



Polymetallurgical Corporation: Metals Manufacturer Implements 100% of Recommendations

ASSESSMENT DATE: FEBRUARY 27, 2002

BENEFITS:

- Identified potential annual energy cost savings of \$54K
- Recommendations saved approximately 13% of total energy costs
- Eight recommendations were made to reduce energy usage and productivity costs by a total of \$70,278
- 100% of Recommendations Implemented

APPLICATIONS:

The IAC assessment team discovered opportunities to decrease energy usage and thereby increase capacity, improve product quality, and enhance corporate competitiveness. In order to decrease energy usage, the assessment team focused primarily on the manufacturing process as well as motors and air compressor systems. The results at Polymetallurgical will guide IAC assessments at similar packaging facilities, where the savings can be replicated.

Summary

Through the Department of Energy's Industrial Assessment Center located at the University of Massachusetts, Polymetallurgical Corporation, a metals manufacturer, was able to save a significant amount of money from reductions in energy and productivity costs. Through recommended actions in scheduling changes, compressed air systems, administrative costs, and machine changes, Polymetallurgical will be able to save approximately \$70K annually. All recommendations made by the assessment team were implemented at the facility. Further results from this assessment are highlighted throughout the case study.

Company Background

Polymetallurgical Corporation produces wire, conductive springs, and bonded or inlaid metal products. These items have applications in electrical controls, electronics and thermostats, television and telecommunications equipment, among others. Annual energy bills for the 79,700 square foot facility totaled \$418K

Assessment Approach

A team of students and faculty from the Industrial Assessment Center (IAC) at the University of Massachusetts Amherst performed an industrial assessment at Polymetallurgical Corporation in North Attleboro, Massachusetts in the winter of 2002. The assessment was led by Center Director, Dr. Lawrence Ambs, and Assistant Director, Dr. D.B. Kosanovic, both Professors in the Department of Mechanical and Industrial Engineering at the University of Massachusetts.

Energy Conservation

The assessment team identified energy consumption awareness practices for the employees at the facility as a cost-effective way to significantly reduce energy consumption. The team recommended that the facility stagger the furnace start-up over the period of a few days reducing peak demand. Employees are encouraged to reduce compressed air pressure, shut off the air compressor room exhaust and duct the outside air to the air compressor inlets.

At the facility, heating comprises 83% of total natural gas usage while the remainder is for small process use. Major electrical consumption and demand arises from the facility's major energy consuming equipment such as the electric furnace and the air compressors.



Reduce Peak Demand

It was observed that the plant's electrical demand charges comprised a good portion of its utility bills. It was also noted that a spike in peak demand during the summer affected the demand charges for the remainder of the year. It came to the team's attention that restarting all of the facility's annealing furnaces after a two-week plant shutdown was the probably cause of this jump in peak demand. The following recommendation resulted in savings:

- Stagger the furnace startup and shutdown over a period of a few days, thus decreasing the power spike caused by starting the furnace from when it is cold.
- This recommendation saved nearly 10% of the company's utility bills

Implement Temperature Setback

The team learned that the temperature in the building was set to a constant 70 degrees year round. By lowering this temperature to 60 degrees in the heating season and raising it to 80 degrees during the cooling season for the overnight and weekend periods, the company would save money on space conditioning for the times when the plant is unoccupied. By controlling these temperatures with electronic programmable thermostats, it was determined the company would save almost \$11K.

Results

Table 1 shows the annual cost savings to accrue at the Polymetallurgical Corporation facility from implementing the energy conservation opportunities identified by the IAC team during the assessment. Based on these results, the facility can reduce its energy consumption by over 1,100 MMBtu. These reductions will consequently reduce utility costs by a total of \$70,278

Table 1. Opportunities at Polymetallurgical Corporation's North Attleboro Facility

Recommended Action	Annual Resource Savings	Annual Cost Savings (\$)	Implementation Cost (\$)	Payback (months)
<i>Scheduling</i>				
Reschedule Furnace Start-up to Reduce Peak Demand	0 MMBtu/yr	\$38,495	\$4,091	2
<i>Compressed Air Systems</i>				
Reduce Compressed Air System Pressure	30 MMBtu/yr	\$605	\$0	0
Shut Off Air Compressor Room Exhaust	22 MMBtu/yr	\$249	\$0	0
Duct Outside Air to the Compressor Inlets	4.2 MMBtu/yr	\$86	\$350	49
<i>Administrative Costs</i>				
Obtain Tax-free Status for Electricity Purchases	0 MMBTU/yr	\$15,314	\$0	0
Pay Bills On Time to Avoid Late Payment Fees	0 MMBtu/yr	\$483	\$0	0
<i>Other Energy Savings</i>				
Implement Temperature Setback	981 MMBtu/yr	\$10,764	\$14,100	16
Replace Clutch-Type Motor with VFD	136 MMBtu/yr	\$4,282	\$6,950	20
Totals	1,173 MMBTU/yr	\$78,278	\$25,490	4

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