California Energy Commission
Public Interest Energy Research (PIER) Program
Transportation Energy Research

Life-Cycle Greenhouse Gas and Energy Analyses of Algae Biofuels Production

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Transportation Energy Research
http://www.energy.ca.gov/research/transportation

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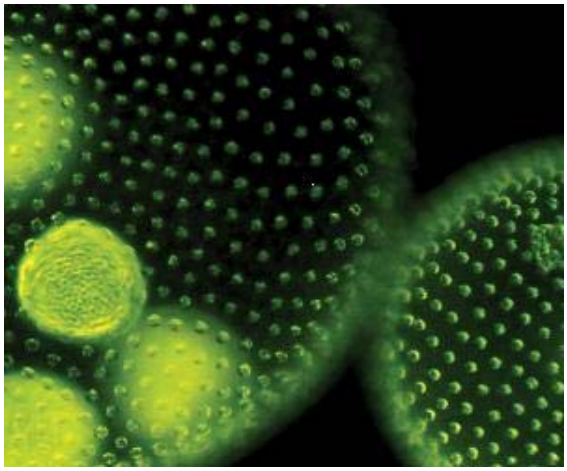
Fact Sheet

The Issue

Algae biofuels directly address the Energy Commission's Public Interest Energy Research Transportation Research Area objective of increasing alternative fuel use in California through sources that both reduce oil dependency and reduce climate change. While algae fuels will minimize land use impacts, a high-profile study recently argued that current methods of algae production could make algae fuels more carbon-intensive than conventional biofuels. Critics of this study argue that alternative algae processes and energy recovery from waste streams could more than compensate for these inputs. In particular, the efficient use of residual algae biomass and efficient harvesting techniques must be incorporated effectively into the overall process to improve sustainability. The uncertainty looming over the sustainability of algae biofuels suggests that the life-cycle performance of these fuels is a critical knowledge gap.

Project Description

This project will evaluate existing algae life-cycle studies and compare new analyses of multiple production scenarios and process assumptions to improve the understanding of the energy and environmental implications of algae biofuels. A transparent and objective comparison of existing studies with new analysis will be developed to assess the life-cycle greenhouse gas emissions, net energy consumption, and net liquid fuels production. Statistical analysis on the variation of these assumptions will also be performed to characterize the most uncertain parameters.



Algae
Photo credit: prweb.com

PIER Program Objectives and Anticipated Benefits for California

The objective of this project is to provide a better understanding of the energy and environmental implications of algae biofuels. The research will evaluate existing life-cycle assessment studies and compare them with a range of new analyses on algae production

scenarios and process assumptions that have not been considered previously.

California is a world leader in renewable fuels research and development, particularly algae fuels. This project will support a budding California industry's development.

Project Specifics

Contract Number: MRA-02-089
Contractor: University of California, Merced
City/County: Merced/Merced County
Application: Nationwide
Amount: $142,747
Term: March 2011 to December 2011

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