

Grid-Scale Storage

PRIZE ELEMENT	DESCRIPTION
PRIZE CONCEPT	The purpose of this X PRIZE competition is to dramatically reduce the costs associated with grid-scale energy storage and accelerate market acceptance and deployment of this technology, particularly with the goal of enabling renewable energy generators to enter the market at a large scale.
PURSE SIZE AND DISTRIBUTION	\$10 Million plus a \$15 Million 30-year AMC to a single winning team
TIMEFRAME	Open ended (estimated 5-10 years)
TARGET PARTICIPANTS	Energy storage suppliers/manufacturers, startup energy storage device companies
TEAM COMPOSITION	Open to any private group from any nation. Each team may have any number of participants.
REGISTRATION REQUIREMENTS	A team must complete a form detailing the storage technology that will be pursued, pay a \$1000 registration fee, be accepted by the X PRIZE Foundation as a team, execute the Master Team Agreement (MTA) once available, and comply with the rules and provisions of the MTA.

Grid-Scale Storage

<p>PERFORMANCE MEASURES AND WINNING CRITERIA</p>	<p>The prize will be awarded to the first team that can build an energy storage device with a capacity of at least 150 MWh, a charge/discharge rate of 25 MW, a ramp rate of at least 2.5 MW/min with a zero-crossing delay of no more than 10 minutes, and at a demonstrated lifetime annual cost outlay of no more than \$500,000 via a repeatable manufacturing process. These metrics will be demonstrated through testing ("behind the scenes") as well as a final publicized electric train run at a location TBD by the X PRIZE Foundation with a second unit. If more than one team attempts the competition at the same time, and more than one team fulfills all the criteria, then teams will be ranked according to roundtrip efficiency (by the method outlined in the MTA). No more than three teams will be ranked and will share the purse in the following manner: \$7.5 million and the AMC(s) to the winner and \$2.5 million to the second place team (if two teams are successful) or \$7 million and AMC(s), \$2 million, and \$1 million if three teams are successful.</p>
<p>REPORTING AND JUDGING REQUIREMENTS</p>	<p>Teams will make appropriate accommodation to give the judges unfettered access on a non-interference basis. Teams agree to fully cooperate with the judges during pre-demonstration testing, verification, and competition requirements, and will share with the judges information about the device, its components, and the processes used to store energy. Information shared with the judges shall remain confidential. Teams will answer all questions posed by the judges in order to enable the judges to verify the certifications provided by the teams. The intent of the X PRIZE Foundation is to protect as fully as possible all trade secrets and technical know-how of the competing teams.</p>

Grid-Scale Storage

ADDITIONAL ELEMENTS	<p>The storage device developed by the team shall include all necessary power control electronics for AC-in to AC-out "plug-and-play" operation. This type of operation will be required during the testing and demonstration phases of the competition. Construction and transportation (if required) of a second storage device to the demonstration site will be the team's responsibility. The first team to announce demonstration readiness will be evaluated by the XPF for approximately one month on the first device, after which, if the team is found to be demonstration-ready, the demonstration will be set for one year from that date and all other registered teams will be informed of the demonstration deadline. If other teams become demonstration-ready during that year, they will have the remaining time (minus one month for XPF evaluation) for construction/transportation of their second device. At three months before the demonstration no new teams will be excepted for consideration.</p>
FUNDING GUIDELINES	<p>The technology used in the attempt can be developed privately, or under a government contract or grant. However, the device itself and all components related to performing the demonstration, shall be constructed or purchased and operated using private funds. Teams attempting to participate by using direct or indirect government subsidies will be disqualified.</p>

Prize Matrix : Home-Scale Storage

PRIZE ELEMENT	DESCRIPTION
PRIZE CONCEPT	The purpose of this X PRIZE competition is to prompt the creation of a large energy storage capacity by developing a radically new, minifridge-sized storage device cheaply enough to be compelling for a large number of individual homeowners to buy.
PURSE SIZE AND DISTRIBUTION	\$5 million + a \$5 million contract for 50,000 units for the first prize winner; \$5 million dollars for a possible cogeneration unit.
TIMEFRAME	Open ended (estimated 5 years)
TARGET PARTICIPANTS	Designers and manufacturers of energy storage devices.
TEAM COMPOSITION	Open to any group from any nation. Each team may have any number of participants.
REGISTRATION REQUIREMENTS	A team must pay a \$1000 registration fee, be accepted by the X PRIZE Foundation as a team, execute the Master Team Agreement (MTA) once available, and comply with the rules and provisions of the MTA.
PERFORMANCE MEASURES AND WINNING CRITERIA	The X PRIZE will be awarded to the first team that builds 100 energy storage devices that can store at least 5 kWh at 70% round-trip efficiency, pass accelerated lifetime testing that indicates an average lifetime of at least 4±0.5 years, and create a business plan that will show that they can scale up production to at least 25,000 units per year within two years. Once a team declares that they will be making a delivery, other teams will have a month to make a delivery of their product; if more than one team meets the minimum criteria, ties will be determined by average roundtrip efficiency over the accelerated lifetime testing. Cogeneration devices must produce combined electrical and thermal energy at 70% efficiency.
REPORTING AND JUDGING REQUIREMENTS	Teams will deliver their devices to an X-PRIZE-run testing site, where they can observe the judges testing the devices. The judges shall monitor all aspects of the attempt, devices, and operations of the devices during the attempt period. Teams agree to fully cooperate with the judges in monitoring the attempt and competition requirements, and will share with the judges information about the device and its components. Information shared with the judges shall remain confidential. Teams will answer all questions posed by the judges in order to enable the judges to verify the certifications provided by the teams. The intent of X PRIZE Foundation is to protect as fully as possible all trade secrets and technical know-how of the competing teams.
ADDITIONAL ELEMENTS	The technology must pass standard home-use generator safety requirements, and the mass of a given raw materials that goes into an individual device must be less than 4×10^{-7} of the 2007 worldwide production of that raw material.
OPEN QUESTIONS	Will production of these storage devices produce more greenhouse gases than they remove from the atmosphere?

Prize Matrix: X PRIZE for Energy Storage (Developing World)

PRIZE ELEMENT	DESCRIPTION
PRIZE CONCEPT	To enable a new era of economic and social development in off-grid regions of the world by the provision of an affordable energy storage system using renewable energies to harvest energy and to replace fossil fuels as the current dominant energy storage technology.
PURSE SIZE AND DISTRIBUTION	\$7.5 Million (USD) for grand prize, \$2.5 Million for deployment prize, \$1 Million for flexible generation bonus prize, and \$1 Million for extremely low-cost bonus prize
TIMEFRAME	For grand prize, winning criterion is first to achieve, but there is a 5-year deadline from prize announcement. The clock for deployment bonus prize (also first to achieve) starts when grand prize is won and has 2-year deadline. The other two bonus prizes have no deadlines.
TARGET PARTICIPANTS	Large energy storage manufacturers, large diesel generator manufacturers [e.g. Mahindra Poweral], small energy storage manufactureres [e.g. Deeya Energy], hobbyists, university teams, government teams [e.g. US DoE or GoI MNRE]
TEAM COMPOSITION	Open to any public or private group from any nation. Each team may have any number of participants.
REGISTRATION REQUIREMENTS	A team must complete a form detailing a description of the proposed energy storage solution (including reliability and manufacturability assessments), pay a \$500 registration fee, be accepted by the X PRIZE Foundation as a team, execute the Master Team Agreement (MTA) once available, and comply with the rules and provisions of the MTA.
PERFORMANCE MEASURES AND WINNING CRITERIA (GRAND PRIZE)	The X PRIZE for Energy Storage (Developing World) will be awarded to the first team that can build a device with demonstrated cost of less than \$2500 (USD) and use it to complete the following tasks. Operate 5 business/commercial applications for 10 hours non-stop on 5 consecutive days. Each of the applications will require approximately 5kW of power and will be standardized. Each team will have the choice of using any of 5 standardized charging stations (solar, wind, hydro, biomass gasification, and waste-to-energy).
PERFORMANCE MEASURES AND WINNING CRITERIA (DEPLOYMENT PRIZE)	The X PRIZE for Deploying Energy Storage (Developing World) will be awarded to the first team that runs energy storage systems in 50 villages (chosen by the X PRIZE Foundation) for 5 months meeting the following requirements. System reliability (only allowed to fix or change any of the machines up to a total of 7 times) and system availability (up to 7 days off out of 5 months); The X PRIZE Foundation will give competitors access to buy the standardized charging stations used for adjudicating the Grand Prize.

Prize Matrix: X PRIZE for Energy Storage (Developing World)

PRIZE ELEMENT	DESCRIPTION
PERFORMANCE MEASURES AND WINNING CRITERIA (FLEXIBILITY BONUS)	The Flexibility Bonus will be awarded to the winner of the grand prize if all five charging stations are used.
PERFORMANCE MEASURES AND WINNING CRITERIA (LOWCOST BONUS)	The Low-Cost Bonus will be awarded to the winner of the grand prize if the demonstrated cost is less than \$1000.
REPORTING AND JUDGING REQUIREMENTS	Teams will make appropriate accommodation to give the judges unfettered access on a non-interference basis. The judges shall monitor all aspects of the attempt, devices, and operations of the devices during the 5-day attempt period. Teams agree to fully cooperate with the judges in monitoring the attempt and competition requirements, and will share with the judges information about the system, which comprises the device and its components. For the Deployment Prize, the teams will share with the judges information about the business plan. Information shared with the judges shall remain confidential. Teams will answer all questions posed by the judges in order to enable the judges to verify the certifications provided by the teams. The intent of X PRIZE Foundation is to protect as fully as possible all trade secrets and technical know-how of the competing teams.
ADDITIONAL ELEMENTS	The technology used in the attempt can be developed publically or privately. The system may also be purchased and operated using public or private funds.
OPEN QUESTIONS	Technological innovation solutions here can be potentially proliferated to other users who are connected to the grid. The connection of storage solutions to the grid will potentially further cause supply demand imbalance to the grid system unless future supply can meet demand; negative reinforcing loop. How can the system address to prevent causing a negative effect to the existing grid infrastructure.

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