



LOUISIANA CHEMICAL MANUFACTURER

LSU INDUSTRIAL TRAINING AND ASSESSMENT CENTER

CASE STUDY NO. 3

Audit Highlights

- The team's report identified eight recommendations that estimated annual savings at \$139,996.
- The total implementation cost of projects is estimated at \$206,600 with an average payback period of 1.48 years.
- The recommended projects incorporate adjustable burners and enhance the sensitivity of temperature control.

Facility Highlights

- The site is part of the LSU AgCenter's network of rural manufacturers.
- The facility created a useful industrial by-product that could be transformed into beneficial-use products.
- The team saw a site dedicated to employee ergonomics, which makes for comfortable work conditions.

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 three projects: enhancing temperature control, utilization of in-process recycling, and an adjustment of burners. The assessment took place during the spring 2025 cycle and will hopefully lead to a future successful funding application from the manufacturer.



Student team assesses newer, efficient facility Photo by LSU ITAC students

Application Process

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.



Using In-Process Recycling Whenever Possible

During the assessment, the team observed that the facility generated a significant amount of scrap material that goes to waste. By implementing in-process recycling, the facility can reuse these by-products and reintegrate them into the manufacturing process. This reduces the facility's cost for raw materials and eliminates the associated energy costs. Additionally, the facility can convert nonhazardous industrial waste to beneficial-use products to create more sustainable pathways for waste. Overall, the facility can maintain high product integrity while lowering disposal fees and the carbon footprint.

Energy Savings
None

Total Cost Savings
\$24,480/year

Implementation Cost
\$14,000

Payback Period
0.57 years

Enhance Sensitivity of Temperature Control and Cutoff

Energy Savings
26,140 kWh/year

Total Cost Savings
\$2,760/year

Implementation Cost
\$4,900

Payback Period
1.78 years

The team identified opportunities to improve sensitivity in its temperature control and safety cutoff systems. The current controls allow for wider temperature fluctuations, which can lead to energy waste through overheating and potential degradation of product quality. By enhancing the sensitivity of temperature controls, the system can maintain a more accurate temperature tolerance. Additionally, upgrading to more sensitive safety cutoff switches provides an essential layer of protection; these sensors allow for an immediate shutdown that prevents equipment damage and minimizes the risk of fire. Implementing these controls not only reduces the total energy consumption but also extends equipment lifespan by reducing thermal stress.

Adjustment of Burners for Efficient Operation

During the team's visit, the students observed that the facility's combustion system was operating with suboptimal fuel consumption and incomplete combustion rates. If burners are not regularly calibrated, it can decrease thermal efficiency and increase the output of harmful emissions. Adjusting the burners can stabilize and make the flame more efficient to maximize heat transfer. Precise burners ensure that fuel is fully converted and allow the system to respond more accurately to fluctuating load demands. This adjustment not only results in significant fuel savings but also improves overall safety and reliability of heating equipment.

Energy Savings
None

Total Cost Savings
\$62,919/year

Implementation Cost
\$100,000

Payback Period
1.59 years

Other Recommendations

The team had additional recommendations for upgrading to higher-efficiency equipment and renewable options. The higher-efficiency equipment includes belts, thermostats and lights. For example, the lighting system was outdated, but upgrading could reduce electricity consumption while maintaining proper illumination throughout the space, saving \$1,945 per year with a \$450 implementation cost.

Additional recommendations include enhancing sensor control cutoffs and replacing older boiler equipment, which have higher payback periods (1.7 and 4.4 years, respectively) due to initial capital investment but have the potential to save \$16,918 per year. The recommendations outlined are a summary and not a comprehensive economic analysis of projects.

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