

MTSU Sustainable Campus Fee Funding Request Form

The Sustainable Campus Fee (SCF) supports projects that advance sustainability at MTSU. This form allows students, faculty, and staff to propose initiatives that contribute to a greener campus through energy efficiency upgrades, infrastructure improvements, education, research, and efforts to enhance campus biodiversity.

There are 5 sections to the application: Section I: Contact Information, Section II: Project Category, Section III: Project Description, Section IV: Project Cost, and Section V: Project Performance Information (For applicable projects).

The Sustainable Campus Fee is administered through a partnership with the Office of Student Affairs, the Center for Student Involvement & Leadership, and the Center for Energy and Sustainability (CES).

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Request Number **SCFR27000052**

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SECTION II: Project Category

Please note that all proposed projects will have to comply with MTSU campus guidelines and recommendations.

1. Select the category that best describes the project. (Select One - See Descriptions Below)

Research and Innovation

CATEGORY DESCRIPTIONS

Energy Conservation/Efficiency - (e.g. installing LED light bulbs, adding insulation to walls, replacing old appliances with energy-efficient models, installing programmable lighting, etc.)

Renewable Energy - (e.g. implementing projects to harness naturally replenishing sources like wind, water, and sunlight to generate electricity - like solar-powered picnic tables, etc.)

Sustainable Transportation - (e.g. installing covered bike racks, replacing fuel vehicles with electric vehicles, etc.)

Alternative Fuels - (e.g. setting up electric vehicle charging stations, implementing hybrid or electric vehicles, purchasing electric or propane power equipment, etc.)

Recycling - (e.g. purchasing recycling bins, improving signage, recycling difficult materials, etc.)

Waste Reduction - (e.g. establishing a reuseable to-go container program, reducing food waste, installing waterbottle filling stations, etc.)

Water Conservation - (e.g. purchasing rain barrels, creating a rain garden, switching to low-flow water fixtures, installing low-flow water valves, etc.)

Biodiversity - (e.g. planting pollinator garden, tree planting, installing bird boxes, etc.)

Education - (e.g. hosting a sustainability fair to raise awareness about green practices, hosting bike repair and/or safety workshops)

Research and Innovation - (e.g. researching the effects of microplastics, solar feasibility study, etc.)

SECTION III: Project Description

Please include as much detail as possible in this section. The more information you provide, the better equipped the adjudication committee will be to fully understand your request and make an informed decision.

To expand a text box, click and drag the two diagonal lines in the bottom-right corner. This allows you to adjust the size and view of your content as you type.

1. Project Title

MTSU Campus Energy Analytics and AI Laboratory

2. Scope: Work to be accomplished

Facilities Services proposes establishing a Campus Energy Analytics and AI Laboratory using a dedicated local AI computing platform.

Local processing will reduce dependence on recurring cloud AI services. Future software, storage, support, or expansion costs will be evaluated through normal university budgeting processes.

The system will analyze approved data from campus building automation systems, utility meters, environmental sensors, occupancy schedules, and facilities systems to identify energy-conservation opportunities.

Initial work will focus on selected campus buildings and will include developing energy-analysis and fault-detection methods for conditions such as after-hours HVAC operation, simultaneous heating and cooling, inefficient equipment operation, control problems, sensor failures, and abnormal energy consumption.

The platform will initially use secure, read-only data connections and will not directly control building equipment. Facilities personnel will review findings before corrective actions are taken.

The project will also measure and document energy savings resulting from implemented improvements and establish a framework that can later be expanded to additional campus buildings.

3. Scope: Benefit Statement

Primary Category: Energy Conservation/Efficiency

Secondary Categories: Research and Innovation; Education

The project will help MTSU identify and reduce avoidable energy consumption across campus buildings.

By combining existing building automation, utility, sensor, and occupancy data, the platform can identify inefficient HVAC operation, unnecessary equipment runtime, control problems, and other energy-conservation opportunities that may not be apparent through traditional reporting.

The project will also provide measurement and verification of implemented improvements, helping MTSU document energy savings, avoided utility costs, and environmental benefits.

The platform creates additional value by supporting student learning, faculty research, predictive maintenance, and improved use of MTSU's existing investments in building controls, meters, sensors, and facilities data.

4. Location of Project

The project will be administered by MTSU Facilities / ITOT Services .

The computing platform will be installed in a secure university-managed location and will analyze approved data from facilities throughout the MTSU campus.

5. Participants and Roles

Facilities Services – Project implementation, facilities data, building systems expertise, review of findings, and implementation of approved energy-conservation measures.

6. Student Participation in the project and/or Student Benefit from the project

The project will provide student workers in facilities with opportunities to work with real-world campus energy, building, and environmental data.

Potential activities include developing dashboards, analyzing energy consumption, evaluating HVAC performance, developing AI and machine-learning models, calculating energy savings, and participating in sustainability research.

The project will help establish the MTSU campus as a living laboratory where students can apply emerging technologies to real energy and sustainability challenges.

7. Future Operating and/or Maintenance Requirements

Facilities Services will provide routine operation and maintenance of the platform, including system updates, data storage, network connectivity, security updates, and equipment maintenance.

The project will primarily use existing campus data sources and is not expected to require significant recurring operating expenses.

Local processing will reduce dependence on recurring cloud AI services. Future software, storage, support, or expansion costs will be evaluated through normal university budgeting processes.

The electricity consumed by the platform will also be monitored and compared with documented energy savings resulting from the project.

8. Additional Comments or Information Pertinent to the Proposed Project

This project creates a reusable campus energy-analysis capability rather than a one-time energy study.

The platform can support HVAC optimization, utility analysis, occupancy-based operation, remote sensor monitoring, predictive maintenance, and evaluation of future energy-conservation projects.

Initial goals include monitoring selected campus buildings, developing energy and equipment-performance rules, identifying verified conservation opportunities, and documenting resulting energy and cost savings.

The project will also provide MTSU with an opportunity to study the energy requirements of artificial intelligence. The local platform's electricity consumption will be measured and compared with the energy savings it helps identify.

The long-term goal is straightforward: use data and AI to identify campus energy savings that substantially exceed the energy required to operate the analytical platform.

Any supporting documents or attachments will be on the pages following the SCF Request.

Note, all projects are expected to be completed by December 31, 2026.

SECTION IV: Project Costs

1. Project Cost Estimate 7300

2. Source of Estimate

Dell.com

3. Has previous funding from this source been awarded?

If Yes, please explain how this request differs from previous funding request.

SECTION V: Project Performance Information

If your project is expected to reduce energy consumption (e.g. through lighting upgrades or HVAC improvements etc.), please provide an estimate of potential savings. Feel free to contact the Center for Energy and Sustainability for help making these calculations at ces@mtsu.edu.

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

The project will evaluate the energy benefit of performing selected campus energy-analytics and AI workloads on a dedicated local computing platform rather than relying exclusively on externally hosted data-center resources.

For planning purposes, operation of the proposed system at up to 280 watts for approximately 8 hours per business day would equal approximately 560 kWh annually.

Using an industry-average data-center Power Usage Effectiveness (PUE) factor of approximately 1.54, an equivalent 560 kWh of IT computing could represent approximately 862 kWh of total data-center facility energy consumption when associated cooling, power distribution, and infrastructure are included.

This provides an estimated potential infrastructure energy difference of approximately 300 kWh annually for the defined workload.

More importantly, the platform will be used to identify energy-conservation opportunities in campus HVAC and building systems. The first-year objective will be to document building energy savings that exceed the approximately 560 kWh consumed annually by the local analytical platform.

Estimated local-vs.-data-center energy difference: approximately 300 kWh/year.

Additional campus energy savings: To be measured and documented through identified HVAC and building-efficiency improvements.

2. Annual Energy COST Savings (\$)

Using the estimated local-versus-data-center energy difference of approximately 300 kWh per year and MTSU's stated electricity rate of \$0.095/kWh, the estimated direct electricity savings are approximately:

$300 \text{ kWh} \times \$0.095/\text{kWh} = \$28.50 \text{ per year}$

This estimate represents only the energy difference associated with the computing infrastructure and does not include savings produced by energy-conservation opportunities identified by the platform.

The project's primary financial benefit is expected to result from identifying and correcting inefficient HVAC schedules, simultaneous heating and cooling, control problems, excessive equipment runtime, sensor problems, and other avoidable campus energy consumption.

Estimated direct computing energy cost savings: approximately \$29/year.

Additional energy cost savings from identified conservation measures: To be measured during the pilot project.

3. Annual Operating Cost Savings or Other Cost Savings. Specify in dollar amount, if applicable. (\$)

The project is expected to provide additional operating-cost benefits by establishing a reusable MTSU-owned analytical capability.

Potential savings include reduced dependence on recurring cloud AI and computing services, reduced need for outside analytical or consulting services, and reduced staff time required to manually review large volumes of building and energy data.

The platform may also provide indirect operating savings by identifying equipment problems earlier, reducing unnecessary equipment runtime, supporting predictive maintenance, and helping prevent minor control or equipment problems from becoming more costly maintenance issues.

Because MTSU does not currently have an equivalent dedicated AI energy-analysis service against which to establish a recurring annual cost, these savings cannot yet be accurately quantified.

Estimated annual operating cost savings: To be determined and documented during the first-year pilot.

4. Matching or Supplementary Funding (Identify and explain, if applicable)

Non

Acknowledgment

I acknowledge that a project summary and photo must be submitted, if I am awarded funding and upon completion of the project.

Supporting Documentation or Attachments if provided.