Algae can be a Complete Solution to Replace Petroleum Fuels and Plastics

Michael Burkart, PhD

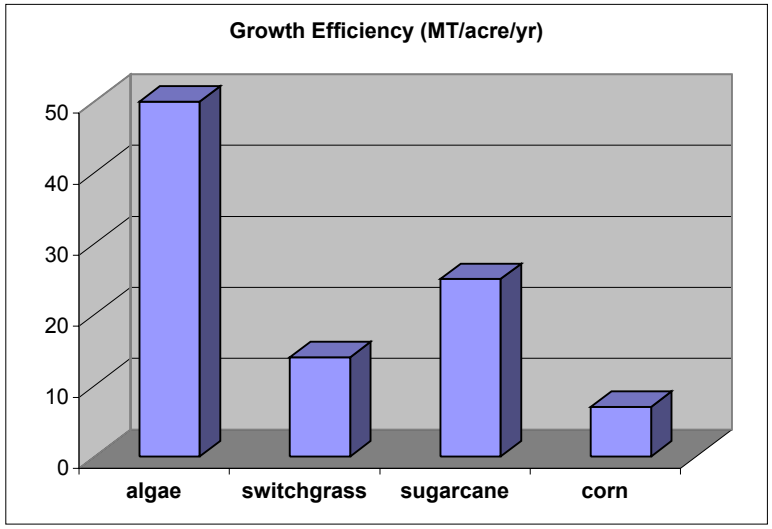
Department of Chemistry and Biochemistry
University of California San Diego
California Center for Algae Biotechnology
Center for Renewable Materials

Algenesis Materials, Inc.
Photosynthex, Inc.

ALGENESIS

SX
Biodegradable
Renewable

Algae are the Most Sustainable Crop



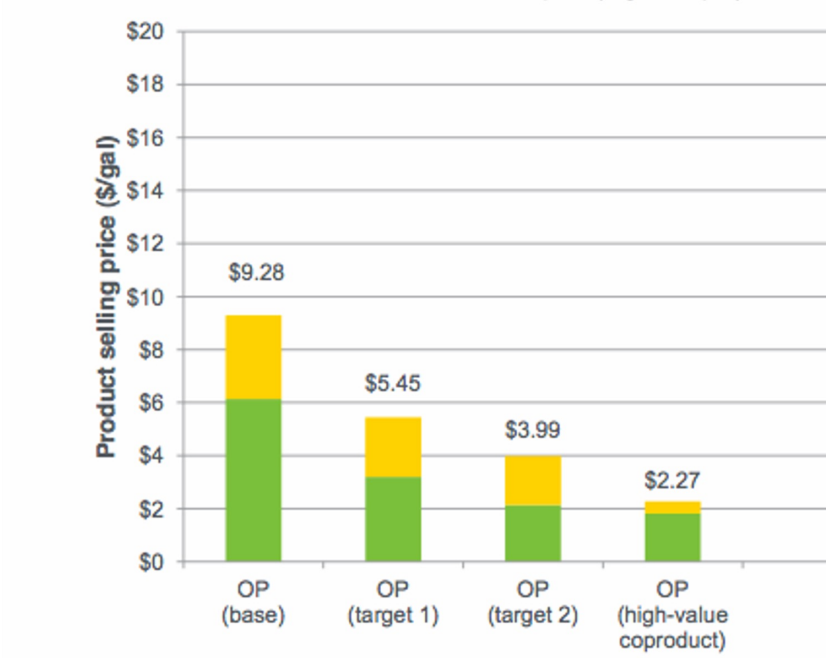
Productivity →

Crop	Oil content (%)	Oil gal/acre	Protein lbs/acre
Canola	40-45	113	-
Mustard	25-27	70	-
Safflower	42-48	146	-
Soy	20-22	55	356
Jatropha	32-35	202	-
Palm	48-52	635	-
Beef	-	-	20
Algae	20-60	5,000	10,000

The most productive photosynthetic organisms on the planet!

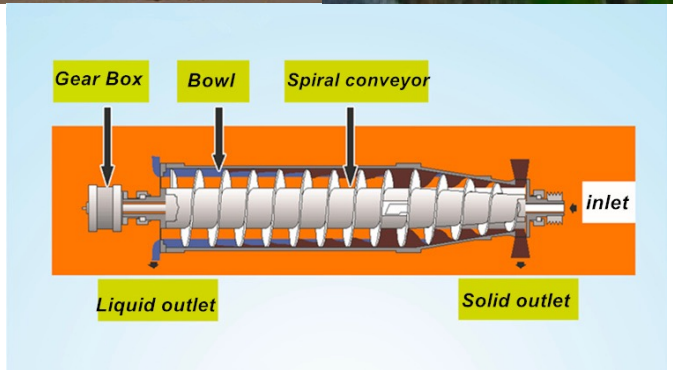
Mayfield S, Burkart M. Biochemist. **2021**, *43*, 34-8.

Projecting Algae Fuel Costs



Growth rate	25 g/m²/d	25 g/m²/d	30 g/m²/d	30 g/m²/d
Lipid content	25%	40%	50%	50%
Harvesting cost	Base	Cut by 50%	Cut by 50%	Cut by 50%
Extraction cost	Base	Base	Cut by 50%	Cut by 50%
Spent biomass utilization	AD	AD	AD	Sell @ $500/ton

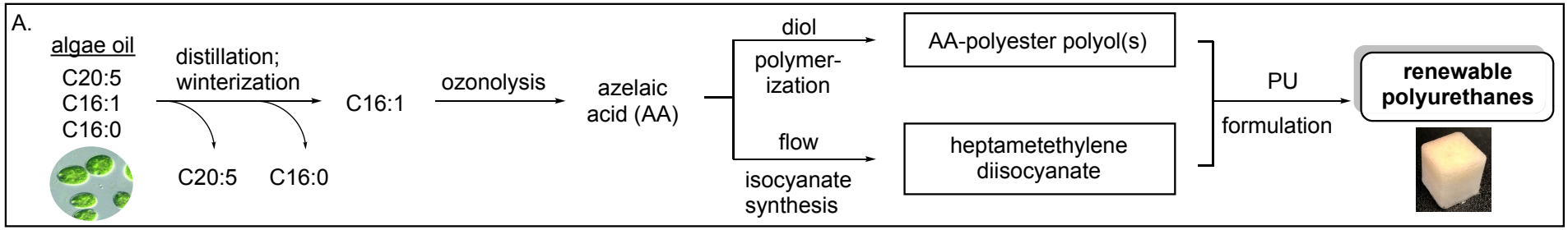
Source: Department of Energy's Office of the Biomass Program

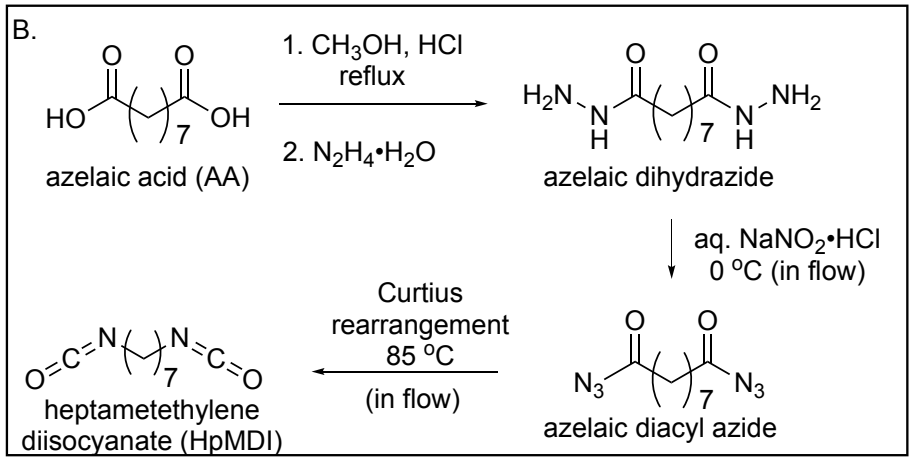


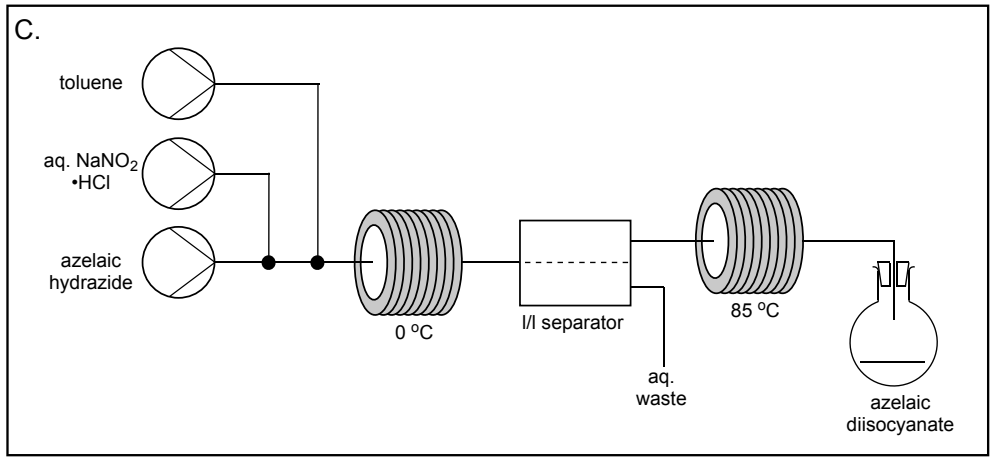
We have the technologies and processes to make renewable fuels from algae TODAY!

Sapphire Energy LCA:
Liu X, et al. Biores. Tech. **2013** *148*, 163-71.

Petrochemical Replacements: Plastics







2015 – Algae
Surfboard w/ Arctic Foam

2019 – Algae
Flip Flops w/ REEF

soleic

Blueview Pacific
https://blueviewfootwear.com/