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Seaweed as a Future Fuel Option: Potential and Conversion Technologies

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Abstract : The purpose of this work is to provide a comprehensive overview of seaweed as the alternative feedstock for biofuel production and key conversion technologies. Resource depletion and climate change are the driving forces to hunt for renewable sources of energy. Macroalgae can be preferred over land based crops for biofuel production because they are not in competition with food crops for arable land, high growth rates and low lignin contents which require less energy-intensive pre-treatments. However, some disadvantages, such as high moisture content, seasonal variation in chemical composition and process inhibition limit its economic feasibility. Seaweed can be converted into gaseous and liquid fuel by different conversion technologies, but biogas via anaerobic digestion from seaweed is attracting increased attention due to its dual benefit of an economic source of bio-fuel and environment-friendly technology. Biodiesel and bioethanol conversion technologies from seaweed are still under development. A selection of high yielding seaweed species, optimal harvesting season and process optimization make them economically feasible for the alternative source of renewable and sustainable feedstock for biofuel in future.

Keywords : anaerobic digestion, biofuel, bio-methane, conversion technologies, seaweed
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