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Boiler Tune-ups: *Improve efficiency, reduce pollution, and save money!*

Did you know . . .

- Inefficient industrial, commercial, and institutional (ICI) boilers waste money and pollute?
 - There are over 1.5 million ICI boilers in the United States?
 - Boilers burning coal, oil, biomass, and other solid fuels and liquid are a major source of toxic air pollution?
 - New federal Clean Air Act rules require certain boilers to get regular tune-ups?
 - Keeping your boilers tuned-up can reduce hazardous air pollution?
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Energy Management, Tune-ups and Energy Assessment

Reducing the amount of fuel used by boilers is one of the most cost effective ways to control hazardous air pollution. **Tuning-up** a boiler optimizes the air-fuel mixture for the operating range of the boiler which ensures less fuel is wasted, and reduces emissions of hazardous air pollutants produced by inefficient combustion. Conducting an **energy assessment** of the systems and processes that the boiler supports helps to identify opportunities to improve boiler system efficiencies and reduce fuel use.

EPA, through its ENERGY STAR program, can help you build into your energy program critical practices that will keep your boilers operating efficiently. The **ENERGY STAR Industrial Energy Guides** and the **Building Upgrade Manual** can help you identify opportunities to reduce boiler energy demands through better boiler system efficiency measures, waste heat recovery, and other proven energy management practices. (Download these valuable resources at: www.energystar.gov/energyguides and www.energystar.gov/index.cfm?c=business.bus_upgrade_manual)

Assessing your energy management practices and program can help you identify operational and organizational strategies necessary to support and maintain boiler efficiency. The **ENERGY STAR Energy Program and Facility Assessment Matrix** can help you quickly evaluate your energy management practices. (Download the matrix at: www.energystar.gov/guidelines)

Conducting tune-ups and energy assessments of boiler systems are good energy management practices and should be implemented on regular basis. If you would like to enhance your existing energy program, check out additional energy management resources at www.energystar.gov/buildings.

Are boiler tune-ups and energy assessments mandatory?

For some facilities, the new federal Boiler rules known as the Boiler MACT (major sources) and Boiler Area Source Rule (smaller sources) require periodic boiler tune-ups and a one-time energy assessment. Additionally, boilers that burn coal, oil, biomass, and other solid fossil and liquid fuels may be subject to emission limits. Most boilers that burn natural gas are not impacted by the new boiler requirements. EPA estimates that only 13% of existing boilers will be required to do tune-ups, and roughly 1% will need to meet new emission limits.

To learn more about the EPA's Boiler rules, visit: www.epa.gov/ttn/atw/boiler/boilerpg.html and www.epa.gov/airquality/combustion/actions.html

Common Boiler Systems Energy Efficiency Measures		
Component	Objective	Action
Combustion	Reduce stack losses	<ul style="list-style-type: none"> • Measure and monitor flue gas temperature. • Reduce air leaks in stack. • Keep stacks and airways clean. • Reduce flue gas temperature.
	Reduce excess air	<ul style="list-style-type: none"> • Test and monitor flue gas oxygen levels. • Check and eliminate air leaks in boiler. • Optimize oxygen concentrations for boiler operating levels. • Install or adjust positioning controls. • Install or calibrate oxygen sensors & controls.
	Improve heat transfer	<ul style="list-style-type: none"> • Removing fouling and scale on the water side of boiler tubes and heat exchangers. • Increase boiler insulation. • Increase heat transfer surface areas. • Reduce boiler blowdown losses.
	Recover waste heat	<ul style="list-style-type: none"> • Add stack economizer to pre-heat boiler feed water. • Collect and return steam condensate to boiler feed water. • Add waste heat recovery device to preheat intake air or for process heating.
Steam	Reduce or eliminate losses	<ul style="list-style-type: none"> • Maintain or increase insulation to reduce heat loss. • Find and repair failing steam traps. • Find and repair steam leaks. • Upgrade steam traps. • Shorten and optimize steam piping runs.
	Recover waste heat	<ul style="list-style-type: none"> • Recover blowdown steam. • Recover flash steam from steam traps and use for preheating boiler feed water. • Recover flash steam low temperature steam applications. • Recover condensates.
	Optimize demand and uses	<ul style="list-style-type: none"> • Evaluate steam system uses and determine if less steam or lower temperatures can be used. • Schedule steam uses to maximize boiler output efficiency.
Process	Improve process efficiency	<ul style="list-style-type: none"> • Replace old inefficient boilers and steam systems. • Consider alternative process heating methods if more efficient than steam or hot water systems.