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Liaw Y. Batan, Gregory D. Graff, Thomas H. Bradley

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**-Techno-economic and Monte Carlo Probabilistic Analysis of Microalgae
Biofuel Production System**

Liaw Y. Batan^{1,a,*}, **Gregory D. Graff**^{2,a} and **Thomas H. Bradley**^{1,a}

¹ Department of Mechanical Engineering ² Department of Agricultural and Resource
Economics ^a Colorado State University, Fort Collins CO

*Corresponding author. Phone (970) 232-8006. Email: liaw.batan@hotmail.com

Abstract

This study focuses on the characterization of the technical and economic feasibility of an enclosed photobioreactor microalgae system with annual production of 37.85 million liters (10 million gallons) of biofuel. The analysis characterizes and breaks down the capital investment and operating costs and the production cost of unit of algal diesel. The economic modelling shows total cost of production of algal raw oil and diesel of \$3.46 and \$3.69 per liter, respectively. Additionally, the effects of co-products' credit and their impact in the economic performance of algal-to-biofuel system are discussed. The Monte Carlo methodology is used to address price and cost projections and to simulate scenarios with probabilities of financial performance and profits of the analyzed model. Different markets for allocation of co-products have shown significant shifts for economic viability of algal biofuel system.

Keywords: microalgae, biofuel, closed photobioreactor, economics, feasibility, modelling, production cost, Monte Carlo simulation

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