



U.S. DEPARTMENT
of **ENERGY**

Office of Critical Minerals
and Energy Innovation

Cultivating Algal Innovation: DOE's Role in Advancing Algae R&D

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Algae Congressional Language and Interagency Initiatives

FY26 Appropriations

HOUSE:

Recommends **not less than \$30 million** for algae-related activities. (p. 95)¹

SENATE:

Recommends **not less than \$20 million** for algae-related activities (p. 75)²

CONFERENCE:

The agreement provides **\$25 million** for algae-related activities. (p. 94)³

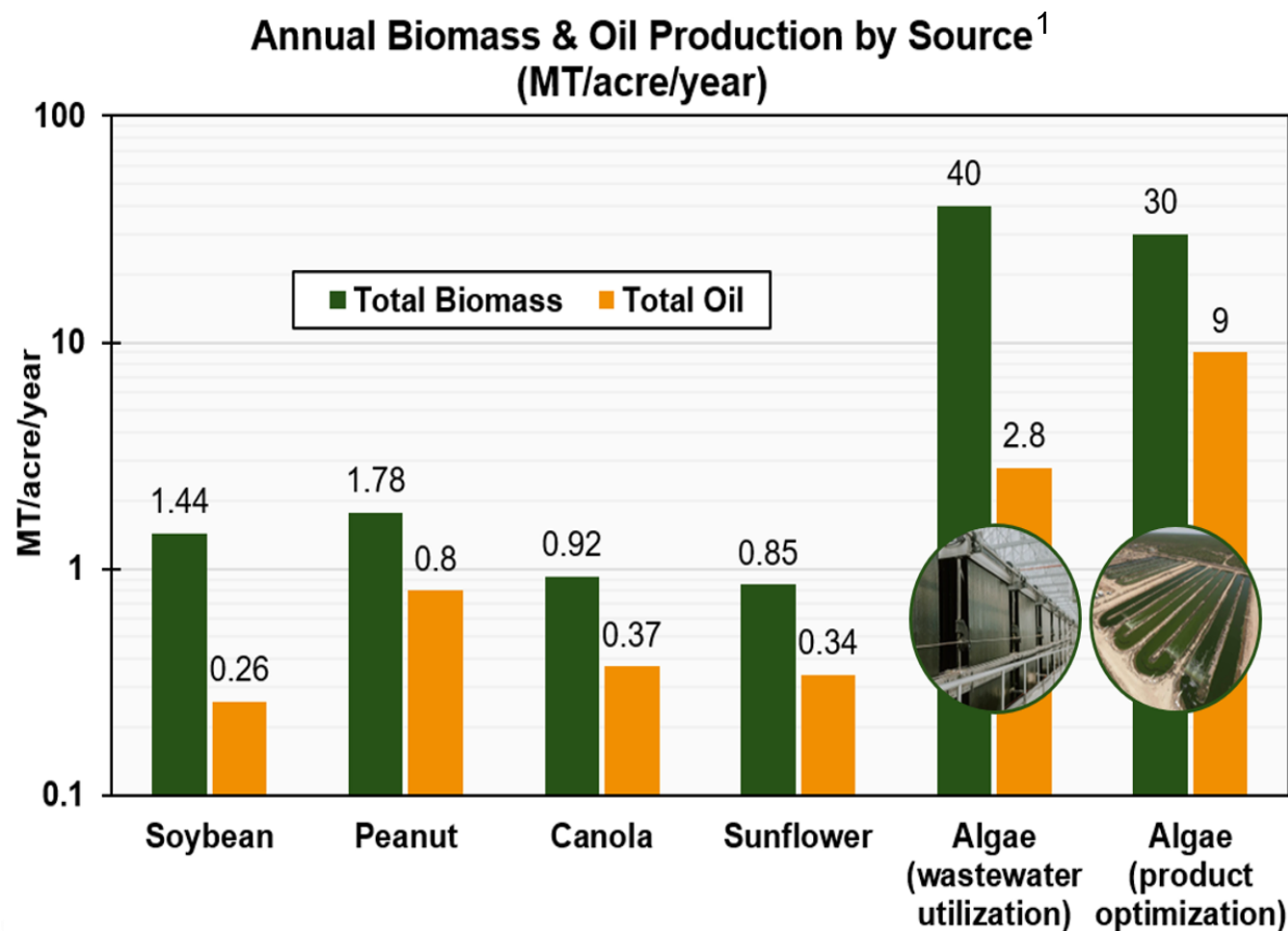
Interagency Activities: Why algae for chemicals and products?

Algae are the fastest-growing photosynthetic organisms and algal biomass can produce chemicals, fertilizers, nutraceuticals, pigments, food, animal feed, bioplastics, and biofuels.⁴



Algal R&D Background

- Algae can be:
 - utilized as a service** for treating waste or
 - grown like an agricultural crop.**
- Compared with other domestic oil crops, algae accumulates **>30x more biomass and >10x more oil** per acre.¹
- Global algae products market was valued at **>\$44 billion in 2025**, with a **CAGR of >7%**.²
- Lowering algae production cost remains a challenge. Models show that algae feedstock costs are >2x higher today than competing commodities.^{1,3}

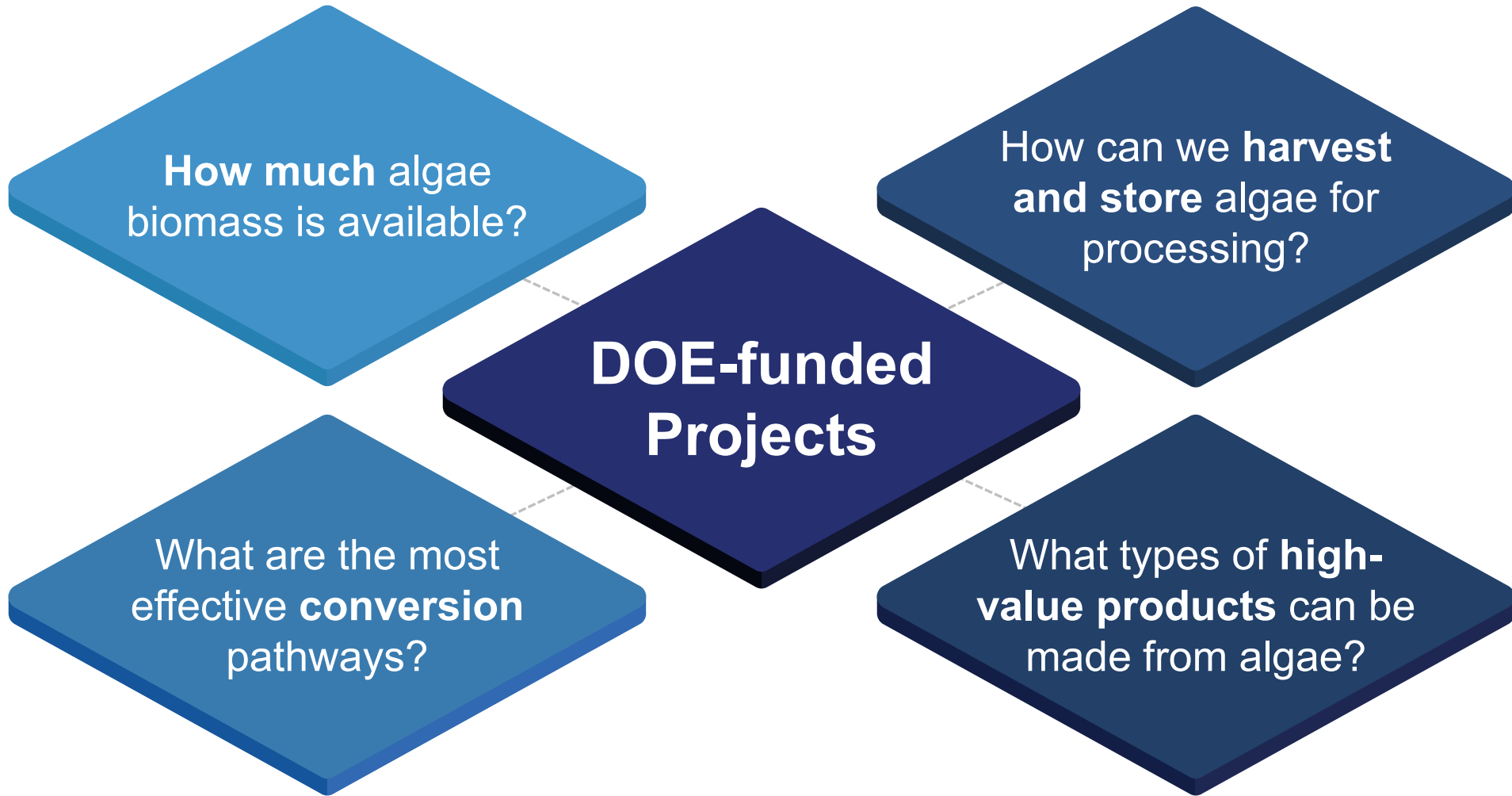


Microalgae Cultivation and Services

- Purpose-grown algae crops
 - High-quality biomass, high oil content
 - Multiple product streams
 - Utilizes non-arable land and non-potable water
- Used to treat wastewater and effluents
 - Low-quality biomass, low oil content
 - Nutrient recovery and recycle
 - Water remediation credits
 - Critical mineral recovery



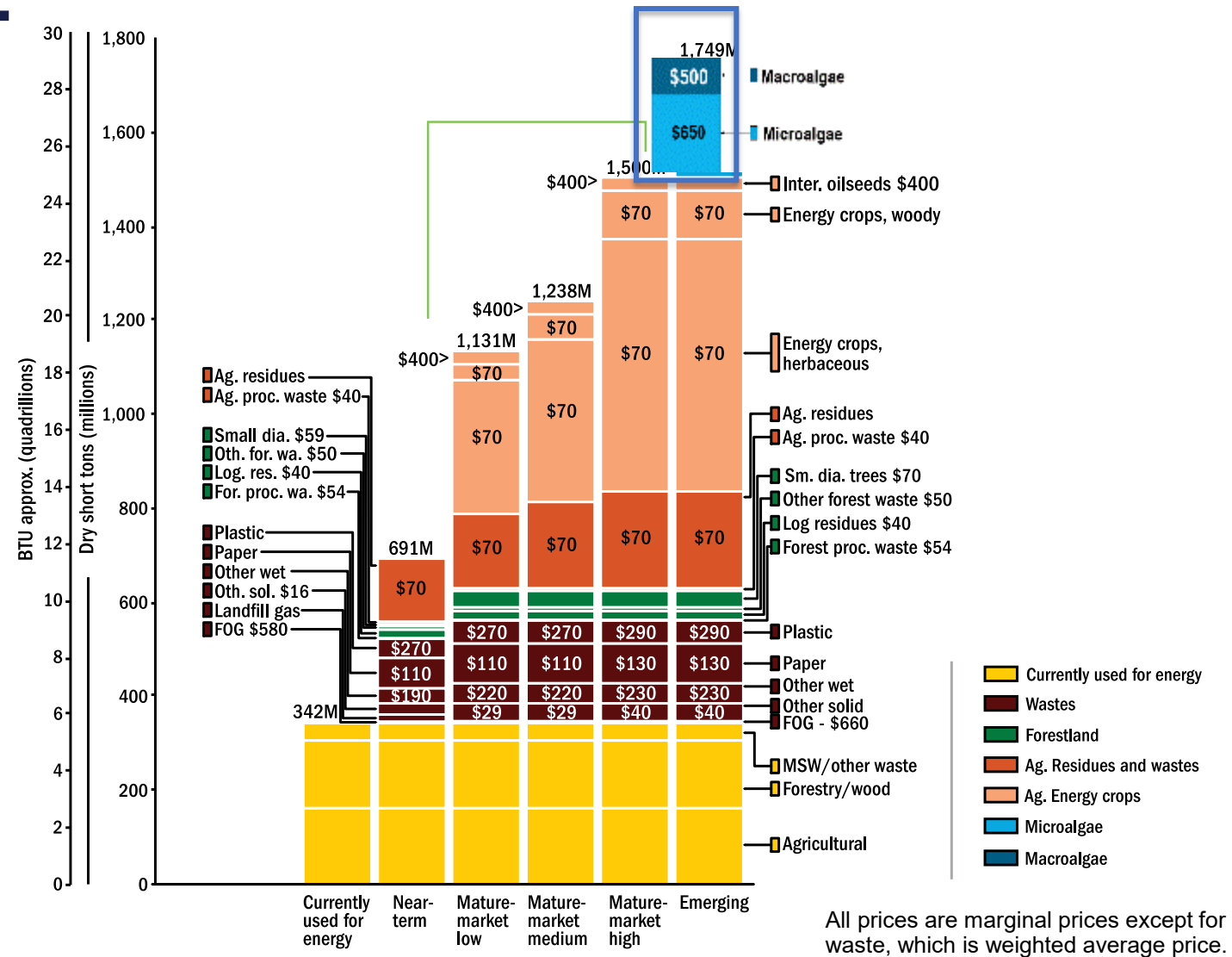
Addressing Research Gaps and Market Development



2023 Billion-ton Report¹: Algae Resource Assessment

- Purpose-grown energy crops represent potential for 425 million tons.*
- Emerging cultivated algae resources can supply another 250 million tons.
- Potential of algae could be much greater if costs are reduced.
- *Sargassum* (seaweed waste product) provides an additional feedstock.

* Mature-market medium scenario



Sargassum Harvesting – Turning a Problem into Potential

- Millions of tons of *Sargassum* (a type of brown macroalgae) inundate beaches in the Caribbean, west Africa, and southeast U.S. every year.
- *Sargassum* clean-up is costly and erodes beaches by removing sediment.
- DOE projects are converting this nuisance seaweed into biochemicals, fertilizers, biofuels, and high-value products including graphite.



DOE Algae R&D Supports National Priorities

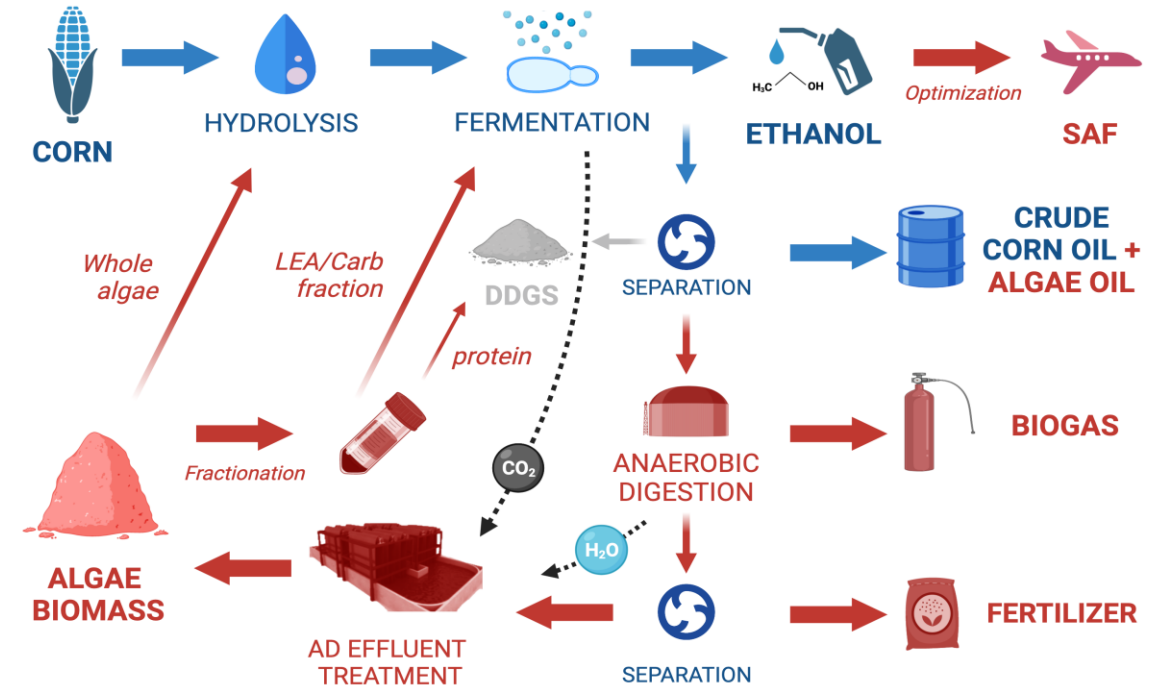
Initiative	Strategic Priority	Algae's Role
Ending Reliance on Foreign Fertilizers	Develop reliable and cost-effective U.S. fertilizer supply chain	Nutrient capture and recycle from wastewater using algae systems
Enabling Nuclear Energy Abundance	Maximize use of wastes, including nuclear waste heat and waste carbon resources	Utilize waste heat as a resource to heat algae ponds to produce valuable products
Meet Demands of Energy and Clean Water for the AI Revolution	Support growing use of AI in the U.S.	Process data center wastewater and utilize data center waste heat for algae systems
Performance Enhanced (PE) Chemicals	Contribute to American chemical manufacturing dominance	Provide PE chemicals and chemical feedstocks generated from non-arable land and non-potable water
Critical Minerals	Develop domestic supply of critical minerals	Extract critical minerals from mine tailings and produced water sources

Project Highlights

Arizona Center for
Algae Technology &
Innovation (AzCATI)
testbed facility:
Community resource



Novel Waste2Jet Pathway: Evaluating Blending & Integration of Algae Feedstocks with Corn Ethanol Fermentation



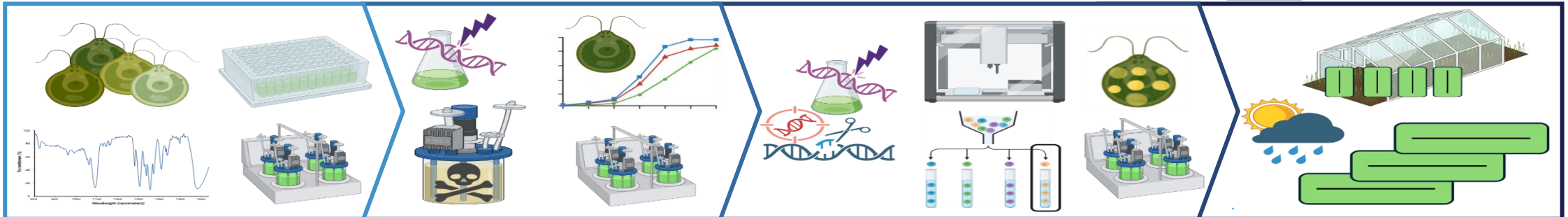
DISCOVER Consortia: Systematically screening and identifying top performing strains

Task 1 Characterize Strains

Task 2 Increase Robustness

Task 3 Increase Liquid Productivity

Task 4 Validate Pond Performance

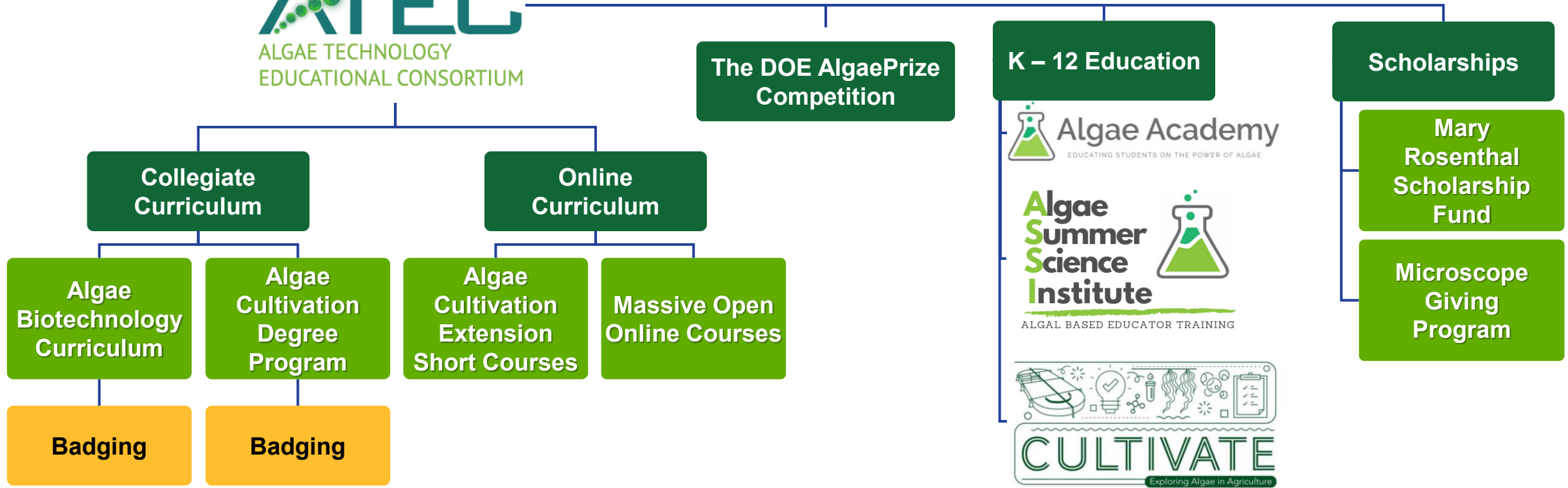


STEM Education and Workforce Development¹



Our Mission

We see a future that embraces algae as an essential solution for a healthy society and planet. Our mission is to promote the power of algae and create that future through education, mentoring, workforce development, and public outreach.



How To Work With DOE



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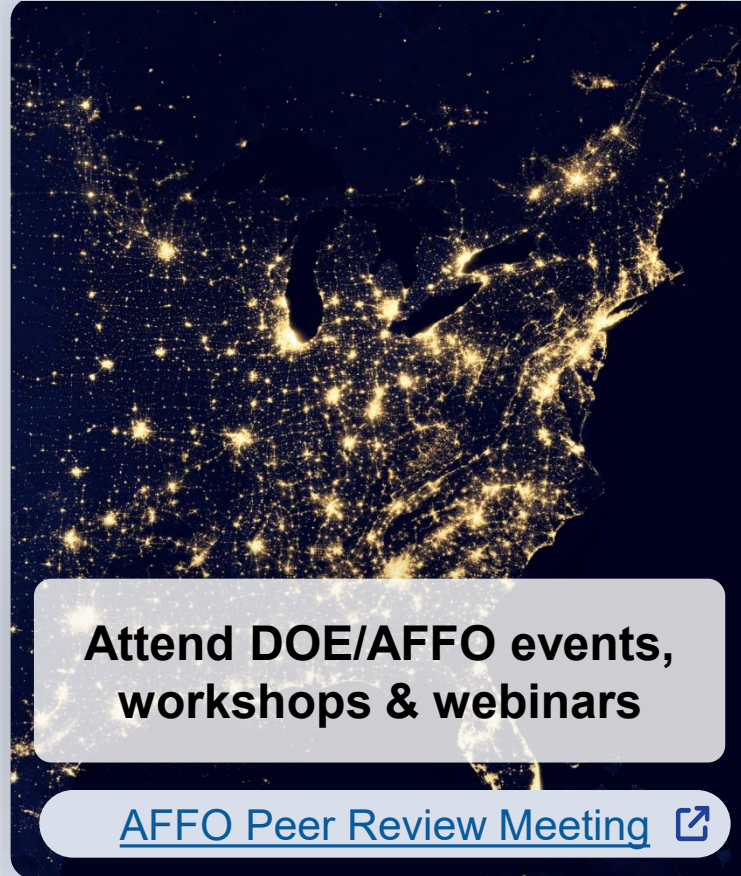
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*Alternative Fuels and
Feedstocks Office*



Apply to AFFO/DOE Funding Opportunities

- Requests for information (RFI's)
- Notice of Funding Opportunities
- Partnership Intermediary Agreements



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Thank you!

Questions?