

Solar Energy X-Prize

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Overview

The X-Prize

ChallengeRel
evancePotentialBreak
throughsPossible
Obstacles

Agenda:

- Purpose
- Prize Parameters
- Prize Logistics
- Prize Marketing
- Potential Market
- Potential Breakthroughs

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Purpose:

Develop an easily scalable, economical solar technology that can span the widest range of applications in developing nations

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Increased Accessibility for Residential Use

Customizable System - Customer Choice

Requires No Existing Infrastructure

Ease of Installation and Maintenance

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Develop a **modular photovoltaic system** that supplies **30 kWh** for **5 days**.

Less than **1 kg** for the smallest unit

- Provides 15 W per hour over 24 hours

Functional after being **dropped** from a **one-story height**

Installation time of one hour for the smallest unit

- Requiring no special knowledge or tools.

Demonstrate production scalability

- Produce 30,000 unit (approximately 1% of Malawi's population without electricity)

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Prize Implementation

7 years to successfully complete all parameters

Output assessed under standard laboratory conditions

- Unit and system power output tested under conditions mimicking summer and winter (sunlight incident angle)

Installation demonstrated on site

- Malawi appointed resident to assemble within 1 hour
- No special tools or knowledge

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Prize Marketing



Malawi: The Beginning of a New Light
Malawi builds its own solar power system.

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Prize Marketing

magazines



Professional
associations



universities



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Prize Marketing

Key marketing points

- innovation
- Fame
- LARGE MARKET SIZE

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Motivation for Participation: Large Market Size

Country	% households without Electric Lighting	Total number of Households without Electric Lighting
Germany	0.0%	0.0
Uganda	90.1%	5,971,197.3
Rwanda	90.8%	2,451,509.2
Malawi	94.3%	3,092,474.2
India	34.0%	75,532,054
Bangladesh	53.3%	14,315,260.7

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Motivation for Participation: Large Market Size

Equates to 539,075,529.95 people
within just six counties

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Motivation for Participation: Non-Governmental Organizations

Partnerships with NGOs

- First buyers already secured

Potential NGOs Partners

- United Nations
- Gates Foundation

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Power Efficiency

- Achieving required output necessitates more efficient use of space

Storage

- Continuous output assures system reliability in case of bad weather

Durability

- Allows for lower cost and greater ease of installation

Versatility

- Potential applications include all areas of the world. Compatible with variable energy demands

Eyes on the X-Prize [1-1-1]

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Efficiency

- Weight: 1 kg/Unit
- 15 W for 12 hours per day
- Scale up to 30 kWh

Durability

- 1-Story Shock Test

User-Friendliness

- 1-Hour to Install
- No Specialized Training, Knowledge, Tools

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Questions?

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Base unit is to provide enough electricity to power a outdoor lantern rated at 15 W for 12 hours per day. Assuming that the unit only has 5 peak hours to produce the necessary power, the base unit should output 36 W.

According to the DOE Energy Information Administration, the average American household uses **29.19 kWh per day**.

To achieve this would require **167 modular units**. At ten dollars a unit, the total cost to power an average household with solar would be **1,670 dollars**.

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Other Challenge Considerations

- Size/Weight Restrictions
- Toxic Material Restriction
- Recycled Material Bonus
- Ability to Feed Back to Grid
- Ability to sell storage and solar panel separately for an even more customizable system
- Installation Manual

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- Uses 8 D-size batteries, 15-watt output
- Operates up to 14 hrs. on high setting or up to 30 hrs. on low setting
- Spiral U-tube 15-watt fluorescent bulb
- Light intensity: 405 lumens
- \$29.95 at REI

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- Rechargeable from either 12V or 110V outlets
- Operates up to 6 hrs. on high setting or up to 9 hrs. on low setting
- Spiral U-tube 11-watt fluorescent bulb
- Light intensity: 280 lumens
- \$44.95 at REI

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GSE SUNLINQ SP-12 12.5 Watt Portable Solar Panel



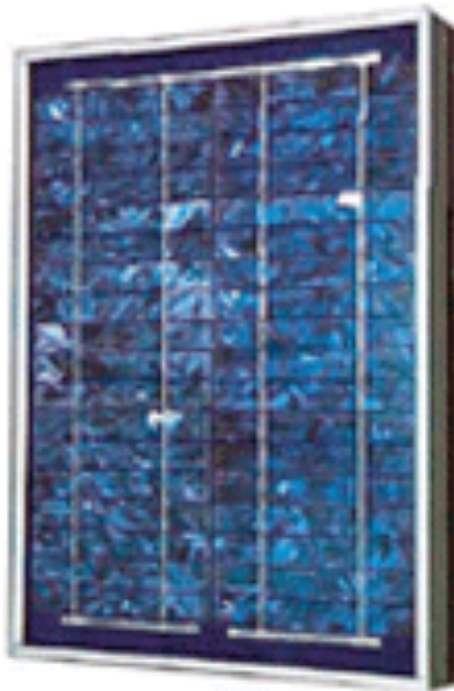
From CampingLanterns.net

- Charge/rechargeable flash lights, lanterns, cell phones, GPS units, satellite phones, MP3 players and portable games.
- CIGS
- Output 12 V
Power 300 mA
- Price: \$163.99 at CampingLanterns.net

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PowerUp's BSP20

- Power output: 20 W
- Voltage: 17.3 V
- Amperage: 1.2 A
- Dimensions (inches): 19X16.7X1.31
- Weight: 4.8 lb
- Multi-crystalline cells
- \$152 at WholesaleSolar.com

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- Solar Pebble by Plus Minus Design
- Easy to Angle/Install (some assembly required)
- Integrated storage
- £5 per unit desired price
- Is not modular or expandable
- Does not have the same power requirements



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- Tough Stuff Solar Panel
- Flexible, water resistant
- Resilient to 80 °C
- Easy to Install
- Does not meet power requirements
- No price listed yet



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- Power in Developing Worlds
 - One estimate currently has consumers paying \$15 kWh through the use of C batteries in Ghana
 - Kerosene can be very dangerous