Energy and Water Management Plan

Section 1: Instructions

Texas Government Code §447.009 requires each state agency and institution of higher education to set and report percentage goals for reducing its usage of water, electricity, transportation fuel, and natural gas. Per 34 Tex. Admin. Code §19.14 (2016), these goals must be included in a comprehensive energy and water management plan (EWMP) submitted every fiscal year to the State Energy Conservation Office (SECO) by **Oct. 31**. This requirement is intended to streamline and standardize the energy reporting requirements of state agencies and institutions of higher education.

Please complete Section 2: Agency Information and Section 3: Providing Agency or Section 4: Tenant Agency, as applicable, for **Fiscal Year 2021**. Save this form as "EWMP-Agency-FY2020.docx" and return this form by email to seco.reporting@cpa.texas.gov no later than **Oct. 31**.

Please visit the SECO's Energy and Reporting website for more information. For questions about reporting, please contact seco.reporting@cpa.texas.gov or call 844-519-5676.

Section 2: Agency Information

Please provide the name and number (if applicable) of the agency that is submitting an Energy and Water Management Plan.

Agency Name: Midwestern State University

Agency Number: 735

Please provide the contact information for the person(s) responsible for implementation of the recommendations in the plan and the contact information for the person(s) responsible for reporting and submitting the plan, if different.

Implementation Contact

Name: Kyle Owen

Title: Associate Vice President for Facilities Services

Email: kyle.owen@msutexas.edu

Phone: 940-397-4648

Reporting/Submission Contact

Name: Kyle Owen

Title: Associate Vice President for Facilities Services

Email: kyle.owen@msutexas.edu

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Section 3: Providing Agency

Does your agency occupy or manage a state-owned building and pay the utilities?

☒Yes ☐No

If NO, please skip to **Section 4: Tenant Agency**.

If YES, please complete the following:

Have you submitted, or will you be submitting by October 31, FY 2021, energy and water usage data for your agency and properties using the ENERGY STAR Portfolio Manager tool?

☒Yes ☐No

Progress Report

The Progress Report section must outline the progress of activities related to the implementation of projects from the previous Energy and Water Management Plan (if applicable), including continuation of or new preliminary energy audits, a summary of the results, utility efficiency and cost savings. *Agencies should periodically conduct preliminary energy audits to identify new utility savings opportunities.*

Midwestern State University (MSU) provided an energy management master plan to the LBB in November 2012 in compliance with Executive Order RP 49 and updated the plan in a submission to the LBB in October 2017. An update on recommendations from the 2017 report are as follows:

1. The renovation of Bolin Hall will include upgrades to modern standards including the building envelop, new HVAC controls systems instead of pneumatics, modern air handlers, and LED lighting throughout. Construction will begin in December 2023 and be completed in the fall of 2025.
2. Continuing efforts to replace compact fluorescent bulbs with LEDs when they burn out:
    a. Central Plant: 20 HID high bay fixtures upgraded to LED. Fluorescent fixtures (13) in the control room, break room, and plumbing shop were replaced with LED fixtures.
    b. D.L. Ligon: Fluorescent recessed fixtures (18%) in the football locker room were upgraded to LEDs.
3. A significant effort to begin replacing fluorescent bulbs in campus buildings was initiated in FY21 and has continued through FY23. Dillard College of Business had all of the third-floor fluorescent fixtures upgraded to LEDs, 50% of the second-floor fixtures, and 50% of the first-floor fixtures. Another 378 fixtures were replaced on the second and third floors of Moffett Library ($83k) with plans to replace all of the remaining fixtures on the third floor in FY24. We will begin replacing fixtures in the Fain Fine Arts building starting with studio 105 in FY24, too.
4. Replaced an inefficient boiler heating system in the Beyer Greenhouse ($22k).
5. Replaced a leaky transformer at the Bridwell Activities Center ($37k).
6. The condensate receiver tank in the basement of Fain Fine Arts was replaced with a new pumping system to avoid unnecessary wasting of steam condensate water ($18k).
7. A new dimming system with LED spot lights was installed at Akin Auditorium to replace the archaic (circa 1980s) dimming system ($114k).
8. A leaky steam joint in the tunnels (tunnel A, 1065') was replaced to reduce steam losses ($13k).
9. MSU's chilled water system is sized to allow for campus expansion. However, the steam system is considered undersized such that additional buildings cannot be added to its loop. The last two campus buildings MSU constructed, Legacy and Centennial, have their own dedicated boilers instead of using steam from Central Plant because of Central Plant's lack of capacity. In 2021,

the Legislature provided funds to evaluate the campus steam load requirements and add energy efficient boilers in the Central Plant so new buildings can be heated with the existing tunnel loop instead of installing individual boilers in new structures. The funds became available in August 2022 to proceed with the design effort which was completed in October 2023. The project is currently bidding with plans to initiate construction by April 2024.

Energy usage results are as follows: From FY22 to FY23, MSU observed a 2.3% decrease in electricity usage, a 3.2% increase in gas usage, and a 29.0% increase in water usage. The slight decrease in electricity usage is attributed to a reduction in on-campus students and enrollment, although the lower than normal temperatures last winter resulted in higher gas consumption than in FY22. **A failed city water meter resulted in two months of zero usage in FY22**; the FY23 consumption was typical when compared to usage from FY17-FY20. In FY22 compared to FY17, MSU observed a 3.9% increase in electricity usage, a 8.7% increase in gas usage, and a 10.1% increase in water usage. The increase is attributable to an 8% increase in campus square footage during that same period.

Goals

The Goals section must summarize the future goals for utility conservation. Pursuant to Texas Government Code §447.009, each state agency and institution of higher education shall set percentage goals for reducing the agency's or institution's use of water, electricity, transportation fuels and natural gas. The percentage goal should state a target year and reference the target goal relative to a benchmark year.

click to enter your agency's Goals content.

Utility	Target Year	Benchmark Year	Percentage Goal
Water	FY2023	FY2016	1%/year
Electricity	FY2023	FY2021*	1%/year
Transportation Fuels	click to enter year	FY2016	1%/year
Natural Gas	FY2023	FY2016	1%/year

*Texas Government Code Section 388.005(c) and (f). Entities who began energy conservation tracking prior to September 1, 2007 or in attainment areas, may substitute their own electricity benchmark year.

Strategy for Achieving Goals

The Strategy section must describe how the agency or institution plans to prioritize and implement cost effective utility efficiency measures in order to meet the established utility conservation goals.

MSU has been active in pursuing energy reduction technologies and procedures for ~15 years including a SECO loan in 2011 to save gas and electrical energy, and replacement of natural grass athletic fields with artificial turf in 2015 to reduce water consumption.

In the fall of 2019, and in response to Health and Safety Code Section 388.005C passed by the 86th Legislature, MSU updated the energy master plan which was included in the FY20 submission. The consulting firm that developed the 2019 energy master plan determined the only financially feasible option for saving energy was to pursue LED light retrofitting (reference pages 4 and 5 of the master plan) at a cost of $4.1 million. By retrofitting all campus lighting with LEDs, it is anticipated energy savings of 5.1% could be achieved. However, funding limitations restrict MSU's ability to invest $590k per year necessary to realize the 5.1% savings at the end of seven years. Instead, MSU continues to invest ~$100k per year for the foreseeable future to retrofit lighting.

MSU continually seeks opportunities for energy efficient and reduction. In December 2020, MSU requested an energy usage report from Ameresco. Ameresco suggested LED lighting retrofits, upgrades to plumbing fixtures to low-flow technology, additional insulation for steam pipes, variable speed pumping for heating water hot water pumps, upgrades to fume hoods/fans for energy conservation, rehabilitation of cooling towers, replacement of an older boiler, and replacement of air handlers in two buildings (Hardin, Bolin) at a total of almost $9 million with a twenty-year payback. Unfortunately, the payback period was unusually long and not reasonable. MSU continues to pursue LED retrofits at a more economical price with planned investments of approximately $100k per year. MSU will address its aging concrete cooling tower in FY24 and will be pursuing replacement of a 1960s vintage boiler in Central Plant in FY24.

The Legislature has provided funding for MSU to upgrade the utility systems in Bolin Hall as part of a $43M renovation project. Design work began in December 2022 with plans to start construction in December 2023; construction is expected to complete in late 2025. A significant part of the project's scope is to upgrade, replace, and retro-commission the existing mechanical, electrical, and plumbing building systems in order to gain energy efficiencies, as well as, to comply with the current building codes. This will include replacement of the pneumatic control system with Andover digital controls, replacement/retrofit of air handling equipment, replacement of exhaust fans and fume hoods, upgrade of electrical switch gear, and a new temperature control system for the greenhouse.

While the overarching university goal is to reduce utility costs by 1% per year, economic opportunities to achieve this goal are limited due to progress to date which has reduced feasible opportunities to install more energy efficient systems with reasonable paybacks. The university still pursues cost effective options whenever available.

Implementation Schedule

The Implementation Schedule section must outline a proposed timeline for implementing utility cost reduction measures and a strategy for monitoring utility savings of the installed utility measures.

MSU will continue efforts of retrofitting the last fluorescent fixtures on the third floor of Moffett Library in FY24 to LEDs, and begin the process in Fain Fine Arts in studio 105. Portions of other buildings will be converted to LED lighting each year until fully upgraded. The Bolin Hall renovation design began in 2022 with construction ending late 2025. Upgrades to half the building's HVAC systems and electrical equipment will occur in FY24, and the other half in 2025.

Finance Strategy

The Finance Strategy section must describe how the agency or institution plans to obtain funding for the recommended utility cost reduction measures. This section should show the estimated cost of all projects and the funding sources to be used.

The cost of the lighting retrofit project for FY24 is $51k and will be funded by State Higher Education Funds (HEF). In future years, approximately $100k/year of lighting retrofit upgrades will be implemented, and will be funded by State Higher Education Funds.

Transportation Fuel Consumption (if applicable)

*If your agency maintains one or more state-owned vehicles and **does not** report fuel usage via the Texas Fleet System, document the total gallons of transportation fuel used by your facility and fleet vehicles below.*

Does your agency maintain one or more state-owned vehicles? ☒Yes ☐No

Does your agency report its fuel usage via the *Texas Fleet System*? ☒ Yes ☐ No ☐ No Vehicles

Transportation Fuel Type	Amount
Unleaded Gasoline*	click to enter use in kgal
Diesel	click to enter use in kgal
Bio-Diesel	click to enter use in kgal
E85 (Flex Fuel)	click to enter use in kgal
Compressed Natural Gas (CNG)	click to enter use in kgal
Unleaded for Gas Hybrids	click to enter use in kgal
Liquified Petroleum Gas (LPG)	click to enter use in kgal
Ethanol	click to enter use in kgal

*Do not include unleaded gasoline for gasoline hybrids

Employee Awareness Plan

The Employee Awareness Plan section must outline how the agency will make employees aware of utility cost reduction measures, both directly (affecting change in behavior) and indirectly (not designed to affect behavior).

Similar upgrades to the lighting control systems with motion sensors will be installed as part of the Bolin Renovation Project, including an updated HVAC control system which should increase the efficiency of the heating and cooling equipment. Modern fume hoods whose extraction air volume changes with the sash height will also be installed in Bolin.

Section 4: Tenant Agency

Progress Report

The Progress Report section must outline the progress of the implementation of projects from the previous Energy and Water Management Plan or Resource Efficiency Plan (if applicable), including a summary of the results of the projects in terms of utility efficiency and cost savings.

click to enter your agency's Progress Report

Transportation Fuel Consumption (if applicable)

*If your agency maintains one or more state-owned vehicles and **does not** report fuel usage via the Texas Fleet System, document the total gallons of transportation fuel used by your facility and fleet vehicles below.*

Does your agency maintain one or more state-owned vehicles? ☐Yes ☐No

Does your agency report its fuel usage via the *Texas Fleet System*? ☐ Yes ☐ No ☐ No Vehicles

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Unleaded for Gas Hybrids	click to enter use in kgal
Liquified Petroleum Gas (LPG)	click to enter use in kgal
Ethanol	click to enter use in kgal

*Do not include unleaded gasoline for gasoline hybrids

Employee Awareness Plan

The Employee Awareness Plan section must outline how the agency will make employees aware of direct utility consumption. Plans might include employee training, signage or recognition programs.

click to enter your agency's Employee Awareness Plan