

Marine Biomass as a Biofuels Feedstock: a perspective from the U.S.

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Supported by their favorable growth characteristics and biochemical composition, macroalgae are currently gaining increasing attention as a feedstock for production of biofuels. Macroalgae cultivation currently supplies a global industry for production of food and chemicals. Past work has shown that kelp can be readily converted to methane gas. Recent work has shown that kelp can also be converted to alcohols and bio-oils. Future progress in conversion technologies will undoubtedly result in optimization and paths to scale-up of the various conversion processes. Problematic, however, is the production of biomass at the scale needed to contribute to the liquid fuels economy. Our initial estimate indicates that the amount of marine biomass needed to meet a nominal 1% U.S. gasoline replacement target would exceed the global production of cultured seaweeds reported by FAO by over ten-fold. This level of production is, in principal, possible in the extensive Exclusive Economic Zone and Territorial Waters of the U.S., but would require additional research and development in large-scale, open-ocean macroalgae cultivation technology and infrastructure.