Rec 2/22/13

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MTSU Clean Energy Initiative Project Funding Request

There are five (5) sections of the request to complete before submitting. See http://www.mtsu.edu/sga/cleanenergy.shtml for funding guidelines. Save completed form and email to cee@mtsu.edu or mail to MTSU Box 57.

1. General Information	
Name of Person Submitting Request: John Rozell	
Department/Office: Engineering Technology, Voorhees Building	Phone # (Office) 904-8568
MTSU Box #: Box 19	Phone # (Cell)
E-mail: john.rozell@mtsu.edu	Submittal Date: 2/22/13

2. Project Categories (Select One)			
Select the category that best describes the project.			
	Energy Conservation/Efficiency		Sustainable Design
	Alternative Fuels		Other
X	Renewable Energy		

3. Project Information
a. Please provide a brief descriptive title for the project. **b.** The project cost estimate is the expected cost of the project to be considered by the committee for approval, which may differ from the total project cost in the case of matching funding opportunities. **Any funding request is a 'not-to-exceed' amount. Any proposed expenditure above the requested amount will require a resubmission.** c. List the source of project cost estimates. d. Provide a brief explanation in response to question regarding previous funding.
3a. Project Title: Retrofitting Campus Electric Golf Carts/Utility Vehicles with Solar Cell Charging Capability.
3b. Project Cost Estimate: $1700 for a rigid solar cell that also serves as the cart roof,(based on Helisolar Roof Panel kit available at frugaldougalsgolf.com) $300 for promotional vinyl vehicle graphics, per vehicle. At this time, one (1) cart is to be converted. $2000
3c. Source of Estimate : Review of Internet solar cell suppliers (Frigal Dougal Golf, Helios Solar Power)

3d. If previous funding from this source was awarded, explain how this request differs? Previously, a solar powered cart was developed for the Enginerring Technology Dept., and has been in use for some time. The ET department would like to utilize its resources to promote the conversion of additional electric carts for other MTSU departments as a means of showcasing clean energy technology. Initially, one cart will be converted, but it is hoped that the project could expand to several carts being converted for other MTSU departments.

4. Project Description

(Completed in as much detail as possible.)

a. The scope of the work to be accomplished is a detailed description of project activities.
b. The benefit statement describes the advantages of the project as relates to the selected project category.
c. The location of the project includes the name of the building, department, and/or specific location of where the project will be conducted on campus.
d. List any departments you anticipate to be involved. Were any departments consulted in preparation of this request? Who? A listing may be attached to this form when submitted.
e. Provide specific information on anticipated student involvement or benefit.
f. Provide information for anticipated future operating and/or maintenance requirements occurring as a result of the proposed project.
g. Provide any additional comments or information that may be pertinent to approval of the project funding request.

4a. Scope: Work to be accomplished:

1. Select an electric cart from the fleet or obtain a cart specifically for this conversion (MTSU News & Public Affairs dept. has recently offered a cart to be converted).

2. Perform any maintenance/cleaning/refinishing required on cart.

3. Purchase conversion kit.

4. Install conversion kit.

5. Update vehicle with vinyl promotional graphics.

4b. Scope: Benefit Statement :

Any opportunities to develop alternative energy sources to reduce energy cost, to show actual application of alternative energy technology, and to promote clean energy are beneficial to MTSU, its students, and the community. As a marketing tool, a solar powered vehicle used for on-campus transportation, implemented by Engineering Technology students, provides department visibility to both students and visitors on campus. It also provides a hands-on opportunity for Engineering Technology students to work with alternative energy vehicle technologies.

4. Project Description (continued)

4c. Location of Project (Building, etc.):

The Faculty R&D Lab, Room 120, in the Voorhees Industrial Studies building could be utilized for housing the cart while the solar cells are installed. This project would need to be coordinated with other research projects in this area that are currently underway.

4d. Participants and Roles

Campus departments and/or maintenance employees that currently operate electric carts would provide a vehicle for retrofit. At this time, News & Public Affairs has indicated an interest in providing a cart.

Engineering Technology would provide lab space, tools, and supervise students in retrofitting the carts.

4e. Student participation and/or student benefit:

Engineering Technology students would prepare the vehicle, perform required maintenance, repairs, repainting, detailing prior to conversion. They would install the solar cell, the controller, and all required wiring. This project provides students exposure with clean energy technologies and could be the basis for future alternative energy vehicle projects. This project could also assist in meeting senior student project requirements.

4f. Future Operating and/or Maintenance Requirements:

For electric powered carts, the primary maintenance costs are battery replacement. Solar charging systems keep batteries are near full charge. Continuous charging reduces buildup of sulfur in the cells, which can double battery life. With cart battery replacement costing as much as $140 per battery, or $800-900 per cart, extending the battery life becomes significant. Solar powered carts, used regularly at golf courses, can assume a 15 to 20 year operational life.

Solar cells are primarily maintenance free for their lifetime.

4g. Additional Comments or Information Pertinent to the Proposed Project

Many colleges and universities (Bethel, Yale, St. Louis, Davison, Dickenson) have already established cart conversion projects to support sustainability. MTSU already is investigating hydrogen powered vehicles as an alternative energy source. This is a simple way of promoting alternative energy while serving a daily need on campus.

5. Project Performance Information

Provide information if applicable.

a. Provide information on estimated annual energy savings stated in units such as kW, kWh, Btu, gallons, etc.
b. Provide information on estimated annual energy cost savings in monetary terms.
c. Provide information on any annual operating or other cost savings in monetary terms. Be specific.
d. Provide information about any matching or supplementary funding opportunities that are available. Identify all sources and explain.

5a. Estimated Annual Energy Savings (Estimated in kW, kWh, Btu, etc.)

The daily fuel costs for an electric cart are 16.5 cents per day, based on a off peak rate of $0.05 per kWh, or $60.23 per year*

*Per Final Report, Evaluation of Solar-Assisted Electric and Gas Golf Carts, prepared by the Toronto and Region Conservation Authority under the Sustainable Technologies Evaluation Program, August 2010.

5b. Annual Energy COST Savings ($)

$60.23 in electricity costs per vehicle stored outside and allowed to recharge via solar cells.

5c. Annual Operating or Other Cost Savings. Specify. ($)

Reducing the battery depth of discharge by maintaining full charge extends life of the battery bank. Exact cost savings is difficult to determine, due to quality of battery, proper maintenance, and climate. Solar charged carts should expect to extend the life of the battery, and in some instances, double the life of the battery. A normal battery typically lasts 3-4 years and a battery kept at full charge with a solar charger should expect about 5-8 years of life.

5d.Matching or Supplementary Funding (Identify and Explain)

Dept. Of Energy may have clean energy grants available to government entities. Individuals have tax credits available but not sure MTSU would qualify for these.