

# appendix 5:

## Method of Calculating Results for the BestPractices Program

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ITP's BestPractices program is designed to provide industrial plant managers with information for identifying and evaluating opportunities for improving the efficiency of energy-intensive systems in their production facilities. These energy-intensive systems include those with motors and drives, pumps, air compressors, steam, and process heat. BestPractices relies on five main delivery channels to disseminate technical information on energy-intensive systems to a target audience of medium- and high-energy-consuming manufacturing establishments: 1) plant-wide assessments (PWAs), 2) collaborative-targeted assessments (CTAs), 3) training, 4) software, and 5) publications. BestPractices also uses, to a limited extent, technical assistance, showcases, case studies, and special events to deliver information.

In 2001, BestPractices aggressively began a campaign to identify the program's benefits by developing a methodology to estimate the program's outcome. All program output (or activities) within the delivery channels are now recorded in ITP's Tracking Database. The database is a valuable source of information used to identify the demand for BestPractices products. In 2002, BestPractices worked with Oak Ridge National Laboratory to develop the methodology to estimate the energy savings from the activities recorded in the Tracking Database. In FY 2001 and 2002, the methodology was used to develop estimates of program savings. Changes in program activities and savings' estimates are likely to occur as the methodology and data quality in the database evolve. The methodology will be peer reviewed in 2004.

The current methodology for developing savings' impacts is highly limited by the availability of actual or relevant data in the Tracking Database. As a result, BestPractices is able to identify savings directly from assessments conducted as PWAs or CTAs but must estimate savings from the other three delivery channels (training, software, and publications). BestPractices uses similar approaches for estimating the savings in the three delivery channels. First, the number of separate plants participating in each delivery channel is identified using activity data from the database. From this number, an estimate is developed of the number of plants taking action as a result of the BestPractices information used. Next, maximum potential energy savings per plant are estimated using the history of ITP assessment experience in each of the categories of energy-intensive systems. This maximum potential energy savings per plant is then reduced to provide a lower estimate of savings that would result from a plant in the target audience of medium- and high-energy-consuming industries using the particular BestPractices product. The lower estimate of savings, multiplied by the number of plants taking action, results in the estimated savings for a delivery channel. Savings and descriptions for each of the five main delivery channels are summarized below.

## Plant-Wide Assessments

PWAs identify overall energy use in manufacturing processes and highlight opportunities for best energy management practices for industry, including adopting new, efficient technologies. Plants are selected through a competitive solicitation process and must agree to a minimum 50% cost-share for conducting the assessment. Working with plant personnel, a PWA team conducts an onsite analysis of total energy use to identify opportunities and recommend ways to reduce energy use and costs.

By the end of FY 2002, four rounds of PWA solicitations resulted in 33 awards, and four showcase efforts resulted in 7 showcase PWAs. In 2002 alone, 17 plants had completed recommendation reports and implemented projects identified during the assessments. Savings identified in the PWA assessment reports and resulting case studies are used to determine savings impacts. In FY 2002, PWAs identified annual savings of 8.17 TBtu. As participants continue to implement additional measures in the years following assessments, these savings are expected to increase. Experience with PWA grantees indicates that savings identified in the assessment reports are often exceeded and that projects can take three years to fully implement. In addition, many PWAs often generate additional savings by replicating activities throughout their organizations as companies implement measures that were found to be successful with the original BestPractices PWA. This was the case when 10 plants in 2002 replicated similar measures originally identified by PWAs: 2 Alcoa plants, 5 AMCAST plants, 1 Neville Chemicals plant, and 2 Rohm & Haas plants.

## Collaborative-Targeted Assessments

A critical tool of BestPractices is CTAs, whereby DOE experts in industrial energy management provide energy-system-targeted, in-plant technical assistance to identify specific improvements. These assessments are used for training and software development and as a prelude to conducting a showcase demonstration. Organizations interested in hosting a showcase demonstration can request a walk-through assessment (one to three days) to identify opportunities for increased savings and productivity in energy-intensive systems.

By late FY 2002, BestPractices had conducted 71 CTAs across the five energy-intensive systems. Annual savings identified in the CTA assessment reports are used to determine savings impacts. In FY 2002, 22 CTAs resulted in annual savings of 1.28 Tbtu. In FY 2001, 49 CTAs identified annual savings of 5.6 TBtu.

# Method of Calculating Results for the BestPractices Program

## Impacts

### Training

Training activities continue to play a key role in the BestPractices' strategy and are recorded in ITP's Tracking Database. Participants who attend end-user training learn how to apply software in their own plants to identify and implement savings in energy-intensive systems. From FY 1998 through 2002, representatives from over 1,600 separate plants attended BestPractices training sessions. In 2002, an estimated 390 of the 791 plants attending training took action to implement projects in their own energy-intensive systems, saving an estimated 26.88 TBtu annually.

### Software Tools Distribution

BestPractices has various resources to help address an organization's energy management needs and to facilitate energy-efficiency decision-making. The program offers a range of software tools that can help a plant manager perform a self-assessment of a plant's motors and drives, pumps, air compressors, steam, and process heat systems. Software tools available in FY 2002 included AirMaster+, MotorMaster+ 4.0, the Pumping System Assessment Tool (PSAT), the Steam System Scoping Tool, and 3E Plus Version 3.2. Users can download the software from the program's website or use the Decision Tools for Industry CD, which contains the entire suite of BestPractices software tools. BestPractices also offers "Qualified Specialist" designations for users of AirMaster and PSAT who complete and pass challenging qualification exams.

Software is proving to be a powerful way to disseminate technical information for BestPractices. According to the Tracking Database, over 9,600 separate plants obtained BestPractices software in FY 2002. An estimated 1,730 plants took action to implement projects, saving an estimated 36.1 TBtu annually. In light of the rapidly growing use of the Internet, the influence of software on overall program impacts is expected to grow in the future.

### Publication Dissemination, Technical Assistance, Showcases, Case Studies, and Special Events

BestPractices produces various publications that are distributed in hardcopy or can be downloaded from the Internet. These publications include technical publications (e.g., fact sheets, tip sheets, market assessments, sourcebooks, and repair documents), case studies, and the Energy Matters newsletter. The primary purpose of many of these publications is to raise

general awareness, interest, and desire to learn more about BestPractices so that a plant manager can then investigate options more fully (e.g., by signing up for a training session or downloading and using a software tool). Like software, disseminating publications through the Internet has greatly increased in recent years, in line with the Internet's growth. In FY 2002, over 25,320 separate plants received BestPractices publications. An estimated 9,733 plants took actions to implement projects, saving 4.37 TBtu annually. The estimates of plants receiving publications and taking action as a result of the information may be artificially high because potential double counting of data from the various sources cannot be identified. BestPractices is currently modifying the way it estimates benefits and impacts from this category of program activities.

BestPractices also relies on direct technical assistance, showcases, case studies, and special events to deliver its message to industry. While these activities occur less frequently than the others, they contribute to estimated program savings. In FY 2002, estimated savings from these other areas were 4.99 TBtu.

### Conclusion

The table below shows the energy savings from each of BestPractices's delivery channels and a sum of the subtotals of those channels. Fuel prices and emission coefficients for various fuels from Energy Information Administration publications were used to determine cumulative energy cost savings and carbon reduction.

# Method of Calculating Results for the BestPractices Program

Impacts

	1998	1999	2000	2001	2002
<b>Plant-Wide Assessments (PWAs)</b>					
Unique Plants Implementing Improvements Each Year			2	14	17
New Plant Replications				1	10
Annual Energy Savings from PWAs (TBtu)			0.61	0.67	8.17
Total Cumulative Energy Savings from PWAs (TBtu)			0.61	1.28	9.45
<b>Collaborative-Targeted Assessments (CTAs)</b>					
Unique Plants Implementing Improvements Each Year				49	22
New Annual Energy Savings from CTAs (TBtu)				5.6	1.28
Total Cumulative Energy Savings from CTAs (TBtu)				5.6	6.88
<b>Training</b>					
Unique Plants Reached Each Year	75	150	300	330	791
Unique Plants Implementing Improvements Each Year	38	75	150	165	390
New Annual Energy Savings from Training (TBtu)	2.52	5.03	10.06	6.8	26.88
Total Cumulative Energy Savings from Training (TBtu)	2.52	7.55	17.61	24.41	51.29
<b>Software Tools Distribution</b>					
Unique Plants Reached Each Year	479	959	4,793	10,718	9,608
Unique Plants Implementing Improvements Each Year	86	171	854	1,443	1,730
New Annual Energy Savings from Software (TBtu)	1.98	3.96	19.82	61.6	36.1
Total Cumulative Energy Savings from Software (TBtu)	1.98	5.94	25.76	87.36	123.46
<b>Publication Dissemination, Technical Assistance, Showcases, Case Studies, and Special Events</b>					
Unique Plants Reached Each Year	1,340	2,679	5,357	22,301	25,321
Unique Plants Implementing Improvements Each Year	499	998	1,997	1,470	9,733
New Annual Energy Savings from Publications (TBtu)	1.58	3.16	6.32	1.97	9.36
Total Cumulative Energy Savings from Pubs (Tbtu)	1.58	4.74	11.06	13.03	22.4
<b>Sum of All BestPractices Areas</b>					
Unique Plants Reached Each Year	1,894	3,788	10,452	33,413	35,769
Unique Plants Implementing Improvements Each Year	623	1,244	3,003	3,142	11,902
New Annual Energy Savings (TBtu)	6.08	12.15	36.81	76.64	81.8
Total Cumulative Energy Savings (TBtu)	6.08	18.23	55.04	131.68	213.48
Energy Cost Savings (B\$)	0.027	0.082	0.298	0.756	1.20
Carbon Reduction (MMTCE)	0.109	0.327	0.986	2.37	3.84