



DOE'S Energy Savings Assessments and Training Programs

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➤ **Outline**

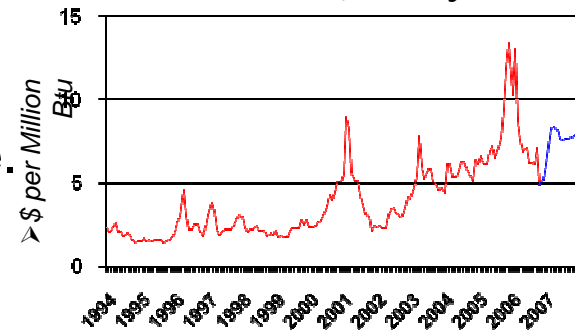
- *Outline of the Save Energy Now Initiative*
- *Energy Savings Assessments*
 - *Overview*
 - *Implementation*
- *Partnerships and Outreach*

Global Energy Challenges

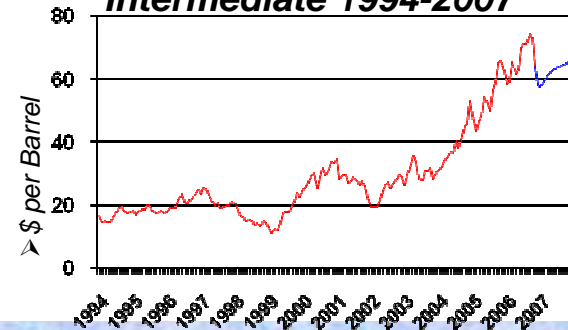
Growth in demand for limited resources have increased prices and market volatility, impacting national energy security, economic security, and environmental quality

- **National energy security:** Global oil and gas reserves are in unstable areas and flexible alternatives are not readily available.
- **Economic security:** Rising prices hurt America's ability to remain competitive in the global market place.
- **Global Warming:** Global concerns regarding carbon emissions and climate change are forcing businesses and governments to rethink their strategies on energy fuels.

➤ **Natural Gas Prices, Henry Hub 1994-2007**



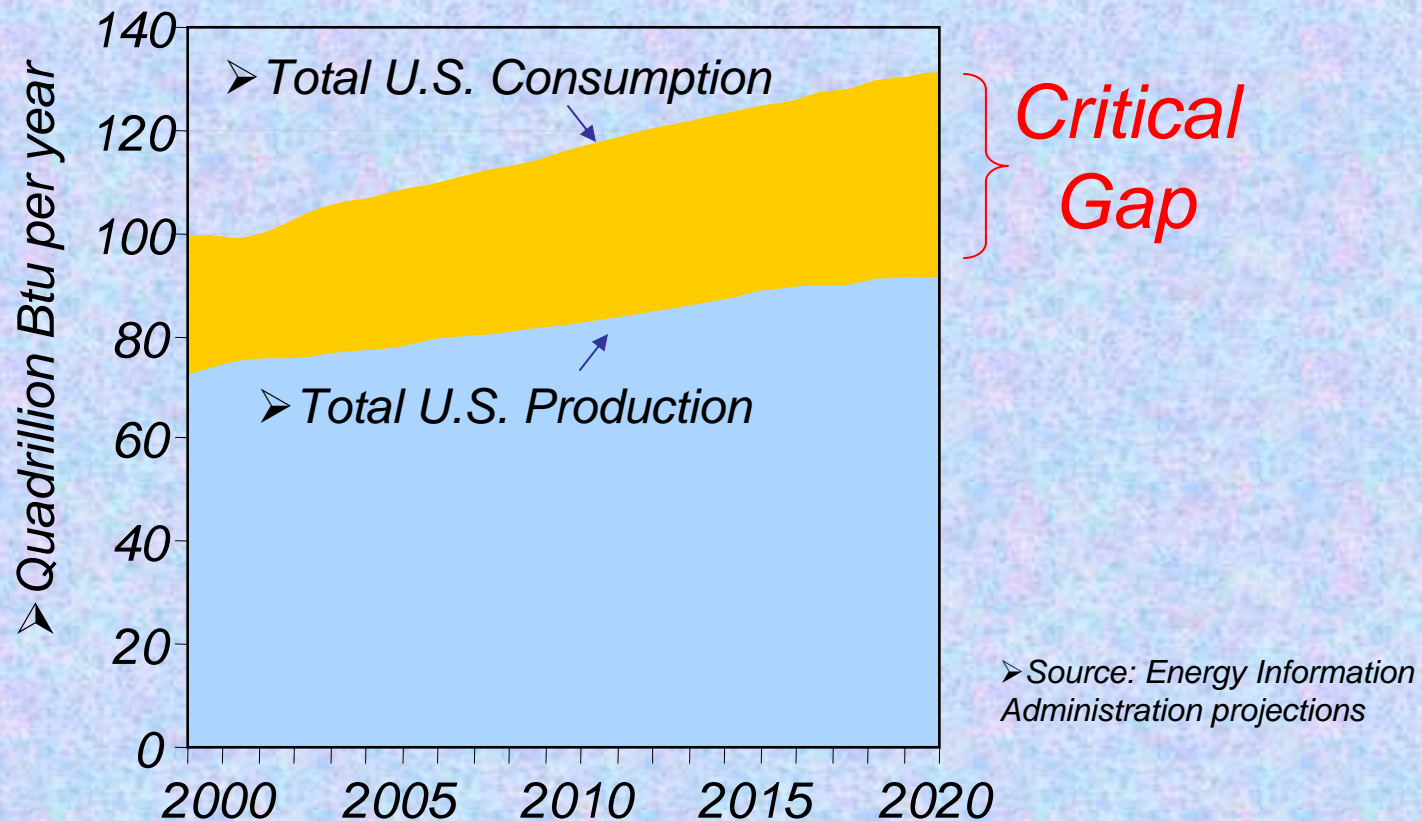
➤ **Spot Oil Price, West TX Intermediate 1994-2007**



➤ **Consideration of these challenges has led the U.S. government to re-evaluate how it can most effectively respond.**
Save Energy Now Program

Projected Energy Use

Total U.S. Energy Production vs. Consumption, 2000-2020



Current U.S. Policy Environment

- Increased Public Awareness of Energy Issues
- Immediate Opportunity
 - Implementation of Energy Policy Act 2005 (EPACT)
 - Congress may consider additional measures
- General U.S. Approach
 - Public/Private Partnerships--Engage business wherever possible
 - Building America
 - Building Energy Codes Program
 - Energy Star
 - Save Energy Now Program
 - Leading by Example
 - Federal Energy Management Program

“Easy Ways to Save Energy” Campaign

In Fall 2005, DOE created four initiatives in response to supply shortages and skyrocketing natural gas prices:



1. *Energy Hog campaign*
 - *Public Service Announcements*
2. *Energy Savers tips to help homeowners save energy*
3. *Federal Energy Management Program (FEMP) energy saving teams*
4. ***Industrial Technologies Program (ITP)***
“Save Energy Now”

Save Energy Now Program

The Context

“America’s businesses, factories, and manufacturing facilities use massive amounts of energy. To help them during this period of tightening supply and rising costs, our Department is sending teams of qualified efficiency experts to 200 of the nation’s most energy-intensive factories. Our Energy Saving Teams will work with on-site managers on ways to conserve energy and use it more efficiently.”



**Secretary of Energy Bodman
National Press Club
October 3, 2005**

ITP Mobilized Existing Capabilities

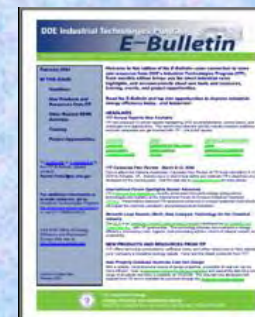
- Suite of respected software tools for assessing plant systems
- Established training programs
- Cadre of Qualified Specialists in various assessment tools/systems
- Network of university-based Industrial Assessment Centers (IACs)
- In-depth experience in conducting plant energy assessments
- Strong partnerships and high credibility with influential companies in the manufacturing sector



➤ Secretary Bodman at the Caterpillar Tractor ESA

Assessments Build on Existing Resources

- Established training programs on software tools
- Cadre of Qualified Specialists in various assessment tools/systems
- Network of university-based Industrial Assessment Centers (IACs)
- In-depth experience in conducting plant energy assessments using DOE tools
- Internet Info Resources
- EERE Info Center: 877-337-3463



Save Energy Now: The Industrial Component of “Easy Ways to Save Energy”



- *Conduct energy savings assessments of the most energy-intensive U.S. plants*
- *Work with partners to create awareness and find energy savings solutions*
- *Disseminate energy savings information and tools to 50,000 plants to help reduce natural gas and electricity use.*

Save Energy Now

➤ **Goals**

- Encourage industry to voluntarily reduce its energy usage in a period of tight supplies by working with America's largest energy-intensive plants
- Create momentum to significantly improve energy efficiency practices throughout the manufacturing sector



Energy Savings Assessments Overview

Plant Energy Assessments

➤ Small/Medium Plant Assessments



- *Plants with energy consumption \$100,000 to \$2 million*
- *Over 500 assessments per year*
- *Average plant savings: 4.2 billion Btus (about \$21,000)*
- *Conducted by Industrial Assessment Centers at 26 universities*

➤ Large Plant Assessments



- *Over 120 assessments underway or completed*
 - *Plant-wide assessments (comprehensive)*
 - *Targeted system assessments (quick focused)*
- *Annual savings opportunities identified: >\$250 million*
- *Average identified energy savings per plant: 10%-15%*
- *Annual savings implemented ~\$30 million*

Save Energy Now Program

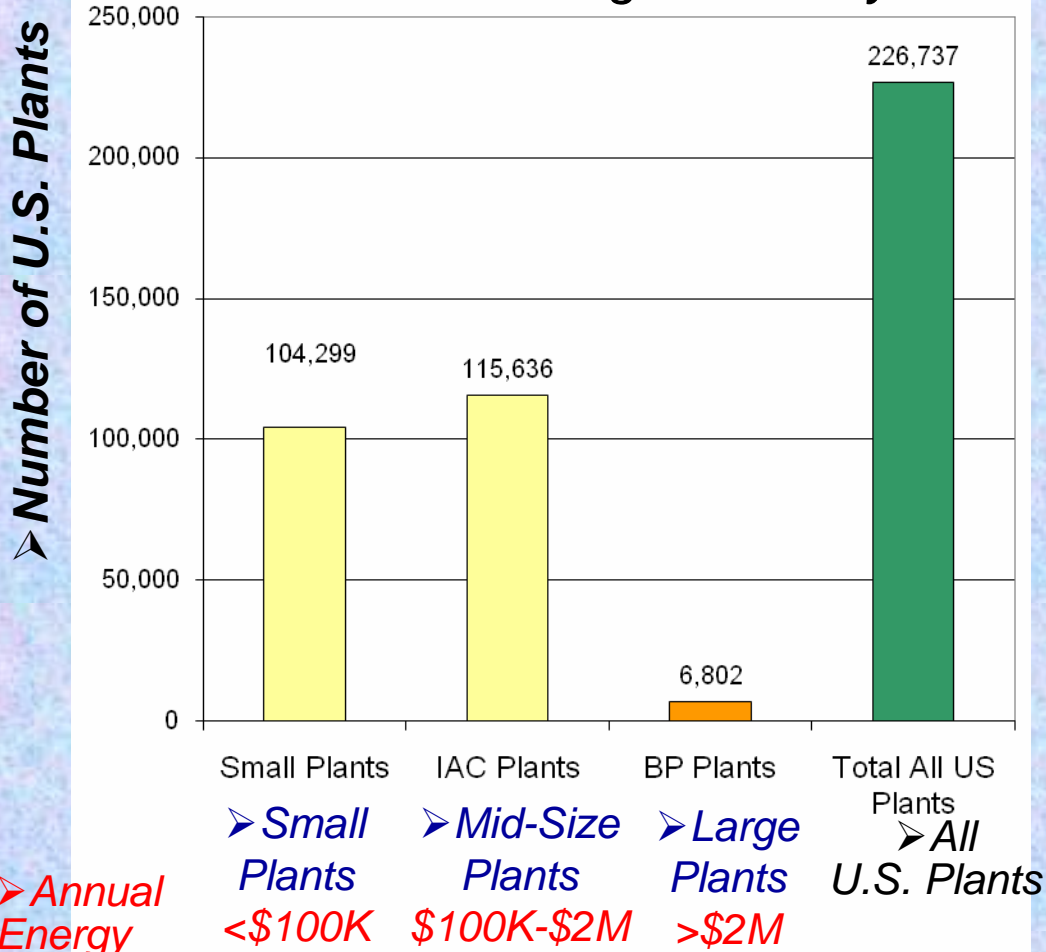
Energy Savings Assessments

- Assessments of targeted industrial systems by Qualified Specialist using the DOE software tools
- ESA Report identifies potential energy and cost savings
- Plants are selected by DOE based on several factors, including:
 - The plant's energy consumption
 - The company's intention to include other similar plants within their company

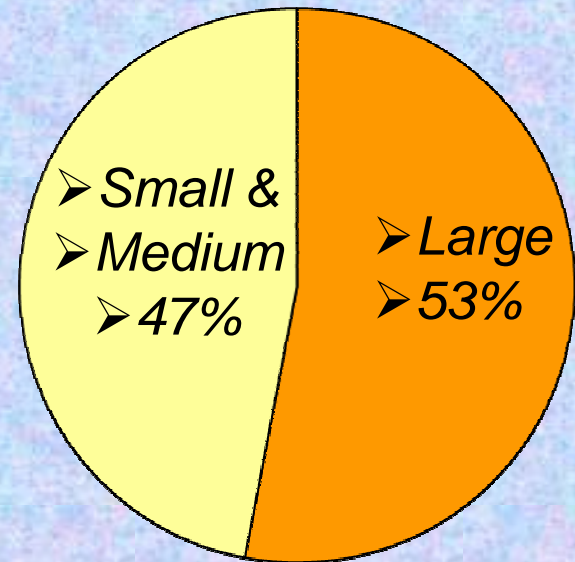


Relatively Few Plants Use the Most Energy

➤ U.S. Manufacturing Plants: By Size



➤ Percent of Total Industrial Energy



➤ 1998 EIA MECS

➤ Annual Energy Costs

Save Energy Now Program

Industrial Assessment Centers



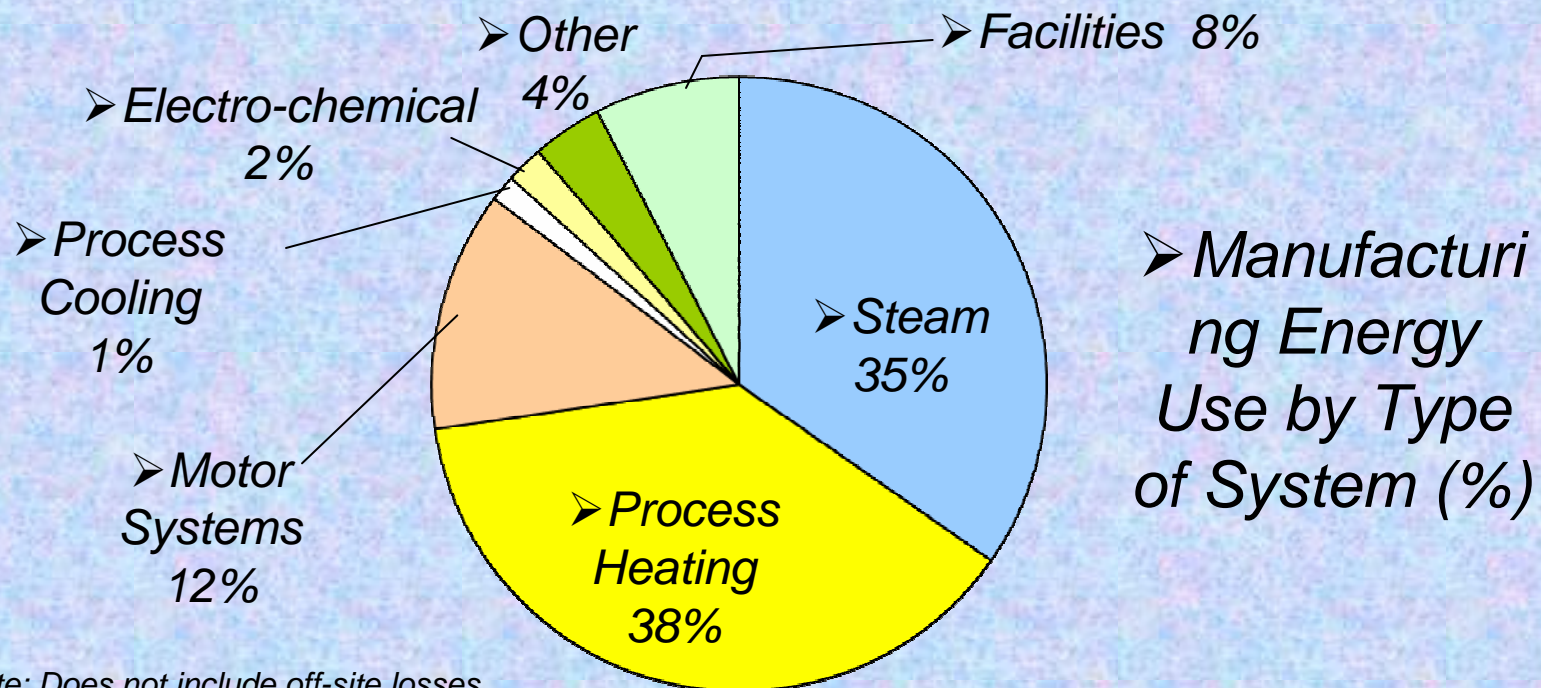
For facilities using \$100K ~\$2.5M/year in Energy



Save Energy Now Program

Energy Savings Teams

- Teams composed of DOE Qualified Energy Experts and plant personnel
- Teams will focus on one of five DOE efficiency tools
- Plant personnel and affiliates will be trained on DOE efficiency tools



➤ Note: Does not include off-site losses

Save Energy Now Program

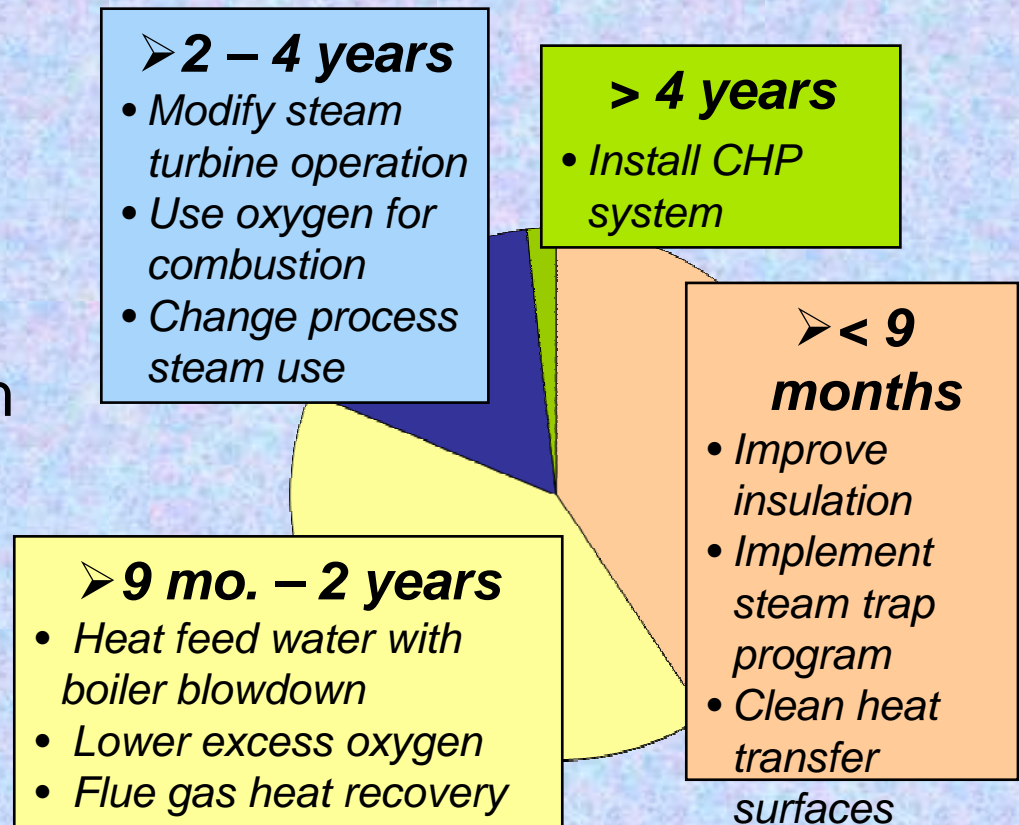
*Energy Savings
Assessments
Implementation and
Results*

2006 Energy Savings Assessment Results

- 350 assessments completed
- With 350 plants reporting:
 - Natural gas savings = 66.4 trillion Btu/yr
 - Equivalent to >925,750 U.S. Homes
 - Carbon dioxide avoided = 5.6 MMT/yr
 - Identified opportunity = \$687 million/yr

Plants are Implementing!

- As of January 1, 2008
 - Plants report having completed almost \$95 million worth of energy savings projects
 - Over \$270 million worth of additional energy savings are either in progress or being planned
 - Companies are replicating savings at other plants



➤ *Estimated Payback Periods for Recommended Actions*

➤ www.eere.energy.gov/industry/saveenergynow

➤ *Total Energy Savings*

➤ By 2008, the Assessments of 2006 will annually save the energy carried by 10 LNG tankers.



Save Energy Now Program

Save Energy Now – 2007

- ✓ **250 Assessments in 2008 (250 in 2007, 200 in 2006)**
- ✓ **Streamlined online application**
- ✓ **More energy system types**
 - ✓ Add compressed air, pump, and fan systems to existing process heating and steam systems
- ✓ **Publicity and Case Studies for replication**
- ✓ **Recognition program being developed**

Application

Step 1: Enter your corporate contact information



Step 2: Enter your plant energy use information



Step 3: Review and edit your plant energy use information



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Energy Efficiency and Renewable Energy *Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable*

Industrial Technologies Program

Energy Savings Assessment Application User Agreement

In order to be considered for an Energy Savings Assessment the applicant agrees to:

1. Work with the plant managers that participate in the Energy Saving Assessment to consider investing in the energy saving opportunities that the assessment identifies, consistent with corporate financial policies.
2. Have staff from the applying plants attend a DOE end-user training on steam or process heating systems either before the Energy Savings Assessment or as soon after as possible. Training schedules are available at www.eere.energy.gov/industry/bestpractices/calendar.html
3. Allow a DOE expert to work with their staff to identify energy savings opportunities
4. Allow the DOE expert to report on the energy savings opportunities identified
5. Provide information to DOE on progress toward implementing the identified savings six, twelve and twenty-four months after the assessment.
6. Provide information to DOE on replication of the ESA findings at other company plants six, twelve and twenty-four months after the assessment.

Agreement to these six conditions will complete your application. No further changes can be made.

Questions about the Energy Savings Assessment program? [Click Here](#) or call 1-877-EERE-INF (1-877-337-3463)
Experiencing technical difficulties? [Click Here](#)

Internet

Save Energy Now Program

Save Energy Now Qualification – 2008

- **Cost Sharing has been eliminated! Multiple assessments at single plants are now allowed.**
- Plants using $>.3$ Trillion Btu annually
- 2006/7 assessment plants can participate again
- 3rd Parties can apply on behalf of plants
 - Utility, state energy office, non-profit consortium, etc .
- Check out the Save ENERGY NOW Website for information. Google “Save Energy Now” if you can’t remember the link!

All Industrial Plants Get Assistance

For plants applying who do not meet the criteria for an Energy Savings Assessment, other assistance will be offered such as:

- Industrial Assessment Center assessment
- Personalized phone consultation to address energy efficiency in their plant
- Self-assessment tools
- Information products, DOE software tools and training

Energy Savings Assessment Process



- *Teams are DOE Energy Experts and plant personnel*
- *Teams focus on fans, pumps compressors, steam or process heating systems*
- *Plant personnel trained on DOE software tools*



Assessment Expert spends 3 days on site

Day 1

- Safety briefing, tour plant
- Overview of DOE Tool to plant personnel
- Agree on potential energy efficiency opportunities to investigate
- Initiate data collection for potential opportunities

Day 2

- Continue data collection
- Apply DOE tool to quantify potential opportunities
- Plant lead and expert agree on opportunity results



Day 3

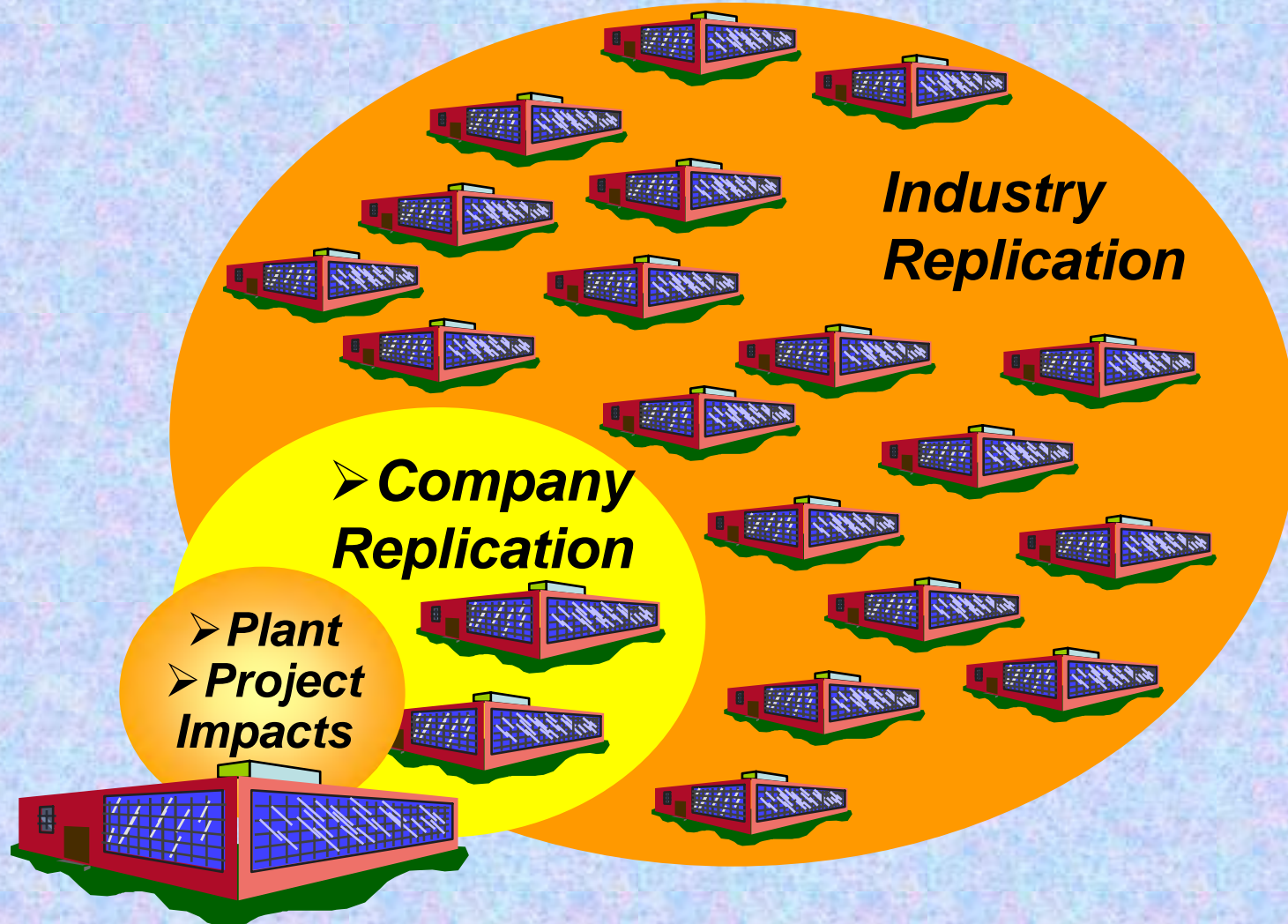
- Wrap up tool analyses
- Plant lead and expert ensure they agree on opportunity results
- Closeout meeting in p.m. to review results

➤ *Give a man a fish
and he will eat for
a day*

*Teach a man to
fish
and he will eat for
a lifetime*



ESA Goal: Replication



Save Energy Now Program

Partnerships and Outreach

Save Energy Now Program

➤ *Technology Delivery*

- **Industrial Assessment Centers**

*No-cost assessments provided to eligible **small and mid-sized plants** by university-based teams*

- **Technology Demonstrations**

ITP solicits proposals to install and field-test emerging technologies

- **Plant-wide Assessments**

*Up to \$100K in EERE funds competitively awarded to **large plants** through an open solicitation process. Cost-shared funding pays for third-party analysis.*

- **Technical Assistance**

Web sites, newsletters, case studies, tip sheets, technical briefs, EERE Information Center, allied partners, Regional Offices, showcases, energy events, etc.

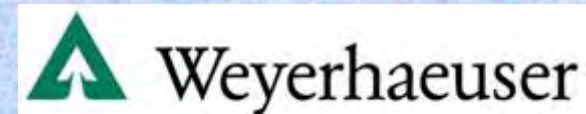
- **Tools and Training**

Training in practices and software to improve the energy performance of plant systems



Robust Partnerships to Reach Plants

- Allied Partners
- States
- Utilities
- Equipment Suppliers and Service Companies
- Trade Associations
- Replication within Industrial Companies



Save Energy Now Program

Save Energy Now Outreach Goal: 50,000 Plants

- *Utilize a wide variety of information materials, web tools and technical assistance*
- *Work with our existing partners and develop new partnerships to significantly increase our “reach”*



US Department of Energy's

QuickPEP Tool

Quick Plant Energy Profiler Tool

<http://www1.eere.energy.gov/industry/quickpep>

Introduction & Background

- US Department of Energy (DOE) Works With Industry Partnerships to Identify Key Customer Needs
- One of the conclusions
 - Ability to profile a plant's energy
 - An independent, easy-to-use tool to identify energy savings opportunities in plants
- Led to meetings to sketch the framework of the model
 - Specifications
 - Software platform

Industrial Sectors in QuickPEP

NAICS No.	Industry
325	Chemicals
321,322	Forest Products
324110	Petroleum Refining
33111	Integrated Steel
311,312	Food and Beverage
212	Coal, Metal Ore etc.
3313	Aluminum and Alumina
336	Transportation Equipment
332	Fabricated Metals
334,335	Comp. Electronics and Appl.
326	Plastics and Rubber Products
	EAF Steel
313,314,315,316	Textiles
327130	Cement
333	Heavy Machinery
3272	Glass and Glass Products
3315	Foundries

QuickPEP Tool

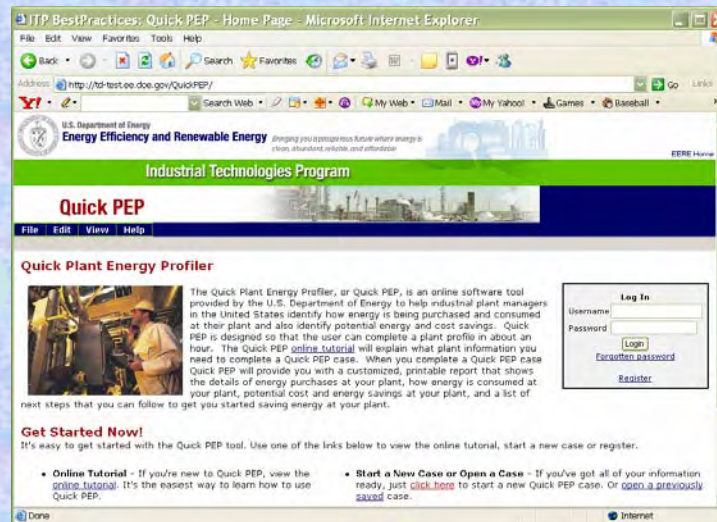
INPUTS

Plant description

*Utility supply data –
electricity, fuel &
steam*

*Energy consuming
system information*

Scorecard responses



OUTPUTS

*Overall picture of
plant energy use*

*Summary of energy
cost distributions*

*Preliminary
assessment &
comparison*

*Areas for energy
efficiency
improvement*

*Energy cost
reduction potential*

QuickPEP Website

ITP BestPractices: Quick PEP - Home Page - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Refresh Mail Print W Search Web My Web Mail My Yahoo! Games Baseball

Address <http://td-test.ee.doe.gov/QuickPEP/> Go Links

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EERE Home

Industrial Technologies Program

Quick PEP

File Edit View Help

Quick Plant Energy Profiler



The Quick Plant Energy Profiler, or Quick PEP, is an online software tool provided by the U.S. Department of Energy to help industrial plant managers in the United States identify how energy is being purchased and consumed at their plant and also identify potential energy and cost savings. Quick PEP is designed so that the user can complete a plant profile in about an hour. The Quick PEP [online tutorial](#) will explain what plant information you need to complete a Quick PEP case. When you complete a Quick PEP case Quick PEP will provide you with a customized, printable report that shows the details of energy purchases at your plant, how energy is consumed at your plant, potential cost and energy savings at your plant, and a list of next steps that you can follow to get you started saving energy at your plant.

Log In

Username

Password

[Forgotten password](#)

[Register](#)

Get Started Now!

It's easy to get started with the Quick PEP tool. Use one of the links below to view the online tutorial, start a new case or register.

- **Online Tutorial** - If you're new to Quick PEP, view the [online tutorial](#). It's the easiest way to learn how to use Quick PEP.
- **Start a New Case or Open a Case** - If you've got all of your information ready, just [click here](#) to start a new Quick PEP case. Or [open a previously saved](#) case.

Done Internet

QuickPep Use

- Use a top-down approach at a plant with QuickPEP as a starting point to:
 - Understand energy flow
 - Identify cost impacts
 - Identify potential energy cost reduction project areas
 - Benchmark plants at a corporate level
 - Benchmark individual systems at the plant level
 - Monitor performance over a period of time

QuickPep Use

- -Prioritize different energy systems based on energy savings potential and undertake an ESA on each of those systems
- -Continue further due diligence to implement energy savings and performance improvement projects
- Results are entirely dependent on data collected.

Process Heating Assessment and Survey Tool (PHAST) Training

- 2-hour Webcast on the use of the PHAST.
- Introduces the tool and presents the basics—and the benefits—of using it to target opportunities for energy savings in your plant.
- Recommended if your plant is scheduled to receive a [2007 Energy Savings Assessment](#), if you are considering applying for one, or if you want a good start in using the tools.

Process Heating Assessment Training

- 1-day workshop

- Introduction to process heating and process heating equipment, discussion of combustion and other heating methods; heat transfer in furnaces; waste heat recovery; commonly used process heating controls; and emissions from heating processes.

- Instructions on how to use DOE's Process Heating Assessment and Survey Tool (PAST) software tool.

PHAST Specialist Qualification

2-day workshop

- Developed to qualify industry professionals on the use of the Process Heating Analysis and Survey Tool (PHAST).

- The workshop is open to individuals with substantial knowledge of process heating systems and who are interested in taking a rigorous qualifying exam.

Process Heating Assessment and Survey Tool (PHAST)

- Estimate annual energy use and energy cost for furnaces, heaters and boilers
- Identify furnace energy use, efficiency and losses:
 - detail heat balance and energy use analysis
- Perform “what-if” analysis for potential energy reduction and efficiency improvements:
 - Analyzes changes in operation, maintenance and retrofits of components/systems
- Obtain information on energy saving methods
- Identify additional resources.

Use PHAST at Your Plant to Analyze Heating Systems

- Understand energy use and cost
- Analyze energy distribution and losses
- Identify potential project areas for energy savings and cost reduction
- Benchmark plants at a corporate level
- Benchmark individual systems at the plant level
- Monitor performance over time.

Steam System Assessment Tool Training

- 2-hour Webcast on the use of the Steam System Assessment Tool suite.
- Introduces the tools and presents the basics—and the benefits—of using them to target opportunities for energy savings in your plant.
- Recommended if your plant is scheduled to receive a [2007 Energy Savings Assessment](#), if you are considering applying for one, or if you want a good start in using the tools.

Steam End User Training — 1-day workshop

- Covers the operation of typical steam systems and discusses methods of system efficiency improvement.
- Designed for plant personnel who have steam system responsibilities in industrial and institutional plants.
- The course covers three key areas of potential system improvement:
 - Steam Generation Efficiency
 - Resource Utilization Effectiveness
 - Steam Distribution System Losses

Steam System Specialist Qualification

-2½-day workshop

-For steam service providers who are interested in becoming proficient in using the BestPractices Steam tools and references, including:

[Steam System Scoping Tool \(SSST\)](#)

[Steam System Assessment Tool \(SSAT\)](#)

Steam System Survey Guide

[3E Plus Insulation Appraisal Software](#)

Steam System Scoping Tool

- Helps steam system personnel to perform initial self-assessments of their steam systems.
- Profiles/grade steam system operations and management. This tool will help you to evaluate your steam system operations against best practices.

Steam System Assessment Tool (SSAT)

- Allows development of approximate models of real steam systems.
- Use these models to quantify the magnitude—energy, cost, and emissions-savings—of key potential steam improvement opportunities.

3E Plus Version 3.2


- Calculates the most economical thickness of industrial insulation for user input operating conditions.
- Has built-in thermal performance relationships of generic insulation materials or you may use your own conductivity data for other materials in calculations.

Other Areas of Training/Software

- Compressed Air-Software/Training
- Motors-Software/Training
- Pumps-Software/Training
- Fans-Software/Training
- Chilled Water Analysis-Software
- Combined Heat and Power-Software
- NO_x-Software

Where to Download the Tools

- US DOE website - <http://eereweb.ee.doe.gov/industry/bestpractices/software.html>
- Search the internet by Keyword – “DOE BestPractices Software Tools”



The screenshot shows a Microsoft Internet Explorer browser window displaying the 'Software Tools' page of the U.S. Department of Energy's Energy Efficiency and Renewable Energy (EERE) website. The page features a green header for the 'Industrial Technologies Program' and a navigation menu on the left. The main content area is titled 'Software Tools' and includes a description of the BestPractices software collection, a 'New Online Software Tools Forum' section, and a 'Decision Tools for Industry—Order the Portfolio of Tools on CD' section. The browser's address bar shows the URL: http://www.eere.doe.gov/bestpractices/software_tools.shtml.

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Industrial Technologies Program

Home: [BestPractices](#): [Tools and Publications](#): [Software Tools](#)

Software Tools

BestPractices has a varied and expanding software collection. Much of the software can be accessed here. A few packages must be ordered from the EERE Information Center via [e-mail](#) or by calling 1-877-EERE-INF (877-337-3463).

With the right know-how, you can use these powerful tools to help you identify and analyze energy system savings opportunities in your plant. While the tools are accessible here for download, we also encourage you to attend a training workshop to enhance your knowledge and take full advantage of opportunities identified in the software programs. For some tools, advanced training is also available to help you further increase your expertise. Find out more about [training](#).

New Online Software Tools Forum
BestPractices offers a new online software tools [forum](#) to help users with questions about software tools. Visit the forum to post questions, share your knowledge, and learn from other users.

Decision Tools for Industry—Order the Portfolio of Tools on CD
The Decision Tools for Industry CD contains the MotorMaster+ (MM+), Pump System Assessment Tool, Steam System Tool Suite, 3E Plus and the new AirMaster+ software packages described on this page. In addition, it includes MM+ training. The training walks you through the fundamentals and the advanced features of MM+ and provides examples for using the software to make motor purchase decisions. Read the fact sheet, ([PDF 718 KB](#)) [Download Acrobat Reader](#). Please order the CD via e-mail from the [EERE Information Center](#) or call the EERE Information Center at 1-877-EERE-INF (877-337-3463).

BESTPRACTICES

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- Tools & Publications**
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- Results for Industry
- Partnerships
- Recognition
- Solicitations

Save Energy Now Web Site

The screenshot shows a web browser window with the address <http://www.eere.energy.gov/industry/saveenergynow/>. The page header includes the U.S. Department of Energy logo and the text "Energy Efficiency and Renewable Energy" with the tagline "Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable". Below this is a green banner for the "Industrial Technologies Program" and a navigation menu with links: "About the Program", "Program Areas", "Information Resources", "Financial Opportunities", "Technologies", "Deployment", and "Home". The main content area features a "Save Energy Now" heading and a large image of an industrial facility. To the left is a "Quick Links" sidebar with links to "FAQs", "DOE 'Easy Ways to Save Energy Now' Initiative (PDF 89 KB)", and "Download Adobe Reader". The main text discusses the impact of energy price increases and the launch of the "Save Energy Now" initiative to help businesses and manufacturing facilities. To the right is a "Coming Soon" section with links for "Call for companies interested in participating in this initiative", "Updates on the ITP E-Bulletin", and "ITP Partners Webcast". Further right is a "NEWS" section with two articles: "Energy Secretary Bodman Kicks Off National 'Easy Ways to Save Energy' Campaign" and "National Press Club Remarks Prepared for Energy Secretary Bodman". Below the news is a "FEATURE" section with a link to "Manufacturers: Lower Your Energy Bill". At the bottom of the page, there is a "Frequently Asked Questions" section and a "Printable Version" link.

➤ **Save Energy Now Web Site**
www.eere.energy.gov/industry/saveenergynow

Save Energy Now Program

➤ Energy Matters



➤ BestPractices' 8-page quarterly newsletter provides topical feature stories, guest articles by subject matter experts, case studies, efficiency tips, and program information. Topics include:

- System-level efficiency
- Financing energy projects
- Selling projects to management

➤ www.eere.energy.gov/industry/bestpractice/s/energymatters

➤ Serves as a form of “push communication” to an audience of approximately 27,000 plant engineers, managers, and operators, academia, and government agencies.

Save Energy Now Program

ITP E-Bulletin

DOE Industrial Technologies Program
E-Bulletin
A Monthly Update from the U.S. Department of Energy's Industrial Technologies Program

June 2004

IN THIS ISSUE:

- Headlines
- New Products and Resources from ITP
- Training
- Project Opportunities

To access the ITP E-Bulletin online, go to:
<http://www.eere.energy.gov/industry/ebulletin>

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itebulletin@ee.doe.gov

For additional information or to order materials, go to:
Industrial Technologies Program
<http://www.eere.energy.gov/industry>
or call 877-EE-RE-INF (877-337-3463)

Visit DOE Office of Energy Efficiency and Renewable Energy Web site at:
<http://www.eere.energy.gov/>

DOE/OO-102004-1859
June 2004

U.S. Department of Energy
Energy Efficiency and Renewable Energy
Protecting and promoting the future energy needs of today, tomorrow, and afterwards.

➤ A monthly e-mail update of key program and technology developments of interest to industrial partners, featuring:

- Headlines
- New ITP Products and Resources
- Training
- Project Opportunities
- Case Studies

➤ www.eere.energy.gov/industry/ebulletin

Save Energy Now Program

EERE Information Center

- *Information on EERE products/services*
- *Unbiased, customized technical and programmatic assistance to help achieve industrial energy savings*
- *Experts help thousands of industries as well as consultants, vendors, government agencies, and others that serve them*

➤ *Voice:* ➤ **877-337-3463**

➤ *Fax:* ➤ **360-236-2023**

➤ *Email:* ➤ **eerecsc@ee.doe.gov**



Questions & Answers

