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Novel method for algal biomass dewatering and harvesting

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Algal biofuel has significant potential for reducing the US's dependence on fossil fuels while curbing greenhouse gas emissions. Despite these benefits, a scalable, sustainable, and commercially viable system has not yet been developed. The key barriers relate to the cost and energy intensity of algal feedstock production, mainly during biomass harvesting and dewatering. It has been estimated that harvesting and dewatering account for 30 to 50% of the cost of algal biomass production. Harvesting and dewatering equipment has also been estimated to comprise 90% of upfront cost for algal biomass production. Moreover, the most energy and carbon intensive processes in the existing algae-to-biofuel pathways are harvesting and dewatering, accounting up to 90% of the total energy requirements. To address these challenges, a thermal energy capture system is proposed for algal biomass harvesting and dewatering. The proposed technology is a fundamentally new approach and potentially transformative. It will utilize low-grade thermal energy in a flue gas stream, which is affordable and readily available at stationary sources such as power plants, for heating algal biomass in heat exchangers and subsequently dewatering in an evaporation tank. This paper will present the major findings from the research.

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