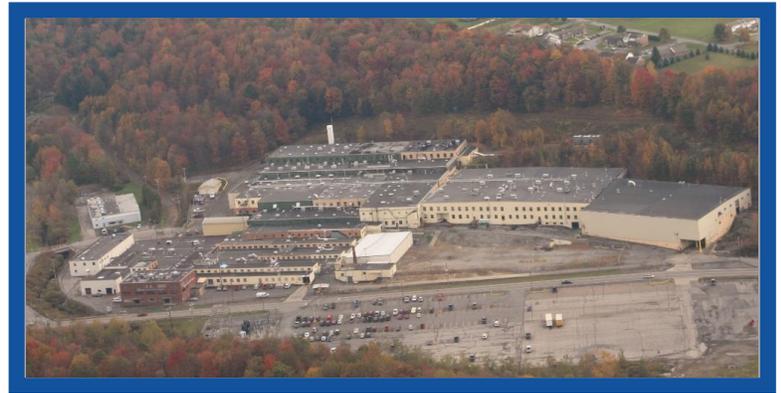


Economy, Energy & Environment (E3) Pilot Project – Keystone Powdered Metal Co.

The Need:

Keystone Powdered Metal Company (KPMC), a technological leader in the powdered metal (P/M) industry, wanted to improve the energy efficiency and reduce the carbon footprint of their production operations. KPMC's customers are placing increased emphasis on energy conservation and greenhouse gas reduction. A major customer, Ford Motor, has established a goal of a reduction of 25% in energy consumption per vehicle manufactured by 2016. Another major customer, Chrysler, is asking for KPMC's plans to reduce their carbon footprint.



The PennTAP Connection:

PennTAP received a grant from the US EPA and the PADEP for the delivery of an Economy, Energy and Environment (E3) pilot project in Pennsylvania. PennTAP partnered with The NWIRC, a regional service provider of the PA MEP IRC network, to recruit local manufacturers that wish to implement strategies designed to improve energy, environmental and economic efficiencies. PennTAP and NWIRC experts in lean, environmental and energy practices performed free E3 assessments to help identify strategies for better efficiencies in energy usage and pollution prevention within the selected organization.

The Project:

The PennTAP-NWIRC-KPMC team decided that the E3 pilot project at KPMC would proceed according to the following two distinct sub-projects:

1. A cross-functional Energy and Environmental assessment team worked to identify waste reduction and energy saving opportunities site-wide with subsequent screening and economic analysis of priority options.
2. A two-day lean manufacturing quick changeover event was conducted to reduce the non-value added activities within the 1000-Ton Press set-up process. The focus was on lean manufacturing parameters such as activity value, number of operators, cycle times, changeover time, batch size and yield.

“The E3 project provided a good opportunity to take a fresh look at energy utilization and resource conservation.”

*Gary Anderson
Vice President Research & Engineering
Keystone Powdered Metal Company*

*E3 Assessment Results
7,500 MWh/yr electricity reductions potential
\$246,000 savings potential*

About the Company

Keystone Powdered Metal Company
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www.keystonepm.com
Gary Anderson
Vice President Research & Engineering

County: Elk
Employees: 350
Industry: Powdered Metal Products

The Outcome:

A comprehensive assessment of energy used at Keystone's St. Marys facility identified the following processes as excellent candidates for cost-effective process modifications that will yield a substantial reduction in energy consumption combined with an associated reduction in the facility's carbon footprint.

1. Converting the first zone of the three parts washers in the clean room from electric water heating to natural gas heating will eliminate the majority of the electric heating load in this process.
2. Converting the preheat zone in one of Keystone's pusher furnaces from electric resistance heating to natural gas heating will substantially reduce the electric energy demand of this production process and will provide key input for future preheat zone process modifications to be implemented at the remaining nine (9) pusher furnaces that are located at Keystone's St. Marys and Lewis Run facilities.
3. A cistern will be installed behind the facility that will collect spring water for use as make-up water for Keystone's recirculated water cooling system. This task will reduce the quantity of water supplied to the Keystone facility by the St. Marys Water Authority with an associated reduction in the Authority's electric energy consumption for water treatment and pumping.
4. The VHO fluorescent lights and metal halide lights in the major mold/sintering area of the facility will be upgraded with more energy efficient lighting fixtures.

A summary of the identified opportunities cost, savings, and anticipated energy and waste reductions are provided in the following table.

Opportunity Description	Electric Demand Reduction	Electric Use Reduction	Carbon Footprint Reduction	Cost	Savings
	kW	kWh/yr	Tons/Yr	\$	\$/yr
1 Wash Water Heating Conversion	174	825,801	582	\$60,000	\$25,200
2 Sintering Furnace Preheat Conversion – One Furnace Demo	130	1,213,600	794	\$110,000	\$34,371
3 Cooling Water	0	6,030	1	\$15,000	\$8,100
4 Lighting Upgrade	46	407,673	291	\$66,000	\$20,500
Total These Tasks	350	2,453,104	1668	\$251,000	\$88,171
Sintering Furnace Preheat Conversion – Remaining Furnaces	740	5,074,000	3321	\$660,000	\$158,000
Ultimate Total	1090	7,527,104	4989	\$911,000	\$246,171

As of November 1, 2013, the lighting and cooling water projects are complete. KPMC is arranging loan financing for the wash water heating and sintering furnace preheat conversion projects.

The following provides a summary of the expected results from the Lean Manufacturing Quick Changeover Event and implementation of the Action Plan component of the E3 pilot project for the 1000-Ton Press set-up process.

- Estimated Annual Savings = \$40,000
- Additional Savings Opportunities = Lower EOQs, less inventory, visual inventory system
- Processing what is needed (Pull) and not Overproducing (Push)



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