



US DOE Industrial Technologies Best Practices Software Tools Fan System Assessment Tool Introduction

Presented By

Developed For Oak Ridge National Lab by
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Agenda

- ❑ Training Webcast Introduction
- ❑ Introduction of Fan Efficiency Concepts - 20 minutes
- ❑ Introduction of Tools - 20 minutes
- ❑ FSAT Demonstration - 20 minutes
- ❑ Q & A - 10 minutes
- ❑ Summary



Fan System Assessment Training

Learning Objectives (one day training)

Class participants will:

1. explain the benefits of optimizing fan systems;
2. calculate the cost of operating fans in their facility;
3. explain the interaction between the fan curve and the system curve;
4. estimate the overall efficiency of a fan system;
5. analyze the optimization potential of fan systems;
6. describe how to use FSAT software;
7. create an action plan to improve fan system efficiency and reliability in their plants; and
8. report one concept or technique from the day's program that they consider significant.



Fan System Assessment Training

Learning Objectives (Qualified Specialist training)

- ❑ Estimate operating costs and identify optimization opportunities for a fan system case study
- ❑ Understand the use of manometers, pitot tubes and other instruments as measurement tools in a fan performance test
- ❑ Develop a measurement plan as part of a performance test
- ❑ Understand how FSAT handles gas temperature and density
- ❑ Describe how to manage files in FSAT
- ❑ Understand how to use FSAT to get the greatest benefit when modeling fan systems
- ❑ Analyze field data to establish FSAT inputs
- ❑ Input field data results and use FSAT to evaluate fan systems
- ❑ Demonstrate competence in using FSAT to pre-qualify good potential fan system optimization opportunities.



Fan System Assessment Tool

**Developed by the U.S. Department of Energy
(DOE)**

FSAT will:

- ❑ Calculate fan system energy use**
- ❑ Determine system efficiency**
- ❑ Quantify optimization savings**



Fan and motor inputs:

Fan style **CENTRIFUGAL - Backward Curved (SISW)**

Diameter **70.00** Fan diameter, in.

Fan configuration **Changeable** Motor nameplate hp **350**

Motor nameplate rpm **1780**

Motor efficiency class **Average**

Nominal motor voltage, volts **460**

Operating parameters: Operating fraction **1.000**

Electricity cost, cents/kwhr **4.00**

Electrical power or current and drive inputs:

Power Measured power, kW **273.9**

Measured voltage, volts **468**

Drive type **Belt drive**

System inputs:

Measured Measured flow rate, cfm **113976**

Measured fan static pressure, in H2O **10.00**

Gas property inputs:

Estimate: Gas density, lbm/cu.ft. **0.0748**

Gas compressibility **0.994**

Equivalent fan static pressure, in. H2O **10.03**

Specific size **0.370**

Calculated Results:

	Existing fan, motor	Existing fan, EE motor	Optimal fan, EE motor
Fan efficiency, %	53.1	53.1	81.4
Motor rated hp	350	350	300
Motor shaft power, hp	350.0	350.0	228.3
Motor efficiency, %	95.3	95.8	95.9
Motor power factor, %	87.6	87.8	85.0
Motor current, amps	385.8	382.6	257.9
Electric power, kW	273.9	272.4	177.6
Annual energy, MWhr	2399.4	2386.5	1555.5
Annual cost, \$1,000	96.0	95.5	62.2
Annual savings, \$1,000	0.0	0.5	33.8

Size margin (%) for optimal fan motor **15**

Optimization rating **64.8**

Click for background information

STOP

fluid hp **178.4**

Existing W-G eff **48.6**

Optimal W-G eff **74.9**

Log file controls:

Log current data Retrieve Log data Select a file for individual log deletion

Summary file controls:

Create new or append existing summary file --> Existing summary files **CREATE NEW**

Facility **XYZ** Application **Example**

System **ABC** Date **January 1, 2004** Evaluator **John Doe**

Notes **Example fan for FSAT**

When using FSAT keep in mind that:

- ❑ *FSAT is best for the big picture.*
- ❑ *FSAT requires good input data.*
- ❑ *FSAT requires you to know which type of fan is suited your load.*
- ❑ *FSAT analyzes one load point.*
- ❑ *FSAT will not tell you what to do to improve the system.*



Optimization Benefits

- Financial
- Corporate
- Production
- Maintenance
- Safety
- Environmental
- Societal



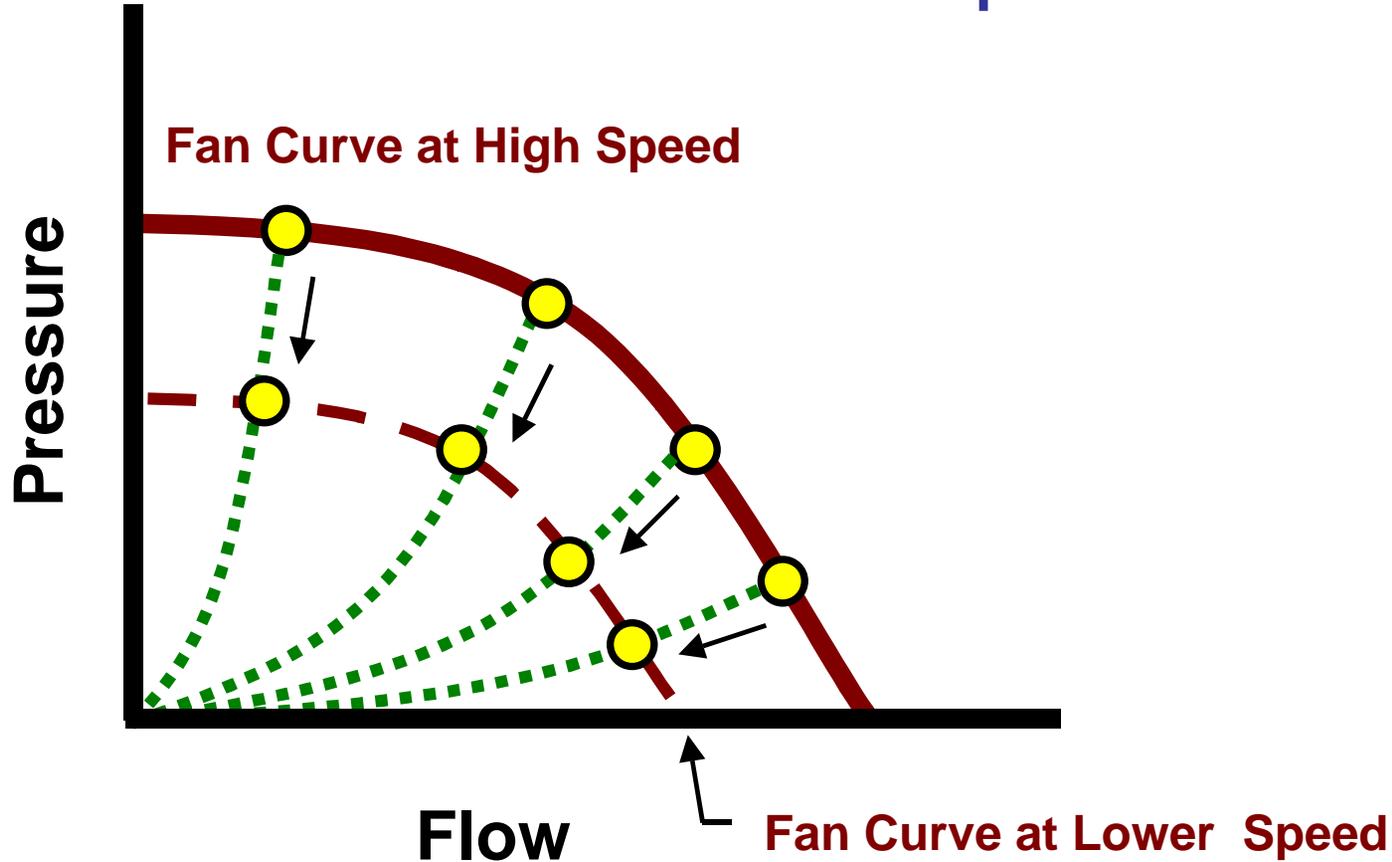
Time Magazine April 5, 2004



Fan Speed and the Fan Curve

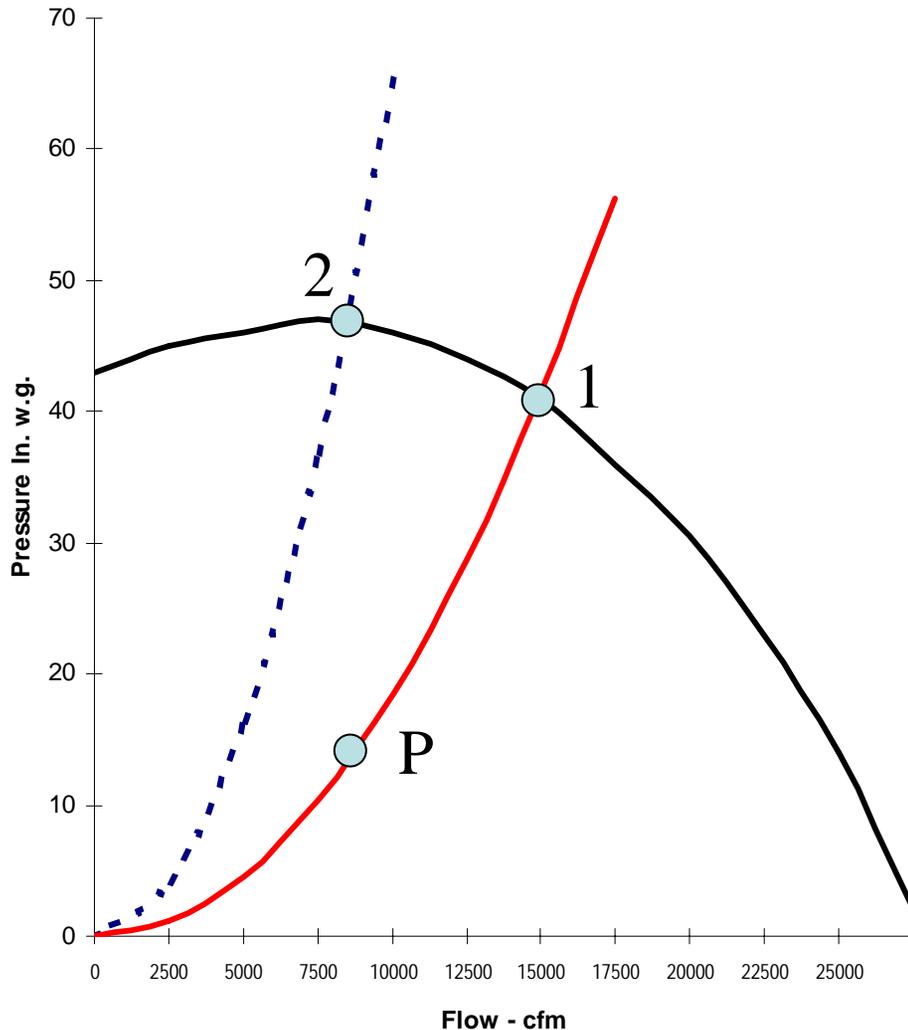
Fan speeds up: more flow and pressure

Fan slows down: less flow and pressure



Combustion Air Fan - OSB

Fan Curve and System Curve interaction



Point P:

Process requirements
(8,080 cfm and 12 in. w.g.)

Point 1:

Flow and pressure with open damper
(16,000 cfm, 42 in. w.g.)
-- assumes the motor doesn't overload)

Point 2:

Flow and pressure with damper closed
(8,080 cfm, 43 in. w.g.)



Overall Fan System Efficiency

Several factors affect the overall fan system efficiency:

- ❑ Fan impeller shape
- ❑ Dampers and control methods
- ❑ Poor installation (System Effect)
- ❑ Drive type
- ❑ Motor type
- ❑ Fan Size



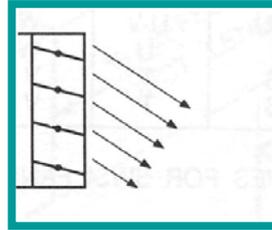
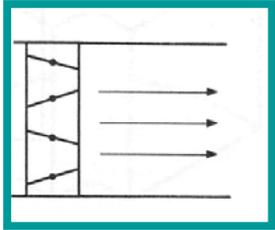
What is Efficiency?

$$\eta = \frac{\textit{output}}{\textit{input}} \quad \text{or} \quad \eta = \frac{\textit{Useful Output}}{\textit{Energy Input}}$$

Efficiency is the portion of energy you paid for that is actually doing the work



Types of Dampers



Damper Locations:

Inlet Vane - Use with Caution

Inlet Damper - Poor

System Damper - Bad

Outlet Damper - Worst

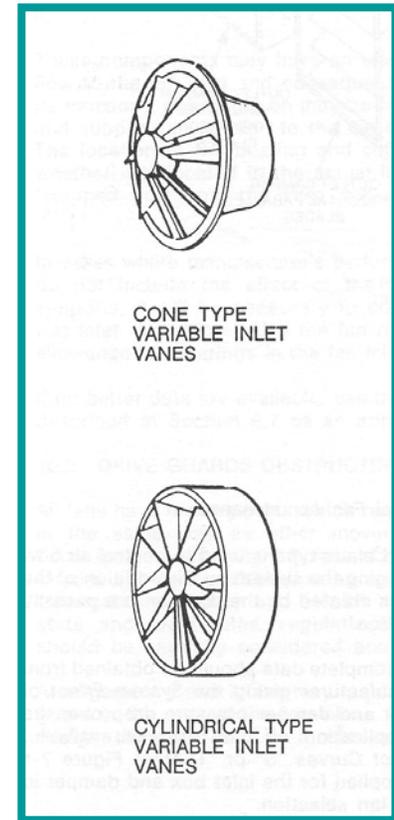


Diagram Courtesy AMCA



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Diameter Fan diameter, in. **70.00**

Fan configuration Motor nameplate hp **350**

Changeable Motor nameplate rpm **1780**

Motor efficiency class **Average**

Nominal motor voltage, volts **460**

Operating parameters: Operating fraction **1.000**

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Electrical power or current and drive inputs:

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Drive type **Belt drive**

System inputs:

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Gas property inputs:

Estimate: Gas density, lbm/cu.ft. **0.0748**

Gas compressibility **0.994**

Equivalent fan static pressure, in. H2O **10.03**

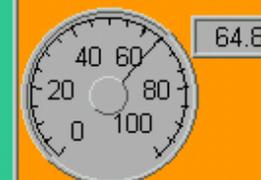
Specific size **0.370**

Calculated Results:

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Fan efficiency, %	53.1	53.1	81.4
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Size margin (%) for optimal fan motor **15**

Optimization rating



Click for background information

STOP

fluid hp **178.4**

Existing W-G eff **48.6**

Optimal W-G eff **74.9**

Log file controls:

Log current data

Retrieve Log data

Select a file for individual log deletion

Summary file controls:

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Existing summary files

CREATE NEW

Facility **XYZ** Application **Example**

System **ABC** Date **January 1, 2004** Evaluator **John Doe**

Notes **Example fan for FSAT**



Fan System Optimization Checklist

Fan System Optimization Checklist For fans over 50 hp that operate more than 4000 hours per year

Instructions: Use this checklist to qualitatively select the top optimization projects for FSAT analysis. Make a copy of this list for each of your major systems, then go through the list and add up the points for the conditions that apply. **If there are any control, production & maintenance, or system effect indicators, then add points for size and run hours as follows:** *If the system operates more than 6000 hours add a point. **If the system is over 100 hp add a point per 100 hp (200 hp = 2 points, 300 hp = 3 pts, etc). Also add a point or points if production or maintenance problems are severe. Two or more points can indicate a good optimization opportunity. Four or more points probably indicate a very good opportunity. **Note:** Fans with adjustable speed drives usually are not good candidates for optimization.

Fan System _____

Are there problems with the system? _____

Points** 1 ___ Motor _____ hp Points* 1 ___ Operating hours _____ Tally the points _____

Control	Production & Maintenance	System Effect
Points	Points	Points
2 ___ Motor overloads unless damper restricts flow	2 ___ Too much flow or pressure for production	2 ___ 90° turn <i>right</i> at fan outlet or inlet
2 ___ Spill or bypass	2 ___ Unstable or hard to control system	1 ___ 90° turn <i>near</i> fan outlet or inlet
2 ___ Discharge damper	2 ___ Unreliable system breaks down regularly	2 ___ Dirt leg at bottom of inlet duct
1 ___ Inlet damper	1 ___ Not enough flow or pressure for production	1 ___ No outlet duct
1 ___ Variable inlet vane	1 ___ System is excessively noisy	1 ___ Restricted or sharp inlet
1 ___ System damper	1 ___ Buildup on fan blades	
1 ___ Damper is mostly closed	1 ___ Need to weld ductwork cracks regularly	
	1 ___ Radial fan handling clean air	

Facility/Contact/ phone/fax: _____

See full size handout



FSAT Data Collection Worksheet

See full size handout

FSAT Data Collection Worksheet

System Name _____

FAN AND MOTOR

<input type="checkbox"/> Airfoil SISW	<input type="checkbox"/> Backward Curved SISW	<input type="checkbox"/> Backward Inclined SISW
<input type="checkbox"/> Airfoil DIDW	<input type="checkbox"/> Backward Curved DIDW	<input type="checkbox"/> Backward Inclined DIDW
<input type="checkbox"/> ICF Air Handling	<input type="checkbox"/> ICF Material Handling	<input type="checkbox"/> ICF Long Shavings
<input type="checkbox"/> Radial	<input type="checkbox"/> Radial Tip	<input type="checkbox"/> Vane Axial

Fan Speed _____ rpm OR Fan Diameter _____ in.

Motor HP _____ hp

Motor Speed _____ rpm

Motor Efficiency Class: Energy Efficient Standard Efficient Unknown (Average)

Nominal Motor Voltage _____ volts

Motor Full Load _____ amps

OPERATING FRACTION AND ELECTRIC RATE

Operating Fraction _____

Electric Rate _____ cents/kwhr

SYSTEM INFORMATION [MEASURED OR REQUIRED CONDITIONS]

Measured Power _____ kW OR Measured Current _____ amps

Measured Bus Voltage _____ volts

Drive Type: Direct Belt

Required [not including avoidable pressure drop due to partially closed dampers]

Flow Rate _____ cfm Fan Static Pressure _____ in H₂O

Measured [Fan outlet pressure minus fan inlet pressure] – Inlet velocity pressure

Flow Rate _____ cfm Fan Static Pressure _____ in H₂O

GAS PROPERTIES [Optional. Complete if non-standard conditions]

Gas Density _____ lbm/cu.ft

If gas is air, FSAT can help estimate density:

Inlet Dry Bulb _____ °F

Inlet Wet Bulb _____ °F OR Inlet Relative Humidity _____ %

Ambient Pressure _____ in Hg OR Elevation Above Sea Level _____ Ft.

Air Inlet Pressure Above Ambient _____ in H₂O



FSAT Inputs - Key Points

- ❑ Fill in the [FSAT Data Collection Worksheet](#) for your fan.
- ❑ Make note of how much pressure is being developed vs. what is needed.
- ❑ Enter the information in FSAT.
- ❑ If you do not know density, use the calculator.
- ❑ Wait until all data is entered to look at results



Fan System Assessment Tool

File Edit Operate Windows Help

Fan and motor inputs:

Fan style: CENTRIFUGAL - Backward Curved (SISW)

Diameter: Fan diameter, in. 70.00

Fan configuration: Motor nameplate hp 350

Changeable: Motor nameplate rpm 1780

Motor efficiency class: Average

Nominal motor voltage, volts 460

Calculated Results:

	Existing fan, motor	Existing fan, EE motor	Optimal fan, EE motor
Fan efficiency, %	53.1	53.1	81.4
Motor rated hp	350	350	300
Motor shaft power, hp	350.0	350.0	228.3
Motor efficiency, %	95.3	95.8	95.9

Size margin (%) for optimal fan motor: 15

Optimization rating: 64.8

Click for background information

Operating

Electrical

Power

Drive type: Belt drive

Annual savings, \$1,000: 0.0, 0.5, 33.8

Existing W-G eff: 48.6

Optimal W-G eff: 74.9

System inputs:

Measured: Measured flow rate, cfm 113976

Measured fan static pressure, in H2O 10.00

Log file controls:

Log current data

Retrieve Log data

Select a file for individual log deletion

Summary file controls:

Create new or append existing summary file -->

Existing summary files: CREATE NEW

Gas property inputs:

Estimate:

Gas density, lbm/cu.ft. 0.0748

Gas compressibility 0.994

Equivalent fan static pressure, in. H2O 10.03

Specific size 0.370

Facility: XYZ Application: Example

System: ABC Date: January 1, 2004 Evaluator: John Doe

Notes: Example fan for FSAT

Demonstration



Fan and motor inputs:

Fan style **CENTRIFUGAL - Radial (SISW)**

Speed **▼** Fan speed, rpm **2470**

Fan configuration **Changeable** Motor nameplate hp **125**

Motor nameplate rpm **1780**

Estimate: Nameplate Full Load Amps **146.7**

Motor efficiency class **Standard efficiency**

Nominal motor voltage, volts **460**

Operating parameters: Operating fraction **1.000**

Electricity cost, cents/kwhr **5.00**

Electrical power or current and drive inputs:

Current Measured current, amps **107.3**

Measured voltage, volts **461**

Drive type **Belt drive**

System inputs:

Required Required flow rate, cfm **8080**

Required fan static pressure, in H2O **12.00**

Gas property inputs:

Estimate: Gas density, lbm/cu.ft. **0.0671**

Gas compressibility **1.000**

Equivalent fan static pressure, in. H2O **13.41**

Specific speed **31690**

Calculated Results:

	Existing fan, motor	Existing fan, EE motor	Optimal fan, EE motor
Fan efficiency, %	18.0	18.0	59.6
Motor rated hp	125	125	40
Motor shaft power, hp	88.7	88.7	26.8
Motor efficiency, %	93.2	95.3	93.9
Motor power factor, %	82.8	83.3	80.4
Motor current, amps	107.3	107.3	33.2
Electric power, kW	71.0	69.4	21.3
Annual energy, MWhr	621.8	607.9	186.6
Annual cost, \$1,000	31.1	30.4	9.3
Annual savings, \$1,000	0.0	0.7	21.8

Size margin (%) for optimal fan motor **15**



Click for background information

STOP

fluid hp **15.3**

Existing W-G eff **16.0**

Optimal W-G eff **53.6**

Log file controls:

Log current data **Retrieve Log data** **Select a file for individual log deletion**

Summary file controls:

Create new or append existing summary file --> Existing summary files **CREATE NEW**

Facility **OSB plant** Application **core dryer**

System **combustion air** Date **08 March 2005** Evaluator **rgw**

Notes **Combustion Air fan - Core Dryer**

Fan System Assessment Tool

File Edit Operate Windows Help



Fan and m

Fan style

Speed

Fan config

Changeabl

Esti

- CENTRIFUGAL - Airfoil (SISW)
- CENTRIFUGAL - Backward Curved (SISW)
- CENTRIFUGAL - Radial (SISW)
- CENTRIFUGAL - Radial Tip (SISW)
- CENTRIFUGAL - Backward Inclined (SISW)
- CENTRIFUGAL - Airfoil (DIDW)
- CENTRIFUGAL - Backward Curved (DIDW)
- CENTRIFUGAL - Backward Inclined (DIDW)
- AXIAL - Vane Axial
- ICF - Air Handling
- ICF - Material Handling
- ICF - Long Shavings

Calculated Results

Fan eff

Motor

Motor shaft

Motor eff

Motor powe

Motor cur

Electric

Operating parameters:

Operating fraction

1.000

Electricity cost, cents/kwhr

5.00

Fan System Assessment Tool

File Edit Operate Windows Help



Fan and motor inputs:

Fan style CENTRIFUGAL - Radial (SISW) ▼

✓ Speed
Diameter

Changeable ▼

Estimate:

Fan speed, rpm 2470

Motor nameplate hp 125 ▼

Motor nameplate rpm 1780

Nameplate Full Load Amps 146.7

Motor efficiency class Standard efficiency ▼

Nominal motor voltage, volts 460

Operating parameters: Operating fraction 1.000

Electricity cost, cents/kwhr 5.00

Calculated Results

Fan effi

Moto

Motor shaft

Motor effi

Motor power

Motor curr

Electric p

Fan System Assessment Tool

File Edit Operate Windows Help



Fan and motor inputs:

Fan style **CENTRIFUGAL - Backward Curved (SISW)** ▼

Diameter ▼

Fan diameter, in. ▲▼ **70.00**

Fan configuration

Changeable ▼

Motor nameplate hp **350** ▼

Motor nameplate rpm ▲▼ **1780**

Motor efficiency class **Average** ▼

Nominal motor voltage, volts ▲▼ **460**

Operating parameters:

Operating fraction ▲▼ **1.000**

Calculated

Motor

M

Motor

Mo

Fan and motor inputs:

Fan style **CENTRIFUGAL - Radial (SISW)**

Speed

Fan speed, rpm **2470**

Fan configuration

Changeable

Motor nameplate hp **125**

Motor nameplate rpm **1780**

Estimate:

Nameplate Full Load Amps **146.7**

Motor efficiency class **✓ Standard efficiency**

Energy efficient

Average

Nominal moto

Operating parameters:

Operating fraction **1.000**

Electricity cost, cents/kwhr **5.00**

Electrical power or current and drive inputs:

Current

Measured current, amps **107.3**

Measured voltage, volts **461**

Calculated Results

Fan eff

Moto

Motor shaft

Motor eff

Motor powe

Motor cur

Electric p

Annual ene

Annual co



Fan and motor inputs:

Fan style **CENTRIFUGAL - Backward Curved (SISW)** ▼

Diameter ▼

Fan diameter, in. ▲▼ **70.00**

Fan configuration

Changeable ▼

Motor nameplate hp **350** ▼

Motor nameplate rpm ▲▼ **1780**

Motor efficiency class **Average** ▼

Nominal motor voltage, volts ▲▼ **460**

Operating parameters:

Operating fraction ▲▼ **1.000**

Electricity cost, cents/kwhr ▲▼ **4.00**

Calculated Results:

Fan effici

Motor

Motor shaft p

Motor effici

Motor power f

Motor curren

Electric po

Motor nameplate rpm 1780

Estimate:

Nameplate Full Load Amps 146.7

Motor efficiency class Standard efficiency

Nominal motor voltage, volts 460

Operating parameters: Operating fraction 1.000

Electricity cost, cents/kwhr 5.00

Enter power or current and drive inputs:

- Power
- ✓ Current

Measured current, amps 107.3

Measured voltage, volts 461

Drive type Belt drive

System inputs:

Required

Required flow rate, cfm 8080

Required fan static pressure, in H2O 12.00

Log file controls:

Log current data

Ret...

Estimate:

Nameplate Full Load Amps

Motor efficiency class

Nominal motor voltage, volts

Operating parameters: Operating fraction

Electricity cost, cents/kwhr

Electrical power or current and drive inputs:

Measured current, amps

Measured voltage, volts

Drive type

Direct drive

✓ Belt drive

System inputs:

Required flow rate, cfm

Required fan static pressure, in H2O

Log file controls:

Log current data

Ret L da

Motor shaft

Motor eff

Motor powe

Motor cur

Electric p

Annual ene

Annual co

Annual savin

Motor efficiency class **Standard efficiency** ▼

Nominal motor voltage, volts

Operating parameters: Operating fraction

Electricity cost, cents/kwhr

Electrical power or current and drive inputs:

Current ▼

Measured current, amps

Measured voltage, volts

Drive type **Belt drive** ▼

Measured
 Required

Required flow rate, cfm

Required fan static pressure, in H2O

Log file controls:

Gas property inputs:

Gas density, lb/ft³

Facility **OSB plant**

Return to Motor Efficiency Factors

Nameplate hp

Synch. rpm

Rated voltage

Motor class

Energy efficiency standards (NEMA MG1 Table 12-10) ODP TEFC

Full load amps

% full load amps

% FLA fit

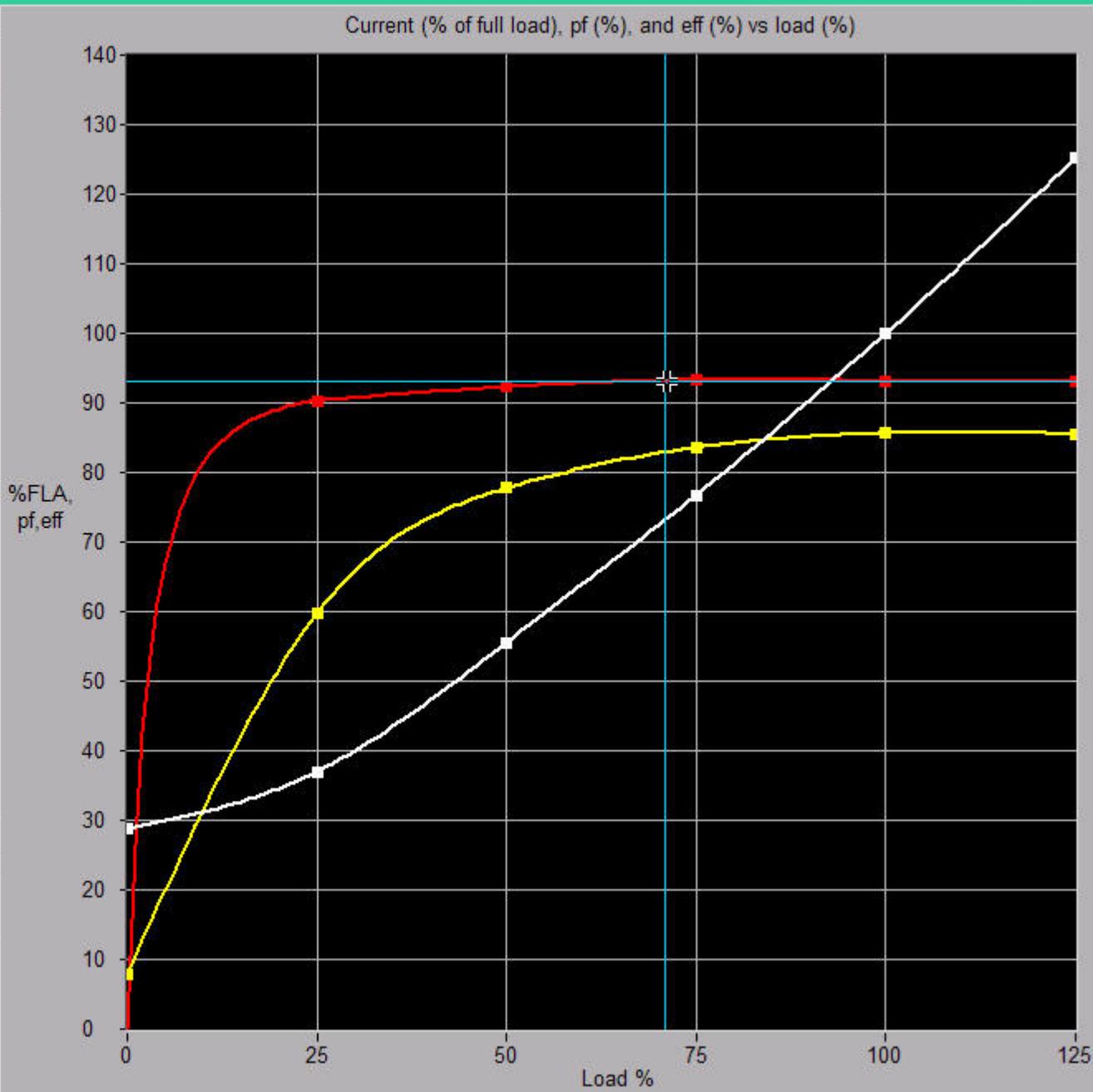
power factor (%)

power factor fit

efficiency (%)

efficiency fit

Current, power factor, efficiency			
% load	%FL amps	pf%	eff%
25	36.99	59.71	90.31
50	55.60	77.76	92.27
75	76.75	83.59	93.27
100	100.00	85.63	93.17



A

Return to Motor Efficiency Factors

Nameplate hp 20

Synch. rpm 1800

Rated voltage 460

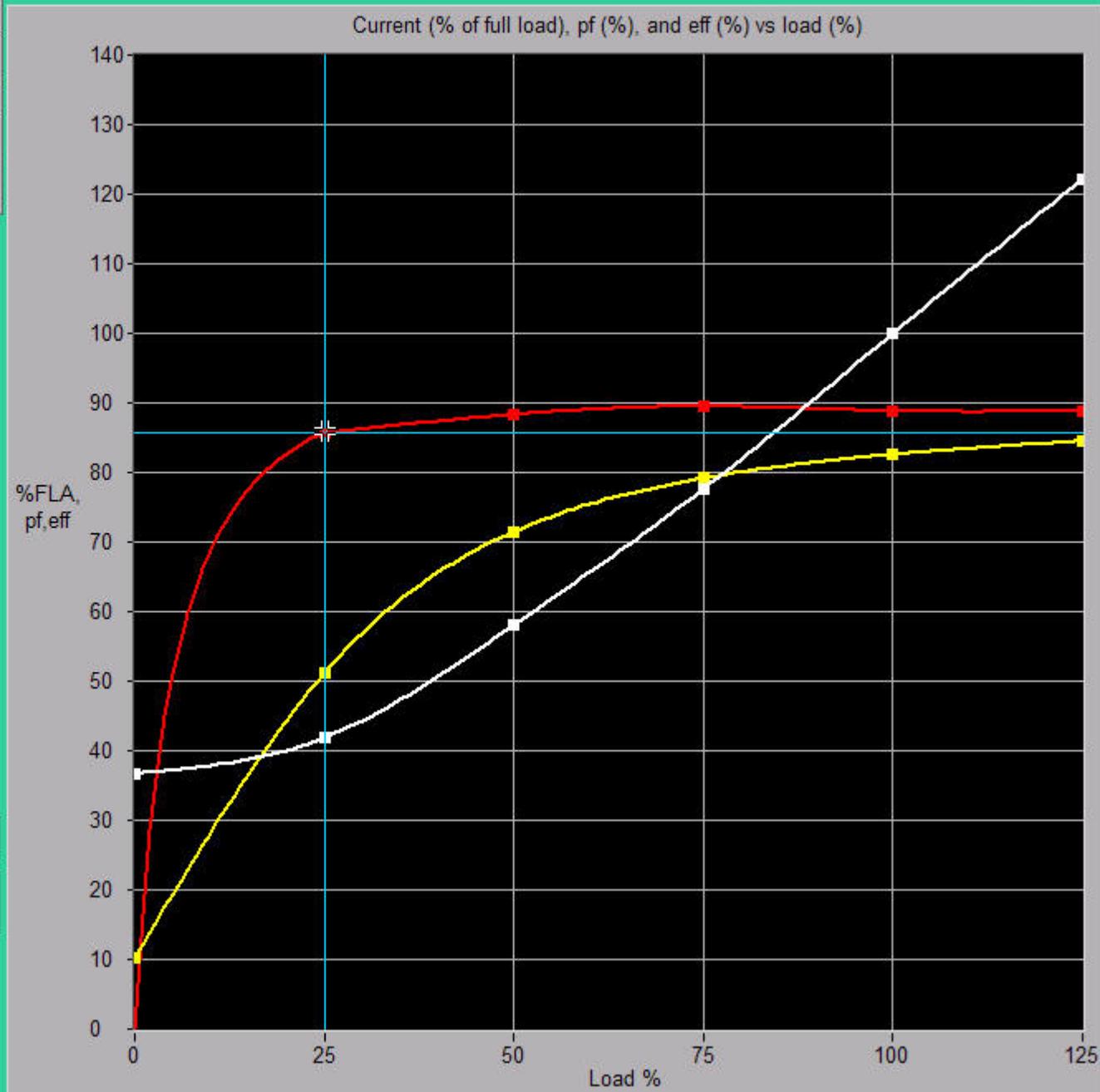
Motor class Standard efficiency

Energy efficiency standards (NEMA MG1 Table 12-10) ODP 91.00 TEFC 91.00

Full load amps 25.54

Current, power factor, efficiency			
% load	%FL amps	pf%	eff%
25	41.83	51.15	85.67
50	58.08	71.48	88.32
75	77.62	79.18	89.48
100	100.00	82.57	88.80

- % full load amps
- % FLA fit
- power factor (%)
- power factor fit
- efficiency (%)
- efficiency fit



A 25.0 85.7

Navigation icons: zoom in, zoom out, pan, and other controls.

Electrical power or current and drive inputs:

Power ▼

Measured power, kW

Measured voltage, volts

Drive type

System inputs:

Measured ▼

Measured flow rate, cfm

Measured fan static pressure, in H₂O

Gas property inputs:

Estimate: 

Gas density, lbm/cu.ft.

Gas compressibility

Log file

Log
curre
data

Facility

System

Notes

Gas type

Air

Estimate:

Ambient press., in. Hg 29.92

Gas inlet pressure above ambient, in H2O 0.00

Estimated compressibility 1.0000

Estimate:

Gas density, lbm/cu.ft. 0.0657

Click to
accept results
and continue

Cancel changes,
don't update

inlet above ambient pressures will be reflected in the values shown on the panel that called on this estimator. If changes are made to either after leaving this estimator, the density will NOT be updated to reflect those changes unless the user returns here.

Inlet dry bulb temperature, deg F	▲ 128.00 ▼
Absolute ambient pressure, in Hg	▲ 29.92 ▼
Air inlet pressure above ambient, in H2O	▲ 0.00 ▼
Inlet relative humidity, %	▲ 50.0 ▼

Data type

- ✓ Relative humidity
- Dew point temperature
- Wet bulb temperature

Print a copy of the calculated data

Click to accept results and continue

Cancel changes, don't update

Saturation pressure, psia	2.1091E+0
Water vapor partial pressure, psia	1.0545E+0
Humidity ratio, W	4.8083E-2
Saturation humidity ratio, W_s	1.0422E-1
Degree of saturation, μ	0.461
Specific volume, ft ³ /lb dry air	15.96
Enthalpy, B/lb	84.47
Dewpoint, deg F	103.49
Wet bulb temperature	106.80
Actual air density, lbm/cu.ft.	6.5668E-2
Relative humidity, %	50.00

Absolute inlet pressure, in. Hg	29.92
Absolute inlet pressure, in. H2O	407.46
Absolute inlet pressure, psia	14.70

With the exception of the saturation pressure values for temperatures of 32 F and above, all results are based on methods described in the ASHRAE Fundamentals Handbook (1997), Chapter 6, Psychrometrics.

The terms are consistent with those used in the ASHRAE publication.

The saturation pressures for temperatures above 32 F are based on the algorithm used in Steam Tables, by Keenan, Keyes, Hill, and Moore (1969 edition).

Questions & Answers



Summary

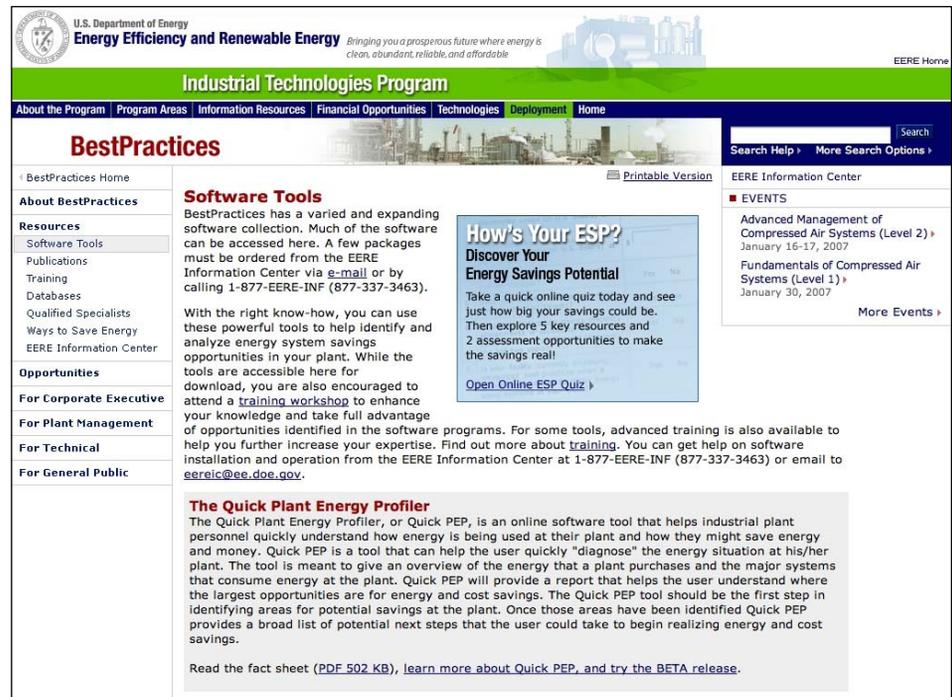
- Use the Fan System Optimization checklist to:
 - Identify poorly performing fan systems
 - Justify resources to develop project ideas into implementation plans
- Use the FSAT Tool at your plant to:
 - Identify cost impacts of poorly performing fan systems
 - Identify cost effective projects
 - Justify capital projects at corporate level
 - Benchmark individual systems at the plant level



Download the Tool

DOE BestPractices Web site:

<http://www.eere.energy.gov/industry/bestpractices/software.html>



The screenshot displays the DOE BestPractices website interface. At the top, the U.S. Department of Energy logo is visible alongside the text "Energy Efficiency and Renewable Energy" and the tagline "Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable". The page is titled "Industrial Technologies Program" and features a navigation menu with links for "About the Program", "Program Areas", "Information Resources", "Financial Opportunities", "Technologies", "Deployment", and "Home".

The main content area is titled "BestPractices" and includes a "Printable Version" link. A left sidebar lists navigation options: "BestPractices Home", "About BestPractices", "Resources" (with sub-links for Software Tools, Publications, Training, Databases, Qualified Specialists, Ways to Save Energy, and EERE Information Center), "Opportunities", and "For Corporate Executive", "For Plant Management", "For Technical", and "For General Public".

The central text under "Software Tools" states: "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 identify and analyze energy system savings opportunities in your plant. While the tools are accessible here for download, you are also encouraged 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](#). You can get help on software installation and operation from the EERE Information Center at 1-877-EERE-INF (877-337-3463) or email to eereic@ee.doe.gov."

A featured box titled "How's Your ESP? Discover Your Energy Savings Potential" encourages users to take a quick online quiz to explore 5 key resources and 2 assessment opportunities. A link "Open Online ESP Quiz" is provided.

Below this, the "The Quick Plant Energy Profiler" section describes an online software tool that helps industrial plant personnel understand energy usage and identify savings opportunities. It notes that the tool provides a report on energy consumption and cost savings, and offers a broad list of potential next steps. A link is provided to "Read the fact sheet (PDF 502 KB), [learn more about Quick PEP](#), and [try the BETA release](#)."

On the right side of the page, there is a search bar and a section for "EERE Information Center" with a list of "EVENTS" including "Advanced Management of Compressed Air Systems (Level 2)" and "Fundamentals of Compressed Air Systems (Level 1)".



Find Additional Training

Visit the DOE BestPractices Training Web site:

www.eere.energy.gov/industry/bestpractices/training

See the Training Calendar for events in your area:

www.eere.energy.gov/industry/bestpractices/events_calendar.asp

Become a Qualified Specialist:

www.eere.energy.gov/industry/qualified_specialists.html

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Industrial Technologies Program

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BestPractices

BestPractices Home Printable Version

About BestPractices

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Qualified Specialists
Ways to Save Energy
EERE Information Center

Opportunities
For Corporate Executive
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For Technical
For General Public

Training
Do you want to learn how to manage your motors and optimize your pumping system? Or do you need to calculate the energy cost of compressed air in your facility?
Whatever your industrial concern, you've come to the right place.
BestPractices offers system-wide and component-specific training programs to help you run your plant more efficiently. The training is offered throughout the year and around the country.
Please contact the [Training Coordinator](#) for further information on training sessions.
Visit the [Training Calendar](#).

Training Sessions

- Compressed Air Systems
- Fan Systems
- Motor Systems
- Process Heating
- Pumping Systems
- Steam Systems

Printable Version

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EERE Information Center

EVENTS

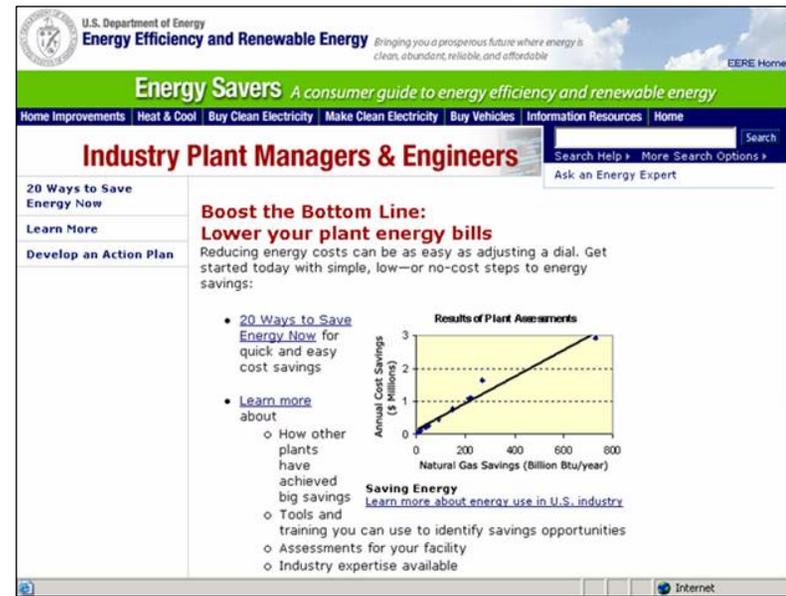
- Advanced Management of Compressed Air Systems (Level 2) | January 16-17, 2007
- Fundamentals of Compressed Air Systems (Level 1) | January 30, 2007

More Events



See the “Industrial Energy Savers” Web Site

- 20 ways to save energy now
- Tools & training you can use to identify savings opportunities
- Industry expertise available
- Assessments for your plant
- Develop an Action Plan
- Learn how others have saved
- Access the National Industrial Assessment Center (IAC) Database



The screenshot shows the 'Energy Savers' website, a U.S. Department of Energy initiative. The page is titled 'Industry Plant Managers & Engineers' and features a navigation menu with links for 'Home Improvements', 'Heat & Cool', 'Buy Clean Electricity', 'Make Clean Electricity', 'Buy Vehicles', 'Information Resources', and 'Home'. A search bar is located in the top right corner. The main content area is divided into two columns. The left column contains a sidebar with links for '20 Ways to Save Energy Now', 'Learn More', and 'Develop an Action Plan'. The right column features a section titled 'Boost the Bottom Line: Lower your plant energy bills' with a sub-header 'Results of Plant Assessments'. This section includes a line graph showing a positive correlation between 'Natural Gas Savings (Billion Btu/year)' on the x-axis and 'Annual Cost Savings (\$ Millions)' on the y-axis. The graph shows a line starting at the origin and passing through points approximately at (100, 0.5), (200, 1.0), (300, 1.5), (400, 2.0), (500, 2.5), (600, 3.0), and (700, 3.5). Below the graph, there is a 'Saving Energy' section with a link to 'Learn more about energy use in U.S. industry' and a list of bullet points: 'How other plants have achieved big savings', 'Tools and training you can use to identify savings opportunities', 'Assessments for your facility', and 'Industry expertise available'.



EERE Information Center

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Web site: www.eere.energy.gov/informationcenter



Web Site and Resources

Visit these DOE Web sites for the latest information and resources:

Industrial Technologies Program (ITP) Web site:

www.eere.energy.gov/industry/

BestPractices Web site:

www.eere.energy.gov/industry/bestpractices

Save Energy Now Web site:

www.eere.energy.gov/industry/saveenergynow



- Fact Sheets
- Newsletters
- Tip Sheets
- Brochures
- Reports
- Software Tools
- Data



Acknowledgments

U.S. Department of Energy's
Industrial Technologies Program

