

Energy Savings Opportunities for Wheeling Nisshin Inc.

The Industrial Assessment Center (IAC) at West Virginia University (WVU) discovered opportunities to decrease energy usage and enhance corporate competitiveness. Wheeling Nisshin Inc., a galvanized steel facility located in Follansbee, WV. The assessment team focused on the galvanization process as well as the energy support systems. The recommendations at this facility may serve as a template for potential savings at similar plants.

Company Background

Wheeling Nisshin, Inc. facility located in Follansbee, WV is a leading manufacturer of galvanized steel sheets.

Summary

As a result of the assessment, energy efficiency recommendations were made for improvement. Opportunities for saving energy were identified with respect to the installation of occupancy sensors, developing a repair/replace policy through a motor management system, replacing the existing high pressure sodium fixtures with LED fixtures, installation of photo sensors for lights, installation of sensors to detect degradation of pot hardware, installation of VFD on the blower mixer, heat recovery from exhaust in absorption chiller, insulation of hot surfaces and reducing the compressor set point for all compressors.

Four of the nine recommendations made by the team were planned to be implemented, resulting in the reduction of energy consumption by 1,006,149 kWh of electricity and an annual cost saving of \$54,842. Additionally, the recommendations save 1,754 MMBtu of natural gas which results in annual



cost savings of \$3,860.

Energy Conservation Analysis

In general, the management and employees at the facility are “energy conservation” oriented and follow many good practices to save energy. For example, the plant used LED lighting in production areas, used vibration program for motors, used vortex air nozzles, recycled cooling water and utilized recuperative burners. The assessment team was pleased with the level of energy efficiency awareness amongst plant personnel.

The recommendations identified by the team were discussed with the plant personnel on the assessment day. The plant personnel were encouraged to contact and interface with IAC-WVU for further discussion and/or clarification required with respect to the implementation of the assessment recommendations.

Benefits at a Glance

The implemented measures will result in annual electricity savings of 1,006,149 kWh, natural gas savings of 1,754 MMBtu and annual cost savings of \$58,172.

Average Payback is 2 months.

Implemented recommendations will reduce carbon dioxide emissions by 2,401,668 pounds.

Occupancy sensors

The assessment team suggested to install occupancy sensors in designated areas. The plant personnel appreciated the value in the efficient use of occupancy sensors for lighting. Occupancy sensors reduce the electrical usage for lighting during unoccupied periods and hence are expected to contribute towards a productive workforce, while simultaneously saving energy.

Implementing occupancy sensors in the facility areas has increased the efficiency of the lighting system. In effect, these suggestions have significantly reduced energy usage.

Process Equipment

Reducing the pressure delivered to compressed air consuming equipment and processes will reduce the volume of air consumed by the system. The energy savings associated with network pressure results from a decrease in demand. The assessment team measured the air pressure available at different locations in the facility using pressure transducers. This reduced the facility’s compressed air usage significantly. The implementation of these suggestions yielded significant energy savings

Natural gas Savings

The facility was recommended to insulate hot surfaces on burner assembly and casing of the boiler.

This would help the facility in saving 1,754 MMBtu of gas annually. The team projected a savings of \$3,860 annually after implementation.

Preventive Maintenance Savings

Electrical motors are widely used equipment in manufacturing facilities. The assessment team recommended the use of a repair/replace policy for motors.

By performing motor analysis regularly, the motor efficiency can be improved, thereby reducing the energy usage of the motors

This recommendation would also help the facility to determine if they had to purchase a new motor or rewind the existing ones.

Assessment Savings Tabulated

The following Table presents the annual cost savings that has resulted at Wheeling Nisshin Inc. due to the planned implementation of recommendations. The energy conservation opportunities that were identified in the assessment and were implemented will reduce annual electric usage by 1,006,149 kWh and gas usage by 1,754 MMBtu per year. This translates into an annual cost savings of \$58,172 and an annual reduction in CO₂ emissions of 2,401,668 pounds.

Planned Implementation of Recommendations

Planed Assessment Recommendations	Annual Conservation (MMBtu)	Annual Conservation (kWh)	Total Annual Savings (\$)	Capital Costs (\$)	Simple Payback (months)
Reduce Compressor Pressure Set-Point	-	741,372	40,630	534	1
Establish Repair/Replace Decision Policy through Motor Management System	-	249,001	13,353	1,514	2
Insulate Hot Surfaces on Flanges and Pipes	1,754	-	3,860	2,024	7
Install Occupancy Sensors in Designated Areas	-	15,776	869	1,671	24
Total	1,754	1,006,149	58,172	5,743	2