

The Steam System Tool Suite (SSTS)

The U.S. Department of Energy's (DOE's) Industrial Technologies Program (ITP) offers a collection of software tools to help you identify and analyze energy system savings opportunities within your plant or facility. As part of ITP's Tool Suite, the Steam System Tool Suite (SSTS) enables you to evaluate the energy efficiency opportunities of your steam system using an unbiased approach. This, in turn, could lead to further private sector detailed engineering analyses and design specifications with the goal of implementing identified energy-saving opportunities.

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 SSTS

- 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 SSTS, other free software tools, or to learn more about DOE Qualified Specialists and training opportunities, visit www.eere.energy.gov/industry/bestpractices.



Improve Steam System Performance with SSTS

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 10% or more in fuel costs. To help you tap into potential savings at your facility, ITP offers a suite of tools for evaluating and identifying steam system improvements.

Scope Out the Hottest Opportunities for Savings

The **Steam Systems 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 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 assess 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.

SSTS also offers the **3E Plus®** software tool, which allows steam users to calculate how much insulation is needed to cost-effectively conserve energy and avoid the expense of overinsulation.

“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 components of typical steam systems—boilers, backpressure turbines, condensing turbines, deaerators, letdowns, flash vessels, and feedwater heat exchangers.

The tool considers 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

SSST

In 2001, six DOE Industrial Assessment Centers used 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. The table below summarizes the results of these assessments.

Steam System Savings Identified by Industry*

Industry (No. of Assessments)	Average Energy Savings (kWh/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

SSTS will be a part of the upcoming Energy Management Toolkit, which will act as the primary delivery mechanism for additional tool access from the Energy Management Portal.

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 SSST, SSAT, and 3E Plus. 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 SSTS 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.

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, DOE's Office of Energy Efficiency and Renewable Energy invests in a diverse portfolio of energy technologies.

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Energy Efficiency &
 Renewable Energy

For more information, please contact:

Industrial Technologies Program (ITP)
www.eere.energy.gov/industry

EERE Information Center

1-877-EERE-INF (1-877-337-3463)
www.eere.energy.gov/informationcenter