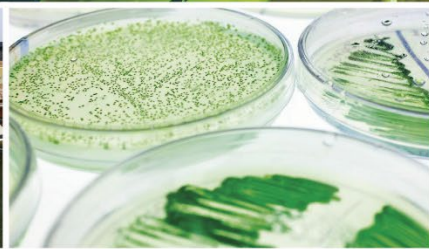




U.S. DEPARTMENT OF ENERGY
AlgaePrize
NextGen Algal Innovators

2023-2025 Rules



U.S. DEPARTMENT OF **ENERGY** | Office of ENERGY EFFICIENCY & RENEWABLE ENERGY
BIOENERGY TECHNOLOGIES OFFICE

AMERICAN **MADE**
U.S. DEPARTMENT OF ENERGY

thealgae foundation

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The U.S. Department of Energy AlgaePrize will be governed by this Official Rules document, which establishes the rules and requirements for the AlgaePrize. The AlgaePrize organizers, the National Renewable Energy Laboratory, the Algae Foundation, and the U.S. Department of Energy reserve the right to modify this Official Rules document if necessary and will publicly post any such modifications as well as notify AlgaePrize competitors of a revised document.

Welcome to the U.S. Department of Energy AlgaePrize!

Products made from algae are the natural solution to the energy, food, economic, and climate challenges facing our world today. Algae have the power to simultaneously put fuels in our vehicles, recycle carbon dioxide (CO₂), provide nutrition for animals and humans, and create jobs for millions of Americans.

The Prizes

This competition will award two separate rounds of prizes:

Research Synopsis Prize

The first stage of judging will result in up to 15 student teams being selected as AlgaePrize finalists. Each finalist team will be awarded \$10,000. \$8,000 of the award will be paid upon notice of finalist selection and an additional \$2,000 will be awarded in support of travel upon submission of the research program's final report.

Final Awards

Finalist teams will present their research at the AlgaePrize competition event. The five top student teams will be selected as AlgaePrize champions. Each champion team will be awarded an additional \$10,000 prize. The five champion teams will then present their research to a final panel of judges. The judges will select a single Grand Champion and award them an additional \$15,000 (*The Grand Champion will have received a cumulative total award of \$35,000, including both finalist awards and the research synopsis prize*). The five champion teams will be invited to participate in a national algal-based conference or symposium, e.g., the Algae Biomass Summit in the fall of 2025 to present their research and network with conference participants from the national and international algae community.

The Competition Explained

The AlgaePrize, sponsored by the U.S. Department of Energy (DOE) Bioenergy Technologies Office (BETO) and supported by the Algae Foundation, the National Renewable Energy Laboratory (NREL), and the American-Made program, challenges students to become the next generation of bioeconomy professionals by expanding novel solutions to production, processing, and new product development on the way to gigaton-scale algae commercialization for fuel, food, products, and CO₂ utilization/sequestration.

Student teams competing in the AlgaePrize will range from high school through graduate programs. The competition will span two academic years. Competitors will learn about the algae industry and will go on to support the nation's biofuel research, algal commercial enhancement, and promote industry-driven education, training, and workforce development. The AlgaePrize will assist in establishing the competitors as serious candidates for the next generation of bioeconomy positions and entrepreneurial opportunities.

Student competitors will:

- Gain experience with innovative algal commercialization technologies
- Develop real-world solutions that shape the global future of algae by producing biofuels, biofoods, biofeeds, and industrial compounds (e.g., biopolymers)
- Develop collaborative and leadership skills by working on multidisciplinary student teams
- Engage and network with industry professionals, national lab researchers, and academics to forge relationships and connections that aid students' transition to the algal-based bioeconomy employment or entrepreneurial endeavors upon graduation

- Compete to earn prize money and national recognition.

The three areas of interest for the AlgaePrize include both microalgae and macroalgae. Student teams should focus their project on one of the following areas of interest:

- Production
- Downstream Processing
- Novel Products, Analytical Tools, or Ecosystem Services.

Competitors will prepare creative solutions for real-world issues in the algae value chain. Qualifying teams will complete a research project and attend the AlgaePrize competition event where teams:

- Present their research to panels of judges
- Compare their projects to those of other teams
- Tour the NREL facilities
- Engage with a variety of organizations about careers related to algae technology, cultivation, and market development.

The final five winning teams will be offered an opportunity to share their technology advancements as part of a national algae conference e.g., the Algae Biomass Summit in the fall of 2025.

Important Dates

AlgaePrize 2023–2025 is a competition that starts in fall of 2023 and runs through spring of 2025.

- **September 2023:** The AlgaePrize will be formally announced via the website, DOE BETO information office, and social media. Teams can begin work as early as the release of the Official Rules. Information about team registration is available on the AlgaePrize website. After a team completes registration, the team is provided access to AlgaePrize communications and resources through the HeroX site, an online forum for participating students to receive timely information from organizers and access necessary resources.
- **Nov. 1, 2023, 12 p.m. Eastern Standard Time (EST):** Teams must register and submit a 500-word abstract by this deadline. Each team must identify a faculty lead/mentor/advisor and a student team captain.
- **Dec. 13, 2023, 12 p.m. EST:** Deadline for receipt of a 10-page Research Synopsis and team photo. Photos will be used to represent competing teams on various DOE, NREL, and partner websites. Photos will not be reviewed by judges.
- **Jan. 15, 2024:** A maximum of 15 student teams will be selected as AlgaePrize finalists. Each of the selected finalist teams will be awarded \$8,000 for research project support funds and an additional \$2,000 to support travel to the student competition weekend. A total of \$ 10,000 will be awarded to each AlgaePrize finalist team.
- **Feb. 5–9, 2024:** Finalist teams virtually present their Research Synopsis to AlgaePrize organizers.
- **June 4, 2024, 12 p.m. Eastern Daylight Time (EDT):** Deadline for receipt of first five-page Research Update. All student team members are required to have completed the [Introduction to Algae Massive Open Online Course](#) (MOOC).

- **July 2024:** An updated version of the AlgaePrize Official Rules is released with clarifications and any needed corrections.
- **Sept. 4, 2024, 12 p.m. EDT:** Deadline for receipt of second Research Update.
- **Dec. 4, 2024, 12 p.m. EDT:** Deadline for receipt of third Research Update.
- **March 10, 2025, 12 p.m. EST:** Deadline for receipt of 25-page Research Project Final Report, 5-minute video, poster, and team and research project photos.
- **April 1, 2025, 12 p.m. EST:** Deadline for receipt of presentation slide deck from teams. Presentation files will not be accepted after this date.
- **April 11–13, 2025:** Finalist teams present projects to judges at the AlgaePrize Competition Weekend Event on the NREL main campus in Golden, Colorado. Teams also participate in related competition weekend events. AlgaePrize champions and grand champions are announced.
- **Summer/Fall 2025:** AlgaePrize winning teams are invited to attend a national algae conference, for presentations and industry interactions.

Failure to submit required material by the due dates may result in the team disqualification from the competition. Any challenges experienced with uploading required documents onto HeroX should be reported immediately (AlgaePrize@theAlgaeFoundation.org). Additionally, if there is a recognized conflict with any of the due dates detailed above, contact the AlgaePrize contest organizers in advance of the deadline (AlgaePrize@theAlgaeFoundation.org).

Eligibility

The following are requirements of team members:

- Teams must have a minimum of two student team members.
- Students must be enrolled in a U.S.-based educational institution (high school, accredited community college, college, university, and/or graduate school). Students must be enrolled in at least one class and must be pursuing a degree or diploma at the time a student joins a team.
- Students will self-certify their eligibility as part of registration for the competition.
- Teams with students from multiple educational institutions are allowed, and multiple teams from the same educational institution are allowed. Individual students may be members of only one team.
- The student team captain must be a U.S. citizen or permanent resident.
- Each team must have a faculty advisor, employed by a U.S.-based educational institution to provide input, guidance, and support.
- Judges, competition organizers, federal employees, and national laboratory employees are not eligible to compete in the competition. Immediate family members of the Office of Energy Efficiency and Renewable Energy, the Algae Foundation, NREL, and EERE contractual employees are not eligible to compete in the competition.
- Student teams composed of all high school students under the age of 18 must have their faculty advisor register the team on HeroX. Each high school may support more than one team. High school students may not be on multiple teams.

- Students who participated in a previous AlgaePrize competition are eligible to participate in subsequent AlgaePrize competitions. Students from submitted teams, finalist teams, champion teams, and grand champion teams from previous AlgaePrize competitions are all welcomed to participate in subsequent AlgaePrize competitions. There are no restrictions on the subject matter, research, and/or development topics submitted by the returning student contestants.

If the organizers become aware that a team or individual is not eligible, that team may be disqualified from competition.

Student participation may be integrated into a senior project or thesis, count as elective or independent study course credit, be added to the curriculum of existing classes, treated as a seminar topic, engaged in as part of a student interest club, or be an extracurricular student activity.

Diversity, Equity, and Inclusion in the Competition

This competition¹ seeks submissions that will benefit members of underserved communities² and underrepresented^{3,4,5} groups.

- Teams are highly encouraged to include individuals from groups historically underrepresented in science, technology, engineering, and math (STEM)^{6,7} on their project teams.

¹ <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/20/executive-order-advancing-racial-equity-and-support-for-underserved-communities-through-the-federal-government/>

² The Biden Administration defines “underserved communities” as populations sharing a particular characteristic that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life, including communities comprised of Black, Latino, Indigenous and Native American persons, Asian Americans and Pacific Islanders, and other persons of color; members of religious minorities; lesbian, gay, bisexual, transgender, and queer (LGBTQ+) persons; persons with disabilities; persons who live in specific rural or urban areas; and persons otherwise adversely affected by persistent poverty or inequality.

³ The term “equity” means the consistent and systematic fair, just, and impartial treatment of all individuals, including individuals who belong to underserved communities that have been denied such treatment, such as Black, Latino, and Indigenous and Native American persons, Asian Americans and Pacific Islanders and other persons of color; members of religious minorities; lesbian, gay, bisexual, transgender, and queer (LGBTQ+) persons; persons with disabilities; persons who live in rural areas; and persons otherwise adversely affected by persistent poverty or inequality.

⁴ Executive Order 13985, “Advancing Racial Equity and Support for Underserved Communities Through the Federal Government” (Jan. 20, 2021).

⁵ The term “underserved communities” refers to populations sharing a particular characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life, as exemplified by the list of in the definition of “equity.” E.O. 13985. For purposes of this competition, as applicable to geographic communities, applicants can refer to economically distressed communities identified by the Internal Revenue Service as Qualified Opportunity Zones; communities identified as disadvantaged or underserved communities by their respective States; communities identified on the Index of Deep Disadvantage referenced at <https://news.umich.edu/new-index-ranks-americas-100-most-disadvantaged-communities/>; and communities that otherwise meet the definition of “underserved communities” stated above.

⁶ According to the National Science Foundation’s 2019 report titled, “Women, Minorities, and Persons with Disabilities in Science and Engineering,” women, persons with disabilities, and underrepresented minority groups—Blacks or African Americans, Hispanics or Latinos, and American Indians or Alaska Natives—are vastly underrepresented in the STEM (science, technology, engineering, and math) fields that drive the energy sector. That is, their representation in STEM education and STEM employment is smaller than their representation in the U.S. population: <https://nces.nsf.gov/pubs/nsf19304/digest/about-this-report>. For example, in the United States, Hispanics, African Americans, and American Indians or Alaska Natives make up 24 percent of the overall workforce, yet only account for 9 percent of the country’s science and engineering workforce. DOE seeks to inspire underrepresented Americans to pursue careers in energy and support their advancement into leadership positions: <https://www.energy.gov/articles/introducing-minorities-energy-initiative>. Note that Congress recognized in section 305 of the American Innovation and Competitiveness Act of 2017, Public Law 114-329:

(1) [I]t is critical to our Nation’s economic leadership and global competitiveness that the United States educate, train, and retain more scientists, engineers, and computer scientists; (2) there is currently a disconnect between the availability of and growing demand for STEM-skilled workers; (3) historically, underrepresented populations are the largest untapped STEM talent pools in the United States; and (4) given the shifting demographic landscape, the United States should encourage full participation of individuals from underrepresented populations in STEM fields.

⁷ Minority Serving Institutions (MSIs), including Historically Black Colleges and Universities (HBCUs)/Other Minority Institutions as educational entities recognized by the Office of Civil Rights (OCR), U.S. Department of Education, and identified on the OCR’s Department of Education U.S. accredited postsecondary minorities’ institution list. See <https://www2.ed.gov/about/offices/list/ocr/edlite-minorityinst.html>.

- Teams are highly encouraged to develop projects that would benefit underserved communities and/or underrepresented^{3,4,5,6,7} groups.
- As part of the Research Synopsis (discussed in the **Submission** Section), applicant teams are required to describe how diversity, equity, and inclusion will be incorporated in the project. Specifically, applicants' teams should include a discussion that describes the actions the applicant team will take to foster a welcoming and inclusive environment, support people from underrepresented groups in STEM, advance equity, and encourage the inclusion of individuals from these groups in their projects or in the algae industry, and the extent the project activities will be located in or benefit underserved communities. The discussion should include metrics to measure the success of the proposed actions. This discussion will be reviewed and scored by the panel of judges reviewing and scoring the Research Synopsis.

Further, students from MSIs or other entities located in an underserved community that meet the eligibility requirements (see the **Eligibility** Section) are encouraged to apply and participate on student teams. The judges may consider the inclusion of these types of entities as part of the selection decision (see Appendix, Section 2, **Program Policy Factors**).

Research Areas of Interest

Teams must limit their submissions to one of the following areas of interest: Production; Downstream Processing; or Novel Products, Analytical Tools, or Ecosystem Services. The AlgaePrize target organisms include: eukaryotic microalgae, eukaryotic macroalgae, and prokaryotic cyanobacteria. The areas of interest are intended to attract (but are not limited to) current algal agronomists, phycologists, and aquaculturists, as well as students from molecular genetics and cultivar improvement departments, aquaculture engineering, and computational modeling departments; and high school students with an interest in science, technology, and engineering majors.

- **Production:** Algal-based production or aquatic agronomy represents a multidisciplinary area of interest ranging from genetic manipulation of cultivars to cultivation; husbandry, including input management and respiration loss; and farming infrastructure to life cycle sustainability and cost analyses. The following represents research project challenges:
 - Cultivar Enhancement: Genetic manipulation, modification, and selection
 - Aquaculture Engineering: New design of algal growth cultivation systems
 - Husbandry and Productivity: Improve algae stability and growth from current DOE metrics.⁸
- **Downstream Processing:** This category represents a series of divergent challenges between micro- and macroalgae. Harvesting, dewatering, preprocessing, extraction, and biorefinery systems offer a variety of technology opportunities for the algae, membrane, engineering, and food technology industries. The following represents research project challenges:
 - Harvesting, Dewatering, and Preprocessing: Novel design of harvesting, dewatering, and preprocessing technologies
 - Development of Biorefinery Applications: Enhancing value chain via chemical and thermal conversions, and constituent separation.

⁸ Wiatrowski, Matthew, and Ryan Davis. 2021. *Algal Biomass Conversion to Fuels via Combined Algae Processing (CAP): 2020 State of Technology and Future Research*. Golden, CO: National Renewable Energy Laboratory. NREL/TP-5100-79935. <https://www.nrel.gov/docs/fy21osti/79935.pdf>.

- **Novel Products, Analytical Tools, or Ecosystem Services:** The development of new algal-based products including biofuel constituents, aquaculture and agriculture feed and feed supplements, human whole foods or protein, polyunsaturated fatty acids, and the novel design and utilization of bio-digestible polymers represents the key to commercial profitability. Remote sensing and computer modeling represent new tools for increasing cultivation efficiencies, improving productivity, detecting contamination prior to crashes, and addressing techno-economic and life cycle analyses. Ecosystem services represent monetized potentials for new income streams. The following represents research project challenges:
 - **New Product Development:** Biofeeds, biofoods, biofuels, and bioproducts such as polymers
 - **Remote Sensing and Modeling:** Development and validation of computational modeling and remote sensing technologies
 - **Ecosystem Services:** Development of novel applications of algae biomass technologies for ecosystem, ecological, and/or environmental services.

Competition Steps and Requirements

The AlgaePrize competition process consists of six steps:

1. **Registration:** Students (see the [Eligibility](#) Section) are encouraged to form student teams, consider the competition’s three algae research areas of interest (detailed above), and select one and develop an innovative and novel research project within that area. Register (see the [Registration](#) Section) prior to the deadline with your team’s abstract.
2. **Submission:** During this step, complete your team’s full Research Synopsis, take a team photo, and submit both of these items by the deadline (see the [Submission](#) Section).
3. **Assessment:** All teams’ Research Synopses will be reviewed and scored by a panel of judges, based on the review criteria (see [Review Criteria](#) Section). The week following the deadline for submitting Research Synopses, a panel of judges will assess and score the synopses based on the review criteria. At the conclusion of the assessment, the panel of judges will select up to 15 finalist teams to participate in the competition.
4. **Announcement:** All teams will be notified of the selections and each winning team will be awarded \$10,000 to assist with their research and travel efforts.
5. **Social Media Postings:** After selection as a finalist team, each team is requested to post a minimum of one new social media posting on either Facebook, LinkedIn, Twitter, or Snapchat each month from selection as a finalist team (January 2024–April 2025). Each team will forward the posting to the manager of the AlgaePrize 2023–2025 contest.
6. **Research and Updates:** After selection and announcement of the winning finalist teams, the teams will have the next year to complete their proposed research projects. Details regarding requirements over the research year are noted in the [Final Submissions](#) Section and include three five-page research updates. All submission deadlines can be found in the [Important Dates](#) Section above.
7. **AlgaePrize Competition Weekend Event:** The finalist teams are expected to participate in the AlgaePrize competition event over the AlgaePrize Weekend. The event will be held in-person at NREL in Golden, Colorado. Over the course of the AlgaePrize Weekend, the finalist teams will participate in event activities including presenting their research projects to a panel of judges. Details related to the specific submission requirements and the associated review criteria may be found below in the [Submission](#) Section.

- Each team is expected to send at least one student and one faculty advisor to this competition event. The team presentation during this event must be given by a student team member and not the faculty advisor.
- There is no maximum number of team members that may attend.
- There are specific DOE guidelines that must be followed for foreign national visitors. If members of your team are foreign nationals, please work with competition organizers to ascertain whether foreign team members can visit NREL.
- The judges will select and announce the top five research teams as the competition champions. These five teams will then present to a final panel of judges. Following the playing of each champion's team video and a 10–15 minute question and answer session with the final panel of judges, a Grand Champion will be selected. More information will be provided prior to the AlgaePrize event.

How to Enter

1. Go to the competition page at www.herox.com/AlgaePrize.
2. Create a HeroX account if you don't already have one, including activating your account by clicking the verification link sent to your email, or sign in and then choose "Solve this Challenge." You'll need to accept the "AlgaePrize 2023–2025 Competitor Agreement" to get started. This indicates your interest in competing; it is not a commitment.
3. By the registration deadline, one person from each team must click "Begin Entry," fill out the necessary form items, then choose "Save & Preview." You then must click "Submit Final Entry" on HeroX to complete registration. This step is when you identify your educational institution (high school, community college, college, university, and/or graduate school). There is no cost to submit a registration. Note that you can edit and re-submit your entry as many times as you would like up until the registration deadline.
4. If you know the email addresses of your team members, or if you are joining an already established team, you can choose those options. Otherwise, just choose, "No, I want to compete individually." You can join and assemble your team with a minimum of two members to be eligible to compete later on in the registration timeframe.
5. Registration entries received by the deadline are deemed applicant teams. All teams who successfully complete a registration and meet eligibility will be accepted.
6. Only one person per team may submit a registration. Other team members should join the registered team via HeroX. Team members may be added or removed from a team at any time. Once you have registered a team, you can invite additional members using HeroX.
7. Email questions to the organizers at AlgaePrize@theAlgaeFoundation.org.

What to Submit: Registration and Submission Steps

Registration

- Research Abstract (500 Words)

Submission

- Title Page
- 10-Page Research Synopsis
- Team Photo

Registration

Research Abstract Content Guidance

The Research Abstract is limited to 500 words and is submitted directly into the HeroX system. It represents a concise summary of the proposed project and should include the area of interest being pursued, the research focus within that area, and the goals and/or metrics associated with the project.

Initial abstract submittals will be used to provide the AlgaePrize organizers with the information they need to select judges for the Research Synopsis stage (such as how many and areas of expertise, etc.). The abstract will not be assessed by a panel of judges and no feedback on content will be provided to teams.

The Research Abstract may be revised and updated in the HeroX system as needed until the deadline. A student team lead and a faculty lead advisor must be selected by the team at this time and noted within the system.

Submission

The 10-Page Research Synopsis

The 10-page Research Synopsis represents each team's research plan for their proposed project and will be reviewed and scored by a panel of judges. Finalist teams will be awarded \$10,000 to support each team's research project and travel and will continue to compete over the next year and present their research at the AlgaePrize Competition Weekend.

The narrative should address all three of the following concepts:

Novelty – This competition seeks innovations that apply to algae production and processing systems along the entire algae value chain including everything from production through products and analytical tools development. The synopsis must describe how the team's proposed research compares to and will advance the current state of technology.

Technical Feasibility – Submissions should identify credible scientific and engineering pathways to advance the proposed area of interest. The synopsis must adequately describe a sound understanding of algae systems whether in production, downstream processing, or new product or analytical tool development.

Impact – The proposed effort should include key improvements, cost targets, and/or life cycle analyses that support the proposed project's efforts toward commercial adoption. In support of President Biden's diversity, equity, and inclusion goals, the team's impact discussion must include how diversity, equity, and inclusion will be included and addressed within the proposed effort.

Team Photo

A photo of the team participating in the competition is required and must be submitted with the Research Synopsis. Photos will be used to represent competing teams on various DOE, NREL, and partner websites. Photos will not be reviewed by judges.

Research Synopsis Formatting Requirements

- File type: Single, bookmarked PDF with all fonts embedded and 300 dpi minimum resolution
- ANSI A 8.5” x 11” paper size
- Minimum 11-point font size
- Minimum ½” margin on all sides
- Written in English
- All additional pages beyond page limits noted will NOT be reviewed
- Title Page, Table of Contents, Process Flow Diagrams, and Citation Pages do NOT count towards the page limits
- All uploaded files must follow the following filename convention:
[TeamName]_[SchoolNameAbbreviated]_[SubmissionName].pdf
Example: TeamXYZ_SchoolMNO_ResearchSynopsis.pdf

Photo Formatting Requirements

- All images must have a minimum resolution of 1920 x 1080 pixels
- Submit images as .jpg; .tiff; or .png
- Filename convention: TeamXYZ_SchoolMNO_TeamPhoto.jpg

How Research Synopsis Will Be Reviewed

The content bullets on the left hand of the tables below are only suggestions to guide teams’ responses; each team decides where to focus their narrative. Images, figures, data, and graphs may be included in the narrative and will count against the page limit. Content over the page limit and not included in the page limit exclusions noted will not be reviewed.

The panel of judges will review and score the Research Synopsis based on the content you provide. The judges will assess the project by agreeing or disagreeing with assigned statements on a 1–6 scale in the column on the right, as shown below.

1	2	3	4	5	6
strongly disagree	disagree	slightly disagree	slightly agree	agree	strongly agree

Question 1: Novelty – Does the proposed project describe a novel solution with algae within the proposed area of interest?

Suggested content:

- Describe how the proposed project is innovative in addressing challenges associated with the utilization of and processing of algae.
- Describe how the proposed project addresses challenges within the proposed area of interest in a new and novel way compared to the current state of technology⁸ (be sure to include which strain you are working with).
- Describe how the proposed effort will be incorporated into the overall algae value chain improving and/or enhancing algae’s commercialization potential (whether by cost reductions, productivity improvements, early contamination detection, downstream processing efficiencies, or new product development, etc.).

Each statement is scored on a 1–6 scale.

- The proposed project is innovative and addresses algal industry challenges.
- The proposed project addresses notable challenges within the algae value chain and represents a significant advancement as compared to the current state of technology.
- The proposed project has a high likelihood of improving the overall algae value chain, enhancing algae’s commercialization potential.

Question 2: Technical Feasibility – Is the proposed project technically feasible?

Suggested content:

- Describe the key technical aspects of the proposed project relative to the proposed area of interest.
- Describe the supporting body of knowledge, baseline, and goals/metrics that support the proposed effort.
- Describe the research approach that will be taken to accomplish the goals and metrics.
- Describe risks and associated mitigation strategies associated with the proposed project.
- Describe the team’s qualifications.
- Describe the resources available for performing and completing the proposed

Each statement is scored on a 1-6 scale.

- The proposed effort represents a technically feasible project relative to the proposed area of interest (the effort describes a sound understanding of algae systems).
- The proposed project is well supported by data, previous work, literature, analyses, and/or additional information, and is based on reasonable assumptions and lessons learned from the notable efforts in the past.
- The approach is reasonable and the goals and metrics are likely to be met.
- Risks and mitigations strategies associated with the proposed project are well described and reasonable.
- The team includes the necessary qualifications to perform the proposed effort.
- The team has (or has access to) the necessary resources to complete the proposed effort.

effort (materials and supplies, research and analytical equipment, or facilities, etc.).	
Question 3: Impact – Will the proposed project be impactful to the algae industry?	
<p>Suggested content:</p> <ul style="list-style-type: none"> • Describe the anticipated impacts resulting from the proposed project. Include potential key improvements, cost targets, life cycle and environmental benefits, and other impacts as applicable to the proposed effort.) • Describe the commercial applicability of the proposed impacts resulting from the proposed project. • As noted in the Diversity, Equity, and Inclusion in the Competition Section, include a plan/discussion describing how the proposed project incorporates diversity, equity, and inclusion goals. • Extent to which the proposed project can benefit underserved communities. 	<p>Each statement is scored on a 1-6 scale.</p> <ul style="list-style-type: none"> • The proposed project will result in significant positive impacts to the algae value chain. • The proposed project has the potential for commercial applicability within the algae value chain (as supported by the key improvements, cost targets, life cycle and environmental benefits, and other proposed impacts). • The proposed project incorporates diversity, equity, and inclusion goals. • The proposed project has the potential to positively impact and benefit underserved communities (if applicable).

This concludes the first phase of this prize competition. Only teams selected as finalists in this first phase will receive a total of \$10,000. Initially, \$8,000 will be paid upon notice of each team’s finalist selection and an additional \$2,000 in support of travel, upon submission of the research program’s final report.

Final Award Competition

In the final award competition, teams will spend a year working on their research. During that year they will provide three research updates and then go on to compete in the AlgaePrize Competition Weekend.

What to Submit: Final Submissions

Research Updates (to be submitted three times; see Important Dates Section)

- Title Page
- 5-Page Research Update (x3)

AlgaePrize Competition Weekend Event

- Title Page
- 25-Page Research Project Final Report
- Research Project Poster
- Research Project Presentation Slide Deck
- 5-Minute Video
- Research Photos

Research Update Title Page – Include the following on a single page:

- Project Title
- Team Name
- Team Members' Names including Faculty Advisor's Name
- School(s) Represented
- Area of Interest
- Date of Submission

Research Update

The 5-page research update report represents each team's progress report for that quarter (see Important [Dates](#) Section for deadlines). Discuss project progress to date, including:

- Breakthroughs
- Achievements
- Relevant data and analyses
- Challenges encountered and how they were or will be addressed
- Targets, metrics, or milestones met or missed over the reporting period
- Next steps

Final Report Title Page – Include the following on a single page:

- Project Title
- Team Name
- Team Members' Names including Faculty Advisor's Name
- School(s) Represented
- Area of Interest
- Date of submission

Research Project Final Report

The 25-page final report represents each team's research project from planning through execution to analyzing data and results and drawing research conclusions and reporting findings. The report should have an abstract summarizing the research project and results. The body of the report should discuss the following:

- Summary of the student team's research project
- What innovative and novel research was proposed and why
- Project goals, metrics, and milestones
- How the research was performed to meet the goals, metrics, and milestones
- Challenges and how they were addressed; risks and mitigation strategies employed

- Any research deviation(s) from the original plan as presented in the Research Synopsis; if any, explain why and the outcome(s)
- Results and conclusions (include data, assumptions, analyses, graphs, and images, as appropriate for support)
- Impacts and commercial applicability (to and within the algae value chain) based on results and analyses
- Lessons learned and next steps
- References cited.

Project Poster

All finalist teams will participate in a Poster Session held during the AlgaePrize Weekend. Teams should print their poster and bring it to the event, labeled with the Team Name, School(s), student team member names, and Area of Interest. The poster should include graphics, photos, and other helpful information to allow students to explain their project while attending a poster session.

Research Project Presentation Slide Deck

Each finalist team must develop a 15-minute presentation highlighting their research area of interest; the research performed; challenges and how those challenges were addressed; results (including appropriate support for those results such as data and analyses); impacts and commercial applicability within the overall algae value chain; and next steps. Include references as a final slide. Presentations will be given to a panel of judges, and each presentation will be followed by a question-and-answer session.

Research Project Video

All finalist teams will submit a 5-minute research project video to highlight their research and results. The video will be reviewed along with the other final deliverables by a panel of judges. Videos will be judged and final disposition of videos will be the Algae Foundation's AlgaePrize website.

Research Photos

Each team must submit up to 10 project photos that represent their work and their team. Please feel free to highlight the human side of technology research and development as well as technology highlights. AlgaePrize organizers will use the images to recognize individual team performance, integrate into event materials, and for outreach, as appropriate. Select images that best represent the project, such as research equipment used or developed in the project or algae growing during the project. If your team membership has changed during the course of the competition, please submit a new team photo as well. The photos will not be provided to the judges.

Research Updates and Research Project Final Report Formatting Requirements

- File type: single, bookmarked PDF with all fonts embedded and 300 dpi minimum resolution
- ANSI A 8.5" x 11" paper size
- Minimum 11-point font size
- Minimum ½" margin on all sides
- Written in English
- All additional pages beyond page limits noted for each will NOT be reviewed
- Title Pages, Table of Contents, Abstracts, Process Flow Diagrams, and Citation Pages do NOT count towards the page limits
- All uploaded files must follow the following filename convention:
 [TeamName]_[SchoolNameAbbreviated]_[SubmissionName].pdf (examples below)
 TeamXYZ_SchoolMNO_ResearchProjectUpdate.pdf
 TeamXYZ_SchoolMNO_ResearchProjectFinalReport.pdf

Research Project Presentation Slide Deck Formatting Requirements

- Presentation must be 15 minutes or less
- File type: .pdf or .pptx (ensure slides have an aspect ratio of 16:9)
- Title slide including same content as title page for reports
- Please note: To ensure all electronically submitted presentation materials work with AlgaePrize organizers' presentation computers, teams planning on presenting videos during their presentations should embed all videos in the slide deck and notify the AlgaePrize organizers at AlgaePrize@theAlgaeFoundation.org, noting their presentation includes videos, before arriving at the AlgaePrize Weekend competition event, to allow the organizers time to make sure the appropriate software and online connections are available and working to play the video(s).
- File Name:
[TeamName]_[AreaofInterest]_[SchoolNameAbbreviated]_ResearchProjectPresentation.pdf (or .pptx)

Research Project Poster Formatting Requirements

- Size: 3 ft. x 2 ft.
- File Type: .pdf
- File Name: [TeamName]_[AreaofInterest]_ResearchProjectPoster.pdf

Research Project Video Formatting Requirements

- Viewing length of video must be 5 minutes or less
- Provide a URL where the video can be viewed by the judges

Research Project Final Deliverables Review Criteria

The following final deliverables will be reviewed and scored by a panel of judges:

- Research Project Final Report
- Research Project Presentation Slide Deck
- 5-Minute Research Project Video
- Team Poster

The judges will assess the overall project based on the information provided in the final deliverables by agreeing or disagreeing with assigned statements on a 1–6 scale, as shown below.

1	2	3	4	5	6
strongly disagree	disagree	slightly disagree	slightly agree	agree	strongly agree

Final Deliverables (Report, Presentation, Poster, and Video)

Review and Assessment of Content

Suggested content:

- Describe the innovative and novel research that was proposed and why (area of interest pursued and why).
- Describe project goals, metrics, and milestones.
- Discuss the research approach performed to meet the goals, metrics, and milestones.
- Describe any challenges/risks and how they were addressed/mitigated. Include how they impacted the project.
- Discuss any research deviation(s) from the original plan, and, if any, explain why and the outcomes.
- Discuss the research results and conclusions (include data, assumptions, analyses, graphs, and images as appropriate to support conclusions).
- Describe the project's impact and commercialization applicability (to and within the overall algae value chain)
- Discuss lessons learned and next steps.
- Video: Highlight the area of interest, the research performed, and the results.
- Video: Prioritize the content to adequately convey that the project met its intended goals.
- Presentation: Discuss the innovative and novel research proposed and performed, including

Each statement is scored on a 1–6 scale.

- The project was innovative and novel within the area of interest selected.
- The goals, metrics, and milestones were relevant and appropriate for the research performed.
- The research approach performed to meet the goals, metrics, and milestones was reasonable, relevant, and appropriate.
- The discussion on challenges/risks indicates challenges/risks were identified, mitigated, and the impacts to the research were reasonable as described.
- Research deviations, if any, are well described and appear appropriate relative to the research performed.
- Research results are described well and are supported by data, assumptions, analyses, and other project-relevant information.
- The project impacts are well described relative to the area of interest and the overall algae value chain. Commercial applicability is discussed well.
- Lessons learned and next steps are provided and are reasonable, relevant, and logical relative to the research project.
- The video was of good quality, concise, and represented a prioritized overview of the research intent, effort, results, and analyses.
- The video conveyed key points concerning the project output creating an enhanced algae value chain with enough detail to be convincing that the project achieved its intended goals.
- The presentation (both the slide deck and the oral presentation) were good quality, concise,

<p>goals, metrics, and milestones; challenges and how they were addressed; results and analyses; impacts and commercial applicability; and lessons learned/next steps.</p> <ul style="list-style-type: none"> • Presentation: Prioritize content to adequately convey that the project met its intended goals. • Question/Answer Session: Speak clearly and concisely and convey a thorough understanding of the project and the results. 	<p>and represented a prioritized overview of the research intent, effort, results, and analyses.</p> <ul style="list-style-type: none"> • The presentation (both the slide deck and the oral presentation) conveyed key points concerning project output creating an enhanced algae value chain with enough detail to be convincing that the project achieved its intended goals. • Responses to the questions from the judging panel were of high quality and indicated a thorough understanding of the project and results.
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At the conclusion of the final deliverables’ review, the panel of judges will select the five winning projects/teams. Each winning champion team will receive \$10,000.

Each of these five champion teams will present their project video to a final panel of judges. This panel will use the same criteria noted above for reviewing the presentation. At the conclusion of all five champion videos and question-and-answer sessions, the final panel of judges will select a Grand Champion project and team. The Grand Champion will receive an additional \$15,000.

All five champion teams (including the Grand Champion) will be invited to participate and present their projects at a national algae conference.

Appendix: Additional Terms and Conditions

1. Requirements

Your submission for the AlgaePrize is subject to the following terms and conditions:

- You must include all the required submission elements. The AlgaePrize organizers may disqualify your submission after an initial screening if you fail to provide all required submission elements.
- Your submission must be in English and in a format readable by Adobe PDF. Scanned handwritten submissions will be disqualified.
- AlgaePrize organizers will disqualify submissions if they contain any matter that, in their sole discretion, is indecent, obscene, defamatory, libelous, lacking in professionalism, or demonstrates a lack of respect for people or life on this planet.
- Your clicking "Accept" on the HeroX platform and proceeding to register for the contest described in this document forms a valid and binding agreement between you and the U.S. Department of Energy and is in addition to the existing HeroX Terms of Use for all purposes relating to its contests. You should print and keep a copy of these rules, which apply only to the contest described here and to no other contest on the HeroX platform or anywhere else.

You will be required to sign the following statement as part of your submission to this prize program:

I am providing this submission package as part of my participation in the AlgaePrize competition. I understand that I am providing this submission to the federal government. I certify under penalty of perjury that the named competitor meets the eligibility requirements for this prize competition and complies with all other rules contained in the Official Rules document. I further represent that the information contained in the submission is true and contains no misrepresentations. I understand false statements or misrepresentations to the federal government may result in civil and/or criminal penalties under 18 U.S.C. § 1001.

2. Program Policy Factors

While the scores of the expert reviewers will be carefully considered, it is the role of the Prize Administrator to maximize the impact of competition funds. Some factors outside the control of competitors and beyond the judges' scope of review may need to be considered to accomplish this goal. The following is a list of such factors. In addition to the judges' scores, the below program policy factors may be considered in determining winners:

- Geographic diversity of teams
- The degree to which the submission supports complementary DOE efforts or projects, which, when taken together, will best achieve the research goals and objectives
- The degree to which the submission expands DOE's funding to new competitors and recipients that have not been supported by DOE in the past
- The degree to which the submission exhibits team member diversity and the inclusion of underrepresented groups, including but not limited to graduates and students of HBCUs and other MSIs or members operating within Qualified Opportunity Zones or other underserved communities
- The degree to which the submission enables new and expanding market segments

- Whether the project promotes increased coordination with nongovernmental entities for the demonstration of technologies and research applications to facilitate technology transfer.
- Judges must sign the conflict of interest (COI)/non-disclosure agreement (NDA) before participating in any review processes.
- Judges shall not have personal or financial interests in any entity that is a registered participant in a prize; be an employee, officer, director, or agent of any entity that is a registered participant in a prize; or have a familial or financial relationship with an individual who is a registered participant.

3. Verification for Payments

The AlgaePrize organizers will verify the identity and role of all competitors before distributing any prizes. Receiving a prize payment is contingent upon fulfilling all requirements contained herein. The AlgaePrize organizers will notify winning competitors using email contact information provided by the individual or entity that was responsible for the submission. Each competitor will be required to sign and return to the AlgaePrize organizers, within 30 days of the date on the notice, a completed NREL Request for ACH Banking Information form and a completed W-9 Form (<https://www.irs.gov/pub/irs-pdf/fw9.pdf>). In the sole discretion of the AlgaePrize organizers, a winning competitor will be disqualified from the competition and receive no prize funds if: (i) the person/entity does not respond to notifications; (ii) the person/entity fails to sign and return the required documentation within the required time period; (iii) the notification is returned as undeliverable; and/or (iv) the submission or person/entity is disqualified for any other reason.

In the event of a dispute as to any registration, the authorized account holder of the email address used to register will be deemed to be the competitor. The "authorized account holder" is the natural person or legal entity assigned an email address by an internet access provider, online service provider, or other organization responsible for assigning email addresses for the domain associated with the submitted address. All competitors may be required to show proof of being the authorized account holder.

4. Teams and Awards

Prizes are distributed by the organizers to a single entity and account, as directed by the individual who registers the team. The team faculty advisor must be identified prior to any award. Multiple recipients will not be accommodated. For U.S. teams, it is the sole responsibility of the team to determine any taxes or associated payments required as a result of this award. Any distribution beyond the initial recipient is the sole responsibility of the team.

5. Submission Rights

By making a submission and consenting to the rules of the contest, for all portions of the submission not marked as protected from public disclosure, a competitor grants to DOE, the AlgaePrize organizers, and any other third parties supporting DOE in the contest a paid-up nonexclusive, irrevocable worldwide license to reproduce, prepare derivative works of, distribute copies to the public, and perform publicly and display publicly the submission material, by or on behalf of the government. This license includes posting or linking to the public portions of the submission on the AlgaePrize organizers or HeroX applications, including the contest website, DOE websites, and partner websites, and the inclusion of the submission in any other media worldwide. Portions of submissions that contestants wish to protect from public disclosure must be marked as required in the [Records Retention and Freedom of Information Act](#) Section of this rules package.

By making a submission, competitors also grant DOE, the AlgaePrize organizers, and expert reviewers the right to review all portions of the submission for purposes of the contest, including but not limited to screening and evaluation purposes. Competitors also grant the AlgaePrize organizers, DOE, and any third parties acting on their behalf the right to publicize on the contest website indefinitely competitors' names and, as applicable, the names of competitors' team members and organizations that participated in the submission. Further, teams

grant DOE, the AlgaePrize organizers, and the Algae Foundation the rights to utilize and replay videos or portions of the videos including amplification through social media and other channels.

6. Competitor Representations and Warranties

By entering, the competitor represents and warrants that:

1. Competitor's entire submission is an original work by competitor, and competitor has not included third-party content (such as writing, text, graphics, artwork, logos, photographs, likeness of any third party, musical recordings, clips of videos, television programs, or motion pictures) in or in connection with the submission, unless (i) otherwise requested by the AlgaePrize organizers and/or disclosed by competitor in the submission, and (ii) competitor has either obtained the rights to use such third-party content or the content of the submission is considered in the public domain without any limitations on use.
2. Unless otherwise disclosed in the submission, the use thereof by AlgaePrize organizers, or the exercise by AlgaePrize organizers of any of the rights granted by competitor under these rules, does not and will not infringe or violate any rights of any third party or entity, including, without limitation, patent, copyright, trademark, trade secret, defamation, privacy, publicity, false light, misappropriation, intentional or negligent infliction of emotional distress, confidentiality, or any contractual or other rights.
3. All persons who were engaged by the competitor to work on the submission or who appear in the submission in any manner have: (i) given the competitor their express written consent to submit the submission for exhibition and other exploitation in any manner and in any and all media, whether now existing or hereafter discovered, throughout the world; (ii) provided written permission to include their name, image, or pictures in or with the submission (or, if a minor who is not competitor's child, competitor must have the permission of the minor's parent or legal guardian) and the competitor may be asked by the AlgaePrize organizers to provide permission in writing; and (iii) not been and are not currently under any union or guild agreement that results in any ongoing obligations resulting from the use, exhibition, or other exploitation of the submission.

7. Copyright

Each competitor represents and warrants that the competitor is the sole author and copyright owner of the submission; that the submission is an original work of the competitor and/or that the competitor has acquired sufficient rights to use and to authorize others, including DOE, to use the submission, as specified throughout the rules; that the submission does not infringe upon any copyright or any other third-party rights of which the competitor is aware; and that the submission is free of malware.

8. Contest Subject to Applicable Law

All contests are subject to all applicable federal laws and regulations. Participation constitutes each competitor's full and unconditional agreement to these Official Rules and administrative decisions, which are final and binding in all matters related to the contest. This notice is not an obligation of funds; the final award is contingent upon the availability of appropriations.

9. Resolution of Disputes

DOE is solely responsible for administrative decisions, which are final and binding in all matters related to the contest. Neither DOE nor the AlgaePrize organizers will arbitrate, intervene, advise on, or resolve any matters between team members or among competitors.

10. Publicity

The winners of the competition (collectively, "champions") will be featured on the DOE, Algae Foundation, Algae Technology Educational Consortium, and NREL websites. Except where prohibited, participation in the contest constitutes each winner's consent to DOE's and its agents' use of each winner's name, likeness,

photograph, voice, opinions, and/or hometown and state information for promotional purposes through any form of media worldwide, without further permission, payment, or consideration.

11. Liability

Upon registration, all competitors agree to assume any and all risks of injury or loss in connection with or in any way arising from participation in this contest. Upon registration, except in the case of willful misconduct, all competitors agree to and, thereby, do waive and release any and all claims or causes of action against the federal government and its officers, employees, and agents for any and all injury and damage of any nature whatsoever (whether existing or thereafter arising, whether direct, indirect, or consequential, and whether foreseeable or not), arising from their participation in the contest, whether the claim or cause of action arises under contract or tort.

No liability insurance naming DOE as an insured will be required of competitors to compete in this competition per 15 USC 3719(i)(2). Competitors should assess the risks associated with their proposed activities and adequately insure themselves against possible losses.

12. Records Retention and Freedom of Information Act

All materials submitted to DOE as part of a submission become DOE records and are subject to the Freedom of Information Act (FOIA). The following applies only to portions of the submission not designated as public information in the instructions for submission. If a submission includes trade secrets or information that is commercial or financial, or information that is confidential or privileged, it is furnished to the government in confidence with the understanding that the information may only be used or disclosed only for evaluation of the application. **Such information will only be withheld from public disclosure to the extent permitted by law, including the FOIA, if it is marked as described below.** Without assuming any liability for inadvertent disclosure, DOE will seek to limit disclosure of such information to its employees and to outside reviewers when necessary for review of the application or as otherwise authorized by law. This restriction does not limit the government's right to use the information if it is obtained from another source.

Submissions containing confidential, proprietary, or privileged information must be marked as described below. Failure to comply with these marking requirements may result in the disclosure of the unmarked information under the FOIA or otherwise. **In addition, as stated in the "How to Enter" section, unmarked or improperly marked submissions will not be protected from public disclosure. Marking instructions are included in the Notice of Restriction of Disclosure and use of Data (below).** The U.S. government is not liable for the disclosure or use of unmarked information and may use or disclose such information for any purpose. The submission must be marked as outlined in the following section and identify the specific pages containing trade secrets, confidential, proprietary, or privileged information.

13. Notice of Restriction on Disclosure and Use of Data

Pages [list applicable pages] of this document may contain trade secrets, confidential, proprietary, or privileged information that is exempt from public disclosure. Such information shall be used or disclosed only for evaluation purposes. The government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source. [End of Notice]

The header and footer of every slide or page that contains confidential, proprietary, or privileged information must be marked as follows: "Contains Trade Secrets, Confidential, Proprietary, or Privileged Information Exempt from Public Disclosure." In addition, each line or paragraph containing proprietary, privileged, or trade secret information must be clearly marked with double brackets or highlighting.

Competitors will be notified of any FOIA requests for their submissions in accordance with 29 C.F.R. § 70.26. Competitors may then have the opportunity to review materials and work with a FOIA representative prior to the release of materials. DOE does intend to keep all submission materials private except for those materials not designated as "will be made public."

14. Privacy

If you choose to provide HeroX with personal information by registering or completing the submission package through the contest website, you understand that such information will be transmitted to DOE and may be kept in a system of records. Such information will be used only to respond to you in matters regarding your submission and/or the contest unless you choose to receive updates or notifications about other contests or programs from DOE on an opt-in basis. DOE and NREL are not collecting any information for commercial marketing.

15. General Conditions

DOE reserves the right to cancel, suspend, and/or modify the contest, or any part of it, at any time. If any fraud, technical failures, or any other factor beyond DOE's reasonable control impairs the integrity or proper functioning of the contests, as determined by DOE in its sole discretion, DOE may cancel the contest. Any performance toward contest goals is conducted entirely at the risk of the competitor and DOE shall not compensate any competitors for any activities performed in furtherance of this prize.

Although DOE may indicate that it will select up to several champions for each contest, DOE reserves the right to only select competitors that are likely to achieve the goals of the program. If, in DOE's determination, no competitors are likely to achieve the goals of the program, DOE will select no competitors to be champions and will award no prize money.

16. National Environmental Policy Act Compliance

DOE's administration of this prize is subject to National Environmental Policy Act of 1969 (NEPA) (42 USC 4321, et seq.). NEPA requires federal agencies to integrate environmental values into their decision-making processes by considering the potential environmental impacts of their proposed actions. For additional background on NEPA, please see DOE's NEPA website, at <http://nepa.energy.gov/>.

While NEPA compliance is a federal agency responsibility and the ultimate decisions remain with the federal agency, all competitors in the AlgaePrize will be required to assist in the timely and effective completion of the NEPA process in the manner most pertinent to their participation in the prize competition. Competitors may be asked to provide DOE with information on fabrication and testing of their device such that DOE can conduct a meaningful evaluation of the potential environmental impacts.

17. Return of Funds

As a condition of receiving a prize, competitors agree that if the prize was made based on fraudulent or inaccurate information provided by the competitor to DOE, DOE has the right to demand that any prize funds or the value of other non-cash prizes be returned to the government.

ALL DECISIONS BY DOE ARE FINAL AND BINDING IN ALL MATTERS RELATED TO THE COMPETITION.