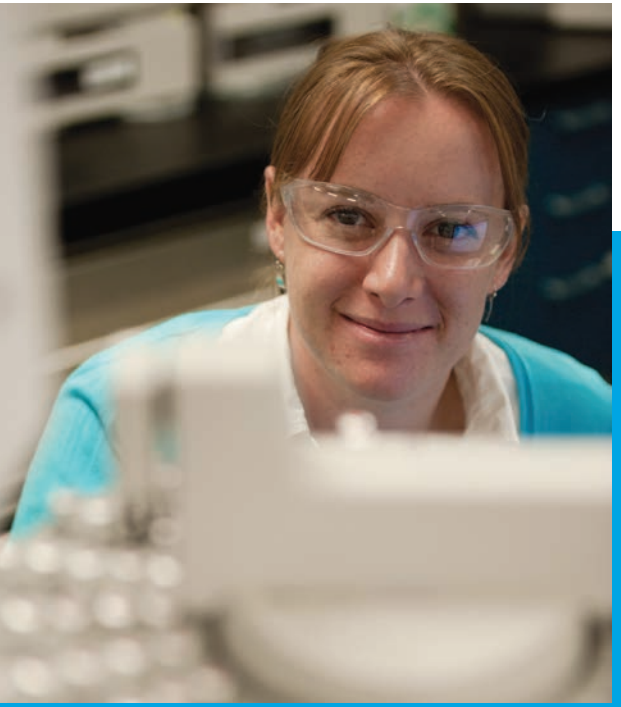
Work with Us!

Find out how you can work with NREL in the following research areas:

- *Bio-prospecting*
- *Strain improvement*
- *Conversion to fuels*
- *Fuel testing*
- *Techno-economic analysis*
- *Life cycle assessment*
- *Siting analysis*
- *Compositional analysis.*

Let's develop promising technologies together!

Photo by Dennis Schroeder, NREL/PIX 19710



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NREL's Algae Research Program:
www.nrel.gov/biomass/microalgal_biofuels.html

DOE Biomass Program Links:

NREL's algal biofuels research is supported in part by the U.S. Department of Energy (DOE) Biomass Program.

DOE Biomass Program Algal Biofuels R&D:
www1.eere.energy.gov/biomass/algae.html

National Algal Biofuel Technologies Roadmap:
www.eere.energy.gov/biomass/pdfs/algal_biofuels_roadmap.pdf

Algal Biofuels R&D at NREL:
www.nrel.gov/docs/fy12osti/56309.pdf

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NREL is a national laboratory of the U.S. Department of Energy
Office of Energy Efficiency and Renewable Energy
Operated by the Alliance for Sustainable Energy, LLC

NREL/BR-5100-56305 • September 2012

Printed with a renewable-source ink on paper containing at least 50% wastepaper, including 10% post consumer waste.

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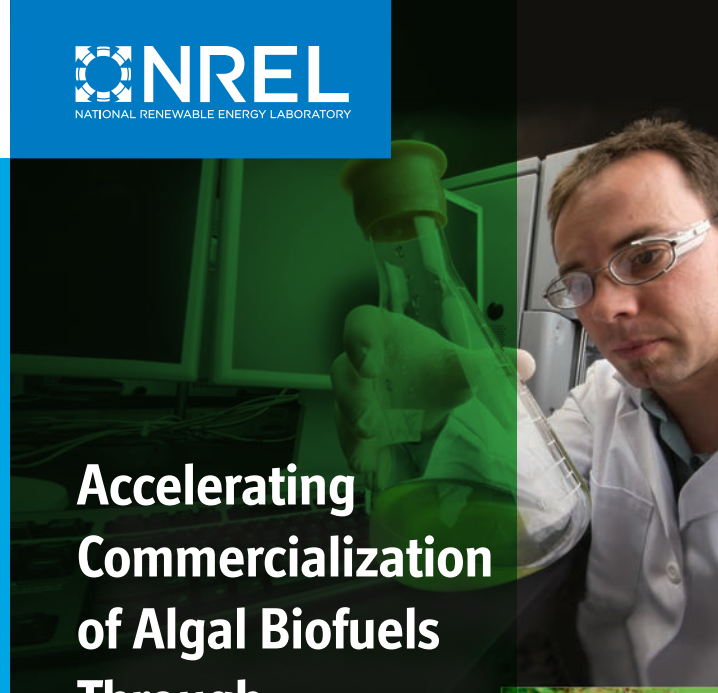
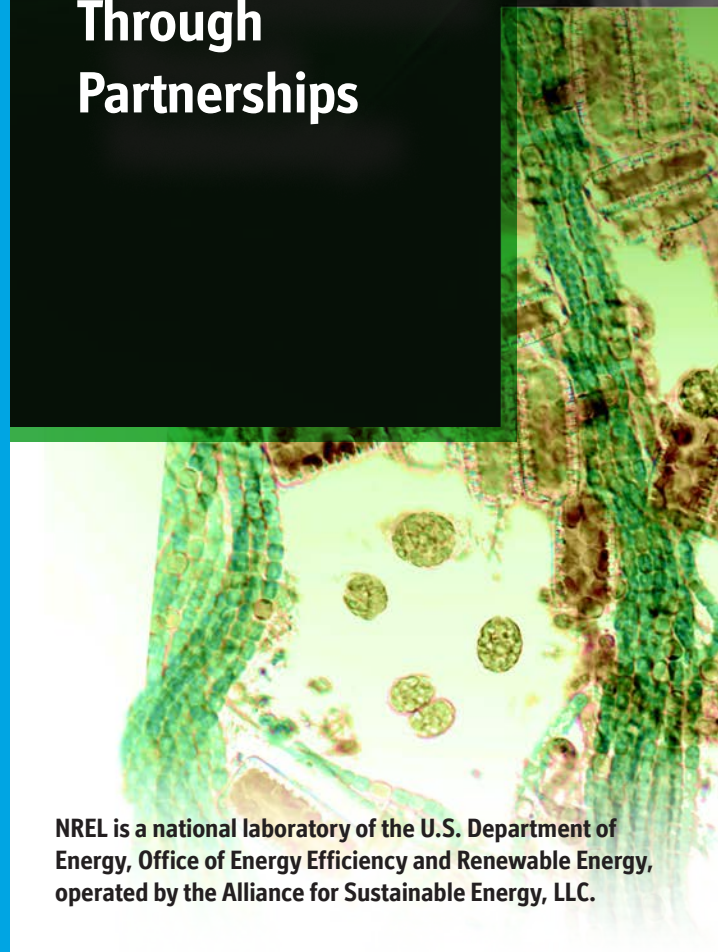


Accelerating Commercialization of Algal Biofuels Through Partnerships



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Overcoming algal biofuels challenges with fundamental and applied R&D.

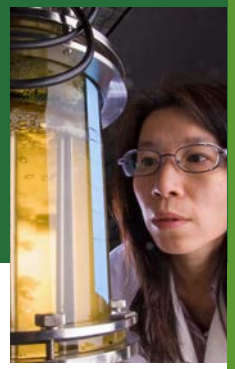


Photo by Pat Corkery, NREL/PIX 16312

NREL is accelerating algal biofuels commercialization through:

- *Advances in applied biology*
- *Algal strain development*
- *Development of fuel conversion pathways*
- *Techno-economic analysis*
- *Robust and high-throughput compositional analysis methodologies.*

NREL scientists and engineers are addressing challenges across the algal biofuels value chain, including algal biology, cultivation, harvesting and extraction, and fuel conversion.

Through partnerships, NREL can share knowledge and capabilities in the following areas.

Photo by Dennis Schroeder, NREL/PIX 18228

Algal Biology

A fundamental understanding of algal biology is key to developing cost-effective algal biofuels processes.

NREL scientists are experts in the isolation and characterization of microalgal species. They are identifying genes and pathways involved in biofuel production. In addition, they have developed a high-throughput, non-destructive technique for assessing lipid production in microalgae.

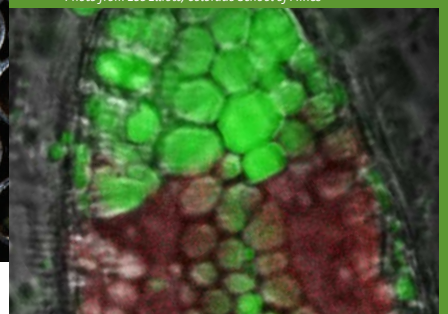
Cultivation

NREL researchers study algal growth capabilities and perform compositional analysis of algal biomass. Laboratory-scale photobioreactors and 1-m^2 open raceway ponds in an on-site greenhouse allow for year-round cultivation of algae under a variety of conditions. A bioenergy-focused algal strain collection is being established at NREL, and our laboratory houses a cryopreservation system for long-term maintenance of algal cultures and preservation of intellectual property.

Characterization

Sound analytical data underpin projects from strain improvement to process development. NREL has invested in the establishment of both robust and high-throughput analytical tools for algae characterization.

Photo from Lee Elliott, Colorado School of Mines



Harvesting and Extraction

NREL is investigating cost-effective harvesting and extraction methods suitable for a variety of species and conditions. Areas of expertise include cell wall analysis and deconstruction and identification and utilization of co-products.

Fuel Conversion

NREL's excellent capabilities and facilities for biochemical and thermochemical conversion of biomass to biofuels are being applied to algal biofuels processes. Analysts are also testing algal fuel properties to measure energy content and ensure compatibility with existing fueling infrastructure.

Techno-Economic Analysis

NREL scientists and engineers are conducting rigorous techno-economic analyses of algal biofuels processes. In addition, they are performing a full life cycle assessment of the entire algae-to-biofuels process.

Photo by Jack Dempsey, NREL/PIX 14581

Photo from Nature Beta Technologies Ltd, Eilat, Israel, subsidiary of Nikken Sohonsha Co. Gifu. Japan, NREL/PIX 22155.