

## Saving Energy for Bayou Shrimp Processors

The Louisiana State University Industrial Assessment Center (LSU-IAC) is committed to helping local industries take the next steps to energy efficiency and sustainability. Bayou Shrimp Processors has recently partnered with LSU-IAC for an assessment of their facility.



Bayou Shrimp Processors from Delcambre, Louisiana, processes and ships quality shrimp. *Photo from Bayou Shrimp Processors, retrieved from americanshrimp.com*

### Assessment Benefits

- The report identified a total cost saving of \$114,604 per year and an increase in overall productivity with automation!
- The total implementation cost is \$32,430 leading to an average payback period of 0.28 years.
- The implementations of our team's recommendations will reduce their carbon dioxide emissions by 0.56%.

### Summary

Through the Department of Energy's Industrial Assessment Center at Louisiana State University, Bayou Shrimp Processors, a shrimp processing company located in Louisiana, will save a significant amount of money by implementing some of the potential recommendations found by the team. The six assessment recommendations together represent a total cost savings of \$114,604/yr., which is 38.99% of the current total annual utility costs. The total implementation cost is estimated at \$32,430, yielding a payback of 0.28 years. If all are implemented, these measures will result in an annual reduction of 9 tons/yr. in carbon dioxide emissions, which is 0.56% of current emissions.

### Bayou Shrimp Processors

Bayou Shrimp Processors processes millions of pounds of shrimp per year in their facility located in Delcambre, Louisiana. The flow of the facility starts with shipment of raw shrimp. The head of the shrimp is removed manually, then the shrimps go through a peeling and shell separation process. Once the shell is separated from the shrimps, the shrimps are separated in different containers based on size. After the shrimp separation process, the shrimps are packaged using automation and then sent to cold storage. Finally, the small packages are manually packed together into boxes and shipped.

### Evaluation Approach

A team consisting of 2 students, the Director, and three Assistant Directors of the Industrial Assessment Center at Louisiana State University performed the assessment in June 2021. The team met with the workers on-site and toured the facility to get an overlook of the plant. Further, the team split up and gathered data to determine potential recommendations to decrease energy consumption, cost, and carbon dioxide

### Facility Highlights

- This site is a part of LSU-IAC rural outreach initiative to better help industries in remote areas of the state.
- Annual production for this facility is 20,000,000 pounds/yr.
- Completely customized and designed by the plant manager who has been with the company for 20+ years.
- The facility is already working towards going green with their partial implementation of LED lights, the use of curtain door and the use of automation.

emissions. The plant manager was pleased to have the LSU teams work with Bayou Shrimp Processors to offer energy efficiency recommendation. The LSU team finalized and submitted the report August 2021 and has since coordinated with Bayou Shrimp Processors on the implementation of the recommendations.

### Automatic Wrapping and Palletizing

LSU-IAC discovered the most fascinating recommendation was the installation of automatic packaging and automatic palletizing equipment. During the assessment, the team observed that all of the packaging and palletizing was done completely by hand. The current process utilizes 3 workers which package and palletize for a total of 12 hours per day! LSU-IAC quickly realized that we could save the company some serious money and time with the improvement of this system. Implementing these automation systems

would cut the company’s labor costs. The students and faculty performed research and many calculations to find that the system would save Bayou Shrimp Processors \$109,280 per year with a payback period of only 0.28 years.

### Energy Saving Recommendations

While the installation of an automated packaging system would save the company over 1/3 of what their current electricity bill costs, the system would require more energy. To cut energy usage, the team recommended 5 energy-saving changes to be made to the facility. AR-1

was to eliminate or reduce compressed air leaks usage, which would save 2,788 kWh per year. AR-2 was to turn off lights that are not in use, which would save 29,761 kWh per year. AR-3 was to eliminate inert gas and compressed air lines, which would save 42,680 kWh per year. AR-5 was to use higher efficiency lamps, which would save 7,795 kWh per year. Finally, AR-6 was to use energy-efficient belts and other improved mechanisms, which would save 3,330 kWh per year. Each of these recommendations require a very small implementation cost with a quick payback period, as shown in the figure below.

### Recommendations Presented by IAC

Assessment Recommendations	Annual Resource Savings	Total Annual Savings	Capital Costs	Simple Payback
Eliminate or Reduce Compressed Air Usage	2,788 kWh	\$169	\$25	0.15 yrs.
Making Practice of Turning Off Lights When Not in Use	29,761 kWh	\$1,804	\$300	0.17 yrs.
Eliminate Leaks in Inert Gas and Compressed Air Lines	42,680 kWh	\$2,586	\$585	0.23 yrs.
Install Automatic Packing Equipment		\$109,280	\$30,730	0.28 yrs.
Utilize Higher Efficiency Lamps and Ballast	7,795 kWh	\$563	\$363	0.64 yrs.
Utilize Energy-Efficient Belts and Other Improved Mechanisms	3,330 kWh	\$202	\$427	2.12 yrs.
<b>Total</b>	<b>45,169 kWh</b>	<b>\$114,604</b>	<b>\$32,430</b>	<b>0.28 yrs.</b>