

Rec 09/29/22

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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](mailto:cee@mtsu.edu) or mail to MTSU Box 57.

1. General Information	
Name of Person Submitting Request Dr. Misa Faezipour	
Department/Office Engineering Technology	Phone # (Office) 615-898-2110
MTSU Box # 19	Phone # (Cell) 972-804-5878
E-mail <a href="mailto:misagh.faezipour@mtsu.edu">misagh.faezipour@mtsu.edu</a>	Submittal Date 09/29/2022

2. Project Categories (Select One)	
Select the category that best describes the project.	
<input type="checkbox"/> Energy Conservation/Efficiency	<input checked="" type="checkbox"/> Sustainable Design
<input type="checkbox"/> Alternative Fuels	<input type="checkbox"/> Other
<input checked="" type="checkbox"/> Renewable Energy	

3. Project Information
<p>a. Please provide a brief descriptive title for the project.</p> <p>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. <b>Any funding request is a 'not-to-exceed' amount. Any proposed expenditure above the requested amount will require a resubmission.</b></p> <p>c. List the source of project cost estimates.</p> <p>d. Provide a brief explanation in response to question regarding previous funding.</p>
3a. Project Title Decomposition of leaves to make compost
3b. Project Cost Estimate Compost heap digging (4 compost heaps @\$500 each): \$2000, Collection of leaves: \$2000; Maintenance yearly: \$2000; Stipend for 1 Graduate Student: \$1200, Stipend for 1 Undergraduate Student: \$800; Total: \$8,000
3c. Source of Estimate Ground services - Leaves decomposition projects and activities involved is the primary source. A regular operation to maintain the heap and its content is the secondary source. Office of Research and Sponsored Programs for student stipend estimates.
3d. If previous funding from this source was awarded, explain how this request differs?

#### 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

Work to be accomplished is the decomposition of leaves that falls in the university's compound to produce compost. Activities include leaves collection from places where it falls on the ground as well as digging a compost heap or constructing an underground tank to contain decomposing leaves. As a higher learning institution, there have been new projects every year that require funding. However, this project differs from the rest as it seeks to generate compost from decomposing leaves which could also be a source of new clean energy (Chia et al., 2020). The generation of this clean energy will have two advantages for the campus. First is an ever-clean compound as leaves will be collected and deposited in the heap for decomposition, and the second is the manure generated can be used to supplement fertilizers. Compared to many other projects, the cost of this project is fairly low and the estimated yearly maintenance should not exceed \$2000 annually.

#### 4b. Scope: Benefit Statement

The project aims to produce compost from campus leaves that would otherwise rot and cause an odor.

We are generating the compost from dry leaves, so instead of using chemical fertilizers, the generation of compost here will be purely organic. The compost could be used for fertilizing the plants on campus and for the food that is grown and used on campus.

Compost-grown food is chemical-free and healthy. This project can also provide ideas and raw materials for other projects and generate revenue (cost savings) by selling organic manure to MTSU community.

#### **4. Project Description (continued)**

##### **4c. Location of Project (Building, etc.)**

A total of four compost heaps are to be constructed within the campus compound. The main reason for constructing compost heaps is to locate dropping points at a convenient place where leave collectors can quickly drop collected leaves. The four compost heaps will be located at the common grounds between PH and CAB, common grounds behind REC, common grounds between SCI and DSB, and common grounds between SAG and MB. (The location of the heaps can be changed).

##### **4d. Participants and Roles**

Decomposing leaves to produce compost is a simple task that can be performed on the grounds. Developers dig and cement a tank to hold the heap. This work is to be performed by university ground keepers. University ground services, and volunteers (students) are to collect leaves and compost them. Dr. Misa Faezipour, the PI, will work closely with the ground services to oversee this process from the construction of the heaps, collection of leaves, to the generation of compost. One undergraduate and one graduate student will also assist the PI with this process. Student volunteers are welcomed to assist with the process of collecting leaves and overseeing the process of producing compost.

##### **4e. Student participation and/or student benefit**

The development of the heap and decomposition process does not directly involve the students, but the student assistants (one graduate and one undergraduate) can closely monitor and control the process and report issues and learn valuable lessons about the decomposition process. Other students can be made to volunteer to participate in the collection of the leaves from all around the university campus.

Food from farms fertilized from compost waste influences students since they eat it daily. The cost of food may reduce due to lower production process. Students also enjoy an environment on the campus that will be free from rotting materials and overlying leaves.

##### **4f. Future Operating and/or Maintenance Requirements**

Once the compost heap is ready, we should leave them for few months, checking them once a month will be sufficient. However, new leaves and other matters related to decomposition must be added once a month. Removal of by-products must be done monthly. Maintaining this way will ensure that the compost is fully functional.

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

This project seeks to produce compost that can be derived from the decomposition of leaves. This opens doors for an additional energy source that can be explored in the future. Since the trees/plants on campus consistently shed their leaves throughout the year, the campus's location makes it an ideal choice for this project. Compost heaps will generate manure if we continue collecting fallen leaves in this manner.

## 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.) N/A

5b. Annual Energy COST Savings (\$) N/A

5c. Annual Operating or Other Cost Savings. Specify. (\$) N/A

Ground services will be able to generate their own compost to use as fertilizer for plants/trees/grass.

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

In the future, the campus may consider developing new compost heaps to supplement existing ones. Also, in case of damage to a compost heap, the campus may have to supplement the budget by constructing a new one (Yamba et al., 2020). The campus may also connect this project with another project related to decomposing waste products (food waste) to generate more organic manure.

## References

Chia, W. Y., Chew, K. W., Le, C. F., Lam, S. S., Chee, C. S. C., Ooi, M. S. L., & Show, P. L. (2020).

Sustainable Utilization of Biowaste Compost for Renewable Energy and Soil

Amendments. *Environmental Pollution*, 267, 115662.

<https://doi.org/10.1016/j.envpol.2020.115662>

Yamba, F. D., Siagi, Z. O., Muchilwa, I. E., & Mwape, M. C. (2020). Waste to Energy: Heat

Recovery from the Compost Reactor as a Source of Renewable Energy.

[doi:10.5923/j.ijee.20201001.02](https://doi.org/10.5923/j.ijee.20201001.02)