



LOUISIANA WATER TREATMENT FACILITY

LSU INDUSTRIAL TRAINING AND ASSESSMENT CENTER

CASE STUDY NO. 2

Audit Highlights

- The team's report identified three recommendations that estimated annual savings at \$358,383.
- The total implementation cost of projects is estimated at \$639,180 with an average payback period of 1.78 years.
- The recommended projects incorporate utilizing solar heat.

Facility Highlights

- The site has a unique treatment process that incorporates large scale settling and chlorine contact chambers.
- Students participating in this assessment were able to meet head facility administrators and parish level environmental health and safety employees.
- The facility produces more than 100 million gallons of fresh drinking water per day.

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 the utilization of multiple speed motors, solar heat and more efficient electrical 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 drinking water facility 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.



Use Adjustable Frequency Drive or Multiple Speed Motors on Existing System

During the team's visit, the students observed that several motor-driven systems currently operate at a constant, fixed speed. The team noticed that these systems utilized energy no matter the variability of water through the system. By installing adjustable frequency drives or multi speed motors, the facility can adjust the motor's rotational speed to meet the processing requirements. This not only lowers electricity consumption but also extends equipment lifespan by reducing mechanical stress. Operators can also achieve more precise control over flow and pressure, leading to more consistent performance and reduced system noise.

Energy Savings
4,033,739 kWh/year

Total Cost Savings
\$310,598/year

Implementation Cost
\$83,380

Payback Period
0.27 years

Use Most Efficient Type of Electric Motors

Energy Savings
131,140 kWh/year

Total Cost Savings
\$10,098/year

Implementation Cost
\$41,000

Payback Period
4.06 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 Solar Heat to Make Electricity

During the team's visit, the students evaluated the potential for integrating solar technology to make electricity. Dependence on external power grids leaves the facility vulnerable to fluctuating utility costs and potential outages. By transitioning to solar heat technology, the facility can move to clean, on-site electricity. This transition offers key improvements such as a reduction in carbon footprint and long-term budget stability. There are also opportunities to integrate floating solar platforms onto sedimentation and chlorine contact basins to conserve space and provide shading for chemical reduction.

Energy Savings
444,845 kWh/year

Total Cost Savings
\$37,687/year

Implementation Cost
\$514,800

Payback Period
13.66 years

Other Recommendations

Though not originally reported, this assessment has built a long-term partnership with facility personnel, and since the initial visit, additional recommendations have been made for various projects. This includes shading the chlorine contact basin to prevent chlorine volatilization

during the summer and integrating sensors into the settling basin to mitigate overuse of chemicals for sediment removal. The outlined recommendations are a summary and not a comprehensive economic analysis of projects.

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