



Sam Matuseski
Chemical Engineering
University of Minnesota Twin Cities

Company Background

CHS is an agricultural cooperative with businesses in grain, feed, fertilizer, and energy. The cooperative structure means that local cooperatives and farmers own the company. They currently have about 10,000 employees. CHS operates farms that grow grain and other crops and purchases crops from local farmers for distribution, as well. They manage an extensive network that processes this grain into ethanol and distributes grain and ethanol globally. They also produce a range of food and animal feed using soybean, canola, and other crops. CHS is headquartered in Inver Grove Heights and its locations span the globe.



“In a world facing accelerated sea level rise, more intense storms, and rising temperatures, climate change has been brought to the forefront of society’s concern. I have always been passionate about making an impact in this space and MnTAP provided me a great opportunity to do so. This experience has taught me skills and provided tools that I will use for years to come.” ~ SM

Project Background

CHS has begun to tackle some sustainability projects, but wishes to establish a more robust, company-wide sustainability program. In the last year, CHS formed an energy council and a few locations in Minnesota have started professional energy audits, as well as tackling LED projects that have already realized cost savings. Their headquarters is very energy efficient, as many of the energy saving opportunities identified have been implemented. With many of the locations needing more information about the cost of energy and potential energy savings projects, CHS looked to a MnTAP intern for help.

Incentives to Change

The biggest incentive to change for CHS are the cost savings associated with reducing energy consumption across facilities. Annual energy expenses for its facilities add up to about \$3 million, which is equal to about 25 million kWh. CHS also wants to become a more sustainable company and establish an on-going sustainability program. With interests in energy and agriculture, the company needs to be forward-thinking amid the current climate. More CHS business partners are requiring that they have sustainability work documented to continue relationships. The work of the MnTAP Intern Project will be used to decide what the best sustainable solutions are to implement countrywide.

SOLUTIONS

Install LED Lighting

All existing metal halide, fluorescent and incandescent lamps are recommended to be replaced with LED lighting. Motion sensors could also be added to areas where foot traffic varies throughout the day to see additional savings. Some lighting projects are in the process of being implemented and some are still at the status of recommended. Implementing these projects at all 3 locations would reduce the electricity usage by 74,000 kWh and save \$13,500 annually.

“Sam was a great addition to our team and we really appreciated his help this summer. I hope that he got as much enjoyment from his internship as we did.”

*~ Stephanie Simms
Environment Specialist, CHS*

Solutions

Fix Compressed Air Leaks

Compressed air leaks are causing compressors at locations to run for longer times than necessary. Fixing the 16 leaks at all 5 locations will result in 32,000 kWh in energy savings, which corresponds to \$4,500 in cost savings. These projects have little to no cost associated with them. Installation of zero loss drains to replace the electric solenoid drains at the St. Charles location would result in additional energy savings.

Install VFDs on Grain Piles

The fans used in grain piles run at 100% speed, 24/7, for months at a time, which is a significant energy expense for locations. It is recommended that the location install VFDs on these fans which ramp the speed up or down based on the wind speed. Installing VFDs at the 9 locations with grain piles would result in 1,595,000 kWh in energy savings and \$223,000 in cost savings.

Implement Changes Recommended from Audit

A professional energy audit was conducted at the Ruthton location. The report is still under review, but it is recommended that the location implement all energy saving opportunities identified by this audit.



Recommendation	Annual Reduction (kWh/yr)	Annual Savings	Status
Install VFDs at 9 locations	1,595,000	\$223,000	Recommended
Install LED lighting at 3 locations	74,000	\$13,500	Implementing
Fix compressed air leaks at 5 locations	32,000	\$4,500	Implementing
Implement changes recommended from audit	TBD	TBD	Recommended

MnTAP Advisor: Michelle Gage, Engineer