

# Hydrogen Generation Potential from Biogenic Residues of Bangladesh

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The rapid depletion of fossil fuels and the impending consequences of global warming led the movement to transitioning towards cleaner pathways for energy production. One of the most promising candidates for a clean and universal energy carrier is hydrogen. At present, 95% of hydrogen is produced from fossil fuel while only 5% is generated from renewable resources. Developed countries have been rapidly facilitating third-generation technologies for sustainable hydrogen production. However, developing countries are yet to be included in the global H<sub>2</sub> economy transition. Bangladesh, a low-income country, is not only rapidly running out of its fossil fuel reserves, but also at the forefront of facing adverse effect of global climate change. Studies estimate that Bangladesh will likely run out of indigenous fossil reserves by 2050 and face an energy resource vacuum, risking its economy. However, being a densely populated and agriculture-focused country, Bangladesh has immense biomass waste in the form of biogenic residues, such as agricultural waste, dairy farm, etc.. According a 2020 report by World Bank, the per capita GHG emission in Bangladesh increased by more than 45% from 2010 to 2020, attributed to fossil fuel usage and disposal of biogenic waste. More than 60 million tons of biogenic waste are generated in the country, which includes livestock waste, field and crop-based residues. which possess an enormous potential to be utilized for sustainable H<sub>2</sub> production. A preliminary estimation indicates that approximately 2 million tons H<sub>2</sub> can be produced annually by utilizing current biogenic waste. This submission focuses on the H<sub>2</sub> generation potential of biogenic residues generated by Bangladesh; namely the potential of switching to H<sub>2</sub> economy utilizing biogenic waste in the context of the country's present infrastructure.