



## **Biofuels from Algae: Chapter 13. Life-Cycle Assessment of Microalgal-Based Biofuels**

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Fossil-fuel depletion and attempts at global-warming mitigation have motivated the development of biofuels. Several feedstock and transformation pathways into biofuel have been proposed as an alternative to the usual fuels. Recently, microalgae have attracted a good deal of attention because of the promise of reduced competition with food crops and lowered environmental impacts. Over the last years, several life-cycle assessments (LCAs) have been realized to evaluate the energy benefit and potential global-warming reduction of biofuel and bioenergy produced from microalgae. This chapter presents a bibliographic review of 15 LCAs of microalgae production and/or transformation into biofuel. These studies often differ by the perimeter of the study, the functional unit, and the production technologies or characteristics. Methods for environmental impact assessment and the energy balance computation also diverge. This review aims to identify the main options and variations among LCAs and concludes with some recommendations and guidelines to improve the contribution of an LCA and to facilitate comparisons among studies.

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