



U.S. DEPARTMENT OF ENERGY

## American-Made Perovskite Startup Prize

The American-Made Perovskite Startup Prize is designed to accelerate the growth of the domestic perovskite industry, with support from a diverse and powerful support network that leverages national laboratories, energy incubators, and other resources across the United States.

**These rules are effective from Aug. 29, 2022**

**These rules reflect updates to the following sections:**

**Updated language on the quarterly application cycle to read multiple submission deadlines per year in the following sections: Section I.2, Section I.3, Section I.7, Section II.4, Section II.5, Section III.4, and Section III.5.**

**Section I.3: Updated Contest Funding table to reflect total number of anticipated Power Up Prize awards throughout the prize.**

**Section I.7: Added the following language to what to submit to the Liftoff Contest:**

- **Competitors must submit a Letter of Intent a minimum of four weeks before completing a submission package for a Liftoff Deadline. Letters of Intent are short documents informing the prize administrator that a competitor plans to participate in an upcoming deadline.**

**Section II.1: Updated Countdown Contest Prizes table to reflect total number of anticipated Power Up Prize awards throughout the prize.**

**Section II.7: Clarification on scoring to include the reviewer recommendation scores.**

**Section III.5: Added the following language to what to submit to the Liftoff Contest:**

- **Letter of Intent:** Competitors must submit a Letter of Intent a minimum of four weeks before completing a submission package for a Liftoff Deadline. Letters of Intent are short documents informing the prize administrator that a competitor plans to participate in an upcoming deadline.

**Section III.6: Added the following language to what to submit to the Liftoff Contest:**

- Competitors must submit a Letter of Intent a minimum of four weeks before completing a submission package for a Liftoff Deadline. Letters of Intent are short documents informing the prize administrator that a competitor plans to participate in an upcoming deadline.

**Previous update, July 20th, 2022:**

**Section I.2:** Updated figure to reflect most recent data

**Section I.3:** Added the following language to include the Power Up Prize and updated the contest funding table:

- DOE can also award a \$40,000 Power Up Prize to teams that are not selected as a Countdown Contest finalist.
- **Power Up Prize:** Teams who submit to one of the deadlines and submit a compelling innovation are eligible to receive a \$40,000 Power Up Prize if they are not selected as a finalist for the Countdown Contest. The Power Up Prize is evaluated under the same criteria plus one additional criteria as the Countdown Contest and is awarded to teams that present a compelling innovation but need further refinement of their technology and/or business plan. Recipients of the Power Up Prize are encouraged to use their funds to iterate on their technology and/or business plan for future deadlines of the Perovskite Startup Prize. See [eligibility](#) for further details regarding these Incentive Prizes and the [Countdown Contest Rules](#) for additional information.
- Power Up Prize recipients receive \$40,000 in cash to further refine their innovation before the next Countdown Contest.

**Section 1.7 Eligibility:** Added the following language:

- Competitors not selected as winner of a particular Countdown Contest review cycle may be selected to receive a Power Up Prize. All contest-eligible competitors can receive a Power Up Prize.
- A team can only receive one Power Up Prize over the entirety of the Countdown Contest, regardless of how many deadlines they submit to.
- The Power Up Prize is an additive prize. Competitors who receive a Power Up Prize in one deadline are still eligible to win the full \$200,000 in future Countdown Contest deadlines.

**Section II.1:** Added the Power Up Prize to the table.

**Section II.3:** Added: The Countdown Contest includes Power Up Prizes of \$40,000 cash for competitors who meet the same criteria as finalists of the Countdown Contest. The Power Up Prize is evaluated under the same criteria plus one additional criteria as the Countdown Contest and is awarded to teams that present a compelling innovation but need further refinement of their technology and/or business plan. Recipients of the Power Up Prize are encouraged to use their funds to iterate on their technology and/or business plan for future deadlines of the Perovskite Startup Prize.

**Section II.5.9:** Added language to include the Power Up Prize.

**Section II.6:** Added a new review criteria under the Reviewer Recommendation:

*If the Statement above is scored as a '1,' then:*

**The following statement is scored as 1 or 6**

- The gaps in this submission can be sufficiently addressed with \$40,000 of additional development.

**Section II.7:** Added language to how the total score is calculated for the Countdown Contest and Power Up Prize, as well as the following language:

**POWER UP PRIZE**

The same criteria used to score the Countdown Contest submissions will be used to evaluate recipients of the Power Up Prize in addition to the new Reviewer Recommendation criteria regarding whether or not the gaps in the submission are addressable with the Power Up Prize.

**Section IV.3:** Added language to include recipients of the Power Up Prize.

## **Previous Update, March 11<sup>th</sup>, 2022:**

### **Section 1.3:** Added the following language:

- When resubmitting, materials should be revised based off the reviewer feedback and support from the Mentor Network or other experts.
- Liftoff Contest competitors are encouraged to continue to work with the Mentor Network and make new connections as their technology and business evolve over time.

**Section I.6.4:** Explained the Perovskite Startup Prize Mentor Network in more detail and explains a new requirement that competitors engage with Perovskite Mentors and include a “Mentor Engagement Outputs” in their submissions.

### **Section I.7 Eligibility:** Two changes have been made:

- For the Countdown Contest, the rule change explains that competitors who have previously provided a submission in this prize must include a “Mentor Engagement Output” in their next submission to be eligible to compete. Furthermore, this “Mentor Engagement Output” must be updated with each resubmission in order to maintain eligibility.
- For the Liftoff Contest, the rule change clarifies how delays in the submissions deadlines will be incorporated into the eligibility periods for applicants to this contest.

**Section I.8 Program Goal Requirements:** Added the following language: The proposed perovskite-based photovoltaic solution will have a pathway to economic viability in the terrestrial power market.

**Section II.5.5, Section II.5.10:** Added a contest process step for obtaining feedback from the Mentor Network.

**Section II.6:** Explained a new application requirement that competitors must engage with Perovskite Mentors and include a “Mentor Engagement Outputs” in submissions.

**Section II.7:** Explained how the new application requirement, the “Mentor Engagement Output”, will be scored.

### **Section III.5.1:** Added the following language:

- Competitors are encouraged to continue leveraging the Mentor Network as their proposed technology and business plans evolve throughout the competition.

**Section IV.1:** Added the “Mentor Engagement Output” to the list of materials that are not intended to be made public.

**Section IV.15:** Added a definition for the “Mentor or Mentor Network” to the list of definitions.

**Previous Update, April 30, 2021:** These rules reflect an update in Section I.7 and Section II.6 regarding company eligibility verification.

The U.S. Department of Energy (DOE)’s American-Made Perovskite Startup Prize will be governed by these official rules. The prize administrator and DOE reserve the right to modify the official rules if necessary, will publicly post any such modifications, and will notify prize competitors of any modifications.

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# I. PROGRAM SUMMARY

## 1. INTRODUCTION

Building a clean energy economy and addressing the climate crisis is a top priority of the Biden Administration. This prize will advance the Biden Administration’s goals to achieve carbon pollution-free electricity by 2035, “deliver an equitable, clean energy future, and put the United States on a path to achieve net-zero emissions, economy-wide, by no later than 2050”<sup>1</sup> to the benefit of all Americans. DOE is committed to pushing the frontiers of science and engineering, catalyzing clean energy jobs through research, development, demonstration, and deployment, and ensuring environmental justice and the inclusion of disadvantaged communities.

The activities incentivized by this prize will support the government-wide approach to the climate crisis by driving innovation that can lead to the deployment of clean energy technologies, which are critical for climate protection. Specifically, DOE’s Solar Energy Technologies Office (SETO) is launching the American-Made Perovskite Startup Prize, a part of the American-Made Challenges, to accelerate the growth of the domestic perovskite industry and support the rapid development of solar cells and modules that use perovskite materials.

The Perovskite Startup Prize consists of two contests that give established perovskite researchers a pathway to move their research from the lab into the private sector. Competitors will start a company and work toward creating a commercial product in less than one year. Participants will have multiple opportunities over approximately 18 months to enter to win cash prizes of up to \$700,000 plus \$100,000 in technical support vouchers as they build a team, form a company, advance their innovative perovskite technology, and make the case for their company’s viability. They will also get access to the American-Made Network—a group of DOE national laboratories, technology incubators and accelerators, investors, and laboratory space and equipment providers that will provide the critical connections at the right times to help competitors on their development path.

This competition will provide resources and funding, and facilitate partnerships, so competitors can advance their technologies and companies, accelerating their cycles of learning from years to months. Ideally, winners of this competition will be well suited to apply to, and receive funding from, future SETO [funding opportunities](#) supporting the scale-up of U.S. perovskite solar module manufacturing.<sup>2</sup>

Currently, the solar industry and its associated research community does not match the diversity of the United States. Women and minorities are underrepresented in the solar industry and in the science, technology, engineering, and math (STEM) fields. STEM fields also lack diversity in geographical origin, with U.S. rural areas underrepresented relative to large population centers. Since STEM students and graduates support R&D activities, which can often result in the formation

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<sup>1</sup> Executive Order 14008, “Tackling the Climate Crisis at Home and Abroad” (Jan. 27, 2021).

<sup>2</sup> Future funding is not guaranteed and is subject to congressional appropriations.



of companies, the lack of diversity in that pipeline adversely affects the opportunities and potential outcomes in scientific and economic output. To achieve the administration's energy justice goals, SETO is working to ensure that the work SETO funds will support more equitable participation in the solar energy community. SETO recognizes the inherent advantages of diverse teams and encourages competitors to consider diversity and inclusion when developing their teams.

This competition will strengthen innovation in U.S. perovskite technology development and manufacturing and assert the nation's global leadership in next-generation solar technologies.

## 2. BACKGROUND

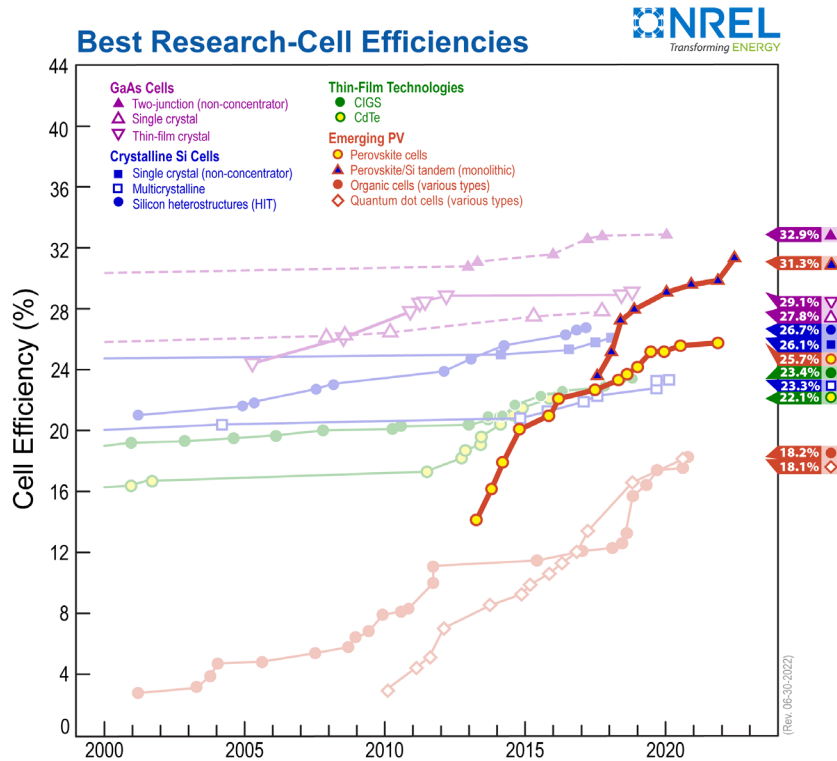
SETO works to accelerate the development and deployment of solar technologies to support an equitable transition to a decarbonized electricity system by 2035 and a decarbonized energy sector by 2050. Achieving these goals will support the nationwide effort to meet the threat of climate change and ensure that all Americans benefit from the transition to a clean energy economy. Today, solar accounts for just 3% of U.S. electricity,<sup>3</sup> which means that to combat climate change, the nation's solar capacity would likely need to grow by hundreds of gigawatts (GW) in the next 15 years, with an annual rate of deployment two to five times higher than recent deployment rates. Continued cost declines are critical to enabling the rapid deployment required to achieve this clean electricity goal. Advancing perovskite technologies, an emerging photovoltaic (PV) material, can help achieve this goal. When used to create solar cells, perovskites have shown potential for high performance and low production costs.

Perovskite photovoltaics are the general name for PV cells that have an absorber layer with an  $ABX_3$  crystal structure. The most famous of these materials for PV applications is a hybrid organic-inorganic perovskite, methylammonium ( $MA^+$ ) lead ( $Pb^{+2}$ ) iodide ( $I^-$ ), or  $MAPbI_3$ , (where  $MA=A$ ,  $Pb=B$ , and  $I=X$  in  $ABX_3$ ). Its remarkable material properties have spawned a massive body of research on permutations of  $MAPbI_3$ . For example, methylammonium has been substituted with formamidinium and cesium, lead has been substituted with tin, and iodide has been substituted with chloride and bromide. Perovskite photovoltaics represent the family of device architectures that use this variety of perovskite absorber layers, which are fabricated in many different ways.

Perovskite PV materials have shown potential for both high performance and very low production costs. Research results from university, national laboratory, and industry groups have shown rapid increases in the power conversion efficiency of perovskite devices over the past several years. The record efficiencies have exceeded those of other thin-film PV technologies, including organic photovoltaics (OPV), copper indium gallium diselenide (CIGS), and cadmium telluride (CdTe). While device stability and lifetime remain an issue, these efficiency results show potential for a high-performance PV technology.

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<sup>3</sup> EIA, Electricity Data Browser. Accessed August 25, 2020.



**Efficiency Records Chart with Perovskite Cells Reaching 25.2% Single Junction; 29.1% in Tandem with a Silicon Cell <sup>4</sup>**

Perovskite photovoltaics can be fabricated using high-throughput approaches, both in the vapor and liquid phases for sheet-to-sheet or roll-to-roll coating. While most demonstrations have been at laboratory scale, these approaches present an opportunity to reduce both direct module production costs and capital intensity for scaled-up production facilities. Greater production capabilities combined with continued improvements in device stability, lifetime, and efficiency may allow perovskite photovoltaics to significantly contribute to the future of low-cost solar PV and enable rapid scaling of domestic solar manufacturing capacity.

The United States is at the forefront of the development of this potentially disruptive technology, and SETO has been strategically investing in perovskite PV research and development (R&D) for the past decade, including through the most recent [SETO FY2018](#), [FY2019](#), and [FY2020](#) funding programs. Yet, in that time, solar manufacturing has centered heavily on silicon modules produced abroad, impeding domestic production of American-Made solar technologies. The growth of perovskite manufacturing in the United States can serve as a catalyst to develop domestic clean energy jobs and accelerate solar deployment to achieve a decarbonized electric system by 2035. The United States needs a vibrant research ecosystem supporting the development of perovskite solar cells, but domestic scale-up and manufacturing of perovskite PV modules requires further action. As the pace of innovation and development accelerates, creating new companies quickly will

<sup>4</sup>Derived from <https://www.nrel.gov/pv/cell-efficiency.html>

help ensure U.S. businesses can maximize their impact on the global perovskite module manufacturing sector.

The American-Made Perovskite Startup Prize is designed to meet this challenge.

Spearheaded by SETO within the Office of Energy Efficiency and Renewable Energy (EERE) and in partnership with the [National Renewable Energy Laboratory \(NREL\)](#), the Perovskite Startup Prize is a series of two progressive contests that will incentivize a burst of activity in moving perovskite solar research from the lab toward a commercial product while supporting the formation of new perovskite companies. To accomplish this, the prize will use a resource-multiplying approach that invests money in the competitors and engages the American-Made Network to help competitors achieve their goals. The program will feature **multiple reviews per year** and **a** rolling judging process to provide a rapid succession of opportunities for competitors to move their work out of the lab. The budget is finite; once it is exhausted, the program will conclude.

The [SETO 2020 Perovskite Funding Program](#)—which is providing \$40 million in funding—is underway concurrently, aiming to improve perovskite stability; establish scalable fabrication techniques to produce high-efficiency, stable devices; and develop test protocols that enable high confidence in long-duration field performance of perovskite-based PV technologies. Subject to appropriations, SETO expects to continue investment in perovskite development, with an increasing focus on manufacturing and commercialization. This prize program is designed to enable highly qualified competitors to form companies relevant to the domestic manufacturing of perovskite modules (see [Section I.5](#) for more details).

### 3. CONTESTS: COUNTDOWN AND LIFTOFF

The American-Made Perovskite Startup Prize consists of two consecutive contests that accelerate efforts to develop new, innovative perovskite solar companies with the potential to manufacture commercially viable products in the United States.

The best-performing competitors in the first contest, Countdown, will be awarded prizes and be eligible to compete in the second contest, Liftoff. Competitors' performance will be reviewed using the criteria described in [sections II](#) and [III](#).

#### The Two Contests:

1. **Countdown Contest** – This contest will reward world-class teams, with high-quality perovskite technology platforms, that form new companies with a clear and credible plan to resolve critical business and technical risks. Only new, for-profit companies—whose date of incorporation is within six months prior to the announcement of this competition or any time after the announcement of the competition—are eligible to compete. DOE expects to select approximately six to nine companies that will receive \$200,000 in cash and become eligible to compete in the Liftoff Contest. **DOE can also award a \$40,000 Power Up Prize to teams that are not selected as a Countdown Contest finalist.** It is not expected that all winners will be selected in the first open-application period; the Countdown Contest has a rolling application period with **multiple**

**submission deadlines per year.** Participant submissions will be reviewed by a panel of expert reviewers from industry, the national laboratories, and the government. Participants who are not selected will be given feedback and encouraged to resubmit **revised materials based off the reviewer feedback and support from the Mentor Network** in future open-application periods. The DOE will announce when the Countdown Contest is over.

a. **Power Up Prize:** Teams who submit to one of the deadlines and submit a compelling innovation are eligible to receive a \$40,000 Power Up Prize if they are not selected as a finalist for the Countdown Contest. The Power Up Prize is evaluated under the same criteria plus one additional criteria in the Countdown Contest and is awarded to teams that present a compelling innovation but need further refinement of their technology and/or business plan. Recipients of the Power Up Prize are encouraged to use their funds to iterate on their technology and/or business plan for future deadlines of the Perovskite Startup Prize. See **eligibility** for further details regarding these Incentive Prizes and the **Countdown Contest Rules** for additional information.

2. **Liftoff Contest** – This contest will reward the achievement of substantial technical progress toward goals set in the Countdown Contest, while simultaneously establishing the critical business and research infrastructure the company will need to be successful. Only winners of the Countdown Contest may compete in the Liftoff Contest. Winners of the Countdown Contest are eligible to apply to the Liftoff Contest within 12 months of winning the Countdown prize. Over the length of this prize competition, DOE expects to select approximately two to three companies that will receive \$500,000 in cash and \$100,000 in vouchers redeemable at national laboratories and qualified service providers. Liftoff Contest competitors who do not win on their first attempt will have one more opportunity to apply to compete in the Liftoff Contest within 15 months of winning the Countdown prize. Competitors who are not selected twice or are outside of these time windows will not be eligible to compete for the Liftoff prize.<sup>5</sup> **The DOE will announce when the Liftoff Contest is over** regardless of whether all Countdown winners have applied to enter the Liftoff Contest. Liftoff Contest submissions will be reviewed by a panel of expert reviewers from industry, the national laboratories, and the government. **Liftoff Contest competitors are encouraged to continue to work with the Mentor Network and make new connections as their technology and business evolve over time.**

The total prize pool for these two contests is \$3 million. Winners will receive up to \$700,000 in cash prizes and \$100,000 in technical support vouchers.

Contest Funding:

Contest	Anticipated Number of Winners	Prizes
1. Countdown	6-9	Each <b>Countdown Contest</b> finalist receives \$200,000 in

<sup>5</sup> For exceptions on this window of eligibility and for more details see [Section I.7](#)

	3-4	Power Up Prize recipients receive \$40,000 in cash to further refine their innovation before the next Countdown Contest.
2. Liftoff	2-3	Each Liftoff Contest winner receives \$500,000 in cash and \$100,000 in vouchers.

To learn more and sign up, go to <https://www.herox.com/PerovskitePrize>

## 4. IMPORTANT DATES

To see the program schedule for the Perovskite Startup Prize, with the application deadlines to participate in the Countdown and Liftoff Contests, please visit <https://www.americanmadechallenges.org/perovskiteprize>

## 5. SETO'S PEROVSKITE STRATEGY

SETO has identified four primary challenges to the commercial success of perovskite solar technologies: power conversion efficiency, stability and degradation, manufacturability, and technology validation and bankability. While the four categories are not independent, each represents a unique set of barriers to the commercial success of perovskite PV. SETO has established a strategy and the accompanying performance benchmarks along the critical path to successfully commercialize perovskites. Perovskites are a rapidly changing technology, and as new information is obtained, this strategy may be updated to keep up with market and technology developments. Competitors are encouraged to familiarize themselves with these challenges. More details can be found by visiting the informational webpage here: <https://www.energy.gov/eere/solar/perovskite-solar-cells>

## 6. AMERICAN-MADE NETWORK

The American-Made Network will support competitors' efforts by connecting them with the U.S. DOE national laboratories, including their world-class research facilities and experts, as well as a private-sector stakeholder community that is already actively assisting entrepreneurs to bring innovative ideas and concepts to market. This community includes incubators, investors, philanthropists, laboratory spaces, lab equipment user facilities, and seasoned industry leaders, all of whom will provide technical insight, business development expertise, product validation, and other support. Throughout the competition, these diverse entities are "Connectors" and will make up the key components of the network.

The American-Made Network will cultivate resources and build connections that enhance, accelerate, and amplify the efforts of the competitors. The objective is to link competitors with potential new team members, resources, financing, perspectives, and relevant industry expertise, all of which are necessary for long-term success.

The Network is comprised of the following:

1. **Prize and Network Administrator (NREL):** DOE has partnered with NREL to administer the American-Made Perovskite Startup Prize. As the administrator, NREL will help competitors locate and leverage the vast array of national laboratory resources. NREL will also connect elements of the network with the competitors, as described below, and distribute prize payments.
2. **Vouchers:** Winners of the Liftoff Contest will receive vouchers they can use to fund work at national laboratories and other facilities to accelerate the production, improvement, or validation of their prototypes. Entities interested in helping competitors through the voucher program can visit the following webpage for details:  
[https://www.americanmadechallenges.org/perovskiteprize/docs/Perovskite\\_Prize\\_Voucher\\_Guidelines.pdf](https://www.americanmadechallenges.org/perovskiteprize/docs/Perovskite_Prize_Voucher_Guidelines.pdf)
3. **Connectors:** Connectors are entities that identify and recruit competitors and support them on their innovation journey. Connectors can be incubators, universities, think tanks, industry groups, or any enabler seeking to help competitors win by performing support activities such as:
  - Attracting leading, world-class perovskite researchers to become contest competitors
  - Helping competitors respond to perovskite R&D challenges, develop business plans, and connect with investors and industry partners
  - Raising non-federal funding to further support perovskite startup companies
  - Connecting competitors with shared lab spaces, facilities, and tools to establish a manufacturing base for their perovskite technology, and connecting competitors to established Mentors in the field

Connectors who support competitors in the Countdown or Liftoff Contests will be financially rewarded, as shown in the table below.

4. **Perovskite Startup Prize Mentors:** Mentors are individuals with skills, expertise, or past relevant experience who can coach and advise competitors as they build their business. **Perovskite Startup Prize** Mentors in the American-Made Network participate in their personal capacity and do not represent a Connector organization. **Perovskite Startup Prize** Mentors can help competitors by:
  - Bringing deep and relevant prior experience in thin-film solar manufacturing and entrepreneurship, especially in solar, to the team
  - Filling an expertise skill gap on the team
  - Advising or coaching teams on their technical and business plans and targets

Working with the Perovskite Startup Prize Mentors when preparing submissions helps competitors engage in and demonstrate cycles of learning. Competitors will be required to submit “Mentor Engagement Outputs” which describes their work with the Perovskite Startup Prize Mentor Network and how their application and approach was changed based off the input received. [Connect to the Mentor Network here](#). More information regarding the “Mentor Engagement Outputs” can be found in [Section II.6. Perovskite Startup Prize](#) Mentors who support competitors in the Countdown or Liftoff Contests will be financially rewarded, as shown in the table below.

**Connector/Mentor Recognition Reward Opportunities:**

Recognition Reward Name	Anticipated Number of Awards	Dollar Amounts	Details*
<b>Recruit</b>	Up to 1 per winning Countdown team	\$1,000 per team	Distributed to Connectors who recruit a perovskite research team that wins the Countdown Contest.
<b>Support**</b>	Up to 1 per winning Countdown team	\$10,000 per team	Can be split between up to 3 Connectors or Mentors identified as significant supporters by Countdown Contest winners.
	Up to 1 per winning Liftoff team	\$15,000 per team	Can be split between up to 3 Connectors or Mentors identified as significant supporters by Liftoff Contest winners.
	Up to 1 per non-winning Liftoff team	\$5,000 per team	Can be split between up to 3 Connectors or Mentors identified as significant supporters by competitors who competed in but did not win the Liftoff Contest.
<p>* Power Connectors and National Labs are ineligible to receive Recognition Rewards.  ** Teams in the Liftoff Contest may only receive up to \$15,000 total in Recognition Rewards.</p>			

Competitors and reviewers participating in the Perovskite Startup Prize cannot also be a Connector or Mentor. If a Mentor or Connector formally joins a team, they forego any financial incentive and recognition payment for that round.<sup>6</sup>

Entities interested in participating as Connectors or Mentors can visit the following site for details: <https://americanmadechallenges.org/network.html>.

- 5. Power Connectors:** Power Connectors are Connectors who play a more substantial role in the competition and receive funds to expand and amplify DOE and NREL’s efforts. Power Connectors operate under a contract with NREL to identify and support competitors in the Countdown and Liftoff Contests. Power Connectors are ineligible for all recognition awards. Power Connectors will be rewarded for efforts that:

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<sup>6</sup> Additional details can be found in the [Guidelines for Connector Recognition Rewards](#).



- Increase the number of new, high-quality competitors
- Expand the network of partners, resources, and tools
- Support contests and teams with an increasingly robust and diverse American-Made Network and expand teams access to nongovernment resources and funding

Entities interested in participating as Power Connectors to support the American-Made Challenges can visit the following site for details: <https://americanmadechallenges.org/network.html>.

## 7. ELIGIBILITY REQUIREMENTS

To compete in the Perovskite Startup Prize, participants must comply with the eligibility requirements below. By uploading a submission package, a team certifies that it is in compliance with these eligibility requirements. Eligibility is subject to verification before prizes are awarded. As soon as the prize administrator becomes aware that a competitor is not eligible to win the Countdown Contest, the competitor may be disqualified. The registered competitor is the individual or entity that registers in HeroX to compete.

### COUNTDOWN CONTEST

- Competitors must be a for-profit business entity, such as a corporation or other organization that is formed in and maintains a primary place of business in the United States with majority domestic ownership and control. Only for-profit companies incorporated within six (6) months prior to the announcement of this competition or any time after the announcement of this competition are eligible to compete. Individuals or groups of individuals are not eligible to compete. A for-profit business entity is eligible to compete only if the registered competitor is an employee or owner of that business.
  - To verify the competitor's company eligibility, proof of incorporation must be provided in the submission, which includes at a minimum the company name, in which state the company is incorporated, and the incorporation date. DOE and NREL will not provide a preliminary review. Examples of documents expected to contain this information include, the articles of incorporation for a company or a screenshot of the Secretary of State's website from the appropriate state where the company is listed.
- Competitors may submit a maximum of two (2) submissions per application period. If more than two submissions are received from a single competitor or team for **an application period**, only the two most recent submissions will be considered.
- Competitors not selected as winners of a particular Countdown Contest review cycle are eligible to submit updated submission packages in subsequent open-application periods for the Countdown Contest.



- When submitting in a subsequent open-application period, competitors will be required to submit **Mentor Engagement Outputs** describing their work with the Mentors in the Mentor Network and how it impacted their resubmitted application as part of their submission package. For each resubmission, there must be a new Mentor Engagement Outputs appended to any Mentor Engagement Outputs submitted previously to show a cycle of learning. Mentor Engagement Outputs that are submitted without updates during subsequent open-application periods will be marked ineligible. See **Section II.6**, Countdown Contest submission requirements for further details.

- **Power Up Prize Eligibility**

- Competitors not selected as winner of a particular Countdown Contest review cycle may be selected to receive a Power Up Prize. All contest-eligible competitors can receive a Power Up Prize.
- A team can only receive one Power Up Prize over the entirety of the Countdown Contest, regardless of how many deadlines they submit to.
- The Power Up Prize is an additive prize. Competitors who receive a Power Up Prize in one deadline are still eligible to win the full \$200,000 in future Countdown Contest deadlines.

## **LIFTOFF CONTEST**

- Only business entities that won the Countdown Contest may apply to compete in the Liftoff Contest. The size and makeup of the team can change from Countdown.
- Competitors must submit a Letter of Intent a minimum of four weeks before completing a submission package for a Liftoff Deadline. Letters of Intent are short documents informing the prize administrator that a competitor plans to participate in an upcoming deadline.
- If a competitor completes a submission package to the Liftoff Contest and is not selected, they are eligible to submit one more time to a future Liftoff round. Competitors who are not selected two times are no longer eligible to compete to win the Liftoff Contest.
- Winners of the Countdown Contest are eligible to compete in the Liftoff Contest for only 12 months after winning Countdown. A three-month extension to 15 months will be allowed if all three of the following conditions are true:
  - The competitor has already applied to compete in the Liftoff Contest once
  - The competitor competed in but did not win the Liftoff Contest
  - The competitor is attempting to submit a second application to compete in the Liftoff Contest.

- Exception to eligibility deadline for winners of the Countdown Contest to apply for the Liftoff Contest:
  - If the timeline of the submission deadlines is extended, the same amount of extension time will also be added to each team's eligibility period. As an example, if the Countdown deadline is extended by three months, the team's eligibility period for the Liftoff Contest will also be extended for three months.
  - The prize administrator will reach out to all Countdown Finalists if a change happens to the submission timeline to ensure eligibility timelines are clear for each team.

#### **All CONTESTS ELIGIBILITY:**

- Private business entities must be incorporated in the United States within six months prior to the announcement of this competition or any time after the announcement of this competition and maintain a primary place of business in the United States with majority domestic ownership and control.
- If an entity seeking to compete does not have majority domestic ownership and control, EERE may consider issuing a waiver of that eligibility requirement where (1) the entity submits a compelling justification; (2) the entity is incorporated in and maintains a primary place of business in the United States; and (3) the entity otherwise meets the eligibility requirements. EERE may require additional information before making a determination on the waiver request. There are no rights to appeal DOE's decision on the waiver request. See [Appendix 2](#) for more information on the waiver process.
- Non-DOE federal entities and federal employees are not eligible to win any prize contests in this program.
- Employees of an organization that co-sponsors this program with DOE are not eligible to participate in any prize contests in this program.
- Individuals who worked at DOE (federal employees or support service contractors) within six months prior to the submission deadline of any contest are not eligible to participate in any prize contests in this program. Additionally, members of their immediate families (i.e., spouses, children, siblings, or parents) and anyone who lives in their household, regardless of relation, are not eligible to participate in the Prize.
- NREL employees directly involved in administration of this prize are not eligible to participate in any prize contest in this program; however, NREL and other national laboratory employees, including lab researchers, may compete and win a prize contest in this competition, provided they are not competing in their official capacity.
- 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 identified by the Department of Homeland Security (DHS), Binding Operational Directives (BOD) as an entity publicly banned from doing business with the United States government are not eligible to compete. See <https://cyber.dhs.gov/directives/>.
- 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 the Consolidated Screening List: <https://www.trade.gov/consolidated-screening-list>.
- This prize competition is expected to positively impact U.S. economic competitiveness. Participation in a foreign government talent recruitment program<sup>7</sup> 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 risk<sup>8</sup> are not eligible to compete.
- As part of your submission to this prize program, you 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 in 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.

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<sup>7</sup> A 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.

<sup>8</sup> Currently, the list of countries of risk includes Russia, Iran, North Korea, and China.

## 8. PROGRAM GOAL REQUIREMENTS

Only submissions relevant to the goals of this program are eligible to compete. DOE will review all submissions to ensure that the following statements are **true**:

- The proposed solution is relevant to the development of perovskite-based photovoltaics.
- The proposed solution represents an innovation that will utilize or introduce a compelling manufacturing technology for perovskite-based photovoltaic devices to the industry.
- The proposed solution incorporates perovskite materials as a key component of the photovoltaic device.
- The proposed perovskite-based photovoltaic solution will have a pathway to economic viability in the terrestrial power market.
- The proposed perovskite technology is being developed by a private entity incorporated in the United States within six months prior to the announcement of this competition or any time after the announcement of this competition and maintains a primary place of business in the United States with majority domestic ownership and control.
- The majority of activities that are described in and support the submission package are performed in the United States.
- The proposed solution is not dependent on new, pending, or proposed federal, state, or local government legislation, resolutions, appropriations, measures, or policies.
- The proposed solution does not involve the lobbying of any federal, state, or local government office.
- The proposed solution is based on fundamental technical principles and is consistent with a basic understanding of the U.S. market economy.
- Submission content sufficiently confirms the competitor's intent to commercialize early-stage technology and develop a viable U.S.-based manufacturing business.

## 9. FIND HELP

Visit <https://americanmadechallenges.org/network.html> to review and contact the members of the American-Made Network who have signed up to help you succeed.

## 10. ADDITIONAL REQUIREMENTS

Please read and comply with additional requirements in [Appendix 1](#).

**COMPETITORS WHO DO NOT COMPLY WITH THESE REQUIREMENTS MAY BE  
DISQUALIFIED.**

## II. COUNTDOWN CONTEST RULES

### 1. INTRODUCTION

The American-Made Perovskite Startup Prize is a two-contest program with up to \$3 million in prizes. This prize is designed to accelerate and sustain solar innovation by supporting entrepreneurs as they develop transformative perovskite technology research via a new business entity. It represents the first necessary business-related step to transform leading American perovskite research into commercialized products manufactured in the United States.

Countdown Contest Prizes
<ul style="list-style-type: none"><li>• 6-9 winners anticipated</li><li>• Each winner receives \$200,000 and can compete in the Liftoff Contest</li><li>• 3-4 \$40,000 Power Up Prizes anticipated</li></ul>

The Countdown and Liftoff Contests are structured to provide the resources and environment necessary to create new perovskite startups and develop them into successful businesses via rapid learning cycles.

The Countdown Contest is the first in this two-contest series, with an anticipated \$1.6 million share of the \$3 million prize pool. The DOE will announce when the Countdown Contest is over. The following guidelines are for competitors interested in the Countdown Contest. “You” and “your” reference competitors in the contest.

### 2. GOALS

The Countdown Contest period focuses on three key areas:

- **Teaming:** Develop a world-class, cross-functional team with credible perovskite and business development expertise that will form a new perovskite PV company.
- **Planning:** Develop well-articulated, aggressive but achievable technical and business goals to be accomplished by the Liftoff Contest that have been vetted by a wide array of stakeholders and industry experts.
- **Facility Access:** Secure access to the necessary equipment and laboratory facilities that enable you to pursue your development plans in the next stage of the competition.

### 3. PRIZES TO WIN

The Countdown Contest offers cash prizes of \$200,000 and the ability to compete in the Liftoff Contest. Winners of this contest will be referred to as finalists.

The Countdown Contest includes Power Up Prizes of \$40,000 cash for competitors who meet the same criteria as finalists of the Countdown Contest. The Power Up Prize is evaluated under the

same criteria plus one additional criteria as the Countdown Contest and is awarded to teams that present a compelling innovation but need further refinement of their technology and/or business plan. Recipients of the Power Up Prize are encouraged to use their funds to iterate on their technology and/or business plan for future deadlines of the Perovskite Startup Prize.

## 4. HOW TO ENTER

Submissions to enter the Countdown Contest will be accepted on a rolling basis and reviewed **multiple times per year** according to the deadlines on the schedule listed at <https://www.herox.com/PerovskitePrize/overview>. Complete a submission package online and submit it before the due date at <https://www.herox.com/PerovskitePrize>. The DOE will announce when the Countdown Contest is over.

## 5. COUNTDOWN CONTEST PROCESS

The Countdown Contest requires the following steps:

1. **Prove Credibility** – The Perovskite Startup Prize seeks to attract qualified competitors who have successfully completed world-class perovskite research. Successful competitors will have already produced perovskite PV material that is on par with the current state of the art.
2. **Team Up** – The Perovskite Startup Prize aims to incentivize the creation of teams that can help win the race to lead the world in perovskite module manufacturing. A strong team will deliberately bring together leaders in different areas of expertise and skill sets, both technical and business-related, to create a perovskite company that can succeed in getting a product into pilot manufacturing. Competitors will leverage the American-Made Network to fill gaps in their teams' expertise, leveraging the potential for recognition payments to Mentors providing assistance.<sup>9</sup>
3. **Activate and Incorporate** – Competitors will need to incorporate as a for-profit business and demonstrate they are committed to the effort. Submissions that include teams of people maintaining the majority of their time on their existing research or other efforts are unlikely to succeed. Competitors will also engage the American-Made Network to gain support, leveraging the potential for recognition payments to the Connector providing assistance.<sup>10</sup> Winning submissions will show a clear and credible commitment from the team.
4. **Develop a Plan and a Deliverable Table** – Competitors will need to develop robust R&D and commercialization plans. They will be required to submit comprehensive and quantifiable goals to be met by the Liftoff Contest deadline.<sup>11</sup> These goals will be an assessment criterion in the Liftoff Contest. This deliverable table is an opportunity for competitors to show they understand

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<sup>9,9</sup> The prize administrator has dedicated approximately \$150,000 to recognize members of the American-Made Network who help competitors advance through the contests.

<sup>11</sup> Examples of deliverable tables can be found here: <https://www.herox.com/PerovskitePrize/resources>

the full depth and breadth of technical and business outcomes necessary to create a successful company.

5. **Obtain Feedback** – Competitors will need to leverage the lessons learned from previous commercialization efforts in solar technologies when developing their own plans to commercialize a perovskite PV technology. Competitors will engage the Perovskite Startup Prize Mentor Network and/or other experts in the field to obtain feedback on their developed plans. Re-submissions to the Countdown Contest will require a report out on what competitors learned from these engagements and this is an opportunity for competitors to show their cycles of learning.
6. **Submit** – Competitors complete their submission packages and submit them online before the contest closes for the relevant review cycle.
7. **Assess** – The prize administrator screens all completed submissions for eligibility and completion and assigns subject-matter expert reviewers to independently score the content of each submission. The scoring criteria will assess the following competitor activities:
  - **Team Capabilities:** Forming an exceptional and committed team to accomplish the stated goals of the proposed solution.
  - **Viability:** Developing a credible and viable perovskite technology stack as well as a viable concept for a perovskite manufacturing company. Also performing substantive due diligence to gather feedback and validate that the proposed technology and manufacturing platform is technically feasible.
  - **Protection:** Developing a clear, well-informed strategy for how existing intellectual property (IP) will be leveraged in this new business and how new IP will be protected, considering the applicability of patents, copyrights, trademarks, and trade secrets.
  - **Milestones and Deliverable Table:** This table is a list of quantifiable development goals (i.e., milestones) that will be accomplished by the time of your Liftoff submission. It will describe the process you will use and evidence you will provide (i.e., deliverables) to show the goals were accomplished. In addition, appropriate justification should be provided to explain the importance of accomplishing the goals as it relates to your company's development and the wider industry.<sup>12</sup> These goals and your ability to accomplish them are core criterion of the Liftoff Contest assessment. The deliverables provided should be both aggressive and achievable. If you are not selected to win the Countdown Contest, you will receive feedback and may improve your submission and resubmit it in a subsequent application cycle. This process may continue until a table of adequate quality is submitted or the Countdown Contest closes.

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<sup>12</sup> Examples of deliverable tables can be found here: <https://www.herox.com/PerovskitePrize/resources>



- **Network Engagement:** Cultivating relationships with members of the American-Made Network and/or other entities can increase the likelihood of creating a viable business based on the proposed solution and enhance the quality of the proposed submission package.
8. **Interview** – The prize administrator may decide to hold an interview with competitors to help answer questions the judge may have.
  9. **Announcement** – Approximately one month after the contest closes, the prize administrator notifies winners **and recipients of the Power Up Prize**, and requests the necessary information to distribute cash prizes. The prize administrator will then publicly announce winners. After winning the Countdown Contest prize, competitors will develop their solutions in accordance with their deliverables table to compete in the Liffoff Contest.
  10. **Resubmission** – Teams that were not selected as winners in a given application cycle may improve their submission package based on the feedback given and resubmit in a following cycle. **They will be required to submit a Mentor Engagement Outputs for each subsequent resubmission.**

## 6. WHAT TO SUBMIT

A complete submission package for the Countdown Contest should include the following items:

- Company Eligibility Verification
- 120-second video (public)
- Cover page
- Narrative answers to four questions (not to exceed 2,500 words)
- Résumés
- Technical assistance request (public)
- One summary PowerPoint slide (public)
- Mentor Engagement Outputs (encouraged for first time competitors, required for resubmissions)
- Letters of commitment or support (optional)

**Note:** Portions of the submission package are made available to the public. These have been denoted as such, and DOE does not intend to release the remaining parts of the submission to the public. See [Appendix 1](#) for additional details.

**All documents must be uploaded as a PDF.**

**Company Eligibility Verification** – Provide evidence of your company’s incorporation date.

- Evidence of your company’s date of incorporation

- Must include at a minimum the company name, in which state the company is incorporated, and the incorporation date
- Examples of documents expected to contain this information include PDF versions of the articles of incorporation for a company or a screenshot of the Secretary of State’s website from the appropriate state where the company is listed.

Reviewers and the Prize judge will evaluate your submissions by agreeing or disagreeing with assigned statements on a 1–6 scale, as shown below. These statements are the criteria.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
strongly disagree	disagree	slightly disagree	slightly agree	agree	strongly agree

<b>Online public video – Who are you, and why will you be successful?</b>	
<p style="text-align: center;"><b>Suggested content you provide</b></p> <ul style="list-style-type: none"> <li>• A description of your team, emphasizing perovskite and business expertise.</li> <li>• An overview of the general operational details about your perovskite innovation and why you have a competitive edge.</li> <li>• Your current capabilities for perovskite deposition and scale-up, and what have you demonstrated to date.</li> <li>• Your target market and how you will create a sustainable business with U.S. manufacturing.</li> </ul>	<p style="text-align: center;"><b>Each statement is scored on a 1–6 scale</b></p> <ul style="list-style-type: none"> <li>• The competitors are highly qualified.</li> <li>• The video describes a unique perovskite approach that has a realistic ability to become a successful business in the long term.</li> <li>• The team has access to state-of-the-art facilities and has demonstrated an ability to produce relevant perovskite devices.</li> <li>• The video identifies a reasonable target market and a path to making a significant impact on the U.S. solar industry.</li> </ul>

Post your publicly accessible video online (e.g., YouTube, Vimeo, etc.). Be creative and produce a video that conveys the required information in exciting and interesting ways, but do not focus on time-consuming activities that only improve production values (i.e., technical elements such as décor, lighting, and cinematic techniques). Assistance from others with experience in this area may be helpful. Members of the American-Made Network may be able to help you create your video.

<b>Cover Page – List basic information about your submission.</b> <i>Template<sup>13</sup>: <a href="https://www.herox.com/PerovskitePrize/resources">https://www.herox.com/PerovskitePrize/resources</a></i>
<ul style="list-style-type: none"> <li>• Project name</li> <li>• Project title or tagline (e.g., your mission in a few words)</li> </ul>

<sup>13</sup> Use of the template is optional, but all components listed here must be included in your document if you choose to create your own.

- Link to your two-minute video online
- Key project members (names, contacts, and links to their LinkedIn profiles)
- Keywords that best describe your solution (e.g., vapor or solution deposition, roll-to-roll, or rail-to-rail)
- Your city, state, and nine-digit zip code
- The partners, affiliates, and Connectors<sup>14</sup> who significantly helped you<sup>15</sup> advance your solution and the major items they helped with (if applicable).

You should answer all of the following four questions. The content bullets are only suggestions to guide your responses. You decide where to focus your answers. The individual answers to the four questions do not have a word limit; however, **the aggregate response to these four questions must not exceed 2,500 words**, not including captions, figures/graphs, or references. A word count must be included at the end of your submission (see template for details). You may also include **up to five supporting images, figures, or graphs**. The reviewers will score the questions based on the content you have provided.

<b>Narrative</b> <b>Maximum of 2,500 words and 5 supporting images or figures (PDF)</b> <b>Template<sup>16</sup>: <a href="https://www.herox.com/PerovskitePrize/resources">https://www.herox.com/PerovskitePrize/resources</a></b>	
<b>Question 1: <i>Team</i></b> – Why is your team considered “world class” with all of the necessary technical and business expertise?	
<p style="text-align: center;"><b>Suggested content you provide</b></p> <ul style="list-style-type: none"> <li>• An introduction to your team and a description of how it came together, highlighting the knowledge and skills that make it uniquely capable of achieving success.</li> <li>• An explanation of how the team identified and filled skill gaps, leveraging the American-Made Network where appropriate.</li> <li>• A statement about why winning the Countdown Contest will substantively change the likelihood of your success.</li> </ul>	<p style="text-align: center;"><b>Each statement is scored on a 1–6 scale</b></p> <ul style="list-style-type: none"> <li>• The team’s drive, knowledge, and complementary skillsets provide a strong competitive edge toward developing a perovskite solar company.</li> <li>• The team identified skill gaps and brought in the right people or partners to fill those gaps.</li> <li>• Winning the Countdown Contest significantly increases the team’s chances of creating a viable business based on their solution.</li> </ul>
<b>Question 2: <i>Technology and Accomplishments</i></b> – What is your technology platform, what have you done to date, and what qualities give you a competitive edge?	

<sup>14</sup> See description of Connector in [I. Program Summary](#).

<sup>15</sup> Remember that you can incentivize Connectors to help you by agreeing to identify them to receive a cash reward if you win the Countdown competition. See the description of Recognition Rewards in [I. Program Summary](#) and the [Connector Guidelines](#) for details.

<sup>16</sup> Use of the template is optional, but all components listed here must be included in your document if you choose to create your own.

<p style="text-align: center;"><b>Suggested content you provide</b></p> <ul style="list-style-type: none"> <li>• A description of the current state of development of your perovskite technology platform, with references to relevant previous work and sufficient accompanying detail to facilitate external evaluation of the achievements you claim.</li> <li>• A description of the innovation or unique value proposition of your technology platform compared to the current state of the art.</li> <li>• A description of your current intellectual property portfolio, who has rights and control over it, and how you will maintain access to it and protect it, where applicable.</li> <li>• A description of the progress made over the contest period, and highlight key engagements, relationships, and milestones.</li> </ul>	<p style="text-align: center;"><b>Each statement is scored on a 1–6 scale</b></p> <ul style="list-style-type: none"> <li>• Sufficient technical detail was provided to understand the underlying core components of the team’s innovation.</li> <li>• The team has produced high-quality perovskite devices with relevant manufacturing processes and deposition techniques.</li> <li>• The team demonstrates a strong understanding of the competitive landscape and their unique value proposition and differentiators.</li> <li>• The team has a clear intellectual property strategy that is well reasoned, covering both existing assets as well as assets yet to be discovered.</li> <li>• A considerable amount of high-quality effort was put into developing the team’s business proposition over the competition period.</li> </ul>
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**Question 3: *Deliverable Table*** – What are your technical and business goals for Liftoff, are they both aggressive and achievable, and will they significantly advance you toward achieving a sustainable business?

<p style="text-align: center;"><b>Suggested content you provide</b></p> <ul style="list-style-type: none"> <li>• Quantifiable performance metrics for the perovskite devices you will produce and have validated by third-party facilities (see special instructions below) as part of your Liftoff Contest deliverables.</li> <li>• Business development milestones for the Liftoff Contest, including how you will leverage your network and the American-Made Network and incorporate stakeholder feedback to accelerate your learning cycles.</li> <li>• A comprehensive list of technical and business milestones that will be necessary to achieve on the path to reaching your Liftoff Contest deliverables.</li> </ul>	<p style="text-align: center;"><b>Each statement is scored on a 1–6 scale</b></p> <ul style="list-style-type: none"> <li>• The stated technical milestones and performance metrics for the Liftoff Contest are ambitious relative to the state of the art, reduce technical risk, and show a commitment to an accelerated development cycle.</li> <li>• The stated business milestones for the Liftoff Contest are ambitious relative to the state of the company’s level of development, reduce business risk, and show a commitment to an accelerated development cycle.</li> <li>• The team provides quantifiable metrics that demonstrate a clear understanding of the necessary progression in technical and business development.</li> </ul>
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**Question 4: *Development Roadmap*** – What are the next steps for your technology and business, and do you have access to the necessary resources to achieve them?

<p style="text-align: center;"><b>Suggested content you provide</b></p> <ul style="list-style-type: none"> <li>• A description of where you stand in your</li> </ul>	<p style="text-align: center;"><b>Each statement is scored on a 1–6 scale</b></p> <ul style="list-style-type: none"> <li>• Meeting the stated goals will demonstrate</li> </ul>
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<p>solution’s development cycle related to the defined goals for the Liftoff Contest, and how they are a significant advancement from your current capabilities (see special instructions below).</p> <ul style="list-style-type: none"> <li>• A description of your team’s readiness to meet your goals, including laboratory and equipment access plans, and identification of future needs for additional resources and/or talent.</li> <li>• An explanation of why these goals would put you in a strong position to move into your next phase of development, attract additional funding, and create a sustainable business with a competitive advantage to manufacture in the United States.</li> <li>• A high-level budget plan to meet your goals for the next 180 days, including how you will leverage program resources—specifically, members of the American-Made Network or other entities.</li> </ul>	<p>critical progress toward developing, testing, and validating the technology platform and the company’s business model.</p> <ul style="list-style-type: none"> <li>• The submission package provides confidence that the team is committed and has access to the resources necessary to execute on their immediate goals.</li> <li>• The team has a reasonable go-to-market strategy with a promising path toward domestic manufacturing.</li> <li>• The competitors’ approach to complete their proposed plan is well reasoned and makes good use of the program resources available to them (such as the American-Made Network).</li> </ul>
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### Special Instructions for Question 3 & 4

- Use only specific, measurable, achievable, relevant, and timely (SMART) outcome-based goals, not activity-based goals, so that a neutral third-party can validate them.
  - For example: Demonstrate a definitive achievement of progress (e.g., “X letters of interest signed” or “achieve X% efficiency”). **Do not** describe how you spent your time (e.g., “provided a report,” “talked to customers,” or “performed experiments”).
- SMART goals for the Liftoff Contest should include:
  - Demonstrating a functional perovskite module, composed of multiple cells, at the multi-centimeter-squared (cm<sup>2</sup>) scale or larger
  - Demonstrating scalable fabrication techniques for the module and its active layers at speeds and/or throughputs relevant to manufacturing
  - Demonstrating process controllability and reproducibility
  - Demonstrating power conversion efficiency and stability on the path to SETO perovskite manufacturing goals as described here: <https://www.energy.gov/eere/solar/perovskite-solar-cells>
- In defining your SMART goals, include quantified, risk-reducing, meaningful, practical, and testable interim milestones.
- SMART goals should include assessment and feedback from many relevant stakeholders (e.g., possible investors, customers, experts in the solution space, and entities that would be the eventual customers or end users of the product.).

- Members of the American-Made Network may be able to help you formulate your SMART goals.

<b>Mentor Engagement Outputs (encouraged for first time competitors, required for resubmissions)</b>		
<b>Maximum of 1 page, 12-point font and 1 inch margins (PDF)</b> <b>Template<sup>17</sup>: <a href="https://www.herox.com/PerovskitePrize/resources">https://www.herox.com/PerovskitePrize/resources</a></b>		
<b>Suggested Content you Provide</b>		
<ul style="list-style-type: none"> <li>Describe the engagements you've had with Mentors in the Mentor Network.</li> <li>Include who you spoke with, what you learned from those engagements, and what and how you modified your approach, research priorities, and/or business plan.</li> <li>If you disagreed with the feedback received, explain why and how you gathered additional information to convince yourself that you are still on the right path.</li> <li>Explain how you identified which feedback points were the most critical to address now.</li> </ul>		
<b>Additional Information on Mentor Engagement Outputs</b>		
<ul style="list-style-type: none"> <li>Mentors can be contacted by reaching out to the Power Connector, ADL Ventures, and more information about the Mentor Network can be found <a href="#">here</a>.</li> <li>Mentor Engagement Outputs from previous submission deadlines must be appended to the new write-ups for each subsequent submission.</li> <li>Resubmission applications without new Mentor Engagement Outputs will be deemed ineligible.<sup>18</sup></li> </ul>		
<b>Mentor Engagement Output Scoring</b>		
<b>Competitor Type:</b>	<b>First Time Competitors</b>	<b>Resubmission Competitors</b>
<b>Scoring Method:</b>	<p>If a Mentor Engagement Output is submitted that addresses each scoring criteria, full points will be automatically awarded.</p> <p>If no write-up or an incomplete write-up is submitted it will not affect the total score.<sup>19</sup></p>	Each scoring criteria is scored on a 1–12 scale.
<b>Scoring Criteria:</b>	<ul style="list-style-type: none"> <li>Competitors interacted with the Mentor Network sufficiently enough to receive substantive feedback on their approach and plan.</li> <li>Applicants successfully identified and understood feedback points identified by Mentors and understood why this feedback may be important for their future technical and/or business plans.</li> <li>The applicants convincingly addressed the Mentor's feedback, changing their</li> </ul>	

<sup>17</sup> Use of the template is optional, but all components listed here must be included in your document if you choose to create your own.

<sup>18</sup> For additional information on eligibility requirements related to this application component see [Section I.7](#)

<sup>19</sup> See [Section II.7](#) for additional details

	<p>approach where they agreed with that feedback and/or defending their approach where they disagreed with that feedback.</p> <ul style="list-style-type: none"> <li>Applicants addressed the feedback that was most likely to highly impact their approach and plan submitted to the Countdown Contest.</li> </ul>
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<b>Reviewer Recommendation</b>	
<ul style="list-style-type: none"> <li>There is no direct corresponding submission requirement for this score. Rather, it is an overall assessment of all materials submitted in HeroX.</li> </ul>	<p style="text-align: center;"><b>Statement is scored as a 1 or 6</b></p> <ul style="list-style-type: none"> <li>This innovation, team, and plan should be strongly considered for a Countdown Contest prize.</li> </ul> <p><i>If the Statement above is scored as a '1,' then:</i></p> <p><b>The following statement is scored as 1 or 6</b></p> <ul style="list-style-type: none"> <li>The gaps in this submission can be sufficiently addressed with \$40,000 of additional development.</li> </ul>

<b>Submission Summary Slide</b> (a PowerPoint slide as a PDF, will be made public)
<p>Make your own public-facing, one-slide submission summary that contains technically specific details but can be understood by most people. There is no template, so feel free to present the information as you see fit. Please make any text readable in a standard printout and conference room projection.</p>

<b>Résumés</b> (no more than two-page PDF per team member)
<p>Please provide two-page résumés for all key project contributors. Links to LinkedIn profiles can be submitted in lieu if the competitor desires. There is no limit on the number of résumés or profile links you may submit. Résumés longer than two pages will not be reviewed.</p>

<b>Technical Assistance Request</b> (two-page PDF, including images, will be made public)
<p>Provide up to two pages describing the areas where you need assistance to realize your solution. Consider the unique capabilities that the national laboratories, a private facility, and/or other members of the American-Made Network could provide to you to resolve these barriers. The prize administrator will make this request broadly available, so members of the American-Made Network can understand your needs and assist you.</p>

### Letters of Commitment or Support (Optional)

Attach one-page letters of support, intent, or commitment from other relevant entities (e.g., lab space providers, shared equipment facilities, strategic manufacturing partners, or owners of critical IP) to provide context and evidence to support your written application. Provide the strongest possible evidence that you have the necessary resources and partners lined up to execute on your plan. Letters of support from partners or others that are critical to the success of your proposed solution will likely increase your score. General letters of support from parties that are not critical to the execution of your solution will likely not factor into your score. Please do not submit multipage letters.

Please read and comply with additional requirements about your submission in [Appendix 1](#).

**COMPETITORS WHO DO NOT COMPLY WITH THESE REQUIREMENTS MAY BE DISQUALIFIED.**

## 7. HOW WE SCORE

### COUNTDOWN CONTEST

The scoring of submissions will proceed as follows:

- A panel of expert reviewers will read, score, and comment on each submission. Each bullet listed in the review criteria under the video submission and the narrative questions will receive a score from 1 to 6. Each bullet listed in the scoring criteria under the Mentor Engagement Output will receive a score from 1 to 12. The bullets have equal weight, so submission components that have more review criteria bullets or have high possible points have a greater influence on the final score.
- For the Mentor Engagement Output, there is separate scoring of the write-up depending on the type of competitor.
  - For first-time competitors, each statement is scored on a completion basis. If a Mentor Engagement Output is submitted that addresses each scoring criteria, full points will be automatically awarded. If no write-up or an incomplete write-up is submitted, it will not affect the total score.

Without the Mentor Engagement Output, there are 20 scoring criteria (four for the video, 15 for the narrative, and one for the reviewer recommendation) with a maximum score of six points each for a total of 120 points. However, if the team scores a '1' on the first Reviewer Recommendation criteria, then the total points possible becomes 121, inclusive of the second Reviewer Recommendation Criteria.

The Mentor Engagement Output adds four scoring criteria each worth 12 points. Under this rule revision, the total points a competitor can score is now 168 points. However, if



the team scores a '1' on the first Reviewer Recommendation criteria, then the total points possible becomes 169, inclusive of the second Reviewer Recommendation Criteria.

If first-time competitors do not submit a Mentor Engagement Output or submit one that is incomplete, this will have no effect on their total score. The total possible points will remain at 120 or 121 points as described above.

- For resubmissions, the Mentor Engagement Outputs will receive a score from 1 to 12 for each of the four criteria, similar to how the narrative questions are scored.
- The final score from an individual reviewer for a submission package equals the total sum of the scores for all the bullets. All reviewers' scores will then be averaged for a final reviewer score for the submission package. The final prize judge will consider reviewer scores when deciding the winners of the Prize.
- Interviews – The prize administrator, at its sole discretion, may decide to hold interviews with a subset of the Countdown Contest competitors. The interviews would be held prior to the announcement of winners, typically within two weeks of the submission deadline, and would serve to help answer questions the judge may have. If you are invited for an interview, you will be contacted 48 hours in advance; participation in the interview will be a prerequisite to receiving an award. An interview invitation is not an indication of winning.
- The judge's final determination of winners will take reviewer scores, interview findings (if applicable), and program policy factors listed in [Appendix 1](#) into account. DOE is the judge and final decision maker and may elect to award all, none, or some of the submissions accepted at each submission deadline.
- All teams that submitted an eligible entry will receive comments on their submission. Teams that are not selected as Countdown Contest winners can resubmit in a future round. Teams are strongly encouraged to take the provided comments into account when resubmitting.

## **POWER UP PRIZE**

- The same criteria used to score the Countdown Contest submissions will be used to evaluate recipients of the Power Up Prize in addition to the new Reviewer Recommendation criteria regarding whether or not the gaps in the submission are addressable with the Power Up Prize.

## **8. FIND HELP**

Visit <https://americanmadechallenges.org/network.html> to review and contact the members of the American-Made Network that have signed up to help you succeed.

## 9. ADDITIONAL REQUIREMENTS

Please read and comply with additional requirements in [Appendix 1](#).

**COMPETITORS THAT DO NOT COMPLY WITH THESE REQUIREMENTS MAY BE DISQUALIFIED.**

# III. LIFTOFF CONTEST RULES

## 1. INTRODUCTION

The American-Made Perovskite Startup Prize is a two-contest program with up to \$3 million in prizes. This prize is designed to accelerate and sustain solar innovation by supporting entrepreneurs as they develop transformative perovskite technology research via a new business entity. It represents the first necessary business-related step to transform leading American perovskite research into commercialized products manufactured in the United States.

### Liftoff Contest Prizes

- 2-3 winners anticipated
- Each winner receives \$500,000 in cash and a \$100,000 voucher

The Countdown and Liftoff Contests are structured to provide the resources and environment necessary to create new perovskite startups and develop them into successful businesses via rapid learning cycles.

The Liftoff Contest is the second in this two-contest program with an anticipated \$1.2 million share of the \$3 million prize pool. Only winners of the Countdown Contest can compete in the Liftoff Contest. They will be referred to as finalists. The DOE will announce when the Liftoff Contest is over. The following guidelines are for competitors interested in the Liftoff Contest. “You” and “your” reference competitors in the contest.

## 2. GOALS

The Liftoff Contest focuses on three key areas:

- **Demonstrated Progress:** Completion of the aggressive milestones and deliverables submitted in the Countdown Contest.
- **Third-Party Validation:** Evaluation by neutral, third-party testing facilities of the demonstrated perovskite module performance claims.
- **Network Development:** Solidification of a core network of mentors and partners to work with to help advance the proposed solution. This network can include national labs, other members of the American-Made Network, funders, and/or private partners.

## 3. PRIZES TO WIN

The Liftoff Contest offers cash prizes of \$500,000 and vouchers worth \$100,000. Two-thirds of voucher funds must be spent at a national lab, and the remaining third may be spent at a national lab or a private facility in the American Made Network. Winners will negotiate the scope of work to be

performed using a voucher and can choose which national lab and/or private facility within the American Made Network will perform the work. For additional information on how the voucher program works, see [https://www.americanmadechallenges.org/perovskiteprize/docs/Perovskite\\_Prize\\_Voucher\\_Guidelines.pdf](https://www.americanmadechallenges.org/perovskiteprize/docs/Perovskite_Prize_Voucher_Guidelines.pdf).

## 4. HOW TO ENTER

The Liffoff Contest will be open to eligible Countdown Contest winners on a rolling basis and reviewed **multiple times per year** as shown on the schedule listed at <https://www.herox.com/PerovskitePrize/overview>. Complete a submission package online and submit it before the due date at <https://www.herox.com/PerovskitePrize>.

## 5. LIFTOFF CONTEST PROCESS

The Liffoff Contest consists of the following steps:

1. **Make Progress** – Competitors work with the American-Made Network<sup>20</sup> to advance their technical and business plans in accordance with the milestone and deliverable table submitted in the Countdown Contest. Changes to this table may be necessary to reflect pivots from the original plan, made to improve product viability. These changes will not result in a negative review unless they are not easily rationalized or clearly in the best interest of the company. Underperformance relative to previously stated goals is not a pivot/adjustment and will likely be viewed negatively. **Competitors are encouraged to continue leveraging the Mentor Network as their proposed technology and business plans evolve throughout the competition.**
2. **Verify** – The best possible evidence, such as third-party testing and outside expert review, must be assembled to support critical technical achievements.
3. **Letter of Intent:** **Competitors must submit a Letter of Intent a minimum of four weeks before completing a submission package for a Liffoff Deadline. Letters of Intent are short documents informing the prize administrator that a competitor plans to participate in an upcoming deadline.**
4. **Submit** – Competitors complete their submission packages and submit online before the contest closes for the **relevant review cycle**.
5. **Selection Assessment** – The prize administrator screens all completed submissions for eligibility and completion and assigns subject-matter expert reviewers to independently score the content of each submission. The scoring criteria will assess the following competitor activities:
  - **Results:** The competitor has met or exceeded the predetermined goals described in their milestones and deliverables table, justified any changes from their original plan, and

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<sup>20</sup> The prize administrator has dedicated approximately \$150,000 to recognize members of the American-Made Network who help competitors advance through the contests.

demonstrated a clear and enduring commitment to do everything they can to make a successful U.S. manufacturing company.

- **Protection:** The competitor has secured the necessary rights to the intellectual property being transitioned out of the lab and into their business.
  - **Infrastructure:** The competitor has proven they have access to all the necessary equipment and expertise they will need to be successful.
  - **Customer Discovery:** The competitor has performed a rigorous customer-discovery process to uncover key insights from entities that would be eventual customers or end users of the product.
  - **Network Activation:** The competitor has cultivated a network of mentors and partners, either inside or outside the American-Made Network, to help advance the proposed solution.
6. **Interview** – The prize administrator may decide to hold an interview with competitors to help answer questions the judge may have.
  7. **Announcement** – Approximately one month after the contest closes, the prize administrator notifies competitors of the results and requests the necessary information to distribute cash prizes to the winners. The prize administrator will then publicly announce winners. After receiving the Liftoff Contest prize, winners can develop their solutions in accordance with their plan.
  8. **Resubmission** – Teams that were not selected as winners in a given **application cycle** may be eligible to improve their submission package based on the feedback given and resubmit in a following **cycle**. See the eligibility requirements in [Section 1.7](#).

## 6. WHAT TO SUBMIT

**Competitors must submit a Letter of Intent a minimum of four weeks before completing a submission package for a Liftoff Deadline. Letters of Intent are short documents informing the prize administrator that a competitor plans to participate in an upcoming deadline.**

A complete submission package for the Liftoff Contest should include the following items:

- Letter of Intent (submitted 4 weeks before the full package)<sup>21</sup>
- Performance verification
- Five-minute pitch and demonstration video (public)
- Cover-page
- Narrative answers to four questions (maximum 2,500 words)
- Summary PowerPoint slide (public)
- Voucher-work slide
- Technical assistance request (public)
- Letters of commitment or support (optional)
- IP agreements (required where applicable)

**Note:** Portions of the submission package are made available to the public. These have been denoted as such, and DOE does not intend to release the remaining parts of the submission to the public. See [Appendix 1](#) for additional details.

**All documents must be uploaded as a PDF.**

**Performance Verification** – Provide evidence of your prototypes’ technical performance.

- Evidence of performance of your perovskite module and device may include:
  - Certification of power conversion efficiency and degradation performance by third-party testing laboratories<sup>22</sup>
  - Videos of device fabrication and performance testing
- Provided written evidence may not exceed 5 pages including all tables and figures.
- Provided video evidence may not exceed 1 minute.

Reviewers and the Prize judge will evaluate your submissions by agreeing or disagreeing with assigned statements on a 1–6 scale, as shown below. These statements are the criteria.

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

**Online Pitch and Demo Video** – Provide a five-minute pitch about your company and what you have accomplished.

Suggested content you provide	Each statement is scored on a 1–6 scale
<ul style="list-style-type: none"> <li>• A description of your perovskite technology</li> </ul>	

<sup>21</sup> [Letter of Intent template](#).

<sup>22</sup> One example of such a facility is the [PV Cell and Module Performance Group](#) at NREL. The American-Made Network may be able to help find other facilities.

<p>and why it is transformational compared with existing perovskite technology.</p> <ul style="list-style-type: none"> <li>• A description of progress made during the competition.</li> <li>• A description of who you are and why you have a competitive edge.</li> <li>• A description of your beachhead market and the scale of the opportunity.</li> <li>• A plan for how you will create a sustainable business with U.S. manufacturing.</li> <li>• The next steps in your development process and a plan for how you will attract the necessary resources to complete it.</li> </ul>	<ul style="list-style-type: none"> <li>• The video describes a unique perovskite approach that has a realistic ability to become a successful business in the long term.</li> <li>• The video demonstrates the team has made significant progress during the competition.</li> <li>• The video shows a knowledgeable and skillful team.</li> <li>• The video identifies a reasonable beachhead market and a path to making a significant impact on the U.S. solar industry.</li> <li>• The video identifies a domestic manufacturing strategy that leverages the strength of the U.S. solar industry.</li> <li>• The video demonstrates a clear path for future development.</li> </ul>
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Post your publicly accessible video online (e.g., YouTube, Vimeo, etc.). Be creative and produce a video that conveys the required information in exciting and interesting ways, but do not focus on time-consuming activities that only improve production values (i.e., technical elements such as décor, lighting, and cinematic techniques). Assistance from others with experience in this area may be helpful. Members of the American-Made Network may be able to help you create your video.

<p align="center"><b>Cover Page</b> – List basic information about your submission  <b>Template<sup>23</sup>:</b> <a href="https://www.herox.com/PerovskitePrize/resources">https://www.herox.com/PerovskitePrize/resources</a></p>
<ul style="list-style-type: none"> <li>• Project name</li> <li>• Project title or tagline (e.g., your mission in a few words)</li> <li>• Link to your five-minute video online</li> <li>• Key project members (names, contacts, and links to their LinkedIn profiles)</li> <li>• Keywords that best describe your solution (e.g., vapor or solution deposition, roll-to-roll, or rail-to-rail)</li> <li>• Your city, state, and nine-digit zip code</li> <li>• The partners, affiliates, and Connectors<sup>24</sup> who significantly helped you<sup>25</sup> advance your solution and the major items they helped with (if applicable)</li> </ul>

You should answer all of the following four questions. The content bullets are only suggestions to guide your responses. You decide where to focus your answers. The individual answers to the four questions do not have a word limit; however, **the aggregate response to these four questions**

<sup>23</sup> Use of the template is optional, but all components listed here must be included in your document if you choose to create your own.

<sup>24</sup> See description of Connector in [I. Program Summary](#).

<sup>25</sup> Remember that you can incentivize Connectors to help you by agreeing to identify them to receive a cash reward if you win the Liftoff Contest. See the description of Recognition Rewards in [I. Program Summary](#) and the [Connector Guidelines](#) for details.

**must not exceed 2,500 words**, not including captions, figures/graphs, or references. **A word count must be included** at the end of your submission (see template for details). You may also include **up to five supporting images, figures, or graphs**. The reviewers will score the questions based on the content you have provided.

**Note:** If you have substantially pivoted from the deliverable table submitted in the Countdown Contest, you must provide an explanation of how and why. It is understood that innovation and entrepreneurship are not usually a linear path, but major changes in direction should always be well rationalized. You were selected on the strengths of your Countdown Contest submission, and significant changes without justification are unlikely to be successful.

<b>Narrative (PDF)</b> <b>Maximum 2,500 words and 5 supporting images or figures</b> <i>Template<sup>26</sup>: <a href="https://www.herox.com/PerovskitePrize/resources">https://www.herox.com/PerovskitePrize/resources</a></i>	
<b>Question 1: <i>Technology and Accomplishments</i></b> – What is your technology platform, what have you done to date, and what qualities give you a competitive edge?	
<p style="text-align: center;"><b>Suggested content you provide</b></p> <ul style="list-style-type: none"> <li>A description of the current state of development of your perovskite technology platform and how it has evolved over the competition period.</li> <li>A description of the innovation or unique value proposition of your technology platform compared to the current state of the art.</li> <li>A description of how your fabrication capabilities have improved or expanded.</li> <li>A description of your IP position, the owner of the IP and the agreements established with any third-party owners of IP.</li> </ul>	<p style="text-align: center;"><b>Each statement is scored on a 1–6 scale</b></p> <ul style="list-style-type: none"> <li>Sufficient technical detail was provided to understand the underlying core tenets of the team’s innovation</li> <li>The team demonstrates a strong understanding of the competitive landscape and their unique value proposition and differentiators.</li> <li>The team has demonstrated significant improvement in their ability to make manufacturing-relevant perovskite devices.</li> <li>The team has secured the necessary IP to begin to develop a business suitable for third-party investment.</li> </ul>
<b>Question 2: <i>Demonstration of the Liftoff Contest Goals</i></b> – Have you successfully demonstrated that you achieved your goals?	
<p style="text-align: center;"><b>Suggested content you provide</b></p> <ul style="list-style-type: none"> <li>Provide the final deliverables submitted in the Countdown Contest and the actual outcomes.</li> </ul>	<p style="text-align: center;"><b>Each statement is scored on a 1–6 scale</b></p> <ul style="list-style-type: none"> <li>The competitors successfully met their Liftoff Contest technical milestones, per their deliverable table, and are demonstrating continued critical progress toward de-risking</li> </ul>

<sup>26</sup> Use of the template is optional, but all components listed here must be included in your document if you choose to create your own. The provided template has been updated from the Countdown Contest.



<ul style="list-style-type: none"> <li>• Describe the critical technical and business milestones that have been accomplished during the competition?</li> <li>• Provide details on your perovskite devices, with an explanation of how the various layers were deposited, the encapsulation scheme, and the materials used.</li> </ul>	<p>their technology.</p> <ul style="list-style-type: none"> <li>• The competitors successfully met their Liftoff Contest business milestones, per their deliverable table, and are demonstrating continued critical progress toward validating the market demand for this innovation.</li> <li>• The samples for which performance validation were provided demonstrate a proof of concept of the key materials and processes on the critical de-risking path.</li> </ul>
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**Question 3: *Team*** – What qualities give you a competitive edge, and how have you improved?

<p style="text-align: center;"><b>Suggested content you provide</b></p> <ul style="list-style-type: none"> <li>• An introduction to your team and an explanation of how it came together, highlighting the knowledge and skills that make it uniquely capable of achieving success.</li> <li>• An explanation of how the team identified and filled skill gaps, leveraging the American-Made Network where appropriate.</li> <li>• A statement about why winning the Liftoff Contest will substantively change the likelihood of your success.</li> </ul>	<p style="text-align: center;"><b>Each statement is scored on a 1–6 scale</b></p> <ul style="list-style-type: none"> <li>• The team’s drive, knowledge, and complementary skillsets provide a strong competitive edge for developing a perovskite solar company.</li> <li>• The team identified skill gaps and brought in the right people or partners to fill those gaps.</li> <li>• Winning the Liftoff Contest significantly increases the team’s chances of creating a viable business based on their solution.</li> </ul>
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**Question 4: *Plan*** – What is your plan to achieve your goals?

<p style="text-align: center;"><b>Suggested content you provide</b></p> <ul style="list-style-type: none"> <li>• Defined goals for the next 90, 180, and 365 days (see special instructions below).</li> <li>• A description of your team’s readiness to meet your goals, including laboratory and equipment access plans, and the need for additional resources and/or talent.</li> <li>• An explanation of how you will turn your company into a sustainable business with a competitive advantage to manufacture in the United States.</li> <li>• A high-level budget plan to meet your goals for the next 180 days, including an explanation of how you will leverage program resources—specifically, the voucher funds,</li> </ul>	<p style="text-align: center;"><b>Each statement is scored on a 1–6 scale</b></p> <ul style="list-style-type: none"> <li>• Stated 90-, 180-, and 365-day goals are ambitious and risk-reducing, and they show a commitment to an accelerated solution development cycle.</li> <li>• The submission package provides confidence that the team is committed and has access to the resources necessary to execute on their immediate plans.</li> <li>• The team has a reasonable go-to-market strategy with a promising path toward domestic manufacturing.</li> <li>• The competitors’ approach to complete their proposed plan is well reasoned and makes good use of the program resources available</li> </ul>
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members of the American-Made Network, or other entities.	to them (such as national laboratories and the American-Made Network).
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Reviewer Recommendation	
<ul style="list-style-type: none"> <li>There is no direct corresponding submission requirement for this score. Rather, it is an overall assessment of all materials submitted in HeroX.</li> </ul>	<p style="text-align: center;"><b>Statement is scored as a 1 or 6</b></p> <ul style="list-style-type: none"> <li>This innovation, team, and plan should be strongly considered for a Liftoff Contest prize.</li> </ul>

#### Special instructions for Question 4

- Use only specific, measurable, achievable, relevant, and timely (SMART) outcome-based goals, not activity-based goals, so that a neutral third-party can validate them (if possible).
  - For example: Demonstrate a definitive achievement of progress (e.g., “X letters of interest signed” or “achieve X% efficiency”). **Do not** describe how you spent your time (e.g., “provided a report,” “talked to customers,” or “performed experiments”).
- SMART goals for the next 90, 180, and 365 days should include specific performance and scaling targets for your fabrication/manufacturing capabilities as well as where, how, and when you expect to raise the necessary funding to continue this development.
- In defining your SMART goals, include quantified, risk-reducing, meaningful, practical, and testable interim milestones.
- SMART goals should include assessment and feedback from many relevant stakeholders (e.g., possible investors, customers, and experts in the solution space, and entities that would be the eventual customers or end users of the product.).
- Members of the American-Made Network may be able to help you to formulate your SMART goals.

Submission Summary Slide (a PowerPoint slide as a PDF will be made public)
Make your own public-facing, one-slide submission summary containing technically specific details that can be understood by most people. There is no template, so feel free to present the information as you see fit. Please make any text readable in a standard printout and conference room projection.

Voucher Work Slide (a PowerPoint slide as a PDF) <b>Template:</b> <a href="https://www.herox.com/PerovskitePrize/resources">https://www.herox.com/PerovskitePrize/resources</a>
Using the Voucher Work Slide template, describe how you will use your voucher funds, including the entities you plan to engage and what they will do with the voucher funds. Provide one slide per entity—national laboratory and/or private facility—that you plan to engage. Include a maximum of two slides. Further details about the voucher process are provided in the <a href="#">voucher guideline</a> .

### Technical Assistance Request (a two-page PDF will be made public)

Provide a maximum of two pages to describe areas where you need technical assistance to realize your solution. Each challenge area should include a description of the specific type of assistance being requested from a national laboratory or member of the American-Made Network.

The challenges being addressed in the Voucher Work Slide **do not** need to be addressed in detail here. Instead, focus on the challenges for which you do not yet have a plan or expertise to address.

The prize administrator will make this request broadly available, so members of the American-Made Network can understand your needs and potentially help you.

### Letters of Commitment or Support (optional, as a PDF)

Attach one-page letters of support, intent, or commitment from other relevant entities (e.g., lab space providers, shared equipment facilities, strategic manufacturing partners) to provide context and evidence to support your written application. Provide the strongest possible evidence that you have the necessary resources and partners lined up to execute on your plan. Letters of support from partners or others that are critical to the success of your proposed solution will likely increase your score. General letters of support from parties that are not critical to the execution of your solution will likely not factor into your score. Please do not submit multipage letters.

### Intellectual Property Licensing Agreements (required if applicable, as a PDF)

Provide documentation showing that you have secured access to the IP underlying your perovskite technology stack from the relevant institution where it was originally developed, where applicable.

Please read and comply with additional requirements about your submission in [Appendix 1](#).

**COMPETITORS WHO DO NOT COMPLY WITH THESE REQUIREMENTS MAY BE DISQUALIFIED.**

## 7. HOW WE SCORE

The scoring of submissions will proceed as follows:

- A panel of expert reviewers will read, score, and comment on each submission. Each bullet listed in the review criteria under the video submission and the four narrative questions will receive a score from 1 to 6. The bullets have equal weight, so questions that have more review criteria bullets have a greater influence on the final score. The final score from an individual reviewer for a submission package equals the total sum of the scores for all the bullets. All reviewers' scores will then be averaged for a final reviewer score for the

submission package. The final prize judge will consider reviewer scores when deciding the winners of the Perovskite Startup Prize.

- Interviews – The prize administrator, at its sole discretion, may decide to hold interviews with some of the Liftoff Contest competitors. The interviews would be held prior to the announcement of winners, typically within two weeks of the submission deadline, and would serve to help answer questions the judge may have. If you are invited for an interview, you will be contacted 48 hours in advance; participation in the interview will be a prerequisite to receiving an award. An interview invitation is not an indication of winning.
- The judge’s final determination of winners will take reviewer scores, interview findings (if applicable), and program policy factors listed in [Appendix 1](#) into account. DOE is the judge and final decision maker and may elect to award all, none, or a subset of the submissions accepted at each submission deadline.
- All teams that submitted an eligible entry will receive comments on their submission. Teams that are not selected as Liftoff Contest winners may be eligible to resubmit in a future round. See the eligibility requirements in [Section I.7](#). Teams are strongly encouraged to take the provided comments into account when re-submitting.

## 8. FIND HELP

Visit <https://americanmadechallenges.org/network.html> to review and contact the members of the American-Made Network that have signed up to help you succeed.

## 9. ADDITIONAL REQUIREMENTS

Please read and comply with additional requirements in [Appendix 1](#).

**COMPETITORS THAT DO NOT COMPLY WITH THESE REQUIREMENTS MAY BE DISQUALIFIED.**

# IV. APPENDIX 1: ADDITIONAL TERMS AND CONDITIONS

## 1. UNIVERSAL CONTEST REQUIREMENTS

Your submission for the Countdown and Liftoff Contests is subject to the following terms and conditions:

- If any team member is actively receiving funding from SETO at the Countdown submission deadline, SETO will review any potential prize awards as well as other DOE funding and make a decision as to whether awarding a prize to individuals or entities already receiving funding is in line with the program policy factors stated later in these rules ([Section V.14](#)).
- You must post the final content of your submission or upload the submission form online at <https://www.herox.com/PerovskitePrize> before the Countdown and Liftoff Contests close. Late submissions or any other form of submission do not qualify.
- The video submission, summary slide, and technical assistance request will be made public.
- The cover page, narrative, **Mentor Engagement Outputs**, and letters of commitment/support are not intended to be made public; however, see [Section V.11](#) regarding the Freedom of Information Act (FOIA).
- You agree to release your submission video under a Creative Commons Attribution 4.0 International License (see <http://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. Competitors may be given an opportunity to rectify submission errors due to technical challenges.
- Your submission must be in English and in a PDF readable and searchable format. Scanned handwritten submissions will be disqualified.
- Competitors will be disqualified if any engagement during the Perovskite Startup Prize—including but not limited to the submission, the online forum, emails to the prize administrator, or other forms of communication—contains any matter that, in the discretion of DOE, is indecent, lacking in professionalism, or demonstrates a lack of respect for people or life on this planet.
- If you click "Accept" on the HeroX platform and proceed to register for either of the contests described in this document, these rules will form a valid and binding agreement between you and DOE and is in addition to the existing HeroX Terms of Use for all purposes relating to these contests. You should print and keep a copy of these rules. These provisions apply only to the contests described here and no other contests on the HeroX platform or anywhere else.

- The prize administrator, when feasible, may give competitors an opportunity to fix non-substantive mistakes or errors in their submission packages.

## 2. VOUCHER PAIRING SYSTEM

The Prize Administrator will coordinate with the other DOE national laboratories and cultivate relationships with private facilities that are willing to work with competitors. Countdown Contest winners will include their planned use of voucher funds as a part of their Liftoff Contest submission. Winners of the Liftoff Contest will then be able to negotiate specifics with either their laboratory partner or private facility and quickly begin voucher work.

Although winners can choose where they spend their voucher funding, two-thirds of voucher funds must be spent at a national laboratory, and the remaining third may be spent at a national laboratory or a private facility of the winners' choice. In the case of a national laboratory, the funds will be provided directly to the laboratory on behalf of the winners to conduct a mutually-agreed-on scope-of-work between the laboratory and the winners. When vouchers are used at a non-national laboratory facility, the winners will be directly paid the voucher prize after the voucher work is complete. Voucher funds may not be redeemed for cash or transferred.

Further details about the voucher process are provided in the [voucher guideline](#).

## 3. VERIFICATION FOR PAYMENTS

The prize administrator will verify the identity and the role of a participant entity 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 **and Power Up Prize recipients** 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 W9 form (<https://www.irs.gov/pub/irs-pdf/fw4.pdf>). At 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; or (iv) the submission or person/entity is disqualified for any other reason.

## 4. TEAMS AND SINGLE-ENTITY AWARDS

The prize administrator will award a single dollar amount to the business entity designated by the primary submitter, whether consisting of a single or multiple entities. The winning business entity is solely responsible for allocating any prize funds among its member competitors as they deem appropriate.

## 5. SUBMISSION RIGHTS

The public videos in this contest must be submitted and released to the public under a Creative Commons Attribution 4.0 International License (see <http://creativecommons.org/licenses/by/4.0/>).

By making a submission and consenting to the rules of the contest, 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 the parts of the submission that are designated as “public” for government purpose. This license includes posting or linking to the public portions of the submission on the prize administrator’s or HeroX’s applications, on 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 DOE, the prize administrator, and judges 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 the competitors’ names and, as applicable, the names of competitors’ team members and organizations, which participated in the submission on the contest website indefinitely.

By entering, Competitor represents and warrants that:

The competitor is the sole, original author and copyright owner of the submission 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, trade secret, trademark, nondisclosure agreement, patent, or upon any other third-party rights; and that the submission is free of malware.

## 6. 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.

## 7. CONTEST SUBJECT TO APPLICABLE LAW

All contests are subject to all applicable federal laws and regulations. Participation constitutes each participant's full and unconditional agreement to these Official 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.

## 8. RESOLUTION OF DISPUTES

DOE is solely responsible for administrative decisions, which are final and binding in all matters related to the contest.

In the event of a dispute, 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. Competitors and potential winners may be required to show proof of being the authorized account holder.

The Prize Administrator will not arbitrate, intervene, advise on, or resolve any matters between team members or any disputes between teams.

## **9. PUBLICITY**

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

## **10. LIABILITY**

Upon registration, all participants 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 or development of any submission. Upon registration, except in the case of willful misconduct, all participants 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.

In accordance with the delegation of authority to run this contest delegated to the director of SETO, the director has determined that no liability insurance will be required of competitors to compete in this competition, per 15 USC 3719(i)(2).

## **11. RECORDS RETENTION AND FREEDOM OF INFORMATION ACT (FOIA)**

All materials submitted to DOE as part of a submission become DOE records. Any confidential commercial information contained in a submission should be designated at the time of submission.

Competitors are encouraged to employ protective markings in the following manner:



- The cover sheet of the submission must be marked as follows and identify the specific pages containing trade secrets or commercial or financial information that is privileged or confidential:

Notice of Restriction on Disclosure and Use of Data:

Pages [list applicable pages] of this document may contain trade secrets or commercial or financial information that is privileged or confidential and 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 page that contains trade secrets or privileged commercial or financial information must be marked as follows: “May contain trade secrets or commercial or financial information that is privileged or confidential and exempt from public disclosure.”
- In addition, each line or paragraph containing trade secrets or commercial or financial information that is privileged or confidential must be enclosed in brackets.

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.

## 12. 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.

## 13. 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 or modify the contest.

Although DOE indicates in the Countdown and Liftoff Contests that it will select up to several winners 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.

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

## **14. 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 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. The following is a list of such factors. In addition to the reviewers' scores, the below program policy factors may be considered in determining winners:

- Geographic diversity and potential economic impact of projects in a variety of markets
- Whether the use of additional DOE funds and provided resources continue to be nonduplicative and compatible with the stated goals of this program and DOE's mission generally
- The degree to which the submission exhibits technological or programmatic diversity when compared to the existing DOE project portfolio and other competitors
- The level of industry involvement and demonstrated ability to accelerate commercialization and overcome key market barriers
- The degree to which the submission is likely to lead to increased employment and manufacturing in the United States or provide other economic benefit to U.S. taxpayers
- The degree to which the submission will accelerate transformational technological, financial, or workforce advances in areas that industry by itself is not likely to undertake because of technical or financial uncertainty
- 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, 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.<sup>27</sup>

- 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.

## 15. DEFINITIONS

**Prize Administrator** means both the Alliance for Sustainable Energy operating in its capacity under the Management and Operating Contract for NREL and SETO. When the prize administrator is referenced in this document, it refers to staff from both the Alliance for Sustainable Energy and SETO staff. Ultimate decision-making authority regarding contest matters rests with the director of SETO.

**Connector or Connector Organization** means an entity that seeks to support the efforts of the competitors. These must be U.S.-based organizations that have the capacity to connect competitors to mentoring, business resources, and/or manufacturing resources, or introduce them to possible sources of funding. This definition is intentionally broad so that many different types of entities are able to participate. Connectors will be earning Recognition Rewards based upon their support of the competitors. Further details can be found at: <https://americanmadechallenges.org/network.html>.

**Mentor or Mentor Network** are a group of individuals who seek to support the efforts of the competitors. The Perovskite Startup Prize Mentors all participate in their individual capacity and use their experience with perovskites and the perovskite marketplace to provide expert advice on their submissions. Engagement of the Perovskite Startup Prize Mentor Network is required for resubmissions in the Countdown Contest and the interactions with the Mentors should be documented in the Mentor Engagement Outputs. Perovskite Startup Prize Mentors are eligible to earn Recognition Rewards based on their support of the competitors.

**Power Connector** means a subset of Connectors that receive contracts from the Alliance for Sustainable Energy to play a more substantial role in the competition and receive funds to expand and amplify the American-Made Perovskite Startup Prize. Not only will these stakeholders work to identify talent and support competitors in the Countdown and Liftoff Contests, but they will also

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<sup>27</sup> 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.

partner with NREL to envision and execute a long-term sustainable strategy for scaling the American-Made Challenges.

**Voucher Funding** – Vouchers are part of the Prizes for the Liftoff Contest. In the case of a national laboratory, the funds will be provided directly to the laboratory on behalf of the winner to conduct a mutually agreed upon scope of work between the laboratory and the winner. When vouchers are used at a non-national laboratory facility, the winners will be reimbursed after the voucher work is complete. For further information, please see:

[https://www.americanmadechallenges.org/perovskiteprize/docs/Perovskite\\_Prize\\_Voucher\\_Guidelines.pdf](https://www.americanmadechallenges.org/perovskiteprize/docs/Perovskite_Prize_Voucher_Guidelines.pdf).

## V. APPENDIX 2: FOREIGN WORK REQUIREMENT

### Waiver

If an entity seeking to compete does not have majority domestic ownership and control, the Office of Energy Efficiency and Renewable Energy (EERE) may consider issuing a waiver of that eligibility requirement where (1) the entity submits a compelling justification; (2) the entity is incorporated in and maintains a primary place of business in the United States; and (3) the entity otherwise meets the eligibility requirements. EERE will not waive the eligibility requirement that all competing entities must be incorporated in and maintain a primary place of business in the United States. Entities seeking a waiver should include a justification along with their submission. EERE may require additional information before making a determination on the waiver request. There are no rights to appeal DOE's decision on the waiver request.

**The justification must address the following waiver criteria and content requirements:**

### Waiver Criteria

Entities seeking a waiver must demonstrate to the satisfaction of EERE that its participation: (1) has a high likelihood of furthering the objectives of this Prize competition and (2) aligns with the best interest of the U.S. industry and U.S. economic development.

### Content for Waiver Request

A waiver request must include the following information:

1. Entity's name and place of incorporation
2. The location of the entity's primary place of business
3. A statement describing the extent to which the entity is owned or controlled by a foreign government, agency, firm, corporation, or person who is not a citizen or permanent resident of the United States, including the applicable percentage of ownership/control
4. A compelling justification that addresses the waiver criteria stated above
5. A description of the project's anticipated contributions to the U.S. economy
6. A description of how the entity has benefitted U.S. research, development, and manufacturing, including contributions to employment in the United States and growth in new U.S. markets and jobs
7. A description of how the entity has promoted domestic manufacturing of products and/or services.

**This is the end of the rules document, thank you for reading.**