



U.S. DEPARTMENT OF ENERGY



Hydrogen Business Case Prize Competition 2021

Preface

This prize will be governed by 15 U.S.C. §3719 and this Official Rules document. This is not a procurement under Federal Acquisitions Regulations (Title 48 of the Code of Federal Regulations) and will not result in a grant or cooperative agreement under 2 CFR 200. The Prize Administrator reserves the right to modify this Official Rules document if necessary and will publicly post any such modifications as well as notify registered prize competitors.

Contents

- Hydrogen Business Case Prize Competition 2021 4
- 1. Competition Summary 4
- 2. Timeline Summary 6
- 3. Hydrogen Business Case Prize Competition Description 7
 - 3.1 Background 7
 - 3.2 Submission Requirements 8
 - 3.3 Data 11
 - 3.4 Tool Formatting Requirements 12
- 4. Competition Process 12
 - 4.1 Eligibility 12
 - 4.2 Mentorship 13
 - 4.3 Scoring 13
- 5. Prizes 18
 - 5.1 Internships Matching Process 19
 - 5.2 Demo Day 19
- 6. Additional Terms and Conditions 19
 - 6.1 Universal Contest Requirements 19
 - 6.2 Verification for Payments 20
 - 6.3 Teams and Single-Entity Awards 20
 - 6.4 Submission Rights 21
 - 6.5 Copyright 22
 - 6.6 Contest Subject to Applicable Law 22
 - 6.7 Resolution of Disputes 22
 - 6.8 Publicity 22
 - 6.9 Liability 22
 - 6.10 Records Retention and the Freedom of Information Act 23
 - 6.11 Privacy 24
 - 6.12 General Conditions 24
- 7. Competition Authority and Administration 24

1. Competition Summary

The Department of Energy (DOE)'s Hydrogen and Fuel Cell Technologies Office (HFTO) within the Office of Energy Efficiency and Renewable Energy (EERE) is committed to encouraging clean energy through research, development, demonstration, and deployment of hydrogen technologies and supporting workforce development in this space. This prize competition will provide an opportunity for competitors to learn about hydrogen production, infrastructure, and utilization technologies and for successful teams to advance their education in this space through DOE-funded internships.

The Hydrogen Business Case Prize Competition engages students and professionals interested in hydrogen and fuel cells to develop a modeling tool that characterizes the regional value proposition for hydrogen in multiple applications, including opportunities to co-locate supply and demand.

The competitors are asked to develop a user-friendly computational tool that characterizes business cases for hydrogen in user-defined scenarios, accounting for multiple end use applications and key drivers of profitability, such as energy prices and infrastructure and hydrogen production costs. The tool must be developed in a format readable by Microsoft Excel, and it must be submitted for scoring at the end of the competition.

The competition consists of two phases and has an eight-month duration. Competitors can join the challenge in teams of 1–5 people. They need to submit an initial set of registration documents with a deadline stated in Table 2 and assign a team captain. Cash prizes for winning teams will be disbursed by the Prize Administrator¹ to the team captain. After the registration is submitted, the next deliverable is the Phase I report submission. During Phase I, the concept submission phase, teams are asked to develop a brief report (up to 10 pages) describing the design of the tool they intend to develop. The report will be reviewed by DOE, and up to 10 teams will be awarded a cash prize and will be invited to continue to Phase II. Then, in Phase II, the tool development phase, teams will develop and submit the tool, along with a final report that details inputs, assumptions, results, and analysis of a case study completed using the tool.

At the end of Phase II of the competition, each competing team will present their tool in front of a panel of experts at a Demo Day event organized by the Prize Administrator. These tools and the associated presentations will then be scored by the panel. DOE will utilize these scores to select the winning teams. At the end of the competition, the top five Phase II winning teams' tools will be posted online made

¹ DOE has partnered with the National Renewable Energy Laboratory to administer the Hydrogen Business Case Prize.

available for beta testing and use by the stakeholder community. Other entrants will also be given the opportunity to post their tools online for beta testing or use by the stakeholder community.

At the conclusion of Phase I, up to 10 teams will be awarded cash prizes of \$10,000 per team and invited to continue into Phase II. After Phase II, members of the teams at 1st and 2nd place will be considered for paid internships located at companies, nonprofits, or national laboratories that are active in the hydrogen and fuel cell technologies sector. Additionally, the top 5 teams will receive cash prizes as summarized in Table 1. Representatives of the top 10 teams will be given the opportunity to make poster presentations of their modeling tools at the DOE Hydrogen Program 2022 Annual Merit Review and Peer Evaluation Meeting (AMR), and the top 10 teams will be given cash stipends of \$1,500 per team member (e.g., a team of five individuals would receive a stipend of \$7,500) to cover travel costs associated with attending the AMR.

Table 1. Competition Benefits and Prizes

Phase I	
Anticipated Number of Awards	Up to 10 teams
Remuneration/ Amount after Phase I	\$10,000 per team
Phase II	
Anticipated Number of Awards	Cash: Five teams Possible Internships: Two teams
Remuneration/ Amount after Phase II	Cash: Teams in first through fifth place will be eligible for the following cash awards: \$50,000 – team at 1 st place \$30,000 – team at 2 nd place \$30,000 – team at 3 rd place \$20,000 – team at 4 th place \$10,000 – team at 5 th place Internships: Competitors in teams at first and second place will each be considered for an internship compensated at \$650/week for up to 3 months, with a \$1,000 stipend for travel pending acceptance with an internship host.

During both phases of the competition, the Prize Administrator will organize weekly 1-hour mentorship sessions, wherein experts from the hydrogen and fuel cell industry will be available to answer competitors' questions about the hydrogen and fuel cell industry. Many of these experts will ultimately also participate as reviewers during the Demo Day and will be from organizations offering internships as prizes. The mentorship sessions will begin in November of 2021.

The National Renewable Energy Laboratory (NREL) is the Hydrogen Business Case Prize administrator and supports student team efforts through educational webinars and informational references. Learn more at www.herox.com/h2businesscase. Questions on these rules or the program overall can be directed to H2BusinessCase@nrel.gov. The captain of each team can register the team to compete at the [HeroX link](#). The website will prompt you for a submission package where applicants can upload the curriculum vitae (CV) of each of the group members and a paragraph description of the hydrogen business case each registered team will be developing.

The internships being offered through this prize will be administrated by the Oak Ridge Institute for Science and Education (ORISE) and will be funded by DOE.

2. Timeline Summary

The key dates of the competition are summarized in Table 2.

Table 2. Key dates

Phase	Date	Prize Milestone
Phase I	October 5, 2021	Prize opens
	October 8, 2021	Informational webinar
	October 29, 2021 by 3 p.m. MT	Deadline for Submission of Registration Documents
	January 21, 2022 by 3 p.m. MT	Deadline for Phase I Submission Package
	February, 2022	Phase I winners will be announced
Phase II	May 6, 2022 by 3 p.m. MT	Deadline for Phase II Submission Package
	May 13, 2022	Demo Day
	Expected announcement May 20, 2022	Phase II winners and internships announced

3. Hydrogen Business Case Prize Competition Description

3.1 Background

The Hydrogen Business Case Prize aims to create educational opportunities for emerging talents within the hydrogen and fuel cell technology space and inform stakeholders about unique business cases in this field and pathways to achieving DOE's Hydrogen Shot target of \$1/kg hydrogen in one decade.

Competitors are asked to develop user-friendly computational tools that can be used to characterize the business case for hydrogen and fuel cells in multiple sectors.

The business case prize is being launched in support of DOE's [H2@Scale](#) initiative to advance hydrogen and fuel cell technologies to enable decarbonization across a range of sectors, including industry (e.g., metals production, heat generation), chemicals, blending into natural gas, energy storage, and transportation (Figure 1). While DOE has funded the development of many analytic tools over the past several decades, each of these tools has focused on individual elements of the supply chain (e.g., production, infrastructure, or specific end uses) or enabled limited integrated analysis that is not region-specific. The Hydrogen Business Case Prize Competition is soliciting the development of new tools that each characterize the regional value proposition of deployments of hydrogen and fuel cells in the near term and evaluate numerous metrics of interest, such as emissions reduction, job creation, profitability, and costs of hydrogen systems. Teams may build upon the capabilities of existing DOE-funded tools and leverage their underlying data, but may not replicate them; eligible submissions will develop integrated modeling capabilities that are not currently available within any one of DOE's existing tools available here: https://www.hydrogen.energy.gov/systems_analysis.html.

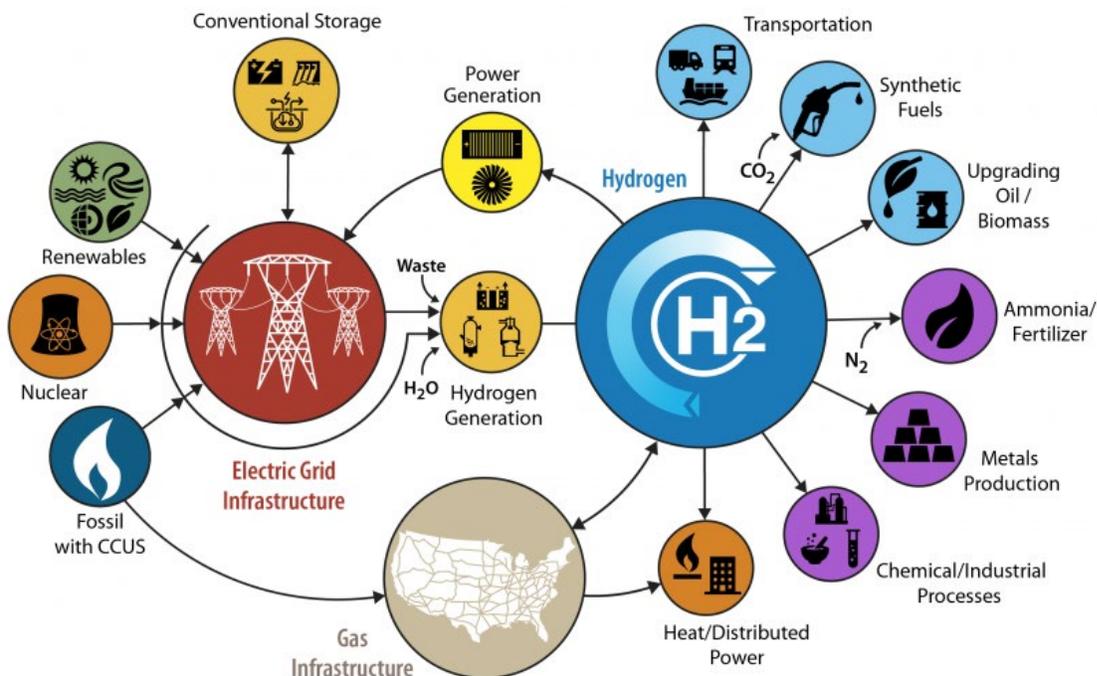


Figure 1. The H2@Scale initiative provides an overarching vision for enabling the large-scale production, delivery, storage, and use of hydrogen across multiple sectors to drive revenue opportunities, reduce costs, and reduce emissions.

3.2 Submission Requirements

3.2.1 REGISTRATION PACKAGE

The team captain must create an account on the HeroX platform and submit all required deliverables below on the HeroX platform by the associated deadlines. Only teams who submit the registration package by the deadline will be allowed to compete for the remainder of the competition. Teams may deviate from the abstract originally submitted in the Registration Package when developing the Phase I and II deliverables. The team captain must remain the same throughout the competition. The team captain may update the team member list in Phase I and Phase II submissions. Only team members listed in the Phase II Submission Package will be eligible for internship placement at the end of Phase II. As noted above, teams may have a maximum of 5 people. If more than 5 team members are listed (including the captain), or if CVs of more than five people are provided, the team may be disqualified. Content provided beyond the word and page limits for each of the deliverables will not be reviewed.

The first deliverable required to participate in this competition is the initial registration package, due no later than the deadline provided in Table 2. The initial registration package consists of:

- Cover page listing the team name, names of team members, and including a brief abstract describing the scope of the tool the team plans to develop. The abstract may be no more than 500 words in length.

- Resumes of team members
 - Each resume may be no longer than 1 page in length and must list any organizations that the team member is currently employed with. This information will be used to prevent conflicts of interest in selection of mentors, reviewers, and organizations offering internships.

3.3.2. PHASE I SUBMISSION PACKAGE

In Phase I of the competition, teams are expected to conduct background research regarding hydrogen and fuel cell technologies and key drivers of business case and sustainability to inform the capabilities and focus areas of the tool they plan to develop. The report must describe:

- All input parameters that the tool will accept
- All metrics that the tool will output
- The location(s) or region(s) that the tool will be designed for
- The timeframe that the tool will be designed to simulate (e.g., 10 years, 20 years, 30 years)
- The hydrogen production, infrastructure, and end use technologies the tool will be able to simulate
- Rationale for the input parameters, output metrics, locations, and technologies that were chosen for inclusion
- Methodology for the framework to be developed.

DOE will then evaluate the Phase I submissions according to the criteria provided in Table 4 of Section 4.4 and will select up to 10 teams for cash prize of \$10,000 and invite them to continue to Phase II. Teams will be allowed to deviate from their Phase I proposal when developing the tool.

The Phase I report submission must include:

- A cover page listing the team's name, name of the tool, names of team members, and an abstract describing the tool the team is planning to develop. The abstract may be up to 500 words in length.
- A report up to 10 pages in length (not including the cover page or CVs) meeting the guidelines described above.
- A single slide summarizing the contents of the report for internal use by DOE. The slide should include names of all team members and be submitted in a format readable by Microsoft PowerPoint.

3.3.3. PHASE II SUBMISSION PACKAGE

In Phase II, each team is expected to develop a tool that can characterize the business case for hydrogen over timeframes of 10–30 years. It is advised the tool focuses on a specific U.S. location (e.g., a facility,

regional demand centers, counties). Competitors are encouraged to focus on 1–2 primary end uses for hydrogen and 2–3 additional end uses, but they may consider additional end uses if they would like. Some examples of end uses are shown in Figure 2, but competitors are welcome to include other applications provided they can justify their choices.² Input and output parameters that applicants may incorporate in the tool include, but are not limited to:

- Quantity of regional hydrogen demand
- Price points for regional hydrogen demands
- Current regional policies (e.g., Renewable Portfolio Standards)
- Sizing of hydrogen technologies (e.g., electrolyzer, storage)
- System cost, revenues, and profit
- Payback time
- Emissions reduction
- Environmental justice metrics
- Corporate social responsibility metrics.

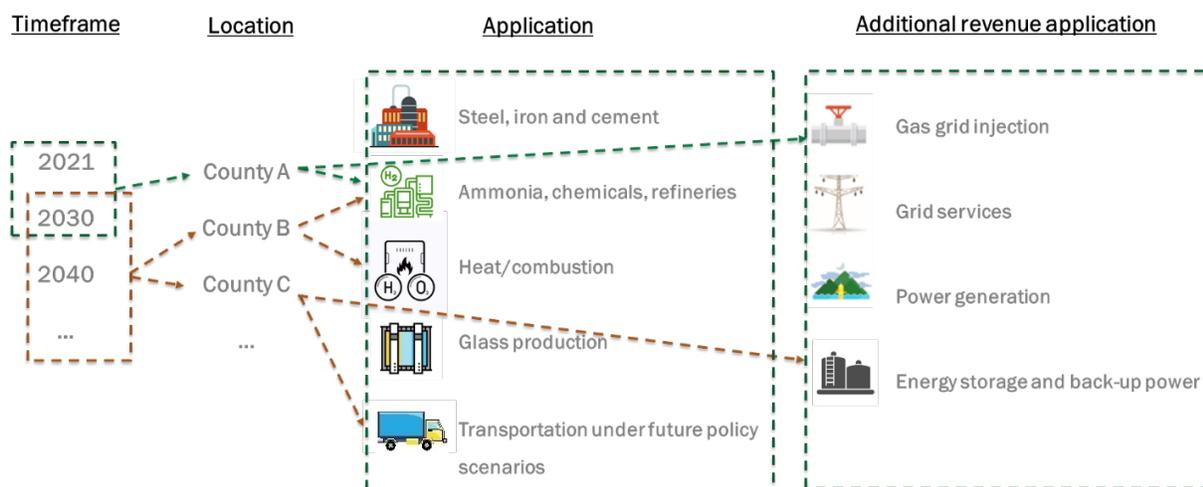


Figure 2. Example pathways that may be evaluated in the business case tool. Example is purely illustrative and not meant to serve as guidance. Teams should feel free to define the tool system boundary and scenarios as they would like, within the guidelines described in Section 3. The arrows in the figure are just illustrative.

For the Phase II submission, teams must upload the following documents:

- **Final report:** This report must be no more than 20 pages in length and comprise the following sections:

² Teams interested in learning more about end uses for hydrogen are encouraged to review recent H2@Scale analysis reports funded by HFTO, available here: <https://www.energy.gov/eere/fuelcells/h2scale>.

- Cover page: 1 page including team name, 500-word abstract, and names of team members.
- Background: Explanation of the scenarios the tool has been chosen to be able to model (location, timeframe, primary and ancillary hydrogen use cases) and justification for how these scenarios were defined.
- Methodology: Explanation of sources chosen for default techno-economic assumptions within the tool, description of all key inputs that users may modify and how these inputs were chosen, description of all key metrics that the tool evaluates and justification for why these metrics were chosen, and description of mathematical frameworks incorporated in the tool (e.g., key equations to calculate business case, environmental justice, or sustainability metrics).
- Case study: The team must complete a location-specific case study regarding the business case for hydrogen using the tool and describe the case study in the report. The narrative should describe key drivers of business case profitability, key drivers of cost, high areas of uncertainty, impacts of hydrogen on sustainability and environmental justice, and areas where future work could improve the tool's functionality.
- **Final tool:** Tool must be submitted in a format readable by Microsoft Excel.
- **Final presentation:** The presentation must be in a format readable by Microsoft PowerPoint. The team will be expected to use this presentation material to present the functionality of their tool at the Demo Day. The Demo Day will be held virtually, and each team will have up to 15 minutes to present the tool and the case study described in the final report, followed by up to 10 minutes of Q&A.

3.3 Data suggestions to inform tool

It is suggested that competitors use published literature sources to inform default techno-economic assumptions within the tool. Data pertaining to the United States is recommended to be used. Examples of relevant data to incorporate include:

- Capital cost of renewable source, hydrogen production technologies, hydrogen storage, and infrastructure
- Efficiencies of hydrogen technologies
- Capacity factors of renewable energy source and hydrogen production technologies
- Techno-economic specifications of industrial process/plant
- Electricity prices
- Limits pertaining to environmental regulations and policies.

3.4 Tool Formatting Requirements

The tool must be user friendly and may be built in any format readable by Microsoft Excel.

4. Competition Process

4.1 Eligibility

- The Hydrogen Business Case Prize Competition is open only to teams comprising exclusively permanent U.S. residents or U.S. citizens.
- DOE employees, employees of sponsoring organizations, employees of organizations supporting administration of the prize (i.e., DOE, NREL, and ORISE), members of their immediate families (i.e., spouses, children, siblings, or parents), and persons living in the same household as such persons, whether or not related, are not eligible to participate.
- Federal employees and DOE national laboratory employees are also not eligible to participate.
- Entities and individuals publicly banned from doing business with the U.S. government such as entities and individuals debarred, suspended, or otherwise excluded from or ineligible for participating in Federal programs are not eligible to compete.
- Entities and individuals identified as a restricted party on one or more screening lists of Department of Commerce, State and the Treasury are not eligible to compete. See Consolidated Screening List.
- This prize competition is expected to positively impact U.S. economic competitiveness. Participation in a foreign government talent recruitment program³ could conflict with this objective by resulting in unauthorized transfer of scientific and technical information to foreign government entities. Therefore, individuals participating in foreign government talent recruitment programs of foreign countries of risk are not eligible to compete. Further, teams that include individuals participating in foreign government talent recruitment programs of foreign countries of risk⁴ are not eligible to compete.

³ Foreign government talent recruitment program is defined as an effort directly or indirectly organized, managed, or funded by a foreign government to recruit science and technology professionals or students (regardless of citizenship or national origin, and whether having a full-time or part-time position). Some foreign government-sponsored talent recruitment programs operate with the intent to import or otherwise acquire from abroad, sometimes through illicit means, proprietary technology or software, unpublished data and methods, and intellectual property to further the military modernization goals and/or economic goals of a foreign government. Many, but not all, programs aim to incentivize the targeted individual to physically relocate to the foreign state for the above purpose. Some programs allow for or encourage continued employment at U.S. research facilities or receipt of Federal research funds while concurrently working at and/or receiving compensation from a foreign institution, and some direct participants not to disclose their participation to U.S. entities. Compensation could take many forms including cash, research funding, complimentary foreign travel, honorific titles, career advancement opportunities, promised future compensation, or other types of remuneration or consideration, including in-kind compensation.

⁴ Currently, the list of countries of risk includes Russia, Iran, North Korea, and China

By uploading a submission package, a team self-certifies that it is in compliance with the eligibility requirements. If the Prize Administrator becomes aware that a team or individual is not eligible, that team may be disqualified from the competition.

Competitors will be disqualified if:

- They fail to meet eligibility or to submit materials/documents on time.
- They are involved in any fraudulent acts, including plagiarism.
- They violate the law.

As part of all submissions, the team captain will be required to sign the following statement:

I am providing this submission package as part of my participation in this prize. 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 and § 287.

4.2 Mentorship

During both phases of the competition, mentors from industry, nonprofits, and/or the national labs will be available virtually for up to an hour a week to answer questions that team members have. The Prize Administrator will facilitate these sessions and aim to ensure that each team is allotted at least 10 minutes of time over the course of the competition with each mentor they are interested in engaging with. The amount of time each team is allotted with each mentor will depend on the number of mentors that are ultimately secured and the number of teams that apply.

These sessions will allow competitors and mentors to get to know one another and be exposed to different thinking and approaches.

4.3 Scoring

DOE will score Phase I submissions and use these scores to select up to 10 winning teams for cash prizes and an invitation to compete in Phase II.

The criteria for scoring are described in Table 4. The first column provides suggested content to meet each criterion. Reviewers will evaluate submissions against these criteria based on the degree to which they agree with statements in the second column, on a 1–6 scale described in Table 3 below.

The Prize Administrator will weight each score as shown in column 2 of Table 4.

Table 3. Scoring Scale for Reviewer Evaluations of Phase I and II submissions

1	2	3	4	5	6
Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree

Table 4. Phase I Scoring Criteria

Criterion: Breadth of Scope	
Suggested Content	Parameters for Reviewer Evaluation
<ul style="list-style-type: none"> Description of scope chosen within the tool, including region of focus, time frame that tool can model, hydrogen production methods and infrastructure planned for inclusion within tool, and end uses planned for inclusion within tool. Description of key variables that will affect the success or failure of the business cases that the tool can simulate. 	<p>The competitor’s rationale for scope demonstrates that the team has a thorough understanding of the current and likely future realities of hydrogen production and consumption. (Scored 1-6. Weight: 40%)</p> <p>Rationale is written in a clear and convincing manner. (Scored 1-6; Weight: 10%)</p>
Criterion: Methodology	
Suggested Content	Parameters for Reviewer Evaluation
<ul style="list-style-type: none"> Descriptions of equations/formula planned for inclusion within tool and data source for default inputs. 	<p>The equations/formula utilized in the tool incorporate sufficient and diverse metrics that together will provide an accurate representation of likelihood of success or failure of business cases that the tool is designed to analyze. (Scored 1-6; Weight: 30%)</p> <p>The date and assumptions utilized by the tool represent are current and credible, given publicly available information. (Scored 1-6;; Weight: 10%)</p> <p>Equations/formula and data sources are clearly described. (Scored 1-6; Weight: 10%)</p>

Phase II submissions will be scored by a panel of invited experts from organizations active in hydrogen and fuel cells across industry, nonprofits, and academia.⁵ The criteria for scoring are described in Table 5. The first column provides suggested content to meet each criterion. Unless stated otherwise in the second column (“Parameters for Reviewer Evaluation”), reviewers will evaluate submissions against content in the first column based on the degree to which they agree with statements in the second column on the scale described in Table 3. DOE will utilize these scores to select the top winning teams. All Parameters for Reviewer Evaluation in Phase II are weighted equally.

Table 5. Phase II Competition Scoring

Criterion 1: Breadth of Scope (Up to 50 Points)	
Suggested Content	Parameters for Reviewer Evaluation
<ul style="list-style-type: none"> Identify the geographic focus of your tool. Explain the rationale for the geographic region chosen, end uses incorporated within the tool, interrelationships between the end uses, and the basis for the price points of hydrogen assumed per end use. List the end uses that your tool is capable of analyzing. 	<p>The rationale for the end uses and geographic region chosen for inclusion within the tool, and the price points for hydrogen assumed per end use, are logical, realistic, comprehensive, and well-described. (Scored 1-6)</p> <p>The tool includes multiple end uses for hydrogen.</p> <p><i>In evaluating this parameter, rather than using the scale in Table 3, reviewers will provide 1 point per end use included for a maximum of 5 points.</i></p>
<ul style="list-style-type: none"> Show how the tool is capable of simulating key measures of business case viability, including revenue, cost, return on investment, and payback period. Explain the manner in which each of these parameters is calculated. 	<p>The tool includes multiple measures of business case viability, and the manner in which each measure is calculated is explained in the final report.</p> <p><i>In evaluating this parameter, rather than using the scale in Figure 3, reviewers should provide 1 point per measure included for a maximum of 5 points.</i></p> <p>The equations/formula included in the report and tool accurately calculate the values of their corresponding metrics. (Scored 1-6)</p>

⁵ Reviewers shall not have personal or financial interests in any entity that is a registered competitor in a prize; be an employee, officer, director, or agent of any entity that is a registered competitor in a prize; or have a familial or financial relationship with an individual who is a registered competitor. All reviewers must sign a standard prize Conflict of Interest/Nondisclosure Agreement before they are allowed to review.

	<p>The metrics chosen for inclusion within the tool provide a meaningful assessment of the viability of a business case and are clearly explained in the report. (Scored 1-6)</p>
<ul style="list-style-type: none"> • Explain how the tool characterizes environmental justice (EJ) impacts of deployments, and describe the formulae used to determine those impacts in the report. • Examples of environmental justice include the concept of equity, reductions in criteria pollutant emissions in disadvantaged communities,⁶ increased employment for members of disadvantaged communities, increase in sustainable regional economic growth, and resilience for communities that are likely to experience negative impacts of climate change. 	<p>The tool contains multiple metrics directly relevant to EJ. <i>In evaluating this parameter, rather than using the scale in Figure 3, reviewers should provide 1 point per metric included, for a maximum of 4 points.</i></p> <p>The final report clearly and accurately describes the rationale for the team’s choice of EJ metrics to include within the tool and how these metrics are evaluated in the tool. (Scored 1-6)</p>
<ul style="list-style-type: none"> • Explain the time frame the tool is capable of modeling. A time frame of 10–30 years is recommended. 	<p>The tool is capable of modeling a time frame of 10–30 years and the final report explains the rationale for the time frame chosen. (Scored 1-6)</p> <p>The tool is able to account for fluctuations in key variables over time (e.g., energy prices), and the report explains why these variables were designed to vary. (Scored 1-6)</p>

⁶ DOE defines “disadvantaged communities” as areas that most suffer from a combination of economic, health, and environmental burdens, such as poverty, high unemployment, air and water pollution, and presence of hazardous wastes, as well as high incidence of asthma and heart disease. Examples include but are not limited to: economically distressed communities identified by the Internal Revenue Service as Qualified Opportunity Zones; communities identified as disadvantaged 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 DOE definition of a disadvantaged community.

Criterion 2: User Friendliness (Up to 6 Points)	
Suggested Content	Parameters for Reviewer Evaluation
<ul style="list-style-type: none"> Ensure that the tool is user friendly. 	<p>The tool allows for easy modifications to inputs, clearly describes outputs, and is intuitive to use. (Scored 1-6)</p>
Criterion 3: Robustness (Up to 6 Points)	
<ul style="list-style-type: none"> Develop the tool to be capable of performing reasonably given changes to user inputs. 	<p>The tool provides reasonable results when sensitivity analyses are conducted given large changes to inputs (e.g., fluctuations in energy prices that could materialize given disruptions in future energy systems). (Scored 1-6)</p>
Criterion 4: Presentation at Demo Day (Up to 12 Points)	
<ul style="list-style-type: none"> Present the tool in a clear and engaging manner. 	<p>Visual materials (e.g., slides) and live demonstration of tool are clear, effective, thorough, creative, and professional. (Scored 1-6)</p> <p>Presenters' oral presentation is clear and engaging, and presenters are prepared (e.g., able to present without reading off of slides) and adeptly able to answer audience questions. (Scored 1-6)</p>

While the scores of the expert reviewers will be carefully considered, it is the role of the Prize Judge to maximize the impact of contest funds. Some factors outside the control of competitors and beyond the independent expert reviewer scope of review may need to be considered to accomplish this goal. In addition to the reviewers' scores, the following program policy factor may be considered in determining winners:

- The degree to which the submission exhibits team member diversity and the inclusion of underrepresented groups, with participants including but not limited to graduates and students of

historically black colleges and universities (HBCUs) and other minority serving institutions (MSIs) or members operating within Qualified Opportunity Zones or other disadvantaged communities.⁷

5. Prizes

The prizes of the Hydrogen Business Case Prize Competition are as follows.

Phase I:

Up to 10 teams—\$10,000 cash prize for each team.

Phase II:

1st Place—Each team member will be considered for a 3-month paid internship (compensation described in Table 1), and a \$50,000 cash prize for the entire team.

2nd Place—Each team member will be considered for a 3-month paid internship (compensation described in Table 1), and a \$30,000 cash prize for the entire team.

3rd Place—\$30,000 cash prize for the entire team.

4th Place—\$20,000 cash prize for the entire team.

5th Place—\$10,000 cash prize for the entire team.

The top 10 teams at the end of Phase II will all be invited to present posters describing their tools at the DOE Hydrogen Program 2022 Annual Merit Review, June 6–9, 2022. If the event is held in person (decision pending COVID conditions at the time), a stipend will be provided to the team to cover travel costs. This stipend will be valued at \$1,500 per team member (e.g., a team of five people would receive a total stipend of \$7,500, awarded to the HeroX account holder). The winning teams will also be publicly recognized by DOE. Cash prizes will be paid to the captain of each winning team upon receipt of the Internal Revenue Service Form W-9 and Automated Clearing House (ACH) banking information. Captains are responsible for further disbursing prize funds.

⁷ DOE defines “disadvantaged communities” as areas that most suffer from a combination of economic, health, and environmental burdens, such as poverty, high unemployment, air and water pollution, and presence of hazardous wastes, as well as high incidence of asthma and heart disease. Examples include but are not limited to: economically distressed communities identified by the Internal Revenue Service as Qualified Opportunity Zones; communities identified as disadvantaged 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 DOE definition of a disadvantaged community.

5.1 Internships Matching Process

At the beginning of the prize competition, DOE will host a webinar announcing the competition and soliciting members of industry and nonprofits with ongoing activities in hydrogen and fuel cells to offer summer internships as part of the prize to the winning and runner-up teams. Stakeholders will be asked to express their interest in offering internships and in participating in the mentorship sessions to DOE within 3 weeks of the webinar. During Phase II of the Prize, stakeholders that expressed interest will be contacted, and those that are still interested will be asked to submit short (1 page or less) descriptions of the internships they are willing to offer and the associated timeframe of those internships. These internship descriptions will be shared with members of the two winning teams. Subsequently, each organization offering internships will be asked to rank the students they are interested in, in order of preference, and to identify students that they are not interested in accepting. Each competitor in a winning team will also be asked to rank the internships they are interested in, in order of preference, and identify internships they are not interested in accepting. These internships and students will then be matched with one another by DOE. All rankings will be processed by DOE and will be kept confidential.

DOE will fund all internships through ORISE. Team members in first and second place who are interested in the internships being offered will need to apply through the [ORISE website](#) once the winning teams are notified.

5.2 Demo Day

At the Demo Day event, teams will present their tools, and a case study performed using those tools, in front of experts from industry, academia, national laboratories, and DOE. Teams must submit their presentations in a PowerPoint format as part of the final submission by the respective deadline in Table 2. Teams will be given 15 minutes to present, followed by up to 10 minutes to answer audience questions. The timing allocated to questions and answers may vary depending on the number of teams that ultimately apply.

6. Additional Terms and Conditions

6.1 Universal Contest Requirements

Your submission for the Hydrogen Business Case Prize Competition is subject to the following terms and conditions:

- You agree to release your stakeholder engagement tool under a Creative Commons Attribution 4.0 International License (see <https://creativecommons.org/licenses/by/4.0/>).
- You must include all the required submission elements. The Prize Administrator may disqualify your submission after an initial screening if you fail to provide all required submission elements.

- Submission of the Initial registration Package, Phase I Submission Package, and Phase II Submission Package must be in English, in a format readable by Microsoft, and in at least 11-point font. Scanned hand-written submissions will be disqualified. The Phase II tool deliverable may be in a format readable by Microsoft Excel; files with macros are permitted. The Phase II presentation must be in a format readable by Microsoft PowerPoint.
- Submissions and competitors will be disqualified if any engagement with the Hydrogen Business Case Prize Competition—including but not limited to the submission, the HeroX forum, or emails to the Prize Administrator—contains any matter that, in the sole discretion of DOE or NREL, is indecent, obscene, defamatory, libelous, lacking in professionalism, or demonstrates a lack of respect for life on this planet.
- If you click “Accept” on the HeroX platform and proceed to register for the competition described in this document, these rules will form 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 the contest. You should print and keep a copy of these rules. These provisions only apply to the contests described here and no other contests on the HeroX platform or anywhere else. To the extent that these rules conflict with the HeroX Terms of Use, these rules shall govern.
- The Prize Administrator, when feasible, may give competitors an opportunity to fix non-substantive mistakes or errors in their submission packages.

6.2 Verification for Payments

The Prize Administrator will verify the identity and the role of a competitor potentially qualified to receive the prizes. Receiving a prize payment is contingent upon fulfilling all requirements contained herein. The Prize Administrator will notify winning competitors using provided email contact information after the date that results are announced. Each competitor (or parent/guardian if under 18 years of age) will be required to sign and return to the Prize Administrator, within 30 days of the date the notice is sent, 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 Prize Administrator, a winning competitor will be disqualified from the competition and receive no prize funds if: (i) the person/entity cannot be contacted; (ii) the person/entity fails to sign and return the required documentation within the required time period; (iii) the notification is returned as undeliverable; (iv) the submission or person/entity is disqualified for any other reason.

6.3 Teams and Single-Entity Awards

The Prize Administrator will award a single dollar amount to the designated primary submitter, whether consisting of a single entity or multiple entities. The primary submitter is solely responsible for allocating

any prize funds among its member competitors as they deem appropriate. The Prize Administrator will not arbitrate, intervene, advise on, or resolve any matters between team members or between teams.

6.4 Submission Rights

By making a submission, and thereby consenting to the rules of the contest as described in this document, a competitor is granting to DOE, the Prize Administrator, and any other third parties supporting DOE in the contest a license to display publicly and use all parts of any submission for any other government purpose. This license includes posting or linking to the portions of the submission on the Prize Administrator or HeroX applications, including the contest website, DOE websites, and partner websites, and the inclusion of the submission in any other media, worldwide. The submission may be viewed by the DOE, Prize Administrator, and reviewers for purposes of the contests, including but not limited to screening and evaluation purposes. The Prize Administrator and any third parties acting on their behalf will also have the right to publicize competitor's name and, as applicable, the names of competitor's team members and organization, which participated in the submission on the contest website indefinitely.

By entering, the competitor represents and warrants that:

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, dialogue from plays, 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 Prize Administrator 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;

Unless otherwise disclosed in the submission, the use thereof by Prize Administrator, or the exercise by Prize Administrator 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;

All persons who were engaged by the competitor to work on the submission or who appear in the submission in any manner have:

- Given 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

- 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 their parent or legal guardian) and competitor may be asked by Prize Administrator to provide permission in writing
- 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.

6.5 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 applicant or that the applicant 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 upon any other third party rights of which the applicant is aware; and that the submission is free of malware.

6.6 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 contest 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 awards are contingent upon the availability of appropriations.

6.7 Resolution of Disputes

The U.S. Department of Energy is solely responsible for administrative decisions, which are final and binding in all matters related to the contest.

Neither the U.S. Department of Energy nor the Prize Administrator will arbitrate, intervene, advise on, or resolve any matters between team members or among competitors.

6.8 Publicity

The winners of these prizes (collectively, "winners") will be featured on the DOE 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.

6.9 Liability

Upon registration, all competitors agree to assume and, thereby, have assumed any and all risks of injury or loss in connection with or in any way arising from participation in this contest, development of any

submission. 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.

6.10 Records Retention and the 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. 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 shall be used or disclosed only for evaluation of the application. Such information will be withheld from public disclosure to the extent permitted by law, including the Freedom of Information Act. 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 Freedom of Information Act or otherwise. 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 follows and identify the specific pages containing trade secrets, confidential, proprietary, or privileged information:

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. [End of Notice]

The header and footer of every 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.

Competitors will be notified of any Freedom of Information Act 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.

6.11 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.

6.12 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.

Although DOE indicates that it will select up to ten winning teams 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 winners and will award no prize money.

6.13. 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 CONTEST.

7. Competition Authority and Administration

The Hydrogen Business Case Prize Competition is organized by DOE and NREL, which is managed and operated by the Alliance for Sustainable Energy, LLC, for DOE. Funding is provided by DOE EERE-HFTO. The views expressed herein do not necessarily represent the views of DOE or the U.S. government.

The Hydrogen Business Case Prize Competition is governed and adjudicated by this rules document, which is intended to establish fair contest rules and requirements. The competition is designed and administered by a team consisting primarily of DOE and NREL staff. In the case of a discrepancy with

other competition materials or communication, this document takes precedence. The latest release of these rules takes precedence over any prior release. The Prize Administrator reserves the right to change contest criteria, rules, and outcomes as needed. Additionally, competitors are encouraged to bring to the organizers' attention rules that are unclear, misguided, or in need of improvement. For the purposes of competition evaluation, a violation of the intent of a rule will be considered a violation of the rule itself. Questions on these rules or the program overall can be directed to H2BusinessCase@nrel.gov.

Expert reviewers may not have personal or financial interests in; be an employee, officer, coordinator, or agent of any entity that is a registered competitor in; or have a familial or financial relationship with an individual who is a registered competitor in this contest.

By making a submission and consenting to the rules of this competition, each team member grants to the Government permission to use and make publicly available any entry provided or disclosed to DOE in connection with the competition. In addition, each team grants to the Government, and others acting on its behalf, a paid-up nonexclusive, irrevocable, worldwide license to reproduce, prepare derivative works, distribute copies to the public, and perform publicly and display publicly, by or on behalf of the U.S. Government, for any and all copyrighted works that are or make up any submission.

Hydrogen Business Case Prize competition and any associated nicknames and logos ("Competition Marks") are trademarks owned by DOE. The trademark license granted to contestants is below. Non-contestants can request individualized trademark licenses (for the purpose of engaging with contestants and/or expressing interest in the competition); the decision to grant such licenses is under the sole discretion of DOE.

1. Contestants are granted, for the duration of the competition, a revocable, non-exclusive, royalty-free license to use the Competition Marks for the purposes of producing materials for the competition and other approved competition-related activities as long as the use does not suggest or imply endorsement of the contestant by DOE, and the use of the Competition Marks by a contestant does not imply the endorsement, recommendation, or favoring of the contestant by DOE.
2. Contestants may not use the Competition Marks for any other purpose. Contestants may not sublicense the Competition Marks.
3. All contestants can request individualized trademark licenses; the decision to grant such requests is under the sole discretion of DOE.

Further, from the [Competes Act](#):

(j) Intellectual property

- (1) Prohibition on the government acquiring intellectual property rights

The Federal Government may not gain an interest in intellectual property developed by a competitor in a prize competition without the written consent of the competitor.

(2) Licenses

As appropriate and to further the goals of a prize competition, the Federal Government may negotiate a license for the use of intellectual property developed by a registered competitor in a prize competition.