

ESW
&
SunEdison/MEMC

Request for Proposals:
Renewable Microgrid Innovation App and Solar-Powered Kiosk



Engineers for a
Sustainable World



Proposal Deadlines
Full Project Proposal: Friday, December 9, 2011

E-mail: education@eswusa.org

ABOUT THE ESW/SUNEDISON PARTNERSHIP

SunEdison and ESW have formed a strategic partnership to support the significant expansion of renewable energy generation, creative improvements in power storage, and integrated resource management and microgrids. One motivation for this partnership is the recognition that 1.5 billion people currently live without access to electricity, and providing access to this basic resource can help spur sustainable economic and social growth. To this end, the National Office of ESW, through a generous gift from SunEdison, will provide grants to ESW chapters to develop technologies and applications for such off-grid environments.

PURPOSE OF THIS RFP

This RFP is to solicit proposals in two specific categories: a renewable energy microgrid “app” and a solar-powered kiosk. Detailed descriptions on each concept are included at the end of this RFP.

ADDITIONAL SUPPORT FROM AUTODESK

Autodesk and ESW have formed a partnership that provides technical assistance to project teams throughout the duration of the ESW/SunEdison projects. Liaisons from Autodesk will be available to the teams to assist in modeling and managing project concepts. Teams taking advantage of this opportunity are encouraged to document the use of Autodesk software such that created content may be used as case studies for Autodesk’s Sustainability Workshop.

ELIGIBILITY

ESW chapters eligible to receive an ESW/SunEdison project grant must be, at a minimum, in good standing with ESW and maintain good standing status throughout the project duration. Eligible chapters must also demonstrate support from a faculty advisor who will remain actively involved in the project throughout its duration.

NUMBER AND SIZE OF AWARDS

ESW will charge a Committee to select projects to receive funding for the second year of this three year program (2011-2014). ESW chapters can compete for up to two projects annually at a maximum of \$5,000 per project. ESW reserves the right to reduce the requested funding amount for any selected project and to negotiate a modified project scope with the proposing chapter.

Multi-year projects can be proposed, but funding decisions will occur on an annual basis with no guarantee of year to year support. New proposals will be requested each year from all eligible ESW chapters regardless of previous funding status. With the large number of high-quality proposals expected, the funding will generally not be sufficient to support international travel, food and beverages, or staff salaries. Chapters are encouraged to find supplemental grants from other sponsors to fund these should they be deemed important to the success of your project.

PROPOSAL DEADLINES

Full Project Proposal	Anticipated Notification Date
Friday, December 9, 2011	Monday, December 19, 2011

PROJECT PROPOSAL REQUIREMENTS

Proposals should not exceed 5 pages (not including cover page but including all appendices and supporting materials). Proposals must be submitted by e-mail.

To enable ESW to quickly and effectively review proposals, each proposal must contain the following elements:

- 1) Completed and signed Cover Page (attached to this RFP)
- 2) A discussion of what the project proposes to accomplish
- 3) A description of how the project will support the mission, vision, and values of ESW
- 4) A detailed project budget

PROPOSAL EVALUATION

In general, proposals will be evaluated according to the following criteria:

- Responsiveness to the RFP (timely submission, eligibility, etc.)
- Relevance to the mission, vision, and values of ESW
- Applicability to the identified area of need in a developing community
- Application to the campus or local community as a test bed for the concept
- Strong institutional support as evidenced by letters of commitment from faculty mentors, department chairs, collegiate deans, etc. This support is equally crucial for delivering high-impact projects
- Project timeline and key milestones
- Collaboration with other ESW chapters
- Quality of detailed annual budget

PROJECT EXPENSE GUIDELINES

Guidelines for acceptable project expenses are as follows:

- Supplies, materials, prototypes
- Computer software, design software, etc.
- Domestic travel (e.g. ESW National Conference travel, etc.)

Expenses that will NOT be supported include:

- International travel
- Salary, wages, etc.
- Food and beverages

PROJECT AWARDS

Applicants will be notified in early January, 2012 of proposal acceptance or denial. Gift funds will be distributed to awarded chapters in early January, 2012.

COLLABORATION

- 1) Throughout the project duration, awarded chapters will be given the opportunity to participate in monthly conference calls with an ESW, Autodesk, and SunEdison representative.
- 2) By May 31, 2012, awarded chapters will be asked to submit a 2-page progress report to ESW summarizing project progress. Send progress report to education@eswusa.org.
- 3) Chapters receiving funding will be allotted time at the ESW National Conference to present their results via a PowerPoint presentation and poster to colleagues and attending industry and faculty representatives. Coordination with the ESW Director of Education and Projects and ESW Conference Director will be facilitated to assist chapters with this.

In addition, to facilitate better management of future funding opportunities and projects, and to ensure the broadest possible impact of these projects, ESW would like each chapter to provide a report, appropriate for web posting, containing:

- A detailed summary of the objectives and goals of the project
- A detailed summary of the results and conclusions of the project
- Any additional information that helps document the success of the project

SUBMITTING THE PROPOSAL

Chapters must submit proposals by email and received by 11:59 PM PST, Friday December 9, 2011. It is preferred that the proposals be sent as PDF files.

Proposals must be e-mailed to: Rob Best
Director of Education & Projects, ESW
education@eswusa.org

Any questions should be addressed to: education@eswusa.org

Solar Kiosk

Many people across the world make their living as individual business people, or entrepreneurs. Many entrepreneurs operate their businesses in small off-grid establishments, conducting their daily business selling goods, services, and food to a general population or catering to a specific group of customers. This project is designed to provide sustainable infrastructure to these entrepreneurs, and demonstrate the ability of this infrastructure to provide economic benefit to an entrepreneurial owner, and her/his employees, of the infrastructure asset. In this project, the infrastructure is the solar-powered portable kiosk.

One goal of this project is to create a recurring revenue stream to the local ESW chapter, and a framework for ESW fundraising. The entrepreneurs in this project are the ESW members themselves. A second goal involves supporting entrepreneurial activity in the developing world, so should also be applicable for that market, in this case off-grid India to synergize with other ESW initiatives. Thus the chapter should consider how the design will transfer internationally.

Solar Smoothies: A case study example has already been performed by University at Buffalo with the creation of a solar power food cart that blends and sells fruit smoothies. [Rob – please provide a link to the experimental write up, slides, etc of the UB project here]. [I will get this information from Mike and include in a later draft.]

Proposals in response to this call should address:

1. Collaboration on the cart design: SunEdison will provide the following hardware to participating ESW chapters: 2 x 280Wp solar panels; 1500 W inverter; charge controller; funding for battery and cart hardware not to exceed \$500/cart. The participating chapters should collaborate by conference, Skype, blogs, or other communication tools.
2. Market analysis: In parallel with part-1, each Chapter is to make an assessment of its local market opportunities. Assessment includes, but is not limited to: a) finding out requirements and rules for selling product (food or non-food) from a cart on the campus, as well as the city where the campus is located, b) listing target events and target locations, durations, attendance, and c) brainstorming potential sustainable products or services which could be sold at events as fundraising effort.
3. Application Development: Once the design and market analyses are complete, the project will be to develop an application for deployment. The application should consider environmental and economic sustainability. Supporting appliances (such as blenders for smoothies) should be evaluated to their source

to determine whether that source company is compliant with sustainable practices. Sources and methods for the application should be evaluated to determine carbon footprint. Product pricing, sales strategy will be determined by each chapter. Collaboration is encouraged.

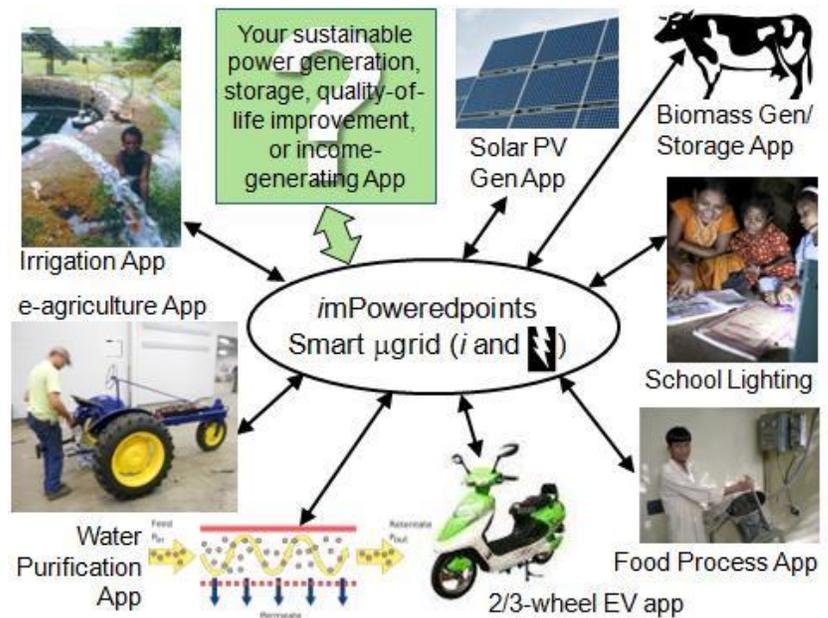
4. Production: Each chapter is to conduct a minimum of 1 fund raising activity using their cart. Multiple fund raising activities are encouraged. Results, metrics, etc. to be reported at the 2012 national conference include profitability, creativity, and sustainable applications.

Cart Design Specifications:

1. 2 x 280 Wp solar panels (1m x 2m dimension).
2. 1500 W inverter (60Hz, 110V US; 50Hz, 240V India)
3. 12 V marine deep cycle batteries
4. Electronic compartment compatible with US Appliances Code
5. Manual propulsion: push or bicycle
6. Material compliant with outdoor storage

imPoweredpoints Renewable Microgrid App - for Sustainable Power Generation, Energy Storage, Quality-of-Life Improvement, and/or Income-generating Activity

The dominant sustainability challenge for the planet is the multiplicative effect of increasing population and increasing per capita energy use. If our trajectory is to be changed we must address both terms in the equation by providing better education and standard of living for the developing world which is known to result in lower growth rates, and by increasing the productive output and reducing the negative impact of each unit of energy used. The vision of Project imPoweredpoints is a world where the creativity of the 1.5B people without electricity has been unleashed by providing them renewable energy as well as the information and education infrastructure needed to sustainably power and empower their off-grid communities. This is to be achieved by focusing on the root causes, as per the figure to the right.



Your project is to accelerate deployment of sustainable clean power and smart microgrids in the developing world. The goal of your project is to design an innovative "app" for the Project imPoweredpoints microgrid, which you can assume to be 240V, AC or DC. As examples, but in no way intended to limit your creativity, apps could include, but would certainly not be limited to: power generation apps, energy storage apps, apps that use power to improve quality of life in the off-grid villages, and apps that create income-generating opportunities for the people. You can assume that the 240V power interface will be specified, and that your app will be able to communicate via standard wireless protocol with the microgrid controller.

Project Specifications:

1. Physical design specifications, 3-D and 2-D representations
2. Fabrication plan
3. Capital Cost and Lifecycle Economic Analysis (annual income, payback period, etc.)
4. Maintenance plan and cost
5. Life Cycle Analysis of Environmental Impact
6. Analysis of implications for Social Sustainability
7. Highlights of the most innovative and creative aspects of your design

8. Plan for demonstration on your campus or in your local community

COVER PAGE
Faculty Advised Project Proposal

Submitted by: _____

Project Title:

ESW Faculty Advisor: _____

Phone Number: _____

e-mail address: _____

Student Project Leader: _____

Phone Number: _____

e-mail address: _____

Total Funding Requested: \$ _____

Authorizing Signatures:

ESW Faculty Advisor

Student Project Leader

Date

Date