natural carbon cycle, in contrast to coal, oil, and natural gas, which release carbon that has been stored for millions of years. As a result, it is a greener and more sustainable substitute for fossil fuels. Additionally, by turning organic materials that would otherwise break down in landfills and produce methane, a powerful greenhouse gas, into useable energy, biomass can help lower waste-related emissions. Biomass energy has the potential to help achieve net zero emissions by taking the place of fossil fuels in hard-to-decarbonize industries. Even though the industry that generates power is moving more and more toward renewable resources like solar and wind, some sectors, such heavy manufacturing, transportation, and heating, still rely significantly on fossil fuels. In addition to replacing petroleum-based fuels in transportation, biomass energy can offer an alternative to coal and natural gas in power plants. To lower the carbon intensity of fuels used in cars, trucks, and even airplanes, biofuels like ethanol and biodiesel can be mixed with gasoline and diesel. By doing this, reliance on fossil fuels is lessened while the functionality and dependability of the current infrastructure are preserved.

Biomass energy is a potent instrument for attaining negative emissions since it may be combined with Carbon Capture And Storage (CCS) technologies in addition to replacing fossil fuels. The technology known as "Bioenergy with Carbon Capture and Storage" (BECCS), which combines biomass energy with CCS, captures and stores CO<sub>2</sub> underground instead of releasing it into the atmosphere. By removing CO<sub>2</sub> from the atmosphere, BECCS could partially undo the harm done by previous emissions. Particularly in industries that are difficult to reduce, this technology has drawn attention as a vital tactic for reaching net zero emissions.

Additionally, biomass energy has social and economic advantages, especially in rural and agricultural regions. Wood chips, agricultural waste, and energy crops are examples of biomass feedstocks that can boost local economies and generate jobs. Farmers and landowners can sell their agricultural waste or cultivate particular crops for energy production, making biomass energy a dependable source of revenue in many areas. This can lessen reliance on traditional agriculture and diversify sources of revenue.

### CONCLUSION

Large-scale biomass production may have unforeseen effects on biodiversity and food security if it results in the conversion of forests or agricultural land that may be utilized for food. Furthermore, even though biomass is thought to be carbon neutral, emissions may still be produced during the collection, transportation, and processing of biomass, especially if inefficient technologies are employed. Therefore, it is important to make sure that biomass is produced and used sustainably, taking resource management and land-use strategies into serious account. Biomass energy can also lessen environmental pollution and the strain on landfills by using waste products. Nevertheless, there are certain obstacles to the broad use of biomass energy. The competition for land between growing biomass feedstock and producing food is one of the main problems.

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