



LOUISIANA WATER TREATMENT FACILITY

LSU INDUSTRIAL TRAINING AND ASSESSMENT CENTER

CASE STUDY NO. 4

Audit Highlights

- The team's report identified four recommendations that estimated annual savings at \$23,813.
- The total implementation cost of projects is estimated at \$51,646 with an average payback period of 2.17 years.
- The recommended projects incorporate utilization of higher efficiency lamps/ballasts and upgrades to equipment and motors.

Facility Highlights

- The site uses surface water from local tributaries to create clean drinking water.
- The processes are highly automated with sensor integration into many of the tanks.
- The facility operates with a small team of roughly 20 employees.

Summary

The LSU Industrial Training and Assessment Center (ITAC), hosted by the LSU College of Engineering, in partnership with the LSU AgCenter, worked with local chemical manufacturers to take the next step into a sustainable future. As part of the U.S. Department of Energy Office of Manufacturing and Energy Supply Chains (MESC) funding, the team of students and faculty provided no-cost sustainability assessments for the manufacturer. The team recommended projects including using less toxic and volatile solvent substitutes, upgrading obsolete equipment and utilizing the most efficient type of electric motors. The assessment took place during the summer 2024 cycle and will hopefully lead to a future successful funding application from the manufacturer.



Student team participates in water purification site visit. Photo by LSU ITAC students

Application Processes

To take part in an assessment with the LSU team or for more information, visit the DOE-ITAC website or email M.P. Hayes at mhayes@agcenter.lsu.edu with questions. This program is designed for manufacturers with annual utility costs of \$100,000 to \$3,500,000 and annual revenue less than \$250 million. Other programs may be available for facilities that do not meet this requirement. In previous years, there have been funding opportunities associated with recommendations for implementations for eligible manufacturers through various federal agencies.



Upgrade Outdated Chemical Dosing Equipment

The LSU team identified several pieces of ageing and/or obsolete equipment that are currently in operation. These systems lead to significant energy waste as they operate outside of their peak efficiency. Upgrading to newer equipment allows for integration of variable-speed drives and improved thermal management. Many energy efficiency programs through local utility providers can offer incentives for equipment upgrades for facilities to implement changes that increase operational efficiency.

Energy Savings
\$83,467/year

Total Cost Savings
\$6,761/year

Implementation Cost
\$41,925

Payback Period
6.2 years

Use Most Efficient Type of Electric Motors

Energy Savings
14,756 kWh kWh/year

Total Cost Savings
\$1,195/year

Implementation Cost
\$6,000

Payback Period
5.02 years

During the assessment, the team noted that several existing electric motors in the facility are older standard-efficiency models. These standard motors account for a large percentage of the facility's total electricity consumption, thus a major area of energy waste. By replacing old motors with more efficient models, the facility ensures minimal energy loss. Improved efficiency also leads to lower operating temperatures, which extends the motor lifespan and improved reliability.

Use Less Toxic and Volatile Solvent Substitutes

The students observed that the facility utilized traditional solvents containing high levels of volatile organic compounds and pollutants. These solvents are typically single-use due to high evaporation rates, leading to frequent restocking and high volumes of hazardous waste disposal. Using aqueous-based or bio-based alternatives as a substitute can reduce these disposal costs and eliminate harsh chemical fumes. Transitioning to low-volatility substitutes can also be filtered for reuse, significantly extending the life of the cleaning fluid and reducing the facility's overall chemical throughput.

Energy Savings
127,052 kWh/year

Total Cost Savings
\$10,355/year

Implementation Cost
\$550

Payback Period
0.05 years

Other Recommendations

The team has additional recommendations for upgrading to higher-efficiency equipment and renewable options, such as the utilization of higher-efficiency lamps and/or ballasts. Overall,

this would save \$5,502 yearly with only a \$3,171 implementation cost. The recommendations outlined are a summary and not a comprehensive economic analysis of projects.

Authors

M.P. Hayes, Assistant Professor in the School of Plant, Environmental
and Soil Science and Louisiana Sea Grant

Chao Wang, Associate Professor in the Department of Construction Management

Chandler Hayes, Assistant Director of Research LSU-ITAC in
the Department of Construction Management

Anna Bohannon, Undergraduate Student at LSU College of Engineering



Visit our website: www.LSUAgCenter.com

P4066-D (online) 10/26

The LSU AgCenter and LSU provide equal opportunities in programs and employment.