ENERGY SAVING TIPS FOR THE **INDUSTRIAL** SECTOR

Very Low Effort

<< Relative Implementation Effort >>

Significant Effort

Energy End Use	Energy Saving Tip	Typical Energy Savings	Relative Capital Cost	Typical Simple Payback Period
Boilers	An ***upgraded boiler maintenance and monitoring program***, including optimizing the air-to-fuel ratio, burner maintenance, boiler tune up, and tube cleaning. Periodic measurement of flue gas oxygen, carbon monoxide, opacity and temperature provides the fundamental data required for a boiler tune-up.	2 - 5% of boiler energy use	None - Low	4 - 6 months
Total Plant Energy	Monitoring and tracking energy use provides the necessary information to develop energy reduction targets and enable informed ***energy management***. Energy management and setting targets lead to continuous improvement in energy efficiency.	5 - 20% of total plant energy use	Low	4 - 10 months
Chillers and Compressors	***Smart defrost controls*** that use sensors so that defrost is initiated only when necessary and terminated just when the fin block is clear of ice, are more efficient than timed defrosting, as they adjust to the varying levels of ice build-up that normally occur.	Up to 15% of cooler energy use	Low	< 3 months
Compressed Air	Regular ***compressed air leak survey*** to identify air leaks. ***Repairing air leaks*** result in reduced energy waste.	Up to 15% of compressed air energy use	Low	4 - 6 months
Motors - Pumps	Since pumps are often conservatively designed, the impellers are larger than they need to be, and require more power than if they were properly sized. ***Impeller trimming*** offers the opportunity to customize the size without having to buy expensive parts. This is an appropriate measure for pumps that; have many open system bypass valves indicating that excess flow is available; need excessive throttling for flow control; have high levels of noise or vibrating; or are operating far from their design points.	Up to 25% of motive power energy use	Low	6 - 8 months
Compressed Air	Cooler air requires less energy to compress it than warmer air. Outdoor air typically is cooler than the air in the compressor room. There is potential for energy savings when the air compressor uses this ***cooler outdoor air at the compressor*** intake thereby increasing efficiency.	1 - 5% of compressor energy use	Low	6 - 15 months
Process Heating	Heat loss through convection and radiation can cause significant reduction in process heating efficiency. ***Insulation*** of equipment and pipes increases the amount of energy available for end uses by decreasing the amount of heat lost from the system.	Up to 5% of process heating energy use	Low - Medium	8 - 10 months
Heating, Ventilation and Air Conditioning	***Ventilation optimization*** ensures ventilation is adequate for the application and minimizes the amount of natural gas required to heat make-up air. Optimized ventilation generally includes any of the following elements: minimize make-up air and exhaust flow rates to necessary flow rates; balance make up and exhaust flow rates to minimize negative or positive air pressure in the working space, including redesign and/or control measures; optimal distribution of air, and interlocking air supply with process to operate only when required.	Up to 20% of ventilation energy use	Medium	1 - 2.5 years
Process Control	Process control systems use information gathered from processes, to adapt the process conditions to be utilized to the maximum potential of the whole system. Applications of ***advanced, automated control*** and energy management systems are applicable to all industrial sectors.	8 - 30% of energy use	High	1 - 2 years
Compressed Air	***Premium Efficiency ASD Compressors*** come with built-in adjustable speed drive (ASD) control that allows the compressor output to match the plant air demand. These compressors may save as much as 40% over standard compressors which typically use modulated control.	15 - 40% of compressor energy use	Medium	3.5 - 6.5 years
Lighting	High-intensity discharge (HID) lighting, such as the metal halide lamp, is the most widely used lighting type in industrial facilities. Recent advances in the development of ***high-bay T5 high-output fluorescent lighting*** indicate that replacing HID lighting with T5 high-output lighting is a promising efficiency measure. Other benefits of T5 high-output lighting over HID lighting are better colour rendering and longer lamp life. Efficient options include high output T5 or pulse-start metal halide fixtures instead of standard metal halide fixtures.	Up to 20% of lighting energy use	Medium	1 - 4 years
Steam Systems	Steam traps are important to the performance of both end-use equipment and the distribution system. Traps provide for condensate removal with little or no steam loss. If the traps do not function properly, excess steam will flow through the end-use device or the condensate will back up into it. Excess steam loss will lead to costly operation while condensate backup will promote poor performance and may lead to water hammer. Traps can also remove non-condensable gases that reduce heat exchanger effectiveness. ***Regular steam trap surveys*** are an important measure to identify faulty steam traps and steam leaks. Repairing the steam leaks and faulty steam traps will minimize steam losses and improve system efficiency.	4 % of steam system energy use	Medium	1.5 - 3.5 years
Boilers and Direct Fired Process Heating (Incl. Ovens, Dryers, Kilns and Furnaces)	***Exhaust gas heat recovery*** increases efficiency because it extracts energy from the exhaust gases and recycles it back to the process. For lower and medium temperature applications, heat recovery from flue gas can be used to preheat make-up air, feed product or ventilation make-up air. Heat wheels are used at a number of facilities to recover the heat. The actual energy savings and costs depend on the heat wheel implemented. For high-temperature applications there are mainly four widely used methods: direct heat recovery to the product; using a recuperator to transfer heat from outgoing exhaust gas to incoming combustion air; using a regenerator to store thermal energy for future use; and using a waste heat boiler. For boilers, economizers are used to recover flue gas heat and preheat make-up air.	Up to 15% of heating energy use	High	2.5 - 4 years

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