

Audit Highlights

- The team's report identified five recommendations that estimated annual savings at \$49,260.
- The total implementation cost of the projects is estimated at \$200,000 with an average payback period of 4.06 years.
- The recommended projects include the installation of vinyl strips on air curtain/high-speed doors.

Facility Highlights

- The site is part of the LSU AgCenter's network of rural processors.
- The facility was interested in converting waste shells into materials for beneficial use.
- Students were able to see an agricultural processing industry that incorporated both automation and hands-on workers.

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 utilization of different or recycled raw material and installation of vinyl strips on air curtain/high-speed doors, as well as using other waste concentration methods. The assessment took place during the summer 2023 cycle and will hopefully lead to a future successful funding application from the manufacturer.



Seafood processors offer unique avenues for sustainability recommendations. 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.



Use a Different or Recycled Raw Material

The LSU team observed that the facility's production cycle relies heavily on generating nonhazardous solid waste materials. These solid scraps are currently being sent to a landfill by a local garbage service, which increases scope three emissions and the carbon footprint. The facility is being charged a standard weekly fee by the waste management company for disposal. Typical extraction processes to generate a new material from solid waste can be energy-intensive, but composting operations offer natural breakdown to beneficial use fertilizers. By pivoting to a partnership for recycled materials, the facility can significantly lower its environmental footprint, avoid high processing costs and lower the cost of disposal.

Energy Savings
None

Total Cost Savings
\$12,150/year

Implementation Cost
None

Payback Period
None

Use Other Waste Concentration Methods

Energy Savings
None

Total Cost Savings
\$34,000/year

Implementation Cost
\$200,000

Payback Period
5.88 years

The team identified an opportunity for wastewater collection for beneficial use. The current method is storage in tanks, which are contracted for disposal, thus incurring a waste fee. This wastewater is high in protein and cannot be disposed of through traditional sewage treatment. The company was encouraged to use a dissolved air flotation (DAF) system to recycle water and concentrate protein for potential byproduct avenues such as feedstock. DAF is a form of waste concentration using flocculants (alginate) to suspend the proteins from the seafood and utilize the byproduct material as a feedstock or fertilizer. Wastewater is introduced

to a chemical solution that coagulates the contaminants while dissolved air is injected under pressure to separate the coagulated contaminants from the water. The bubbles and floating film from the oil and grease

contaminant will collect at the top, where it will be skimmed and removed. The clean water is then cycled back into the system or sent to a separate sewage stream.

Installation of Vinyl Strip on High Speed/Air Curtain Doors

During the assessment, the team observed numerous high-traffic openings such as high-speed and air curtain doors. Every time a door cycles or wind blows an air curtain, the facility loses unnecessary energy that drives up utility costs. The installation of vinyl straps will minimize air loss during these door cycles. By reducing the mass air exchange, the demand on the HVAC system is lowered. Implementing these measures is cost-efficient and leads to an immediate reduction in energy consumption.

Energy Savings
2,892 kWh/year

Total Cost Savings
\$307/year

Implementation Cost
\$230

Payback Period
0.75 years

Other Recommendations

The team has additional recommendations for upgrading to higher-efficiency equipment and renewable options. The lighting system is currently outdated, but upgrading could reduce electricity consumption while maintaining

proper illumination throughout the space, saving \$3,367 per year with a \$3,470 implementation cost. The outlined recommendations are a summary and not a comprehensive economic analysis of the projects.

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P4070-A (online) 10/26

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