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1.0 REVISIONS SUMMARY:

<u>Section</u>	<u>Revision #</u>	<u>Description</u>	<u>Date</u>
	0	Original Document	08/05/2019
	1	Jerry's inputs resolved	8/27/2019
	2	Jeff's comments resolved/addressed	8/29/19
	3	Amy's review	8/30/19

2.0 CHALLENGE STRUCTURE:

Q2.1 What is the NASA CO₂ Conversion Challenge?

A2.1 The NASA CO₂ Conversion Challenge is a public competition that focuses on discovering ways to develop novel, non-biological synthesis technologies that use carbon dioxide (CO₂) as the sole carbon source to generate sugars that can then be used to manufacture a variety of products using both microbial biomanufacturing and chemical synthesis processes. The challenge asks individuals, teams, and organizations that meet the eligibility criteria as stated in the Official Rules to design and develop specialized technologies that can produce glucose or other targeted sugars from CO₂ to help advance sustainable space and Earth-based manufacturing approaches.

Q2.2 Why is this Challenge focused on CO₂ conversion?

A2.2 Future planetary habitats on Mars will require a high degree of self-sufficiency. This requires a concerted effort to both effectively recycle supplies brought from Earth and use local resources such as CO₂, water and regolith to manufacture mission-relevant products. CO₂ is a readily available source of carbon that can be easily obtained from the Martian atmosphere and as a by-product of human metabolism. This carbon (and oxygen) is an essential ingredient in making organic mission products such as food, nutrients, medicines, plastics, fuels, and adhesives. While carbon-containing molecules may be present in mission waste products or in planetary soils, these materials are difficult to use as feedstock for effective manufacturing processes.

Q2.3 What is the relationship between the CO₂ Conversion Challenge and NASA?

A2.3 NASA is the sponsoring and funding agency for the CO₂ Conversion Centennial Challenge.

Q2.4 What can I win in Phase 2?

A2.4 The three highest scoring teams will be awarded the following prizes from a total prize purse of \$750,000:

1st Place - \$350,000

2nd Place - \$200,000



3rd Place - \$100,000

In the event of a tie score between two or more teams, the corresponding award(s) will be divided evenly among the teams. For example, a tie for first place will result in both teams receiving $(\$400,000 + \$250,000)/2 = \$325,000$.

Additional details on the Submission Review process and Scoring can be found on the official challenge site at www.co2conversionchallenge.org.

3.0 PROCESS

Q3.1 I'd like to participate – how do I get started?

A3.1 You must first register on the Official Challenge website and submit the required documents no later than 5:00 PM Central on November 30, 2019. Check your inbox to confirm your registration and acceptance to continue in the competition. Next, complete the online application form, and submit your application no later than 5:00 PM Central on June 5, 2020.

Q3.2 Is participation in Phase 1 required in order to participate in Phase 2?

A3.2 No, participation in Phase 1 is not required in order to participate in Phase 2.

Q3.5 Will there be potential to test/send the entries to space or ISS for further testing?

A3.5 At this time, the Challenge will not directly lead to space-based testing or demonstrations. There is, however, the potential for all eligible participants to apply for future NASA grants and other opportunities which could possibly lead to further testing and eventual testing in space.

Q3.6 What happens to my intellectual property?

A3.6 While the Title, Technical Abstract, and Video for your submission may be published on this website and/or the NASA website, neither NASA nor any of the entities administering this competition shall obtain any other right, title, claim or interest in such materials aside from the permission to review, copy, distribute and display them for purposes of the competition. NASA claims no right, title, or interest to any such intellectual property solely as a consequence of your participation in the competition, including the winning of a prize. NASA reserves the right to share any submissions received with its civil servants and contractors, and reserves the right to approach individual participants about any future opportunities at the conclusion of the competition.

Q3.7 How can I contact someone at NASA about my application?

A3.7 All questions regarding the CO₂ Conversion Challenge should be directed to questions@co2conversionchallenge.org, and a member of our support team will respond as quickly as possible.

4.0 SUBMISSIONS



Q4.1 How will submissions be assessed?

A4.1 Once submissions are received, judges will review the above materials and, upon satisfactory review, schedule a call with the teams to determine if a team has met the requirements for a site visit. A site visit will then be scheduled. A judge will observe and evaluate the system operation at the contestant's facility, which must be within the United States. The team must perform an on-site demonstration for the judge to verify system performance parameters and collect a product sample for verification by an independent laboratory. Results by the independent laboratory will be the determining factor for scoring the sample's target compound composition and quantity. After samples from all participating teams have been collected and analyzed by an independent laboratory, the team will be provided an official score based on the results and scoring criteria described below.

Teams should refer to Section 6.0 of the Official Rules for a detailed description of the evaluation process.

Q4.2 Can competitors use a bioreactor technology?

A4.2 The focus of this challenge is to create physicochemical processes that do not require living organisms or their catalytic products (e.g., enzymes) as a part of the process. Therefore bioreactors are not permitted to be a functional component of the proposed system. Also, systems such as immobilized enzymes are precluded as they rely on the growth, harvesting and purification of organisms to create the necessary process catalysts. Biologically-derived products such as plastics, wood etc. can be used for fabricating parts of the reactor system, but not as a catalytic agent.

Q4.3 Why is \$250,000.00 in insurance required in order to participate?

A4.3 Please refer to section 11.3 of the participation agreement, "this liability insurance shall cover (A) a third party for death, bodily injury, or property damage, or loss resulting from an activity carried out in connection with participation in a competition, with the U.S. Government named as an additional insured under the registered Competitor's insurance policy and registered Competitors agreeing to indemnify the U.S. Government against third party claims for damages arising from or related to competition activities; and (B) the U.S. Government for damage or loss to Government property resulting from such an activity."

Q4.4 Is the goal of the challenge to convert CO₂ to sugar through an apparatus?

A4.4 The focus of this challenge is to create physicochemical processes that do not require living organisms or their catalytic products (e.g., enzymes) as a part of the process to generate the targeted products. Systems such as immobilized enzymes are precluded as they rely on the growth, harvesting and purification of organisms to create the necessary process catalysts. Biologically-derived products such as plastics, wood etc. can be used for fabricating parts of the reactor system, but not as a catalytic agent.

5.0 ELIGIBILITY

Q5.1 Who is eligible to participate?

A5.1 Anyone can participate in the competition as long as they meet the eligibility requirements as stated in the Official Rules, and they are not a citizen or an entity from a country listed on the NASA Export Control Program List of designated countries under Category 2/Column 2. (The current list of designated countries can be found at https://oior.hq.nasa.gov/nasaecp/docs/DCList_02-15-2017.pdf)

NASA welcomes applications from individuals, teams, and organization or entities that have a recognized legal existence and structure under applicable law (State, Federal or Country) and that are in good standing in the jurisdiction under which they are organized with the following restrictions:

1. **Individuals must be** U.S. citizens or permanent residents of the United States, and **must be** 18 years or older.
2. **Entity must be** incorporated in and maintaining a primary place of business in the United States.
3. **Teams must be** comprised of otherwise eligible individuals or organizations, and led by an otherwise eligible individual or organization.
4. **Teams must** conduct their demonstration work in facilities based in the United States, to include AK, HI and U.S. territories.

Refer to Section 7.0 of the Official Rules for a complete set of eligibility requirements.

Q5.2 Can a person with a green card (not US citizen) participate in the competition?

A5.2 Yes, a permanent resident of the United States can participate in the competition.

Q5.3 I am a Federal Employee, may I participate?

A5.3 Federal employees who do not work in the field of study or area of expertise related to a particular challenge may assist a team during non-working hours. They may not use any federal resources in their assistance.

See Section 7.0 of the Official Challenge rules for full details to ensure you meet the eligibility requirements.

Q5.4 We are a Small Business Innovation Research (SBIR) program grantee. Can we apply?

A5.4 If you are a past grantee of the SBIR program, you may apply. If you are a current grantee, please note that no U.S. government funds may be used to prepare your submission. If you have any questions about your eligibility, please contact us at questions@c02conversionchallenge.org.

Q5.5 Can you participate as an individual in the competition?

A5.5 Individuals can participate in the competition as long as they meet the eligibility requirements as stated in Section 7.0 of the Official Rules.

Q5.6 Can we add additional team members after we have registered and completed the Team Registration form?

A5.6 New team members may be added to the team after the initial registration period ends. Team members previously registered for the challenge on one team may not switch teams during the same phase of the competition. The Team Leader must submit a revised Team Roster notifying NASA of the change, and the new team member(s) must sign an Adoption Agreement and Foreign Participation form (if applicable). Any changes to the team roster are not official until accepted by NASA. The existing Team Leader is accountable for any decision to make changes to the team roster, including bringing on new team members and/or releasing registered team members.

Q5.7 Can Universities participate and receive prize money?

A5.7 Eligible Universities are invited to participate in the CO₂ Conversion Challenge and can receive prize money. Any money awarded through a NASA Centennial Challenge is prize money and not considered Grant funding.