

MONTEZUMA MANUFACTURING



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MONTEZUMA



COMPANY BACKGROUND

Montezuma Manufacturing, a division of Cosma International, first opened its doors in 1972. The company specializes in deep draw stamping mild and stainless steels and robotic welding lines featuring metal inert gas (MIG), spot and projection welding. Major customers include General Motors (GM), Ford and Chrysler, to whom the company provides frame rails, heat shields, panel wheelhouses, door reinforcements, inlet pipes, catalytic converter shields and floor pans.

PROJECT BACKGROUND

The goal of the 24-week project was to conduct a facility energy audit to identify opportunities to improve efficiency of the electrical, compressed air, heating and lighting systems. The focus was on compressors, make-up and infrared heating, ventilation for welding processes, and fluorescent and halide lighting. The intern began by developing a baseline and then researched options for reducing energy consumption.

INCENTIVES TO CHANGE

As part of Cosma International, Montezuma Manufacturing is joining its parent company's global initiative to cut costs and reduce energy wherever possible. To achieve these goals, the company needed to conduct a thorough energy audit, develop energy-saving strategies and adopt pollution prevention methodologies. By minimizing waste at the source, the company will reduce emissions, costs and risks, and will exceed regulatory standards.

RESULTS

Electrical: Cost saving opportunities can be achieved through upgrading control methods, purchasing energy efficient equipment and monitoring energy consumption. Specifically, presses, vending machines, personnel fans and cooling towers can all be controlled for optimum energy efficiency. Utilizing energy efficient filters in fume collectors can improve filter and collector longevity and decrease energy consumption. An energy monitoring and targeting program is recommended to find system energy inefficiencies and develop solutions. Finally, high electrical demand charges can be reduced by consistent production scheduling.



Compressed Air: Cost saving opportunities can be found through additional storage capacity, increased system maintenance, performance tracking and proper end use. Additional storage will decrease compressor cycling along with making compressor demand more consistent. As a result, the pressure level can be lowered, resulting in additional energy savings. Increased preventative maintenance is required on the system to keep compressors and piping at optimum efficiency. Using the best possible oil is also a key to maintaining an efficient compressed air system. Checking system performance through monitoring compressor conditions can also help with maintenance. Due to the inefficiency of the system it is not advisable to use compressed air unless completely necessary, as it can be up to fifty times more expensive than a blowing system, in terms of energy costs.

PROJECT	ANNUAL COST SAVINGS	ENVIRONMENTAL RESULTS	STATUS
ELECTRICAL			
AUTOMATE PRESS COUNTER BALANCES	\$17,234	215,428 KWH	IN PROGRESS
INSTALL VENDING MACHINE OCCUPANCY SENSORS	\$841	10,507 KWH	RECOMMENDED
INSTALL PERSONNEL FAN TIMERS	\$8,509	106,363 KWH	RECOMMENDED
SWITCH TO ENERGY EFFICIENT FUME COLLECTOR FILTERS	\$33,397	417,458 KWH	RECOMMENDED
ADJUST COOLING TOWER OPERATION	\$12,913	161,413 KWH	RECOMMENDED
MANAGE POWER CONSUMPTION	\$91,630	1,145,371 KWH	RECOMMENDED
UTILIZE COGGED V-BELTS	\$1,995	24,938 KWH	RECOMMENDED
SCHEDULE WEEKENDS	\$18,352	-	RECOMMENDED
COMPRESSED AIR			
INCREASE COMPRESSED AIR STORAGE	\$10,847	135,593 KWH	RECOMMENDED
IMPLEMENT LEAK DETECTION PLAN	\$11,028	137,854 KWH	RECOMMENDED
INCREASE COMPRESSOR PREVENTATIVE MAINTENANCE	\$13,004	162,553 KWH	RECOMMENDED
INSTALL COMPRESSOR POWER AND FLOW METERS	\$25,845	323,062 KWH	RECOMMENDED
CONVERT TO OFF-BRAND SYNTHETIC LUBRICANT	\$16,799	209,990 KWH	RECOMMENDED
REPAIR AIR LEAKS	\$99,255	1,240,688 KWH	IN PROGRESS
ELIMINATE COMPRESSED AIR CLEANING	\$355	4,434 KWH	IN PROGRESS
HEATING			
SWITCH TO A FORCED AIR CAPTURE FILTRATION SYSTEM	\$32,648	127,375 KWH 25,946 THERMS	RECOMMENDED
INSTALL VENTILATION TIMERS	\$25,979	236,389 KWH 8,128 THERMS	RECOMMENDED
RECOVER COMPRESSOR HEAT	\$23,821	249,823 KWH 4,410 THERMS	IN PROGRESS
INSTALL PROGRAMMABLE THERMOSTATS	\$9,083	9,671 THERMS	RECOMMENDED
LIGHTING			
INSTALL SOLAR PARKING LOT LIGHTS	\$7,688	96,100 KWH	RECOMMENDED
RETROFIT OVERHEAD LIGHTS	\$75,177	939,707 KWH	RECOMMENDED
INSTALL ROOM LIGHT SENSORS	\$5,857	73,209 KWH	RECOMMENDED
INSTALL OVERHEAD LIGHT SENSORS	\$65,861	823,266 KWH	RECOMMENDED

Heating: Cost saving opportunities can be found in recovering lost heat and upgrading heat system controls. Using fume collectors to recycle plant air instead of makeup air units to exhaust plant air is a good way to conserve heat energy. Heat can also be recovered off hot compressors, leading to heated ventilation air, which is crucial to indoor air quality in the winter. Due to human error, heating equipment is sometimes left on when not in use. Installing controls will fix this problem and reduce energy costs.

Lighting: The majority of plant lighting should be retrofitted with fluorescent fixtures with LED solar outdoor lighting to achieve significant cost savings. Adding a control system would reduce unnecessary lighting time and result in additional cost savings.

CONVENTIONAL AIR POLLUTANTS AND GREENHOUSE GASES DIVERTED IN STANDARD TONS					
Total for all sectors					
CO ₂	SO ₂	CH ₄	N ₂ O	CFC	PM ₁₀
6,416.06	32.66	264.27	0.45	74.33	0.75

