

## Facts & Figures

Steam system improvements can save 10.6% in fuel costs at a typical industrial facility. If such improvements were adopted industry-wide, benefits would include more than:

- \$518 billion in reduced fuel costs
- 4.3 million metric tons in reduced carbon dioxide emissions

## Benefits of the Steam System Tool Suite

Steam system assessments using DOE's steam software tools reveal the following opportunities for improvements at large plants:

- Improved blowdown heat recovery
- Use of backpressure turbines for power production
- Recovery of thermal energy from wastewater streams
- Replacement of missing insulation on piping systems
- Reduction of steam leaks resulting from failed steam traps and pipes

## Resources

To download the steam system tool suite and other free software tools and learn more about DOE Qualified Specialists and training opportunities, visit the ITP Web site, [www.eere.energy.gov/industry/bestpractices](http://www.eere.energy.gov/industry/bestpractices).

Additionally, you can contact the EERE Information Center at 1-877-EERE-INF (1-877-337-3463), or via the Web at [www.eere.energy.gov/informationcenter](http://www.eere.energy.gov/informationcenter).

## Tools to Boost Steam System Efficiency

If you consider potential steam system improvements in your plant, the results could be worthwhile. In fact, in many facilities, steam system improvements can save an average of 8% in fuel costs. To help you tap into potential savings in your facility, the U.S. Department of Energy (DOE) Industrial Technologies Program (ITP) offers a suite of tools for evaluating and identifying steam system improvements.

### Scope Out the Hottest Opportunities for Savings

The Steam System Scoping Tool (SSST) quickly evaluates your entire steam system operation and spots the areas that are the best opportunities for improvement. The tool suggests a range of ways to save steam energy and boost productivity. It also compares your system against identified best practices and the self-evaluations of similar facilities.

The software asks 26 questions about different areas of your steam system, including system profiling, steam system operating practices, boiler plant operating practices, and distribution and recovery operation practices. Based on your responses, it provides a score indicating opportunities for improvement. The software is available in Microsoft Excel or Visual Basic formats.

### Learn About Steam System Strategies

The Steam System Survey Guide explains many of the opportunities available for improving your steam system. It is particularly helpful for learning more about the calculations required to determine savings opportunities.

The Guide addresses five areas: steam system profiling, steam properties, boiler operations, resource utilization, and steam distribution. It can help in assessing fuel costs, the combustion efficiency of various boiler fuels, boiler blowdown, vent steam, backpressure turbines versus pressure-reducing valves, condensing turbines, steam leaks, insulation, and condensate recovery.

The 3E Plus<sup>®</sup> software tool allows steam users to calculate how much insulation is needed to cost effectively conserve energy and avoid the expense of over-insulation.

*"DOE has some fantastic programs that can...help us understand how to use our equipment more efficiently—how to save some money in terms of steam production, steam use, and the way we insulate the equipment"*

- Jeff Utley, Manager, Flying J Refinery



## Explore Your Options with System Modeling

The Steam System Assessment Tool (SSAT) models various improvement scenarios and provides energy bill estimates. The tool contains all the key features of typical steam systems—boilers, backpressure turbines, condensing turbines, deaerators, letdowns, flash vessels, and feed water heat exchangers.

The model analyzes boiler efficiency, boiler blowdown, cogeneration, steam cost, condensate recovery, heat recovery, vent steam, alternative fuels, backpressure turbines, condensing turbines, steam traps, steam quality, and steam leaks.

## Steam Tools Get Results

### Steam System Scoping Tool

In 2001, six DOE Industrial Assessment Centers used the SSST to assess steam systems at 18 small- and medium-sized facilities. Those assessments successfully identified 89 steam system improvements with an average payback of 7 months and an average fuel bill savings of 12.5%. Collectively, the improvements yielded a total annual savings of \$2.8 million.

### Steam System Survey Guide

The *Steam System Survey Guide* is used as the technical basis for DOE's targeted steam assessments and Steam End User Training Program. As of September 2008, DOE had conducted 247 targeted steam assessments in large industrial plants through ITP's Save Energy Now initiative.

### Steam System Savings Identified by Industry\*

Industry (No. of Assessments)	Average Energy Savings (Million Btu/year)	Average \$ Savings (Annual)
Aerospace (1)	66,610	\$594,000
Agriculture (3)	150,937	\$1,221,457
Automotive (20)	136,699	\$1,090,246
Chemical (53)	492,885	\$3,378,441
Electronics (3)	68,888	\$253,803
Ethanol (4)	106,514	\$907,939
Food Processing (49)	56,685	\$712,396
Forest Products (57)	294,955	\$3,765,957
General Manufacturing (24)	74,033	\$589,625
Mining (1)	59,391	\$562,515
Petroleum (9)	531,119	\$4,959,038
Plastics (7)	241,361	\$1,484,233
Rubber (4)	100,066	\$1,475,729
Steel (6)	660,194	\$6,551,367
Textiles (6)	74,414	\$1,072,248

\*As of September 2008.

*ITP provides U.S. industries with software assessment tools, training, technical information, and assistance. These resources and energy management practices help plants improve the energy efficiency of their process heating, steam, pumps, compressed air, and other systems; reduce operating costs; and improve their bottom line.*

## Support and Training

ITP offers a 1-day workshop that covers the operation of typical steam systems and discusses methods of system efficiency improvement. The course introduces the SSST, SSAT, and 3E Plus software tools. DOE has developed a Steam System Specialist Qualification training for steam service providers who are interested in becoming proficient in using DOE's steam tools and references. In addition, ITP offers an introductory 2-hour Webcast on how to use the Steam System Assessment Tool suite to identify energy savings opportunities. Visit ITP's online Training Calendar for a list of upcoming sessions: [www.eere.energy.gov/industry/bestpractices/events\\_calendar.asp](http://www.eere.energy.gov/industry/bestpractices/events_calendar.asp).

## A Strong Energy Portfolio for a Strong America

Energy efficiency and clean, renewable energy will mean a stronger economy, a cleaner environment, and greater energy independence for America. Working with a wide array of state, community, industry, and university partners, the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy invests in a diverse portfolio of energy technologies.

### For More Information, please contact:

Industrial Technologies Program (ITP)  
[www.industry.energy.gov](http://www.industry.energy.gov)

EERE Information Center  
1-877-EERE-INF (1-877-337-3463)  
[www.eere.energy.gov/informationcenter](http://www.eere.energy.gov/informationcenter)

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