

JOHN DEERE ENGINE WORKS

COMPANY BACKGROUND

John Deere is the world’s leading provider of advanced products and services for agriculture. Deere & Company entered the tractor business in 1918 when it purchased the Waterloo Gasoline Engine Company. The Engine Works facility in Waterloo, Iowa makes advanced off-highway diesel engines that are used in John Deere equipment and other applications.



done often to make sure new leaks are suppressed before becoming bigger issues. A proactive leak prevention plan is essential in a factory due to the variety of manufacturing equipment and the many uses for its compressed air.

Shut Off: John Deere uses compressed air for many applications. Some compressed air tasks only take a few minutes of an entire shift, but the air stays on the entire day. Controls that automatically shut air off when it is not needed will give John Deere savings that will quickly pay back the project cost. Other compressed air uses could easily be replaced with rags or brooms.

Air Guns: Air guns are used throughout the plant for cleaning and drying purposes. As compressed air guns are loud and prone to leak, brooms, reusable rags, or other manual tools should be considered as cleaning and drying alternatives.



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PROJECT BACKGROUND
John Deere is striving to become an industry leader in reducing greenhouse emissions. By working with a Pollution Prevention intern in the past, John Deere

Engine Works implemented a plastics recycling program as well as a wastewater treatment plan. This year, John Deere continued its partnership with the Iowa Department of Natural Resources by hosting another Pollution Prevention Intern, who focused on reducing compressed air consumption.

INCENTIVES TO CHANGE
John Deere is a world industry leader producing high quality engines that surpass today’s emission standards. The company also recognizes the need to reduce plant energy consumption. With today’s rising energy prices, reducing energy consumption not only benefits the environment but it saves the company tens of thousands of dollars per year. John Deere has been painting its tractors green for many years and will now be able to paint itself in the same color when referring to its environmental achievements.

RESULTS
Compressed air: John Deere Engine Works in Waterloo uses three primary compressors. Each compressor has a 600 HP electric motor. The compressors are kept above the manufacturing floor and are monitored by a control system that determines the load for each compressor and how many compressors to run. Typically the system runs two compressors that average about 70 percent loaded. The compressor system itself needs little improvement. The air intakes are located outside and have filters to strain particulate out of the air, which is excellent. A chiller is located next to the compressors. Both the chiller and compressors are cooled by a plant coolant. The only improvement that could be made in the compressor room is to increase the size of the current storage tank to help minimize load change on the compressors.

The compressed air distribution of the plant has no visible problems.

Leaks: The Pollution Prevention intern found many compressed air leaks. Suppressing those leaks would provide a savings of roughly \$25,000 annually as well as reduce the amount of emissions released by the power plant. Leak surveys are only effective if they are



PROJECT	ANNUAL COST SAVINGS	ENVIRONMENTAL RESULTS	STATUS
AIR LEAKS	\$24,143	603,575 KWH	IMPLEMENTED
AIR PREVENTATIVE MAINTENANCE PLAN	\$20,000	500,000 KWH	RECOMMENDED
AIR TOOLS	\$5,000	125,000 KWH	RECOMMENDED
AIR GUNS	\$10,000	250,000 KWH	IMPLEMENTED
AIR ON DEMAND	\$40,000	1,000,000 KWH	IN PROGRESS

Air Pollutants Diverted in Tons		Green House Gases Diverted in Tons (CO2 Equivalent)	
	Total for all sectors		Total for all sectors
SO2	4.14	CO2	2381
CO	—	CH4	0.12
NOX	7	N2O	0.1
VOC	0.14	CFCS	—
PM	10		