

Audit Highlights

- The team's report identified five recommendations that estimated annual savings at \$83,261.
- The total implementation cost of projects is estimated at \$482,416 with an average payback period of 5.79 years.
- The recommended projects include replacement of chillers and boilers, as well as purchasing and using optimally sized compressors.

Facility Highlights

- The facility prioritized operational efficiency with highly detailed workflows and floor plan.
- The students were able to see lean manufacturing principles in action.
- The site built large piping apparatus that was for specialty projects.

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 replacement of chillers and boilers, as well as purchasing and using optimum-sized compressors. The assessment took place during the spring 2025 cycle and will hopefully lead to a future successful funding application from the manufacturer.



Student team visit metal fabrication to learn unique processes.
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.



Eliminate Old Stock and Modify Inventory Control

The LSU team observed that the facility's inventory management is outdated and/or inefficient. The current storage protocols allow for the accumulation of old stock, which takes up warehouse space and is a potential revenue loss. By eliminating old stock and modifying inventory control, the facility can improve turnover rates while reducing annual storage costs and waste. This was highly sought after for long-term efficiency and space utilization at the facility.

Energy Savings
None

Total Cost Savings
\$16,150 /year

Implementation Cost
\$25,000

Payback Period
1.55 years

Clean or Color Roof to Reduce Solar Load

Energy Savings
91,157 kWh/year

Total Cost Savings
\$6,381/year

Implementation Cost
\$23,003

Payback Period
3.92 years

During the team's visit, the students observed that the facility's roof currently absorbs high amounts of heat due to its dark and/or weathered surface. Our team noticed that the color of the existing roof is dark, which absorbs a lot more heat than a light color because it absorbs radiation energy. By cleaning the roof surface or changing the color, the facility can achieve a much higher solar reflection. Reflective coatings can deflect up to 80% of solar radiation, significantly reducing the annual electricity consumption.

Replace Boiler

During the team's visit, the students observed that the facility's boiler system is outdated and/or inefficient. The team noted that these existing models operate at significantly lower combustion efficiency compared to current models. A large portion of the energy produced by these units is lost, rather than transferred in heat exchange. By replacing the older models with high-efficiency boilers, the facility can achieve up to 30% more thermal efficiency than older models. Modern boilers can also be equipped with modulating burners that can precisely adjust their controls to match the facility's heating demand, ultimately reducing the annual fuel consumption and gas emissions.

Energy Savings
None

Total Cost Savings
\$31,301/year

Implementation Cost
\$286,589

Payback Period
9.2 years

Other Recommendations

The team had additional recommendations for upgrading to higher-efficiency equipment and converting fossil fuel equipment to electric ones. The lighting system is currently outdated, but upgrading could reduce electricity consumption while maintaining proper illumination throughout the space, saving \$1,432 per year with a

\$1,275 implementation cost. The conversion from fossil fuel to electric forklifts was a large capital investment with a 5.16-year payback, but it can decrease carbon emissions and save fossil fuels. 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

P4069-B (online) 10/26

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