

Audit Highlights

- The team's report identified seven recommendations that estimated annual savings at \$507,065.
- The total implementation cost of the projects is estimated at \$1,968,549 with an average payback period of 3.88 years.
- The recommended projects incorporate replacing fossil fuel equipment.

Facility Highlights

- The site is part of the LSU AgCenter's network of rural manufacturers.
- The smaller local industry showed students the global network of consumers that utilized their Louisiana product.
- Facility personnel are engaged with LSU research opportunities for waste sustainability projects for residual materials from their process.



Heavy equipment at a chemical manufacturer offers energy efficiency opportunities. Photo by LSU ITAC students

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 optimally sized compressors and electric motors and improving process control. The assessment took place during the summer 2025 cycle and will hopefully lead to a future successful funding application from the manufacturer.

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.



Improve Process Control to Prevent Loss of Materials

The LSU team observed that the facility's current material handling and transfer methods rely on manual monitoring or dated overflow sensors, which increases the risk of lost materials/products. Improving the process controls to prevent solid material spills ensures the facility's tanks never exceed their capacity. These advanced controls allow for real-time monitoring of material movement. Beyond an immediate reduction in material waste, improved controls enhance overall environmental compliance and reduce labor hours diverted to operational cleaning.

Energy Savings
None

Total Cost Savings
\$56,956/year

Implementation Cost
\$80,000

Payback Period
1.4 years

Size Electric Motors for Peak Operating Efficiency

Energy Savings
174,266 kWh/year

Total Cost Savings
\$12,547/year

Implementation Cost
\$16,300

Payback Period
1.3 years

During the assessment, the team noted that several electric motors within the facility appear to be oversized for their current applications. Motors operating at a lower rate can lead to poor power factors and a reduction in operating efficiency. By properly sizing electric motors to match load requirements, the facility can ensure equipment operation is optimal. Precision sizing reduces power consumption and minimizes heat generation within the motor, which in turn extends the equipment's lifespan and improves its quality.

Use/Purchase Optimum-Sized Compressor

During the team's visit, the students observed that the facility's compressed air system is oversized to meet the production floor's current demand. An oversized compressor spends a significant amount of time short cycling, where it consumes a large percentage of full-load power while delivering more air than needed. This leads to excessive energy consumption and unnecessary wear on the motor. By using an optimum-sized compressor, the system can maintain a higher ratio of power required to produce the amount of air needed.

Energy Savings
567,141 kWh/year

Total Cost Savings
\$40,834/year

Implementation Cost
\$25,000

Payback Period
0.61 years

Other Recommendations

The team had additional recommendations for upgrading to higher-efficiency equipment and renewable options. Most of the equipment is currently outdated and uses fossil fuels, but upgrading to electrical equipment could reduce the carbon footprint while maintaining production rates. The overall savings would be \$53,529 per year with a

\$144,549 implementation cost. Additionally, a large capital project was recommended for thorough insulation of bare equipment, which would annually save \$214,970 in natural gas heating costs, with a longer payback period of about seven years. The outlined recommendations 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

P4065-A (online) 9/26

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