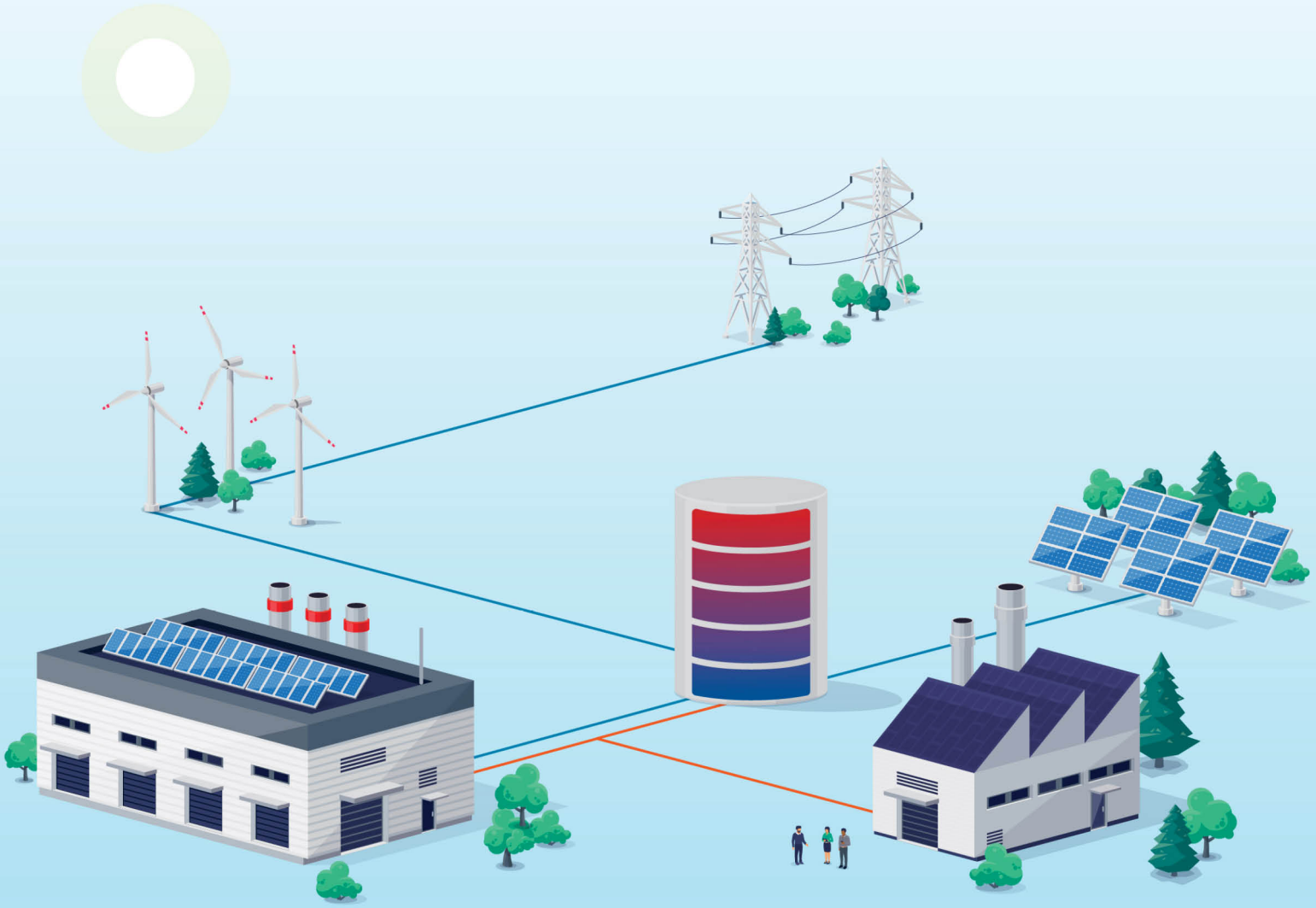
Industrial Energy Storage Systems Prize

AMERICAN MADE
U.S. DEPARTMENT OF ENERGY



Official Rules

PHASE 1: DESIGN

Preface

The U.S. Department of Energy's Industrial Energy Storage Systems Prize will be governed by 15 U.S.C. §3719 and this Official Rules document. This is not a procurement under the Federal Acquisitions Regulations and will not result in a grant or cooperative agreement under 2 CFR 200. The prize administrator reserves the right to modify this Official Rules document if necessary and will publicly post any such notifications as well as notify registered prize participants.

Contents

1 Executive Summary

The U.S. Department of Energy (DOE) Industrial Efficiency and Decarbonization Office (IEDO) is launching the American-Made Industrial Energy Storage Systems Prize. With the recent growth of U.S. industrial electric loads—from both increased American manufacturing as well as a sharp increase in data center construction driven by artificial intelligence—this prize aims to support development of innovative energy storage solutions that can accommodate cooling, thermal, and/or electric energy loads at the industrial facility scale. The industrial sector is a significant contributor to the U.S. economy, contributing $4.8 trillion annually[1] and supporting greater than 20 million jobs[2] while utilizing greater than 30%[3] of the nation's primary energy use. The industrial energy storage solutions developed through this prize will serve as a cross-sector means of advancing energy resilience, reliability, and efficiency of U.S. industrial facilities. Concepts solicited from competitors should enable time shifting of either electric or thermal energy demand, by using thermal energy storage across a range of temperatures of industrial relevance, enabling on-site or near-site energy to fully meet the heat or power demands of industrial processes. These concepts could facilitate the adoption of affordable electricity for industrial facilities by addressing the challenge of intermittency associated with low-cost energy sources and load variability at different timescales. By targeting cost-effective solutions that could easily integrate with existing industrial facilities' footprints, this prize will support the acceleration of market adoption for cost-effective technologies that can be charged by thermal or electrical sources, providing heating, cooling, and/or power to industrial facilities.

1.1 Prizes Overview

The Industrial Energy Storage Systems Prize contains three phases that will support the acceleration of concept design and development, as well as market adoption readiness, for cost-effective energy storage technologies that can be charged by thermal or electrical sources, providing heating, cooling, and/or power to industrial facilities. Throughout all three phases, competitors will be asked to maintain strong alignment of their technical concept development with commercialization goals by including adoption readiness and commercialization plan development. In addition, solutions will be expected to be validated through industrial facility partnering and testing in later phases of the prize. The prize offers a total prize pool of $4,800,000 in cash across three phases. Submissions must align with one of the following three categories:

- Industrial cooling energy storage
- High temperature (>300°C) industrial energy storage
- Industrial thermal storage for hybrid cooling, heating, and power.

Contest	Winners	Prizes	Categories
Design	Up to 18 total winners with six winners expected to be selected in each of the three categories	$100,000	Industrial cooling energy storage High temperature (>300°C) industrial energy storage Industrial thermal storage for hybrid cooling, heating, and power
Advance	Up to nine total winners with three winners expected to be selected in each of the three categories	$200,000	
Validate	Up to three total winners with one winner expected to be selected in each of the three categories	$400,000	

[1] *Interactive Access to Industry Economic Accounts Data,* Bureau of Economic Analysis (2023).
[2] *Goods-Producing Industries,* Bureau of Labor Statistics (2023).
[3] *Manufacturing Energy Consumption Survey,* U.S. Energy Information Administration (2021).

1.2 Key Dates

Please refer to the HeroX platform for important dates: www.herox.com/industrial-energy-storage.

2 Eligibility and Requirements

2.1 Eligibility and Competitors

All-Phase Eligibility

The competition is open only to individuals; private entities (for-profits and nonprofits); nonfederal government entities such as states, counties, tribes, and municipalities; and academic institutions, subject to the following requirements:

- An individual prize competitor (who is not competing as a member of a group) must be a U.S. citizen or permanent resident.
- A group of individuals competing as one team may win, provided all individuals competing as part of the team are U.S. citizens or permanent residents of the United States.
- Private entities must be incorporated in and maintain a primary place of business in the United States.
- Academic institutions must be based in the United States.
- DOE employees, employees of sponsoring organizations, members of their immediate families (e.g., spouses, children, siblings, or parents), and persons living in the same household as such persons, whether or not related, are not eligible to participate in the prize.
- 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.
- Federal entities and federal employees are not eligible to participate in any portion of the prize.
- DOE national laboratory employees cannot compete in the prize.
- 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.
- Individuals participating in a foreign government talent recruitment program[4] sponsored by a country of risk[5] and teams that include such individuals are not eligible to compete.
- Entities owned by, controlled by, or subject to the jurisdiction or direction of a government of a country of risk are not eligible to compete.
- To be eligible, an individual authorized to represent the competitor must agree to and sign the following statement upon registration with HeroX:

  I am providing this submission package as part of my participation in this prize. I understand that the information contained in this submission will be relied on by the federal government

[4] A foreign-government-sponsored talent recruitment program is defined as an effort directly or indirectly organized, managed, or funded by a foreign government, or a foreign government instrumentality or entity, to recruit science and technology professionals or students (regardless of citizenship or national origin, or 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 relocate physically to the foreign state for the previously mentioned 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, complementary foreign travel, honorific titles, career advancement opportunities, promised future compensation, or other types of remuneration or consideration, including in-kind compensation.

[5] DOE has designated the following countries as foreign countries of risk: Iran, North Korea, Russia, and China. This list is subject to change.

to determine whether to issue a prize to the named competitor. 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, and 31 U.S.C. §§ 3729-3733 and 3801-3812.

In keeping with the goal of growing a community of innovators, competitors are encouraged to form multidisciplinary teams while developing their concept. The HeroX platform provides a space in which parties interested in collaboration can post information about themselves and learn about others who are also interested in competing in this prize.

Phase 1 Eligibility

- Competitors may have one submission per category as long as each concept is differentiated. Competitors cannot submit more than one submission per category and can only have three submissions total.

Phase 2 Eligibility

- Only winners of Phase 1 are eligible to compete in Phase 2.
- 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. A for-profit business entity is eligible to compete only if it includes a winner of Phase 1 as an employee or owner. Individuals or groups of individuals are not eligible to compete.

Phase 3 Eligibility

- Only winners of Phase 2 are eligible to compete in Phase 3.
- 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.

2.2 Prize Program Goal Requirements

Only submissions relevant to the goals of this program are eligible to compete. The prize administrator must conclude that all the following statements are true when applied to your submission:

- The proposed solution is related to the energy storage sector and capable of integration with at least one industrial sector.[6]
- The proposed solution is not fully commercialized and is not currently in the U.S. marketplace.
- Most activities that are described in and support the submission package are performed in the United States and have the potential to benefit the U.S. market.
- The proposed solution represents an innovation that will move the energy storage industry beyond its current state.
- The proposed solution does not depend on new, pending, or proposed federal, state, or local government legislation, resolutions, appropriations, measures, or policies.

[6] As defined in the DOE *Industrial Decarbonization Roadmap*, manufacturing-based industrial sectors include petroleum refining, food products, paper products, chemicals, glass, cement and lime, iron and steel, aluminum, fabricated metal products, machinery, computers and electronics, transportation equipment, electrical equipment, wood products, plastics, and other manufacturing. For the purposes of this prize, data centers will also be considered as an industrial sector due to its similar energy load demand profile.

- 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.
- The submission content sufficiently confirms the competitor's intent to commercialize early-stage technology and establish a viable U.S.-based business in the near future with revenues that do not solely depend on licensing fees of intellectual property.

2.3 Find Help With the American-Made Network

The American-Made Network cultivates resources and builds connections that enhance, accelerate, and amplify competitors' efforts. The objective is to link participants with the people, resources, financing, perspectives, and industry expertise necessary for long-term success.

The network for this prize comprises the following:

- **Power Connectors**. Power Connectors are organizations who play a more substantial role in the competition and receive funds to expand and amplify DOE and the National Renewable Energy Laboratory's efforts. They are deeply involved with prize program execution, recruitment, and support. These organizations are contracted to perform a variety of tasks for specific prizes that advance program successes, thereby extending the reach and improving the diversity and inclusivity of the Network overall. Find more information about Power Connectors on the Industrial Energy Storage Systems Prize on HeroX.

2.4 Additional Requirements

Please read and comply with additional requirements in Appendix 1.

COMPETITORS THAT DO NOT COMPLY WITH THE ADDITIONAL REQUIREMENTS IN APPENDIX 1 MAY BE DISQUALIFIED.

3 Prize Description

3.1 Background

The Industrial Energy Storage Systems Prize is part of the American-Made Challenges program, which offers a fast track to the clean energy revolution. Funded by DOE, prizes like this incentivize innovation, training, teaming, and mentoring, connecting the nation's entrepreneurs and innovators to America's national labs and the private sector.

With the forecast surge in electricity demand for data centers coinciding with economy-wide electrification initiatives, solutions to alleviate pressure on the grid and supplement intermittent onsite energy generation will need to be innovated at unprecedented levels.[7] In 2021, the U.S. industrial sector represented 47% of potential peak demand savings for the U.S. electric grid[8] and as electrification of industrial processes becomes more widespread, the potential for the industrial sector to be an asset for the grid will continue grow. Yet, scenarios for industrial electrification and its impact on the grid are poorly understood,[4] and the role of distributed energy resources is often overlooked in planning for an increasingly interactive grid. As electrification of industrial processes becomes more widespread, the potential for the industrial sector to be an asset for the grid will continue to grow. On-site generation and energy storage, flexible industrial energy use, and adoption of digital technologies that enable "smart" interaction can help facilitate a grid-interactive industry that is responsive to operational and market drivers, such as resource adequacy during times of peak demand and high wholesale electricity prices. Industrial energy storage solutions that can accommodate cooling, thermal, and/or electric energy load at the industrial facility size could serve as a cross-sector means of advancing energy resilience, reliability, and efficiency of U.S. industrial facilities, while reducing additional burden on the electricity grid.

This prize will help accelerate market adoption for cost-effective thermal or thermo-chemical energy storage technologies that will provide cooling, electrical, and/or thermal energy to industrial facilities, using thermal or electrical sources. Concepts of particular interest will enable time shifting of either electric or thermal energy demand, by using thermal energy storage across a range of temperatures of industrial relevance, enabling on-site or near-site energy to fully meet the heat or power demands of industrial processes. These storage solutions can be charged by thermal or electrical sources, providing heating, cooling, and/or power. The prize will focus on advancing technology adoption and will ask applicants to assess adoption readiness levels (ARLs).[9] Concepts of any maturity or ARL will be allowed, provided that both technical and commercialization advancements are achieved. In all phases of the prize, competitors will need to clearly articulate the industrial purpose, application, and life cycle assessment and techno-economic analysis targets of the technology. They will also need to show clear intention to commercialize their technology through their own business model(s), industrial partnerships, and summary business plans.

3.2 Phases

In **Phase 1 - Design**, teams will develop a cost-effective concept that has the potential to support industrial-level load storage for thermal or electric energy needs. Competitors may submit concepts that address thermal or electrical energy needs or a combination thereof with application to an industry of their choosing. Competitors should explain how their technology offers a unique value add to their target industry. Applicants will be asked to present their target metrics and justify how their design will meet

[7] Denholm, P., P. Brown, W. Cole, T. Mai, B. Sergi. 2022. *Examining Supply-Side Options to Achieve 100% Clean Electricity by 2035.*. Golden, CO: National Renewable Energy Laboratory. NREL/TP-6A40-81644. https://www.nrel.gov/docs/fy22osti/81644.pdf.
[8] Federal Energy Regulatory Commission. 2023 Assessment of Demand Response and Advanced Metering.https://cms.ferc.gov/media/2023-assessment-demand-response-and-advanced-metering.
[9] For a description of adoption readiness level, visit https://www.energy.gov/technologytransitions/adoption-readiness-levels-arl-framework.

these metrics in a cost-competitive manner. While some metrics have been provided in the following list, competitors may present others beyond these suggestions. In addition, particular emphasis will be placed in this phase on the team's presented strategy for ensuring that solutions can reach an appropriate readiness level for demonstration in later phases. Up to 18 winners will be selected with up to six winners in each category. Winning teams will receive $100,000 in cash and be eligible to compete in the second phase.

Metrics to consider reporting:

- Operating temperature range (°C)
- Thermal capacity (megawatt-hours)
- Round-trip efficiency (energy output/energy input, %)
- Thermal cycles (charge-discharge cycles)
- Thermal reliability (retained energy density after cycling, % over X cycles)
- Discharge time (hours)
- Response time (seconds or minutes)
- Response behaviors to mode change (e.g., switching from charge to discharge)

In **Phase 2 – Advance**, winning teams will advance their concepts via a detailed design showing developmental progress, bench-scale data collection through prototyping, and development of adoption readiness plans. Using collected data, competitors must develop techno-economic and life cycle analyses to support the scaling potential of their energy storage solutions to industrial partners. During this phase, teams must showcase partnerships with at least one industrial partner through submitted letters of intent for adoption. Up to nine winners will be selected with up to three winners per category. Winning teams will receive $200,000 each in cash and be eligible to compete in Phase 3.

In Phase 2, competitors will be asked to focus on business development metrics, including, for example, financial metrics like payback period and return on investment for their technology, as well as technical execution metrics like potential process impact and complexity with respect to integration with existing industrial processes.

In **Phase 3 - Validate**, teams will prepare near-scale experimental devices to validate their designs and demonstrate their technological readiness. Competitors will also develop commercialization plans to showcase the market plan and future scalability for their technology. Competitors may be expected to work with IEDO to generate a validation report for the Industrial Technology Validation program. At the end of Phase 3, up to three winners will be selected with one winner selected in each category. Winning teams will receive $400,000 each in cash. Winning teams may also be eligible for additional support in the form of a cooperative agreement with IEDO, depending on availability of funds.

Metrics competitors may be asked to consider in Phase 3 include cost of components, cost of installation, and economy of scale. Assessment of metric goals set in Phase 1 will be considered during Phase 3.

For both Phase 2 and Phase 3, detailed rules and submission criteria will be released prior to the announcement of Phase 1 winners.

3.3 Technical Category Areas

3.3.1 Industrial Cooling Energy Storage

This category area supports industrial cooling energy storage solutions, using thermal and/or electrical input. In this category, emphasis is placed on low-temperature outputs (below ambient conditions). Typical industrial process cooling systems are large consumers of electrical energy, accounting, for example, of up to 40% of overall energy usage at data centers. Data center energy loads are similar in size to demand at many industrial facilities. Innovative cold thermal reservoir-to-thermal storage solutions

that can provide low-temperature thermal outputs for cooling would help improve energy efficiency and support peak shifting of cooling loads. Although cooling energy storage has been well-represented as a thermal storage technique with cold water or ice tanks, commercial penetration of these technologies has been limited because of site-specific considerations that can hinder economic feasibility, such as capital costs, lack of peak demand charge incentives, and facility integration barriers.[10] As a result, competitors should develop submissions that can push innovation in this space including, but not limited to, concepts that minimize upfront capital costs, footprint of the device, and water resource strain; make retrofitting easier; or other unique benefits that would accelerate market adoption. Hybridized solutions with electrical inputs may also be submitted, although some hybridization concepts may be better suited for the third topic area.

3.3.2 High-Temperature Industrial Energy Storage

This topic area supports high-temperature industrial energy storage solutions, with a focus on thermal outputs above 300°C to support industrial process heating needs for many industries that are difficult to decarbonize. Competitors are encouraged to think beyond the range of thermal outputs typically used for building heating and toward industrial process heating needs, of which a large portion are greater than 300°C.[11] Applicants in this topic area are encouraged to focus on the integration of intermittent or inflexible energy sources to industrial facilities to deliver a continuous high-temperature thermal load. These energy sources may include wind, solar photovoltaics, or grid electricity with variable time-of-use tariffs; and/or intermittent thermal energy sources like solar thermal. Although the focus of this topic is on the thermal energy storage system, competitors should realistically consider the techno-economic viability of input sources.

3.3.3 Industrial Thermal Storage for Hybrid Cooling, Heating, and Power

This topic area supports storage technologies that use a variety of inputs that can include low-temperature reservoirs, waste heat streams, and intermittent renewables to boost the value of the continuous thermal product (heating or cooling) needed, which could also be used to produce on-site electricity by heat engines. Competitors for this category are particularly encouraged to identify alternative methods to optimize the productive use of waste heat. By requiring a hybrid input of unused industrial thermal energy streams with electric energy input, these storage solutions will help ensure that output is optimized for productive energy use.

[10] DOE Office of Energy Efficiency and Renewable Energy. 2020. "Combined Heat and Power Technology Fact Sheet Series: Thermal Energy Storage Overview." https://betterbuildingssolutioncenter.energy.gov/sites/default/files/attachments/Thermal_Energy_Storage_Fact_Sheet_0.pdf.
[11] McMillan, Colin. 2019. "Manufacturing Thermal Energy Use in 2014." NREL Data Catalog. Golden, CO: National Renewable Energy Laboratory. Last updated: July 24, 2024. https://data.nrel.gov/submissions/118.

4 Phase 1: Design

4.1 Goal

Competitors will submit a concept design that has the potential to support industrial-level load storage for thermal or energy needs to increase the energy efficiency of the U.S. industrial sector. Competitors may submit concepts that address electric or thermal energy needs or a combination thereof, in alignment with the technical category areas specified in Section 3.3. Concept designs should be specific to the needs of an identified target in the industry.

4.2 Prizes

Phase 1 offers up to 18 winners receiving $100,000 each. Six winners are expected to be selected in each of the following categories:

- Industrial cooling energy storage
- High-temperature (>300 °C) industrial energy storage
- Industrial thermal storage for hybrid cooling, heating, and power.

4.3 How to Enter

Go to HeroX and follow the instructions for registering and submitting all required materials before the phase deadline. Competitors may also form teams or find partners through the HeroX platform.

4.4 Important Dates

Refer to the timeline on HeroX for relevant dates and deadlines.

4.5 Process Overview

Phase 1 includes the following steps:

1. **Activation and Submission.** Competitors will introduce an innovative concept, assess the feasibility of their concept, and prepare their team for implementation. Competitors will need to complete their submission packages and submit online before the phase closes.

2. **Assessment.** The prize administrator screens submissions for eligibility and completion and assigns subject-matter-expert reviewers to independently score the content of each submission. The reviewer assesses the competitor's materials as described in Section 4.6.

3. **Announcement.** After the winners are publicly announced, the prize administrator notifies them and requests the necessary information to distribute cash prizes. After winning Phase 1, competitors develop their solutions in accordance with their plan to compete in Phase 2.

4.6 What to Submit

A complete submission package for Phase 1 should include the following:

- Cover page
- Link to a 3-minute video pitch (will be made public)
- Technical narrative

- Submission summary slide (will be made public)
- Letters of commitment or support (optional).

All documents other than the video should be uploaded as PDFs.

The following details provide more guidance on what information to provide and how reviewers evaluate and score your submission. Reviewers will evaluate your submissions by assigning a single score for each scored submission section, based on their overall agreement or disagreement with a series of statements.

0	1	2	3
Strongly disagree/does not address	Disagree	Agree	Strongly agree/fully addresses

4.6.1 Cover Page

The cover page will not be made public. While a score is not associated with the cover page, it will serve as an initial qualification screen for competitors to determine the solution's relevance to the prize. This basic information will also enable the prize administration team to assign appropriate reviewers. Competitors should cover the basic information about your submission and must include:

- Project name
- Team name
- Key team members (names, contacts, and links to their LinkedIn profiles, if available)
- City, state, and nine-digit zip code
- Category of the submission
- Short description of the proposed energy solution system (< 500 words)
- Link to the 3-minute video pitch.

4.6.2 Three-Minute Video Pitch (Will Be Made Public)

Online Public Video Pitch

Competitors will produce a 3-minute video that will help reviewers and the public understand the competitor, their concept, and the relevant industry that the technology intends to serve. The video pitch should be tailored for a general understanding. Suggested content for the video is noted on the left-hand side of the following table and the right-hand side includes the scored statements that reviewers will use to evaluate submissions. Reviewers will assign a score between 0 and 3 for each scored statement after reviewing the submission. Reviewers will not view any material beyond 3 minutes.

Suggested Content Competitor Provides	Each Statement Scored on a 0–3 Scale
• A high-level description of the energy storage system concept that the competitor aims to develop through this prize should the submission be selected. • An explanation of the industrial facility electric and/or thermal needs that the concept would address with further development of the technology.	• The described energy storage system appears that it would be viable with further development. • The needs and application of the energy storage system to the industrial facility are clearly communicated.

• A clear connection to how their proposed energy storage system would integrate with the industry of their identification.	• The video presented the content in a compelling and understandable way for a general audience.

Be creative and convey your required information in a fun and engaging way but avoid overfocusing your effort on production value improvements (i.e., elements such as décor, lighting, or cinematic techniques). Reviewers will focus on the content, not the quality, as this video is intended to primarily introduce someone to the technical concept. Post your publicly accessible, 3-minute video online (e.g., on YouTube or Vimeo).

4.6.3 Technical Narrative

Competitors will draft a technical narrative describing their proposed energy storage solution system. It should serve as the primary element of the submission, addressing the scoring criteria detailed in the following table. The content bullets provided are suggestions for guiding your responses, but you decide how you wish to focus your answers. Responses to the technical narrative may be written continuously or separated by criterion, but all three criteria should be appropriately addressed regardless of how the applicant opts to format their response. The technical narrative is intended to be more detailed than the video pitch and should be geared for a technical audience, assuming a familiarity with either the industrial facility identified within the narrative and energy storage technologies.

The technical narrative must **not exceed 2,500 words**, not including captions, figures/graphs, and references. A word count must be included at the end of your submission. Submissions should have 1.5 line spacing at minimum with a font size of 10.5 or greater and margins of no less than 0.5 inch on all sides. You may include **up to five** supporting images, figures, or graphs. The reviewers will score the questions based on the content provided, in accordance with the scoring statements. The narrative should be submitted as a PDF.

Technical Narrative	
Criterion 1: Innovation and Opportunity	
Suggested Content Competitor Provides	**Each Statement Scored on a 0–3 Scale**
• Describe the proposed energy storage system and provide metrics to quantify the significance of the proposal in the context of an industrial facility load. • Identify either how this energy storage system proposed would uniquely benefit the proposed target industry needs and/or could have broader applicability to a range of industrial facility needs. • Provide a description of how this proposed technology or system innovates on the state of the art and is better than existing solutions. • Explain why the proposed energy storage system has yet to be implemented within the	• The energy storage solution identified was well-described and the description clearly showcases how this energy storage concept aligns with the chosen technical category area. • The project's unique value proposition was well-articulated and demonstrates a strong understanding of the target industry's needs. • The competitors provide a thoughtful explanation showcasing the innovative aspects of their proposed energy storage system. • The competitors demonstrate an understanding of the opportunity space for their proposed energy storage system and

context of the proposed industrial facility.	articulate why it has yet to be realized.
Criterion 2: Feasibility and Metrics	
Suggested Content Competitor Provides • Describe the key technical aspects of the proposed energy storage solution/system relative to an industry of your choosing. • Describe the technical and techno-economic metrics that would be used to determine successful implementation and achievement of the goals of the energy storage solution in the context of the defined industrial facility. • Describe any body of knowledge that supports the proposed energy storage solution/system. • Describe the risks and associated mitigation strategies associated with development and implementation of the proposed energy storage solution/system. • Explain how this energy storage solution/system is an economically viable option for supporting the proposed industrial needs.	**Each Statement Scored on a 0–3 Scale** • The proposed solution represents a technically feasible project. • Integration considerations, with respect to energy input and output, were clearly presented and are pragmatic. • The proposed solution can be practically deployable with the proposed target industry, and associated risks or limitations are well-articulated and understood. • The proposed solution is economically viable in the context of the proposed target industry with sufficient justification provided via techno-economic analyses. • The proposed solution is well-supported by data, literature, analysis, previous work, and/or additional information and is based on reasonable assumptions from past efforts. • The approach includes ambitious, but realistic, metrics that address industrial energy efficiency. A sufficient justification has been provided for any deviations from suggested metrics.
Criterion 3: Team and Implementation Strategy	
Suggested Content Competitor Provides • Highlight knowledge, skills, and experience that make your team capable of implementing your proposed energy storage solution/system in the context of the identified industrial facility. • Detail any gaps of expertise on your team and proposed plans to overcome these gaps. If none, clearly indicate why you believe so. • Describe a clear strategy for how the team will move the proposed solution through the stages of Advance and Validate toward future commercialization. • Briefly describe the Adoption Readiness Level (ARL) of the proposed energy	**Each Statement Scored on a 0–3 Scale** • The team has the breadth of knowledge, skills, and experience necessary for the success of the proposed technology. • The team demonstrates entrepreneurial qualities such as adaptability, creativity, decisiveness, resourcefulness, and cooperation to fully cover needed expertise. • The team describes a rational, realistic strategy for designing, developing, and demonstrating the proposed energy storage solution. • The team provides the present ARL and the expected ARL at the end of the prize with sound supporting evidence.

storage solution/system and how the implementation strategy will advance it.	

4.6.4 Submission Summary Slide (Will Be Made Public)

Competitors will create a public-facing, one-slide submission summary that contains technically specific details that can be understood by the public. There is no template, but the text must be readable in a standard printout and conference room projection.

4.6.5 Letters of Support or Commitment (Optional)

Competitors are encouraged to attach one-page letters of commitment or support from relevant entities (e.g., potential industrial end users for the proposed solution). Phases 2 and 3 will require more comprehensive industry end-user partnerships. As such, letters of support from partners or others that are critical to the success of the proposed solution will likely benefit the "Reviewer Recommendation" score. General letters of support from parties that are not critical to the execution of the competitor's solution will likely not factor into the score. A letter must not exceed one page, and all letters must be combined into a single PDF.

4.7 How Winners Are Determined and Awarded

The prize administrator screens all completed submissions and ensures that the teams are eligible. Then, the prize administrator, in consultation with DOE, assigns subject-matter-expert reviewers who independently score the content of each submission. The reviewers will comprise federal and nonfederal subject-matter experts and representatives from the utility partners with expertise in areas relevant to the competition. They will review the competitor's submission package according to the previously mentioned criteria.

4.7.1 Reviewer Panel Scoring

The scoring of submissions will proceed as follows:

- Experts will review each submission individually and assess the response from the competitor to each statement in the three criteria described in the tables in Section 4.6.3.
- Reviewers will score each criterion 0–3, depending on the degree to which the reviewer agrees that the submission reflects the statements for consideration.
- Reviewers will be able to add up to 4 additional points as part of the reviewer recommendation, indicated in the following table. This score does not directly correspond to any one item of the submission, but rather is an overall assessment of the material submitted.

Scoring Criteria: Reviewer Recommendation				
0	1	2	3	4

This submission demonstrates an unacceptable innovation, team, and plan and **should definitely not** be considered in the selection of prize winners.	This submission demonstrates a subpar innovation, team, and plan and **should not** be considered in the selection of the prize winners.	This submission demonstrates a lackluster innovation, team, and plan, but **could** be considered in the selection of the prize winners.	This submission demonstrates an acceptable innovation, team, and plan and **should** be considered in the selection of the prize winners.	This submission demonstrates an exceptional innovation, team, and plan and **should strongly** be considered in selection of the prize winners.

- Each section score will be added together to generate a total score for the submission.

4.7.2 Reviewer Comments

Expert reviewers also provide comments on the submissions they review. The prize administrator will provide comments to teams after the winners are announced. These comments are intended to help teams continue to improve and iterate on their work. The comments are the opinions of the expert reviewers and do not represent the opinions of DOE.

4.7.3 Interviews

DOE may decide to interview a subset of competitors. If so, the interviews would be held prior to announcing the winners and can help clarify questions the reviewers may have. Participating in interviews is not required, and are not an indication of a competitor's likelihood to win.

4.7.4 Final Determination

DOE will designate a federal employee as the judge before the final determination of the winners. Final determination of the winners by the judge will consider the reviewers' feedback and scores, application of program policy factors, and the interview findings (if applicable).

4.7.5 Announcement

Approximately 60 days after the contest closes, the prize administrator will notify the winners and request the necessary information to distribute the cash prizes. The prize administrator will then publicly announce the winners.

5 Phase 2: Advance and Phase 3: Validate

For both Phase 2: Advance and Phase 3: Validate, detailed guidance will be released prior to the announcement of Phase 1 winners. Visit HeroX for the updated rules document closer to the winner announcement.

Appendix A. Additional Terms and Conditions

A.1 Requirements

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

- You must post the final content of your submission or upload the submission form online by 5 p.m. ET on April 29, 2025, before the prize's phase submission period closes. Late submissions or any other form of submission may be rejected.
- You must include all the required elements in your submission. 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 format readable by Microsoft Word or Adobe PDF. Scanned hand-written submissions will be disqualified.
- Submissions will be disqualified if they contain any matter that, in the sole discretion of the U.S. Department of Energy (DOE) or the National Renewable Energy Laboratory (NREL), is indecent, obscene, defamatory, libelous, and/or 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 any of the prizes described in this document, these rules will form a valid and binding agreement between you and DOE and are 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 only apply to the prize described here and no other prize on the HeroX platform or anywhere else.
- The prize administrator, when feasible, may give competitors an opportunity to fix nonsubstantive mistakes or errors in their submission packages.
- As part of your submission to this prize, 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 the information contained in this submission will be relied on by the federal government to determine whether to issue a prize to the named competitor. 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, and 31 U.S.C. §§ 3729-3733 and 3801-3812.

A.2 Verification for Payments

The prize administrator will verify the identity and role of all competitors before distributing any prizes. Receiving a prize payment is contingent upon fulfilling all requirements contained herein. The prize administrator will notify winning competitors using provided email contact information for the individual or entity that was responsible for the submission. Each competitor will be required to sign and return to the prize administrator, within 30 days of the date on the notice, a completed NREL Request for ACH Banking Information form and a completed W9 form (https://www.irs.gov/pub/irs-pdf/fw9.pdf). In the sole discretion of the prize administrator, a winning competitor will be disqualified from the competition and receive no prize funds if: (i) the person/entity does not respond to notifications; (ii) the person/entity fails to sign and return the required documentation within the required time period; (iii) the notification is returned as undeliverable; (iv) the submission or person/entity is disqualified for any other reason.

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

A.3 Teams and Single-Entity Awards

The prize administrator will award a single dollar amount to the designated primary submitter, whether consisting of a single or multiple entities. The primary submitter is solely responsible for allocating any prize funds among its member competitors or teammates as they deem appropriate. The prize administrator will not arbitrate, intervene, advise on, or resolve any matters or disputes between team members or competitors.

A.4 Treatment of Submission Materials

The elements of the submission that are designated public will become publicly available as part of this prize. Therefore, these elements must not include trade secrets or business-sensitive, proprietary, or otherwise confidential information.

If it is necessary to share trade secrets or business-sensitive, proprietary, or otherwise confidential information, it should only be done in an element that is NOT designated as public. Any confidential, proprietary, or privileged information must be marked as described below. Failure to comply with these marking requirements may result in the disclosure of the unmarked information under the Freedom of Information Act or otherwise.

The submission must be marked as follows and identify the specific pages containing trade secrets, confidential, proprietary, or privileged information: "Notice of Restriction on Disclosure and Use of Data: Pages [list applicable pages] of this document may contain trade secrets, confidential, proprietary, or privileged information that is exempt from public disclosure. Such information shall be used or disclosed only for evaluation purposes. [End of Notice]"

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

DOE, the prize administrator, and any other third-party supporting DOE in the contest assume no liability for the public disclosure of any information in the elements designated public and for any unmarked information any element NOT designated as public.

Furthermore, by making a submission and consenting to the rules of the prize the 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 elements of the submission that are designated as public and any unmarked information in the elements of the submission that are NOT designated as public for government purposes, including posting or linking elements on websites or publicizing the submissions and competitors in the media and other announcements. The competitor is granting to DOE, the prize administrator, and other third parties a limited license to use or disclose any properly marked information for evaluation purposes only.

A.5 Representation and Warranties

By entering, the competitor represents and warrants that:

1. The competitor's entire submission is an original work by the competitor and the competitor has not included third-party content (such as writing, text, graphics, artwork, logos, photographs, likeness of any third party, musical recordings, clips of videos, television programs, or motion pictures) in or in connection with the submission, unless (i) otherwise requested by the prize administrator or disclosed by the competitor in the submission, and (ii) the competitor acquired the necessary rights to use and to authorize others, including DOE, to use the submission, as specified throughout the rules.
2. To the best of the competitor's knowledge, the use of the submission in the prize, including any use by DOE or the prize administrator does not and will not infringe or violate any rights of any third party or entity, including, without limitation, patent, copyright, trademark, trade secret, defamation, privacy, publicity, false light, misappropriation, intentional or negligent infliction of emotional distress, confidentiality, or any contractual or other rights.
3. All persons who were engaged by the competitor to work on the submission or who appear in the submission in any manner have:
    a. Given the competitor their express written consent to submit the submission for exhibition and other exploitation in any manner and in any and all media, whether now existing or hereafter discovered, throughout the world;
    b. Provided written permission to include their name, image, or pictures in or with the submission (or, if a minor who is not competitor's child, competitor must have the permission of the minor's parent or legal guardian) and the competitor may be asked by the prize administrator to provide permission in writing; and
    c. Not been and are not currently under any union or guild agreement that results in any ongoing obligations resulting from the use, exhibition, or other exploitation of the submission.
4. The submission is free of malware.

A.6 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 rules and administrative decisions, which are final and binding in all matters related to the contest. This notice is not an obligation of funds; the final award is contingent upon the availability of appropriations.

A.7 Resolution of Disputes

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

Neither DOE nor the prize administrator will arbitrate, intervene, advise on, or resolve any matters between team members or among competitors.

A.8 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.

A.9 Liability

Upon registration, all participants agree to assume any and all risks of injury or loss in connection with or in any way arising from participation in this contest. Upon registration, except in the case of willful misconduct, all 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 judge responsible for this prize, the judge has determined that no liability insurance naming DOE as an insured will be required of competitors to compete in this competition per 15 U.S.C. § 3719(i)(2). Competitors should assess the risks associated with their proposed activities and adequately insure themselves against possible losses.

A.10 Records Retention and Freedom of Information Act

All materials submitted to DOE as part of a submission become DOE records and are subject to the Freedom of Information Act. Where necessary, materials should be marked as noted in Section A.4. Such information will be withheld from public disclosure to the extent permitted by law. Without assuming any liability for inadvertent disclosure, DOE will seek to limit disclosure of such information to its employees and to outside reviewers when necessary for review of the application or as otherwise authorized by law. This restriction does not limit the government's right to use the information if it is obtained from another source.

Competitors will be notified of any Freedom of Information Act requests for their submissions in accordance with 29 C.F.R. § 70.26. Competitors may then have the opportunity to review materials and work with a Freedom of Information Act representative prior to the release of materials. DOE does intend to keep all submission materials private except for those materials designated as "will be made public."

A.11 Privacy

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

A.12 General Conditions

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

Although DOE may indicate that it will select up to several winners for each prize, 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.

DOE may conduct a risk review, using government resources, of the competitor and project personnel for potential risks of foreign interference. The outcomes of the risk review may result in the submission being eliminated from the prize competition. This risk review, and potential elimination, can occur at any time during the prize competition. An elimination based on a risk review is not appealable.

A.13 Program Policy Factors

While the scores of the expert reviewers will be carefully considered, it is the role of the prize judge to maximize the impact of prize 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.
- Whether the use of additional DOE funds and provided resources are nonduplicative and compatible with the stated goals of this program and the DOE 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 degree to which the submission is likely to lead to increased employment and manufacturing in the United States or provide other economic benefits 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-funded efforts or projects, which, when taken together, will best achieve the goals and objectives of DOE.
- The degree to which the submission expands DOE's funding to new competitors and recipients who have not been supported by DOE in the past.
- The degree to which the submission enables new and expanding market segments.
- Whether the project promotes increased coordination with nongovernmental entities toward enabling a just and equitable energy economy in their region and/or community.

A.14 National Environmental Policy Act Compliance

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

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

A.15 Definitions

Prize administrator means both the Alliance for Sustainable Energy operating in its capacity under the management and operating contract for NREL and the Industrial Efficiency and Decarbonization Office (IEDO). When the prize administrator is referenced in this document, it refers to staff from both the Alliance for Sustainable Energy and IEDO staff. Ultimate decision-making authority regarding prize matters rests with the director of IEDO.

A.16 Return of Funds

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

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