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. Applicant Information

Name of person submitting request Linda Hardymon; Sydney Smith	
Department/Office Center for Energy Efficiency; Facilities Services	Office phone # 615-904-8096
MTSU box # 57	Cell phone # 615-519-8096
E-mail Linda.Hardymon@mtsu.edu	Submittal date

2. Project Category

Select the category that best describes the project

☐	Energy Conservation/Efficiency	☐	Sustainable Design
☐	Alternative Fuels	✓	Other Green project maintenance
☐	Renewable Energy		

3. Project Information

    a. Provide a brief descriptive title for the project
    b. Provide the expected cost of the project, which may differ from the total project cost in the case of matching funding opportunities; **any funding request is a not-to-exceed amount, and any proposed expenditure above the requested amount will require a resubmission**
    c. List the source of project cost estimate
    d. Provide a brief explanation of any previous funding from the Clean Energy Initiative

3a. Project title Bigbelly Trash Compactor Software Upgrade
3b. Project cost estimate $1540 ($175 + overhead per trash compactor)
3c. Source of estimate Bigbelly offer
3d. If previous funding from this source was awarded, explain how this request differs This request involves upgrading the trash compactors we've already been awarded.

4. Project Scope

(Completed in as much detail as possible)

a. Provide a detailed description of project activities
b. Describe the advantages of the project in relation to the selected project category
c. Provide the building, department, and/or specific location of where the project will be conducted on campus
d. List any participants in the project—departments, professors, etc.—including any who were consulted in preparation of this request
e. Explain any anticipated student involvement and/or benefit
f. Explain future operating and/or maintenance requirements
g. Provide any additional comments or information that may be pertinent to approval of the project funding request

4a. Work to be accomplished

Bigbelly solar trash compactors send data through a cellular network to their account holders in Facilities Services. The compactors are built on the most widely available network at the time. The current fifth-generation compactors use the AT&T 4G LTE network. Our compactors were purchased before this change and operate on outdated networks, and their connectivity and support will be lost as 2G and 3G networks are discontinued by AT&T.

So, we need to transfer the networks of our outdated compactors; this involves upgrading their main boards. Bigbelly has offered to perform this standard maintenance procedure on-site for a discounted rate of $175/board.

4b. Benefit statement

Upgrading the hardware in our campus trash compactors to be compatible with the 4G cellular network would preserve functionality of our Bigbelly data management system. This system allows us to track trash collection history and efficiency, battery voltage, and more for each solar trash compactor. Checking trash fullness levels remotely avoids unnecessary collection trips, saving time and gas.

4. Project Scope (continued)

4c. Location of project (building, etc.)

1. KUC Courtyard, 2. Student Union by bus stop, 3. Murphy Center by Hall of Fame, 4. Mass Comm, 5. Corner of Voorhies/KOM parking lot, 6. Todd Hall, 7. Rec Center, 8. Science Building

4d. Participants and roles

A Bigbelly representative will upgrade the main boards on campus.

4e. Student participation and/or student benefit

Students benefit from the reduction in campus trash and will see that their campus is modern and environmentally conscious.

4f. Future operating and/or maintenance requirements

Grounds Services will empty the compactors when full.

4g. Additional pertinent information

Cellular network carriers have stated that there is no shutdown of the 4G network scheduled in the near future.

5. Project Performance

Provide information if applicable

a. Estimate annual energy savings in units such as kW, kWh, Btu, gallons, etc.
b. Estimate annual energy cost savings in monetary terms
c. Provide information on any annual operating or other specified cost savings in monetary terms
d. Provide information about any matching or supplementary funding opportunities available, identifying and explaining all sources

5a. Annual energy savings (in kW, kWh, Btu, etc.)

If the solar trash compactors' software is updated, we will maintain our access to real-time trash collection data, meaning fewer wasted trips to check bins that are not yet full.

5b. Annual energy cost savings ($)

Funds spent on fuel will be reduced.

5c. Annual operating or other specified cost savings ($)

Fewer trash bags will need to be purchased.

5d. Matching or supplementary funding ($)

N/A

Challenge: 2G and 3G Cellular Network Sunset (Phase-Out)

Bigbelly station communication is based on cellular networks. Stations are built on the network most widely and universally available at the time; current fifth-generation stations communicate on the AT&T 4G LTE network. Some third-, all fourth-, and many earlier fifth-generation stations operate on 2G and 3G networks: either Verizon CDMA 2G and 3G, T-Mobile 2G, or AT&T 3G depending on the model.

Wireless carriers phase-out older networks and refarm their spectrum to support newer 4G LTE and 5G wireless network technologies. This phase-out results in the loss of network connectivity and discontinued support for all devices that use the 2G and 3G network (alarm systems, vehicle tracking, parking meters, various Bigbelly systems, etc.). The sunset transitions products off legacy networks and onto the latest 4G LTE network.

Verizon, T-Mobile and AT&T have all announced 2G and 3G network sunsets starting at the end of 2019 through 2021. Bigbelly stations communicating on any of these networks will be impacted. Once the network is shut off, impacted units will no longer be able communicate since the network will be non-existent.

There are multiple networks shutting down over the next few years, starting as early as the end of 2019 including: (1) Verizon (CDMA) 2G and 3G; (2) T-Mobile 2G; and (3) AT&T 3G.

Remedy: Main Board Upgrade to 4G LTE Network

Impacted stations on 2G and 3G networks must be transferred to a different network in order to continue to communicate (call into CLEAN software, etc.). These can be easily transferred to the 4G LTE network to ensure connectivity. Extreme growth in the IoT and M2M space has demanded carriers to invest in a longer term 4G solution. Carriers have confirmed that 4G has no known sunset on the horizon and investments are still being made in the network, with dedicated spectrum specifically for connected devices like Bigbelly smart waste units.

Network transfer is an easy fix with upgraded main boards. The upgraded boards connect on the 4G LTE network that stations are shipping with today. This network upgrade is a standard maintenance procedure that can be accomplished in the field on impacted stations. Customers may order the Main Board Upgrade kit through your Account Manager.

Upgrade Main Boards are available to all impacted Bigbelly stations at a discounted price of $175 per board – a significant discount from our standard replacement board as we want to make this as affordable as possible to stay connected. Pricing promotion valid from 11/20/18 through 10/31/19.

SKU	Price
3rd & 4th Gen. Board Upgrade	$175.00
5th Gen. Board Upgrade	$175.00

Upgrade kits include necessary hardware plus detailed installation instructions. It is critical that upgraded stations are reported to Bigbelly Customer Support to initiate station communication on the new network. The upgrade procedure should take no longer than 10-15 minutes per station. Customers may request installation of the upgrade to be completed by a Bigbelly at an additional cost. A qualified field service technician would then be dispatched to complete the upgrade.

Network transitions and technology obsolescence, while inconvenient, are a reality with all connected technologies. Bigbelly is committed to provide support to our customers to make this transition as smooth as possible. Please contact the Customer Engagement Team with any questions or to order your 4G LTE Main Board Upgrade Kits by emailing cedept@bigbelly.com or calling +1-781-444-6002.