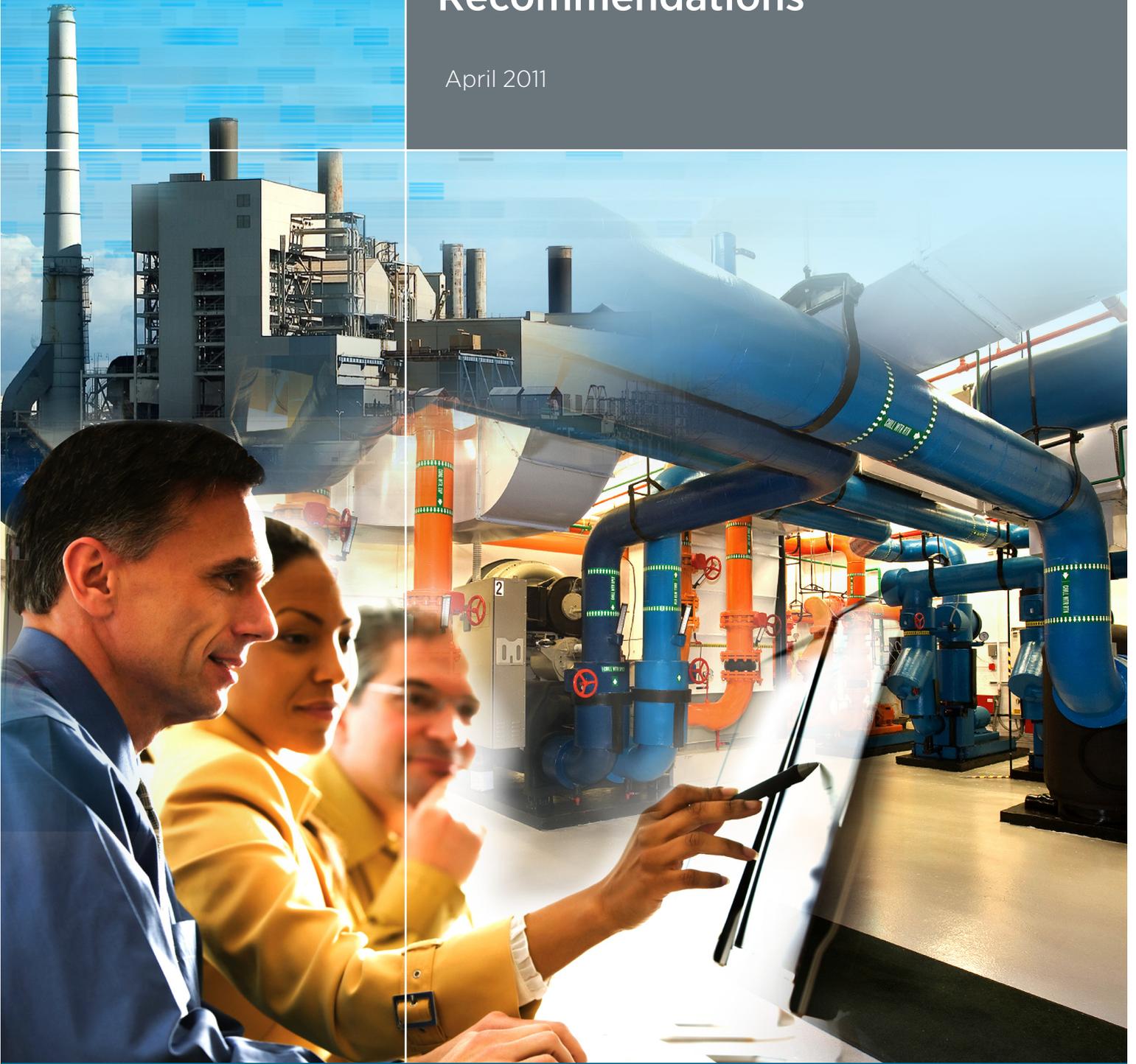


Guiding Principles for Successfully Implementing Industrial Energy Assessment Recommendations

April 2011



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Dr. Anthony Wright of ORNL directed the guidebook's development, with extensive contributions from Fred Schoeneborn of FCS Consulting Services and Michaela Martin of ORNL. The July 2010 workshop was facilitated by Roy Tiley and Lindsay Bixby of BCS, Incorporated, who also translated the workshop discussion into implementation principles. Ursula Schryver of APPA is also noted for her assistance in co-hosting the workshop.

Additionally, the contributions of the following workshop participants and post-workshop contributors are appreciated for their review of and suggestions for this handbook:

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I. Introduction

According to the U.S. Energy Information Administration, the industrial sector consumed 31.4 quads of energy in 2008, which is nearly one-third of all the energy used in the United States that year.¹ Further, more states are adopting legislation that will restrict the emissions of greenhouse gases. Combined, these circumstances present a compelling opportunity for industrial manufacturers to implement energy saving projects and processes to lower their energy consumption and reduce their carbon footprint.

Traditionally, implementation has been viewed as a follow-up step to an energy assessment. However, a key element to achieving real results from an energy assessment—“savings in the ground”—is to view the assessment as an initial step to implementation. This can be achieved by applying the 11 “implementation principles” presented in this guidebook prior to, during, and after an energy assessment. The guide’s primary focus is on the implementation of assessment recommendations. However, many of the principles depicted in this document can be applied broadly to other energy projects. These principles are described in further detail in Sections V and VI. In addition, Appendix A contains a checklist of these activities, their statuses, and the person(s) responsible for ensuring each principle is fulfilled. The development of this guidebook resulted from the *Learning from Success: Assessment-to Implementation Best Practices Workshop*. On July 16, 2010,

representatives from assessment-conducting organizations, as well as industrial companies with high implementation rates, met at the American Public Power Association Headquarters in Washington, D.C., to discuss the steps industrial companies should take to increase the implementation rate of recommendations identified during energy assessments. See Section II for a list of workshop attendees and contributors.

ISO 50001

The forthcoming international energy management standard—International Organization for Standardization (ISO) 50001—will establish a framework for how industrial plants around the world develop and implement energy management programs. As such, the following document contains information about the available tools and resources that will help a broad range of industrial manufacturers successfully implement energy efficiency projects under these programs in order to comply with ISO 50001 and Superior Energy Performance.

II. Workshop Participants

The following table lists the names of the individuals who participated in the *Learning from Success: Assessment-to Implementation Best Practices Workshop*, as well as the individuals that contributed information to this guidebook. The much-appreciated contributions of these individuals led directly to the development of this guidebook.



**LEARNING FROM SUCCESS:
ASSESSMENT-TO-IMPLEMENTATION
BEST PRACTICES WORKSHOP**

Workshop Participants

Name	Company
Lindsay Bixby (Facilitator)	BCS, Incorporated
Walt Brockway	Alcoa
Larry Boyd	Energy Industries of Ohio
Jeff Brooks	State of Idaho Office of Energy Resources
Subodh Chaudhari	WVU National Research Center for Coal and Energy
Craig Cheney	Project Performance Corporation
John Cuttica	UIC Energy Resources Center
Steve Fugarazzo	Raytheon Corporation
Sandy Glatt	DOE, Industrial Technologies Program
Christopher T. Goff	Southern California Gas Company
Greg Harrell	Energy Management Services
Ted Jones	Consortium for Energy Efficiency
Nate Kaufman	American Council for an Energy-Efficient Economy
Chris Milan (Contributor)	Bonneville Power Administration
Rob Naranjo	BCS, Incorporated
John Nicol	Focus on Energy/SAIC
Mike Pehosh	National Rural Electric Cooperative Association
Ken Roden	Nissan North America
Brad Runda	Saint-Gobain
Ursula Schryver	American Public Power Association
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Tom Taranto	Data Power Services, LLC
Jeff Tarbert	American Public Power Association
Roy Tiley (Facilitator)	BCS, Incorporated
Bob Varcoe (Contributor)	General Motors
Dave Weiss	Energy Solutions Center
Anthony Wright	Oak Ridge National Laboratory

III. Value Statement

This guidebook is a clear, simple, and concise description of the key principles and activities that, if adopted by industrial manufacturers, will lead to the successful implementation of recommendations identified during energy assessments. This guidebook is not intended to be a how-to guidebook, but rather a statement of what principles need to be in place in order to achieve satisfactory implementation results from an assessment. This guidebook addresses the activities that need to

happen and the principles that need to be in place before, during, and after an assessment in order to optimize the implementation rate of assessment recommendations. Having these principles in place will ensure the effective use of time and money for all involved, and will allow organizations to save more energy, increase their bottom lines, and promote cultural changes that will make energy a key priority in their plants.

IV. How to Use the Guidebook

This guidebook is designed to be an “at-a-glance” resource for industrial manufacturers seeking information that will help them optimize the implementation of assessment recommendations.

Section V contains a table that lists the guidebook’s 11 implementation principles in chronological order. As such, a key principle can be located under one of the following categories:

- Throughout the Entire Assessment Process
- Before an Assessment
- During an Assessment
- After an Assessment.

Each row lists 1 of the 11 implementation principles, as well as its central component(s) in bulleted form. Section VI also lists the 11 implementation principles in chronological order and provides the following information for each principle:

- A more detailed description of the principle
- An overview of the principle
- A graph indicating when the principle occurs during the assessment process
- A few key take-aways.

The Appendices included in this document provide information about additional implementation resources, including a self-assessment checklist of activities for overall implementation improvement.

V. Implementation Principles

The following table lists each implementation principle and its corresponding component(s). Appendix B also contains this information, as well as supporting resources that will help companies fulfill each principle.

Throughout the Entire Assessment Process	
1. Integrate the Process of Identifying Energy Savings Opportunities with the Process of Implementing Energy Savings Opportunities	<ul style="list-style-type: none">Integrate key processes to promote the implementation of identified savings opportunities
2. Assign Clear Accountability to Those Participating in an Assessment	<ul style="list-style-type: none">Assign the completion of specific activities and projects to specific individuals
Before an Assessment	
3. Explain and Communicate the Implications of Performing an Assessment	<ul style="list-style-type: none">Understand the value of an assessmentRecognize that no assessment is freeUnderstand management expectations in relation to identified implementation opportunitiesMake certain that key plant personnel understand the total value of identified opportunitiesIdentify the roles and responsibilities of key participantsIdentify who can claim resulting energy savings at the onset of the process
4. Know the Company Conducting the Assessment	<ul style="list-style-type: none">Verify the company's credibilityEnsure that the assessment contract clearly defines all components of the assessmentEnsure that the assessor fully understands what motivates company decisionsReview the assessor's history of follow-up and partnership with its clients
5. Undergo an Assessment Only if the Plant Welcomes It and Demonstrates Its Commitment to Implementation	<ul style="list-style-type: none">Make sure the plant welcomes the assessment and shows its commitment to implementationEnsure that management provides resources for the assessment and the implementation of recommendations
6. Organize Assessment Logistics to Promote a Successful Identification Process for Opportunities	<ul style="list-style-type: none">Ensure that the assessment experts are provided with "need-to-know" information before the assessmentConduct safety briefings and address confidentiality issuesMake certain that diagnostic measurement processes are in place before an assessment startsObtain management participation in a kick-off meeting and closeout meetingRequest potential participation and support from utilities and key plant service providersEnsure key plant team members are available to assistConduct assessments primarily when the targeted energy systems are operating
During an Assessment	
7. Employ an Assessment Process that Moves Smoothly from Identifying Opportunities to Implementing Them	<ul style="list-style-type: none">Ensure that identified opportunities meet your facility and/or organizational hurdle ratesDiscuss next-step activities to increase implementationHave the team lead sign off on all pursuable opportunities identified during the assessmentAssign ownership for all identified assessment opportunities to ensure accountabilityObtain management participation in a closeout meeting

After an Assessment

8. Ensure Continued Momentum from the Assessment to the Implementation of Approved Energy Savings Projects

- Ensure that 'risk' issues are evaluated and understood
- Ensure that funding is available for identified opportunities

9. Quantify Energy Savings Benefits

- Track the status of approved energy projects after the assessment
- Report implementation progress to senior management on a periodic basis and demonstrate the resultant savings in company language
- Implement your measurement and verification (M&V) plan based on company expectations

10. Publicize Successful Implementation Results and Recognize Employee Contributions

- Inform key stakeholders of accomplishments
- Have communications and public relations staff continually announce progress
- Celebrate company and individual achievements through recognition programs

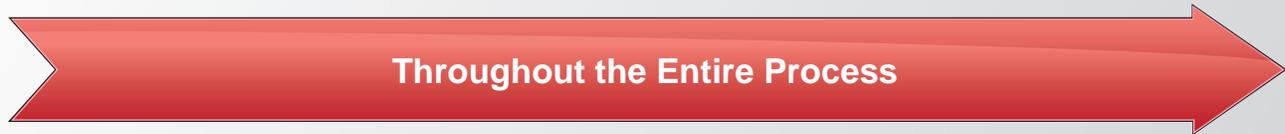
11. Identify "Lessons Learned" to Ensure Future Success

- Have plant personnel review assessment and implementation efforts
- Identify and implement key process improvements

VI. Expanding on the Implementation Principles

Implementation Principle #1:

Integrate the process of identifying energy savings opportunities with the process of implementing energy savings opportunities



Key Take-Away:

- Integrate key processes to promote the implementation of identified savings opportunities

Key Take-Away: Integrate key processes to promote the implementation of identified savings opportunities

The effective implementation of energy assessment recommendations can result from having most—or all—of the 11 implementation principles in place. Therefore, plant personnel should not participate in an assessment without also being prepared for project implementation.

Personnel should read through this guidebook and consider each of the principles presented. In addition, the use of the self-evaluation checklist provided in Appendix A will help ensure that all principles and components discussed in this guidebook are fulfilled.

Company Highlight: Alcoa

Alcoa is a top producer of primary aluminum, fabricated aluminum, and alumina. In one of Alcoa's businesses, the company initiates a formal implementation process as soon as an activity is identified as a best practice. Every location in that business must then deploy the practice by performing a "Kaizen event." Kaizen events include a scoring system and the completion of an action plan that requires follow-up. Alcoa expects that every location will achieve the best practice. The Kaizen event and follow-up activities are typically performed by "experts" from other locations or Alcoa's corporate office.

In addition, Alcoa utilizes a company-wide system to identify and track cost savings, projects, and activities. These items are monitored through several different stages—from initial concept to the delivery of savings. Each project must have an owner and be approved by location finance and management. Periodic progress is reported to Alcoa's Chief Executive Officer.

Implementation Principle #2:

Assign clear accountability to those participating in an assessment



Key Take-Away:

- Assign the completion of specific activities and projects to specific individuals

Key Take-Away: Assign the completion of specific activities and projects to specific individuals

Each individual participating in the implementation process must be assigned a specific role with specific duties. Participants must be aware of project expectations and understand their required level of involvement. This can be accomplished through the distribution of a handout at the onset of the assessment that includes the following information: expectations, roles, logistics, available resources, and an overview of the assessment process.

The handout will act as a reference document, which participants can go back to at any time for clarification. An example handout is provided in Appendix C.

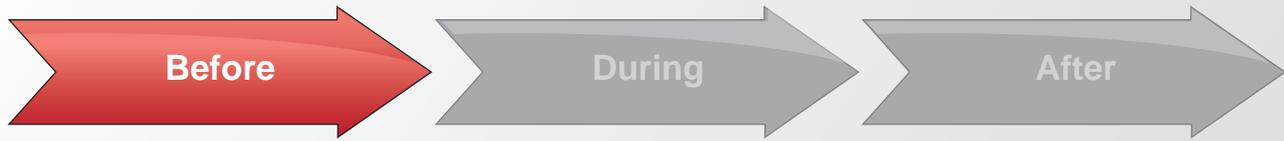
Before assigning roles, it is important to receive internal approval for each person participating in the implementation process.² This provides assurance that all participants will be able to make full commitments to carrying out their tasks. It will also hold everyone accountable. Energy managers, plant managers, and other staff involved will be aware of each others' role(s) and how they fit into the overall process.

“Having the right people participate in the assessment is the key to success. It is important to receive a commitment from both personnel and their managers before getting started to ensure a successful assessment.”

--Brad Runda, Saint-Gobain

Implementation Principle #3:

Explain and communicate the implications of performing an assessment



Key Take-Away:

- Understand the value of an assessment
- Recognize that no assessment is free
- Understand management expectations in relation to identified implementation opportunities
- Make certain that key plant personnel understand the total value of identified opportunities
- Identify the roles and responsibilities of key participants
- Identify who can claim resulting energy savings at the onset of the process

Key Take-Away: Understand the value of an assessment

It is important to make the business case for implementation at the onset of the planning process. Information that can help strengthen the business case includes sharing the value of improved energy efficiency, increased process efficiency, improved environmental outputs, potential cost savings, increased employee motivation, and improved energy management.

Assessment providers and utilities can help a plant develop the business case. For example, the assessor can help demonstrate the value of implementing assessment recommendations by providing examples of plants that have participated in the process, identified energy savings, and realized a return on investment. The assessor can also explain why they are interested in conducting an assessment at your particular plant. In addition, utilities can help by working with a plant to understand its energy bills and identify potential incentives ahead of time for identified energy efficiency projects.

Key Take-Away: Recognize that no assessment is free

As a key component of implementation, assessments are often advertised to manufacturers as “free,” “no-cost,” or “low-cost.” However, viewing assessments in this way undervalues their purpose and leads to lowered accountability. Instead, plants must recognize that there are substantial costs associated with participating in any assessment and implementation process. This includes investing time, effort, and money, among other resources. Therefore, it is important for plants to work with assessors upfront in order to determine these amounts, as well as any other ancillary benefits, and then quantify the total cost of the assessment. Seeing the total will help improve the accountability of those involved and will lead to a more serious commitment to implementation.

Key Take-Away: Understand management expectations in relation to identified implementation opportunities

It is important for the implementation team to recognize and understand management expectations when developing the post-assessment implementation plan. For example, management will expect to gain both value and measurable results from the money spent to implement recommendations. In addition, management will expect that the implementation team understands that its role does not end after the completion of an assessment.

Key Take-Away: Make certain that key plant personnel understand the total value of identified opportunities

Key plant personnel—including the engineering department—should understand the value of identified projects and conduct necessary follow-up engineering analyses to validate recommendations. This includes plant engineering and production staff, as they are directly impacted by the changes. The engineering team will monitor progress and conduct any needed maintenance, while the production staff will utilize the new equipment. This is why both engineering and production staff should be present during the kick-off and closeout meetings, and should be informed of the value and benefits of the potential energy savings opportunities.

Key Take-Away: Identify the roles and responsibilities of key participants

It is critical that each person involved (engineers, supervisors, energy managers, and the plant implementation lead) understands and acknowledges their roles, responsibilities, level of involvement, accountability, and expectations as they relate to implementation. In addition to what is required of them, participants should also understand the expectations and requirements that are proven to lead to successful implementation. A handout describing expectations, roles, logistics, and an overview of the implementation process should be distributed prior to the assessment. Participants should also ask the assessor or plant lead questions that will help them fully understand their roles and responsibilities. A sample handout of these items is provided in Appendix C. In addition, the *ENERGY STAR® Teaming Up to Save Energy: Protect Our Environment Through Energy Efficiency* guide provides step-by-step instructions for establishing an energy management team. This document supplies information about the different roles of an energy team and is available at

http://www.energystar.gov/ia/business/guidelines/continuous_improvement/Teaming_Up_To_Save_Energy.pdf.



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Key Take-Away: Identify who can claim resulting energy savings at the onset of the process

It is important for management and plant personnel to identify who can claim the energy savings that result from project implementation. This conversation will help avoid post-implementation claims of success from those indirectly involved, and will help reinforce the value of implementation to those directly involved, as well as other plant personnel. This will also negate any double-counting of the actual savings achieved.

At the same time, it is important for plant personnel to control the distribution of information about identified savings. Results should only be released after measurement and verification has been performed to a degree that is considered acceptable by management. This will minimize the spread of potentially incorrect information. Plant personnel and management must therefore collectively decide at what point after verification to release the results.

Company Highlight: Raytheon

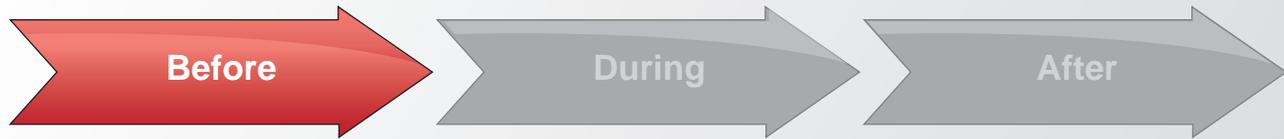
Raytheon formed an Enterprise Energy Team—comprised of mechanical, electrical, and energy engineers—to perform in-house energy assessments at the company’s manufacturing facilities. To help explain and communicate the implications of performing assessments to the company’s operations vice presidents and facilities directors, the energy team designed a survey tool. To secure buy-in from these individuals, the energy team relayed the following information:

- Having a team independent of the host site conduct the energy assessment is vital to identifying and prioritizing energy conservation opportunities
- Defining clear roles and responsibilities for plant operations staff and leaders will be done prior to conducting the assessment
- Resulting cost savings from the implementation of assessment recommendations far outweigh the cost of the assessment itself, which includes the time committed by survey team members and other select site staff, in addition to travel expenses
- Committing to achieving the results identified during the assessment is inherently made, as the facility has come to the realization that remaining competitive in the marketplace requires a constant focus on lowering overhead costs.

As a result, the operations vice presidents and facilities directors have embraced both the assessment team and its survey tool.

Implementation Principle #4:

Know the company conducting the assessment



Key Take-Away:

- Verify the company's credibility
- Ensure that the assessment contract clearly defines all components of the assessment
- Ensure that the assessor fully understands what motivates company decisions
- Review the assessor's history of follow-up and partnership with its clients

Key Take-Away: Verify the company's credibility

A plant must verify the credibility of the company conducting the assessment in order to understand the caliber of the assessor. This includes determining the quality of reports, identifying the assessment areas in which the organization specializes, and understanding potential fees. This also includes ensuring that the assessment organization honors confidentiality agreements, and confirming that the company has previously helped a plant make implementation an ongoing commitment. Questions to help verify the assessment company's credibility include the following:

- What is the name and contact information of the assessor?
- What are the key technical capabilities of the company/expert who will be performing the assessment?
- What examples of past assessment work can be provided as a reference?
- What are the names and phone numbers of area plant managers that have recently received assessments from this organization?

Key Take-Away: Ensure that the assessment contract clearly defines all components of the assessment

There should be no surprises entering into an assessment. The plant and assessor should work together to ensure that the assessment contract contains all pertinent information about each step in the assessment process, such as workday start and stop times, a site visit agenda, what equipment will be analyzed, requirements for follow-up, and what level of detail is needed in the post-assessment report. All of this information should be displayed in a logical, easy-to-read manner.

Key Take-Away: Ensure that the assessor fully understands what motivates company decisions

It is important to maximize an assessor's time by executing an efficient assessment process. In order to make the best use of that time, the assessor must work with the plant prior to the start of the assessment to understand how plant management makes business decisions—does the plant utilize a minimum acceptable rate of return (hurdle rate) or desired return on investment? This will help an assessor make recommendations that fit a company's requirements.



Photo from iStock/9121382

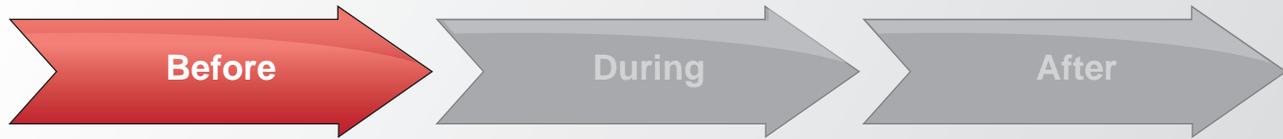
Key Take-Away: Review the assessor's history of follow-up and partnership with its clients

Having the assessor conduct follow-up activities and stay in touch with the plant is a critical component of post-assessment implementation. Follow-up activities are also important to establishing strategic, long-lasting partnerships between an assessor and a company, supporting the continuance of energy efficiency efforts. Before an assessment commences, a plant should determine the assessment organization's protocol for conducting follow-up after assessments. This includes

what follow-up entails (i.e., if it is done over the phone or in person, how often it is conducted, etc.) and how the assessor will work to ensure the client's momentum continues after the assessment. Additionally, a plant should consider soliciting references from other companies that have undergone assessments as a form of due diligence.

Implementation Principle #5:

Undergo an assessment only if the plant welcomes it and demonstrates its commitment to implementation



Key Take-Away:

- Make sure the plant welcomes the assessment and shows its commitment to implementation
- Ensure that management provides resources for the assessment and the implementation of recommendations

Key Take-Away: Make sure the plant welcomes the assessment and shows its commitment to implementation

A plant should only participate in an assessment if it is willing to make an ongoing commitment to implementation. This commitment is more than just participating in a single energy assessment; it is agreeing to make implementation a long-term requirement. Plants should demonstrate this commitment from the very beginning.

Key Take-Away: Ensure that management provides resources for the assessment and the implementation of recommendations

Plant managers should play an active role in supporting both the assessment process and the implementation of viable projects. At the onset of the planning process, it is crucial that management makes a commitment to seeing all acceptable or reasonable projects through. Additionally, management must agree to provide the following:

- Financial resources and incentives for the assessment and the implementation of identified recommendations
- Budget

- Equipment
- Transportation
- Staff.

This can entail conducting research before the assessment begins to identify potential funding opportunities:

- Rebates
- Loans
- Upfront payments to help mitigate the costs of potential projects.
- Tax incentives
- Production exemption
- No utility tax for consumption tied to production in some states.

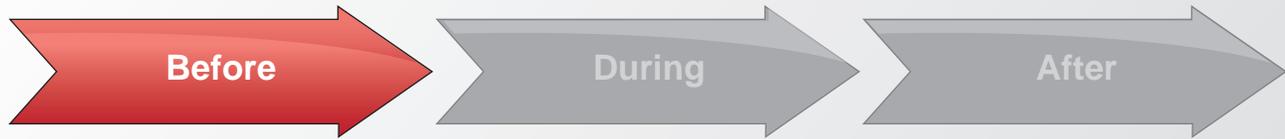
Another option is to schedule a meeting with a local utility company to find out what financial and technical resources are available.

Company Highlight: General Motors

Having a company and a labor union partner together is a powerful way to demonstrate a commitment to the implementation of energy efficiency measures. For instance, the United Auto Workers (UAW) and General Motors (GM) partnered together through the U.S. Department of Energy's *Save Energy Now* LEADER initiative, and that partnership is an important first step in the successful outcome of reducing energy intensity and lowering operating costs. Both UAW and GM view the partnership as an important value-added process. At each GM plant, a team comprised of the site utility manager, key UAW personnel, and production operations staff work together to ensure a positive atmosphere that will lead to a successful assessment.

Implementation Principle #6:

Organize assessment logistics to promote a successful identification process for opportunities



Key Take-Away:

- Ensure that the assessment experts are provided with “need-to-know” information before the assessment
- Conduct safety briefings and address confidentiality issues
- Make certain that diagnostic measurement processes are in place before an assessment starts
- Obtain management participation in a kick-off meeting and closeout meeting
- Request potential participation and support from utilities and key plant service providers
- Ensure key plant team members are available to assist
- Conduct assessments primarily when the targeted energy systems are operating

Key Take-Away: Ensure that the assessment experts are provided with “need-to-know” information before the assessment

In order for an assessor to help a plant make the business case for participating in an energy assessment, they must be provided with all of the “need-to-know” information before the assessment is scheduled. Provided below are examples of “need-to-know” information:

- Plant name and location
- Plant type
- Production hours
- Primary contact information
- Major equipment
- Type of system to be assessed
- Potential assessment dates
- Fuel and utility consumption.

The assessor may also need other relevant information, such as proper attire, company mission and objectives, an overview of existing energy efficiency or conservation projects, security protocols, rate schedules from all

utilities, labor rates, past assessments, building layout, process diagrams, non-disclosure agreement, and a list of equipment undergoing maintenance and/or repair. Additional information on pre-assessment information is provided in Appendix D.

Having this information upfront will provide the assessor with enough background information to tailor the assessment to that specific plant’s needs, which will make the best use of everyone’s time. Doing so will ensure the tools brought onsite by the assessor are safe and permitted. This is also a good opportunity to send any questions about the implementation process to the assessor so all parties involved start off on equal footing.

Key Take-Away: Conduct safety briefings and address confidentiality issues

Safety and confidentiality are critical components of an assessment that should be addressed at the onset of the assessment process. Doing so will ensure that participants understand the requirements of both, and how they will impact their role in the process. This will also help plants

avoid potential safety- or confidentiality-related pitfalls that could have otherwise occurred during the assessment. Moreover, this discussion should also address how to report safety issues. It is recommended to address and document safety issues outside of the assessment report, as doing so would otherwise send a negative tone for implementation.

Key Take-Away: Make certain that diagnostic measurement processes are in place before an assessment starts

Diagnostic measurements are needed during assessments to quantify energy savings opportunities. In many cases measurement equipment will be in place. In some cases the assessor may need accommodations to be made for additional diagnostic equipment.

If your company's implementation policy includes measurement and verification, these requirements should be taken into consideration as you plan assessment activities.

Key Take-Away: Obtain management participation in a kick-off meeting and closeout meeting

The kick-off meeting is where everybody on the implementation team discusses the goals, objectives, and process of the assessment. One way to show support for implementation is to have management participate in the meeting. This will not only ensure that they hear all of the information first-hand from the assessor, but it will also ensure that they are fully informed of the process. This includes knowing who is doing what and understanding the assessor's expectations. This sends a clear message to the implementation team that management is onboard and willing to help.

As the implementation process continues, a technical review with plant staff should be conducted to determine if assessment recommendations are valid. This will help strengthen the argument made to management during the closeout meeting.

Key Take-Away: Request potential participation and support from utilities and key plant service providers

It is important to make strategic partners, such as utilities, aware of your intent to participate in an energy assessment and implement identified recommendations. Utilities can provide preliminary analysis to identify potential patterns, while service providers can provide information about available financial and technical resources to support implementation projects, or potential rate schedules that may apply to the plant. Additionally, service providers may have established relationships with equipment providers that they could recommend.

Key Take-Away: Ensure key plant team members are available to assist

In order for implementation to truly be successful, the right people have to be part of the process—throughout its entire duration. Typical team members should include representatives from the energy, facilities, safety, quality control, public relations, procurement, and financing teams. Legal representatives may also be appropriate, depending on a plant's protocols.

To ensure that the right people are available to help, it is important to make them aware of the upcoming assessment well in advance. If they are interested in participating, confirm with their manager that they will be available to assist throughout the entire process. Make sure each manager is aware of how much time the team member will have to commit to the implementation process.

Key Take-Away: Conduct assessments primarily when the targeted energy systems are operating

It is important to know when the targeted energy systems will be operational. Assessments should only be conducted on days when the equipment is running. This will minimize plant disruption and allow the assessor to evaluate the piece while it is in use.

Company Highlight: Nissan North America

Nissan North America's manufacturing plants have undergone many energy assessments through the U.S. Department of Energy's *Save Energy Now* and Superior Energy Performance programs. Experience has revealed that upfront planning is critical to ensure the efficient and effective investment of resources. Nissan North America involves appropriate plant personnel—who are familiar with the processes and operations of the targeted areas—in the assessment planning stages in order to identify systems that are significant energy users and timeframes that best reflect standard operations on the shop floor. Key equipment personnel, such as experienced maintenance technicians and/or manufacturing engineers, are also called on. These employees' services are required in order to validate that the subject equipment is operating and functioning as observed, or to original equipment specifications.

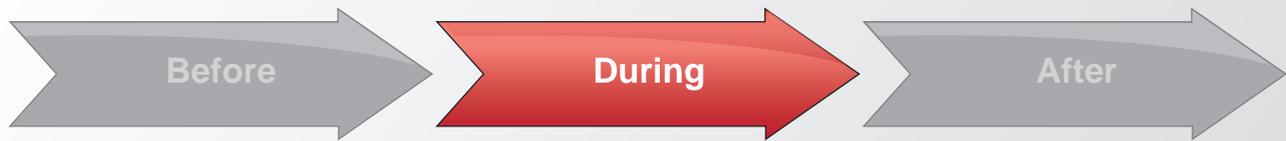
During the lifetime of an ever-changing manufacturing environment, machines are sometimes modified for operations other than what they were originally designed for. For example, pumps or fans can have components modified or have severe wear and/or adjustment issues over time. These conditions are not evident from a casual observation and require a more thorough examination to confirm actual operations. Measurements taken during normal operating hours are more accurate for calculating energy savings, as opposed to just nameplate data from the equipment. Including production operators is also necessary to ensure that the operations of the processes are valid when measurements and observations are made. A cross-functional team approach has been key to ensure sustainable results for Nissan.



Courtesy of Nissan North America

Implementation Principle #7:

Employ an assessment process that moves smoothly from identifying opportunities to implementing them



Key Take-Away:

- Ensure that identified opportunities meet your facility and/or organizational hurdle rates
- Discuss next-step activities to increase implementation
- Have the team lead sign off on all pursuable opportunities identified during the assessment
- Assign ownership for all identified assessment opportunities to ensure accountability
- Obtain management participation in a closeout meeting

Key Take-away: Ensure that identified opportunities meet your facility and/or organizational hurdle rates

One common reason assessment recommendations often go unimplemented is because they do not meet the company's hurdle rate, or the minimum acceptable rate of return. Participants should know and understand their company's hurdle rates. Additionally, participants should ensure that the assessor understands the company's priorities and that he/she seeks out energy efficiency opportunities that fall within those defined parameters. This will make the best use of everyone's time during the assessment and will increase implementation because more realistic recommendations will be provided.

Some opportunities may not meet hurdle rates, but should be identified and implemented for other reasons. These projects may have ancillary benefits not previously considered. For instance, an identified recommendation could have positive environmental impacts that would keep the company in compliance with any pending carbon regulations (as mentioned in Principle 3).

Key Take-Away: Discuss next-step activities to increase implementation

Next-step activities should be considered during the assessment process. In addition, these activities should be addressed during the closeout meeting. This discussion should also include personnel assignments for each activity. Appendix F contains excerpts from the U.S. Department of Energy's Industrial Technologies Program Energy Savings Assessment reporting template, which contains relevant information for next-step activities.

Key Take-Away: Have the team lead sign off on all pursuable opportunities identified during the assessment

Everyone involved in the assessment process will have defined roles and responsibilities. Therefore, each individual is accountable for his or her part in the process. However, the individual leading the team is the person who must make decisions about whether or not to implement certain activities. Having the team lead sign off on all pursuable opportunities will commit the team to implementing each activity that meets the company's hurdle rate (see Appendix F for an example).

Key Take-Away: Assign ownership for all identified assessment opportunities to ensure accountability

After the sign-off on all identified implementation opportunities, the next activity is to assign team members to projects. Team members then take ownership of their assigned projects and, as such, are held accountable for the projects' implementation. It is the job of both the assessor and the lead to make sure each team member understands his or her role, responsibilities, and how they are going to be held accountable.

Appendices G and H include tools that can help with project assignment and ownership. Appendix G contains a Project Scorecard from Saint-Gobain that can be used to track each person's progress on assigned implementation activities. Progress is tracked through a "stoplight" system—projects that are on schedule are green, projects that are within a grace period are yellow, and projects that are past-due are red. The 3M Project Tracking Spreadsheet in Appendix H can also be used to monitor progress. The spreadsheet also includes other useful information, such as cost and energy savings data.

Key Take-Away: Obtain management participation in a closeout meeting

Management should be committed from the onset of the implementation process. This includes participation at key meetings, such as the closeout meeting. This meeting should take place right after the assessment's completion, and should feature the results and key take-aways.

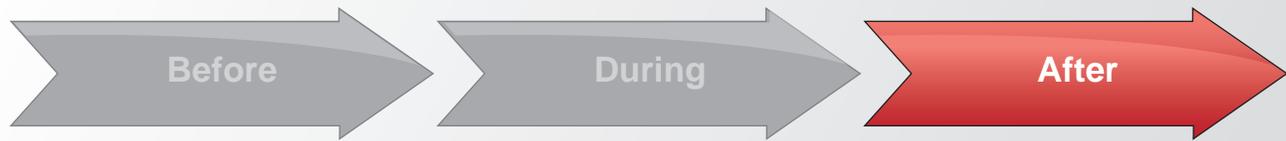
The meeting also serves as an opportunity for the assessor to present information on recommended and mutually agreed upon improvements including costs, potential payback periods, and estimated annual energy reduction numbers. Further, the meeting provides the opportunity to formally thank all assessment participants in front of their manager(s), as well as remind them of their assigned roles post-implementation. Management's presence will help hold all team members accountable.

Company Highlight: Saint-Gobain

To help ensure successful project implementation, Saint-Gobain makes energy efficiency a goal for key plant staff. This provides staff with a financial incentive to implement practical recommendations. Saint-Gobain allocates appropriate amounts of capital for energy projects in the company's upcoming budgets (either specifically or as a placeholder). For current year opportunities that may be undefined in the budget, Saint-Gobain attempts to use project offsets for very attractive projects, especially as the end of the fiscal year approaches. As projects are in the implementation stage, easier opportunities are targeted first because they generate immediate savings, which helps keep people engaged. Active upward communication throughout the process helps keep senior management onboard. Saint-Gobain ensures that the correct participants are involved, that their roles in the process are well-defined, and that their time is dedicated to the process. Finally, recognition is given for successful implementation.

Implementation Principle #8:

Ensure continued momentum from the assessment to the implementation of approved energy savings projects



Key Take-Away:

- Ensure that 'risk' issues are evaluated and understood
- Ensure that funding is available for identified opportunities

Key Take-Away: Ensure that 'risk' issues are evaluated and understood

Minimizing the risk associated with project implementation is very important. In this case, risk is typically associated with a company's financial return on investment, with the impact of the energy project on production, and with the operability of equipment to be purchased. This is an area in which strategic partners, including plant production personnel and utility and state energy offices, can be most helpful. States and utilities can help by identifying available risk-mitigating financial resources, such as loans, grants, tax incentives, rebates, upfront payments, and more. They can also help mitigate potential technical risks. For example, utilities (or companies they recommend) can verify that a vendor's product actually saves the amount of energy it claims to based on experiences with similar clients. This will help plants only purchase equipment that is proven to

save energy and avoid the purchase of poor-performing products. Technical resources also include providing technical staff for the installation of energy efficient equipment.

Key Take-Away: Ensure that funding is available for identified opportunities

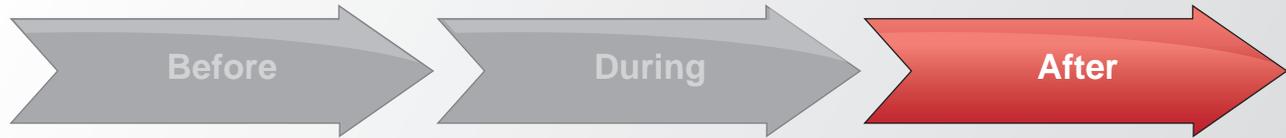
It is important to guarantee that funding is available to cover the implementation of approved energy projects. A proven way of doing this is to work with your company's finance department to identify internal funding (at both the corporate and plant levels) and external financing. Having this department certify that funding is available can help speak management's language for justifying the implementation of identified improvement opportunities.

"In the budget is better than surprise."

- Jeff Yigdall,
PPG Industries

Implementation Principle #9:

Quantify energy savings benefits



Key Take-Away:

- Track the status of approved energy projects after the assessment
- Report implementation progress to senior management on a periodic basis and demonstrate the resultant savings in company language
- Implement your measurement and verification (M&V) plan based on company expectations

Key Take-Away: Track the status of approved energy projects after the assessment

Tracking the status of approved energy projects goes hand-in-hand with accountability, helping to ensure that each person assigned to carry out a certain activity is in fact doing so. Tracking efforts can be accomplished through the use of visuals, such as a thermometer graph to show progress, or by holding weekly implementation meetings to share how each person contributed over the past workweek. Checklists and implementation matrices are also helpful to gauge progress (examples are included in Appendices A, G, and H).

Key Take-Away: Report implementation progress to senior management on a periodic basis and demonstrate the resultant savings in company language

It is critical to both measure and verify implementation results. Having a process in place for reporting results to senior management increases accountability and reconfirms the company's commitment to energy efficiency. This also lets senior management know what risks were mitigated as part of the implementation effort. The Thermometer Chart provided in Appendix I is one way to track implementation; another is through the Prize Tool in Appendix J. The Prize Tool helps plant personnel visually display the progress being made toward assessment targets.



Photo from iStock/6880980

Key Take-Away: Implement your measurement and verification (M&V) plan based on company expectations

Each company needs to adopt and deploy its own plans for measurement and verification (M&V)—measuring and verifying savings from implemented projects. The complexity of M&V plans depends on project type, savings potential, investment, incentive or financing requirements, and organizational expectations. For these reasons, planning for M&V should occur throughout the assessment and implementation process. Often, plans for M&V aren't considered until after projects have already been implemented, which results in lost opportunities for quantifying true energy savings.



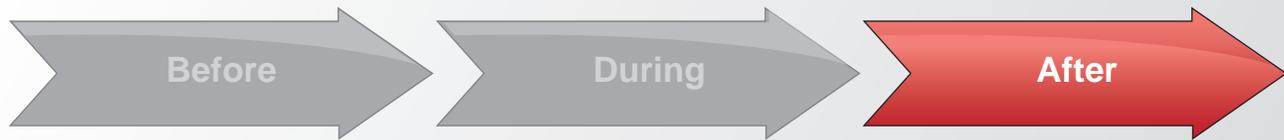
Photo from iStock/6748171

“To know where you were, you need to know where you are, and most importantly, to know where you plan to be.”³

- Larry Fabina, ArcelorMittal

Implementation Principle #10:

Publicize successful implementation results and recognize employee contributions



Key Take-Away:

- Inform key stakeholders of accomplishments
- Have communications and public relations staff continually announce progress
- Celebrate company and individual achievements through recognition programs

Key Take-Away: Inform key stakeholders of accomplishments

Plant personnel that have been involved in the implementation process should celebrate and share their accomplishments with stakeholders. Stakeholders include customers, shareholders, boards of directors, industry or energy efficiency associations, regulators, and any other groups that are vested in your company's well-being. Make them aware of the energy and cost savings your company is experiencing as a direct result of implementing projects identified during the assessment. Additionally, let them know how these efforts are benefitting them. You can accomplish this through phone calls, e-mails, listserv announcements, and/or newsletters. Appendix M contains an outline of potential topics to cover in this correspondence.

Key Take-Away: Have communications and public relations staff continually announce progress

A critical next step is to make your public relations office aware of your (plant and/or company-wide) commitment to energy efficiency. If your organization does not have a public relations office, work with the office that is in charge of sending company-wide announcements. This office can help make the business case for your efforts by formally announcing your commitment to energy efficiency. Making a public announcement will increase the likelihood that projects will be implemented. Work with this office to periodically provide updates about energy and cost savings, benefits, and employee participation.

Key Take-Away: Celebrate company and individual achievements through recognition programs

Finally, make sure that each person who conducted or participated in the implementation of the project is recognized for his or her contributions. This can be done through a formal recognition ceremony, tagging a ceremony on to another event, company-wide congratulatory e-mails, announcements in company newsletters, or thermometer graphs that visually measure energy achievements—just to name a few options. The public affairs office can offer insight about setting up or enhancing a rewards program. Perhaps another

department has set up a recognition program that could serve as a model—the public relations department would have details. Remember: public recognition for energy efficiency and management efforts is a strong motivator, no matter the form it takes.

The 3M highlight below provides an example of how a company successfully celebrates employee implementation efforts. The Thermometer Graph in Appendix I will help gauge implementation progress. Appendix L contains a sample letter of recognition from company management, while Appendix J provides a sample certificate recognizing the completion of implementation.

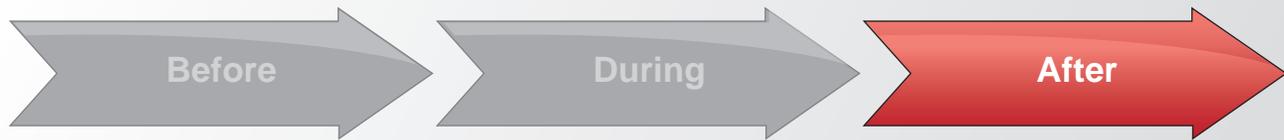
Company Highlight: 3M

3M implements an Annual Energy Recognition Program to celebrate departments/plants that have met or exceeded their goals. For the company’s largest energy users, the rewards system is based on three tiers: British thermal units (Btu) per pound of product, plant energy program effectiveness, and the overall value of the implemented energy projects. Progress is measured at the end of each quarter through the use of a dashboard that considers each of these variables. These data are also used to determine future goals. Smaller energy users follow a self-nomination process. Awards range from certificates, to boxed lunches and coffee/cookies, to formal team dinners where significant others are encouraged to attend. In 2010, seven plants (two domestic and five international) earned Platinum status, while seven facilities achieved Gold status.

Btu per Pound of Product Reduction	Plant Energy Program Effectiveness Rating	Projects Secured – % Delivered Compared To Plant Spend	Points	15 = Platinum 12 – 14 = Gold 9 – 11 = Silver 7 – 8 = Bronze
4%	90%	4%	5	
3 - 4%	85%	3 - 4%	4	
2 - 3%	80 - 85%	2 - 3%	3	
1 - -%	70 - 79%	1 - 2%	0	
0 - 1%	69% -	0 - 1%	0	

Implementation Principle #11:

Identify “lessons learned” to ensure future success



Key Take-Away:

- Have plant personnel review assessment and implementation efforts
- Identify and implement key process improvements

Key Take-Away: Have plant personnel review assessment and implementation efforts

A “post mortem” should be conducted at the end of the implementation process to identify what worked well, what could have been improved, and how things should work the next time. Items to discuss include the following:

- **Preparation and Planning:** Was the team properly prepared for implementation? Were any steps missed? Were there any steps that could have made the process more efficient and/or effective?
- **Communication:** Was there effective communication between all parties (e.g., plant manager, implementation lead, assessor, program administrator, etc.)? Did communication breakdowns occur? How can communication be improved?
- **Personnel and Accountability:** Were the right people included in the process? Did all participants understand their role? Did everyone fulfill his or her duties?
- **Recognition:** Was the team properly recognized for its efforts?

- **Automation:** Were there any steps in the process that could be automated or replicated in the future? If so, could any process templates be developed for future use?
- **Lessons Learned:** Have the lessons learned been shared with other employees that are planning similar projects?

The lessons learned discussion can be in the form of a questionnaire that each person fills out and then submits to the team lead. The team lead would then convene the group to go over the results. Another option is to hold an open discussion with the entire group (without a questionnaire). Regardless of the method, lessons learned need to be documented to ensure a more efficient process in the future. This will help build on activities that went well and avoid future pitfalls. The self-evaluation checklist provided in Appendix A can help ensure that all implementation principles are fulfilled (up to the point of the post mortem). The checklist can also be used to make future plans and assign implementation activities as next steps.

Key Take-Away: Identify and implement key process improvements

Companies should do more than just discuss lessons learned—they should address those lessons learned directly and identify ways to replicate actionable items. For example, if an identified improvement is to improve communication between the implementation lead and the

plant manager, both of these individuals should discuss how they can work together to improve communication. The identified lessons learned should be shared with plant staff that are responsible for developing new projects or conducting major upgrades. These steps should be documented and carried out as part of future assessment and implementation efforts.

VII. Appendix A: Plant Implementation Checklist

Name: _____

Position: _____

Location: _____

Status Category:

0 = No Evidence

1 = In Progress

2 = Fully Aligned

B = Best Practice

NA = Not Applicable

	Implementation Principle	Person Responsible	Status
1.	Integrate the process of identifying energy savings opportunities with the process of implementing energy savings opportunities		
2.	Assign clear accountability to those participating in an assessment		
3.	Explain and communicate the implications of performing an assessment		
	3.1 Understand the value of an assessment		
	3.2 Recognize that no assessment is free		
	3.3 Understand management expectations in relation to identified implementation opportunities		
	3.4 Make certain that key plant personnel understand the total value of identified opportunities		
	3.5 Identify the roles and responsibilities of key participants		
	3.6 Identify who can claim resulting energy savings at the onset of the process		
4.	Know the company conducting the assessment		
	4.1 Verify the company's credibility		
	4.2 Ensure that the assessment contract clearly defines all components of the assessment		
	4.3 Ensure that the assessor fully understands what motivates company decisions		
	4.4 Review the assessor's history of follow-up and partnership with its clients		
5.	Undergo an assessment only if the plant welcomes it and demonstrates its commitment to implementation		
	5.1 Make sure the plant welcomes the assessment and shows its commitment to implementation		
	5.2 Ensure that management provides resources for the assessment and the implementation of recommendations		
6.	Organize assessment logistics to promote a successful identification process for opportunities		
	6.1 Ensure that the assessment experts are provided with "need-to-know" information before the assessment		

	Implementation Principle	Person Responsible	Status
	6.2 Conduct safety briefings and address confidentiality issues		
	6.3 Make certain that diagnostic measurement processes are in place before an assessment starts		
	6.4 Obtain management participation in a kick-off meeting and closeout meeting		
	6.5 Request potential participation and support from utilities and key plant service providers		
	6.6 Ensure key plant team members are available to assist		
	6.7 Conduct assessments primarily when the targeted energy systems are operating		
7.	Employ an assessment process that moves smoothly from identifying opportunities to implementing them		
	7.1 Ensure that identified opportunities meet your facility and/or organizational hurdle rates		
	7.2 Discuss next-step activities to increase implementation		
	7.3 Have the team lead sign off on all pursuable opportunities identified during the assessment		
	7.4 Assign ownership for all identified assessment opportunities to ensure accountability		
	7.5 Obtain management participation in a closeout meeting		
8.	Ensure continued momentum from the assessment to the implementation of approved energy savings projects		
	8.1 Ensure that 'risk' issues are evaluated and understood		
	8.2 Ensure that funding is available for identified opportunities		
9.	Quantify energy savings benefits		
	9.1 Track the status of approved energy projects after the assessment		
	9.2 Report implementation progress to senior management on a periodic basis and demonstrate the resultant savings in company language		
	9.3 Implement your measurement and verification (M&V) plan based on company expectations		
10.	Publicize successful implementation results and recognize employee contributions		
	10.1 Inform key stakeholders of accomplishments		
	10.2 Have communications and public relations staff continually announce progress		
	10.3 Celebrate company and individual achievements through recognition programs		
11.	Identify "lessons learned" to ensure future success		
	11.1 Have plant personnel review assessment and implementation efforts		
	11.2 Identify and implement key process improvements		

VIII. Appendix B: List of Principles and Accompanying Resources

Throughout the Entire Assessment Process

1. Integrate the Process of Identifying Energy Savings Opportunities with the Process of Implementing Energy Savings Opportunities

- Integrate key processes to promote the implementation of identified savings opportunities

Resources

ISO 50001

International Organization for Standardization (ISO)

<http://www.iso.org/iso/pressrelease.htm?refid=Ref1337>

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_tc_browse.htm?commid=558632&development=on (for purchase)

ISO 50001, the forthcoming energy management standard, will establish a global framework for how industrial plants develop and implement energy management programs. Components of this standard will include benchmarking, measurement and verification, evaluation, and open communication with management on progress.

Superior Energy Performance: A Roadmap for Achieving Continual Improvements in Energy Performance

U.S. Department of Energy, Industrial Technologies Program (ITP) and Dow Chemical

http://www1.eere.energy.gov/industry/pdfs/webcast_20100304_sep.pdf

This presentation provides an overview of ITP's Superior Energy Performance program, as well as the upcoming International Organization for Standardization (ISO) 50001 energy management standard.

Self-Paced Module in the Energy Management Toolkit

U.S. Department of Energy, Industrial Technologies Program

The Energy Management Toolkit is scheduled for release in June 2011

The Self-Paced Module is a resource designed to help industrial companies develop energy management plans.

Overview of Energy Management Plan

Georgia Tech recommendation

Currently under development

This presentation will provide an overview and step-by-step guide of how to implement an energy management system.

Guidelines for Energy Management

ENERGY STAR®

http://www.energystar.gov/index.cfm?c=guidelines.guidelines_index

This resource guides companies through each stage of the energy management process, including recognizing achievements.

2. Assign clear accountability to those participating in an assessment

- Assign the completion of specific activities and projects to specific individuals

Resources

Webinar: Preparing for Project Implementation—Assigning Accountability for Each Project

U.S. Department of Energy, Industrial Technologies Program

http://www1.eere.energy.gov/industry/saveenergynow/pdfs/sen_webinar_4-2010.pdf

This webinar, featuring input from the Dow Chemical Company, discusses the importance of assigning roles for project implementation and holding those individuals accountable.

Before an Assessment

3. Explain and Communicate the Implications of Performing an Assessment

- Understand the value of an assessment
- Recognize that no assessment is free
- Understand management expectations in relation to identified implementation opportunities
- Make certain that key plant personnel understand the total value of identified improvement opportunities
- Identify the roles and responsibilities of key participants
- Identify who can claim resulting energy savings at the onset of the process

Resources

Cost of an Assessment

U.S. Department of Energy, Industrial Technologies Program

Currently under development

Upon completion, this short presentation will provide information about the cost of an assessment as it pertains to staff time and outside consultants.

4. Know the Company Conducting the Assessment

- Verify the company's credibility
- Ensure that the assessment contract clearly defines all components of the assessment
- Ensure that the assessor fully understands what motivates company decisions
- Review the assessor's history of follow-up and partnership with its clients

Resources

Industrial Service and Product Providers

ENERGY STAR®

http://www.energystar.gov/index.cfm?c=industry.bus_industry_spps

ENERGY STAR® develops teaming profiles to showcase the value partners find by working with ENERGY STAR Industrial Service and Product Providers. These profiles include specific information on the project scope, costs, energy savings, and financial return.

Qualified Specialist Directory

U.S. Department of Energy (DOE), Industrial Technologies Program (ITP)

www1.eere.energy.gov/industry/bestpractices/qualified_specialists/

ITP's website provides a searchable directory of DOE Qualified Specialists. Qualified Specialists are trained in analysis and the use of DOE software tools, and are experts in assessing industrial energy systems, including steam, fans, process heating, pumps, and compressed air.

Pre-Assessment Questions for End-Users

U.S. Department of Energy, Industrial Technologies Program

Currently under development

This document supplies a short list of questions for an end-user to ask an assessor prior to an assessment.

5. Undergo an Assessment Only if the Plant Welcomes It and Demonstrates Its Commitment to Implementation

- Make sure the plant welcomes the assessment and shows its commitment to implementation
- Ensure that management provides resources for the assessment and the implementation of recommendations

Resources

Webinar: Preparing for Project Implementation before an Energy Assessment

U.S. Department of Energy, Industrial Technologies Program

http://www1.eere.energy.gov/industry/saveenergynow/pdfs/sen_webinar_1-2010.pdf

Featuring Saint-Gobain, this webinar details the steps that need to be taken before an energy assessment to increase the likelihood of project implementation.

Assessment Readiness Checklist

U.S. Department of Energy, Industrial Technologies Program

Currently under development

This easy-to-read checklist will enable an end-user to gauge whether its facility is ready to undergo an assessment.

E-Learning: Online Training for Software Tools

U.S. Department of Energy, Industrial Technologies Program (ITP)

Currently under development

ITP is developing online training courses for its industrial energy system software tool offerings. These short, introductory courses, which are system-specific, will help prepare plant personnel for energy assessments.

System Assessment Standards for Process Heating, Pumps, Steam, and Compressed Air

American Society of Mechanical Engineers

http://www.superiorenergyperformance.net/system_assessment_standards.html

These system assessment standards set requirements on how to conduct an energy efficiency assessment at an individual facility for a specific system type. The standards provide a framework for conducting assessments that help define the market for system assessment services.

6. Organize Assessment Logistics to Promote a Successful Identification Process for Opportunities

- Ensure that the assessment experts are provided with “need-to-know” information before the assessment
- Conduct safety briefings and address confidentiality issues
- Make certain that diagnostic measurement processes are in place before an assessment starts
- Obtain management participation in a kick-off meeting
- Request potential participation and support from utilities and key plant service providers
- Ensure key plant team members are available to assist
- Conduct assessments primarily when the targeted energy systems are operating

Resources

Webinar: Preparing for Project Implementation before an Energy Assessment

U.S. Department of Energy, Industrial Technologies Program

http://www1.eere.energy.gov/industry/saveenergynow/pdfs/sen_webinar_1-2010.pdf

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These system assessment standards set requirements on how to conduct an energy efficiency assessment at an individual facility for a specific system type. The standards provide a framework for conducting assessments that help define the market for system assessment services.

Webinar: Measuring Energy Achievements

U.S. Department of Energy, Industrial Technologies Program

http://www1.eere.energy.gov/industry/saveenergynow/pdfs/sen_webinar_9-2010.pdf

This webinar provides recommendations for tracking and announcing efforts post-assessment. A real-world example is provided by ArcelorMittal.

During an Assessment

7. Employ an Assessment Process that Moves Smoothly from Identifying Opportunities to Implementing Them

- Ensure that identified opportunities meet your facility and/or organizational hurdle rates
- Discuss next-step activities to increase implementation
- Have the team lead sign off on all pursuable opportunities identified during the assessment
- Assign ownership for all identified assessment opportunities to ensure accountability
- Obtain management participation in a closeout meeting

Resources

Webinar: Preparing for Project Implementation during an Assessment

U.S. Department of Energy, Industrial Technologies Program

http://www1.eere.energy.gov/industry/saveenergynow/pdfs/sen_webinar_2-2010.pdf

This webinar, featuring Nissan North America, addresses the steps that should be taken during an assessment to increase the likelihood of project implementation.

After an Assessment

8. Ensure Continued Momentum from the Assessment to the Implementation of Approved Energy Savings Projects

- Ensure that 'risk' issues are evaluated and understood
- Ensure that funding is available for identified opportunities

Resources

Business Case Tool

U.S. Department of Energy, Industrial Technologies Program

Currently under development

This tool will help end-users convert technical energy project information into financial business cases that will help company management make a decision on whether or not to implement energy efficiency projects.

Webinar: Motivating Employees to Implement Projects

U.S. Department of Energy, Industrial Technologies Program

http://www1.eere.energy.gov/industry/saveenergynow/pdfs/sen_webinar_6-2010.pdf

This webinar, featuring CalPortland, offers ways of motivating plant employees to implement energy efficiency projects.

Webinar: Preparing for Project Implementation after an Assessment

U.S. Department of Energy, Industrial Technologies Program

http://www1.eere.energy.gov/industry/saveenergynow/pdfs/sen_webinar_3-2010.pdf

Featuring PPG Industries, this webinar explains the steps that need to take place immediately following an assessment in order to implement recommendations.

Webinar: Providing Resources for Implementation

U.S. Department of Energy, Industrial Technologies Program

http://www1.eere.energy.gov/industry/saveenergynow/pdfs/sen_webinar_5-2010.pdf

Featuring input from Schneider Electric, this webinar provides guidance on how to find and secure resources for implementation.

Webinar: Financing Project Implementation

U.S. Department of Energy, Industrial Technologies Program

http://www1.eere.energy.gov/industry/saveenergynow/pdfs/sen_webinar_8-2010.pdf

This webinar, featuring General Motors, provides guidance on securing financial resources for project implementation.

State Incentives and Resource Database

U.S. Department of Energy, Industrial Technologies Program

http://www1.eere.energy.gov/industry/states/state_activities/incentive_search.aspx

This database provides industry with access to more than 3,500 technical and financial resources and incentives to help implement energy efficiency projects.

State Incentive Handbooks

U.S. Department of Energy, Industrial Technologies Program

http://www1.eere.energy.gov/industry/states/state_regional_exchanges.html

These handbooks provide information on the available state and regional financial and technical resources to assist companies implement energy efficiency projects.

9. Quantify Energy Savings Benefits

- Track the status of approved energy projects after the assessment
- Report implementation progress to senior management on a periodic basis and demonstrate the resultant savings in company language
- Implement your measurement and verification (M&V) plan based on company expectations

Resources

Webinar: Preparing for Project Implementation after an Assessment

U.S. Department of Energy, Industrial Technologies Program

http://www1.eere.energy.gov/industry/saveenergynow/pdfs/sen_webinar_3-2010.pdf

Utilizing an example from PPG Industries, this webinar provides recommendations for tracking implementation progress after an assessment.

Webinar: Measuring Energy Achievements

U.S. Department of Energy, Industrial Technologies Program

http://www1.eere.energy.gov/industry/saveenergynow/pdfs/sen_webinar_9-2010.pdf

This webinar provides recommendations for tracking and announcing efforts post-assessment. A real-world example is provided by ArcelorMittal.

Sub-Metering: Energy Savings Measurement and Verification

Nissan North America: How Sub-Metering Changed the Way a Plant Does Business

[Currently under development](#)

This success story describes Nissan's decision to utilize sub-metering and how the company is able to realize and quantify related energy savings.

10. Publicize Successful Implementation Results and Recognize Employee Contributions

- Inform key stakeholders of accomplishments
- Have communications and public relations staff continually announce progress
- Celebrate company and individual achievements through recognition programs

Resources

Webinar: Preparing for Project Implementation—Announcing the Prize

U.S. Department of Energy, Industrial Technologies Program

http://www1.eere.energy.gov/industry/saveenergynow/pdfs/sen_webinar_7-2010.pdf

This webinar provides suggestions on how the implementation of energy efficiency projects can benefit other departments in an organization, such as the public relations department. The webinar highlights Alcoa's post-assessment efforts.

Webinar: Providing Rewards and Recognition

U.S. Department of Energy, Industrial Technologies Program

http://www1.eere.energy.gov/industry/saveenergynow/pdfs/sen_webinar_11-2010.pdf

This webinar explains the importance of providing employee recognition for project implementation. The webinar utilizes 3M as a best practice model for recognition.

Webinar: Communicating Accomplishments to All Stakeholders

U.S. Department of Energy, Industrial Technologies Program

http://www1.eere.energy.gov/industry/saveenergynow/pdfs/sen_webinar_10-2010.pdf

Utilizing Raytheon as an example, this webinar provides information on how to share implementation accomplishments with a variety of relevant company stakeholders.

Teaming Up to Save Energy

ENERGY STAR®

http://www.energystar.gov/ia/business/guidelines/continuous_improvement/Teaming_Up_To_Save_Energy.pdf

This resource is a “how-to” guide on building an energy management team. The guide discusses the structure, launch, and maintenance of an energy team.

11. Identify “Lessons Learned” to Ensure Future Success

- Have plant personnel review assessment and implementation efforts
- Identify and implement key process improvements

Resources

Webinar: Communicating Accomplishments to All Stakeholders

U.S. Department of Energy, Industrial Technologies Program

http://www1.eere.energy.gov/industry/saveenergynow/pdfs/sen_webinar_10-2010.pdf

Using Raytheon’s post-assessment process as an example, this webinar addresses identifying and implementing lessons learned.

ISO 50001

International Organization for Standardization (ISO)

<http://www.iso.org/iso/pressrelease.htm?refid=Ref1337>

http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_tc_browse.htm?commid=558632&development=on (for purchase)

ISO 50001, the forthcoming energy management standard, will establish a global framework for how industrial plants develop and implement energy management programs. Components of this standard will include benchmarking, measurement and verification, evaluation, and open communication with management on progress.

Superior Energy Performance: A Roadmap for Achieving Continual Improvements in Energy Performance

U.S. Department of Energy, Industrial Technologies Program (ITP) and Dow Chemical

http://www1.eere.energy.gov/industry/pdfs/webcast_20100304_sep.pdf

This presentation provides an overview of ITP’s Superior Energy Performance program, as well as the upcoming International Organization for Standardization (ISO) 50001 energy management standard.

Self-Paced Module in the Energy Management Toolkit

U.S. Department of Energy, Industrial Technologies Program

The Energy Management Toolkit is scheduled for release in June 2011

The Self-Paced Module is a resource designed to help industrial companies develop energy management plans.

Overview of Energy Management Plan

Georgia Tech recommendation

Currently under development

This presentation will provide an overview and step-by-step guide of how to implement an energy management system.

Guidelines for Energy Management

ENERGY STAR®

http://www.energystar.gov/index.cfm?c=guidelines.guidelines_index

This resource guides companies through each stage of the energy management process, including recognizing achievements.

IX. Appendix C: Plant Personnel Roles and Expectations

Overview of Assessment Process Logistics

Standard Roles and Expectations

Implementation is a team effort—no one person at a plant should take on implementation by himself or herself. As such, following are typical roles and responsibilities for each team member throughout the implementation process.

Senior Management: A company’s senior management must be involved at all stages of implementation. This demonstrates a top-down approach to energy management, sending the message to plant employees that management supports implementation. Senior management must demonstrate the following:

- Agree to allow the plant to participate in the assessment
- Dedicate staff to the assessment process
- Set aside budget and allocate resources for implementation—set hurdle rates for the project
- Share expectations regarding post-assessment activities, such as achieving measurable results
- Participate in the assessment kick-off meeting to learn about the assessment’s purpose, goals, and process
- Participate in the closeout meeting to hear first-hand about the assessment results and key lessons learned from the process
- Receive ongoing updates from either the plant energy manager or project lead to gauge progress of projects
- Recognize both individual and group achievements relating to implementation progress and attained results.

Project Lead/Energy Manager: This individual will lead implementation efforts. As such, the lead is ultimately responsible for assigning accountability to the implementation team, in addition to ensuring that the implementation process runs smoothly from start to finish. This includes activities, such as the following:

- Make sure all principles listed in this guidebook are applied throughout the assessment process
- Achieve corporate buy-in
- Ensure all parties involved understand their roles and carry out their responsibilities
- Coordinate staff involvement with supervisors
- Participate in kick-off and closeout meetings
- Ensure the team understands and works to fulfill senior management’s expectations related to implementation
- Verify the credibility of the assessment company prior to participating in the assessment
- Work with the assessor to ensure that there are no surprises during the assessment
- Share “need-to-know” information with the assessor
- Assign staff to implementation projects or activities
- Ensure measurement and verification efforts are performed throughout the assessment and implementation process
- Sign off on all pursuable opportunities
- Track project status and keep management informed of progress.

Communications: The communications team can announce the plant’s commitment to implementation as another means of accountability. This group can help with public relations efforts, including disseminating information about implementation progress and results to company stakeholders. This will let stakeholders know how implementation efforts are positively impacting them. Additionally, this group can help with recognition efforts by sharing this information internally and setting up and executing some sort of recognition event. The communications team can also help increase employee awareness of implementation efforts, as well as plant-floor recognition (level of involvement: approximately one hour per week).

Financial Staff: Financial staff should help the plant energy manager make the business case for implementation by identifying available funding within the organization. The financial team can also help by identifying potential external funding sources to assist with implementation (level of involvement: approximately one hour per week).

Procurement Staff: Procurement staff must understand that they are part of the implementation team. By doing so, they can be supportive of implementation efforts through the purchasing process. As such, procurement staff should be present at the closeout meeting (level of involvement: approximately one hour per week).

Operators and Engineers: Operators and engineers are integral to the overall assessment process. For example, engineers will monitor equipment and make any needed maintenance after the energy efficient equipment is installed. Engineering and operations staff can also assist in the measurement and verification of energy and cost savings.

All Participants: Though the project lead is responsible for assigning specific roles to each member of the implementation team, every participant should expect to do the following as part of their commitment:

- Participate in the kick-off and closeout meetings
- Ask clarifying questions of the assessor or project lead
- Complete projects and activities on time
- Participate in next-step discussions
- Seek funding for implementation
- Review implementation efforts
- Identify and address lessons learned
- Be accountable for their role in the process.

X. Appendix D: Examples of Required Pre-Assessment Information

Provided below is a list of information that is usually requested by an assessor before a plant participates in an energy assessment:

- Plant safety requirements
- Plant information confidentiality requirements
- General information on key facility components, including equipment schematics and equipment listings
- Plant utility rate schedules
- At least one year of plant historical energy and cost data
- Prioritized list of the largest plant end-use equipment
- List of relevant plant energy efficiency projects and the status of these projects
- Relevant plant operation and maintenance records
- Restriction on tools to be used by assessors
- Plant labor rates

XI. Appendix E: Implementation Checklist

Implementation Checklist



- Stress **importance** of focusing on implementation not just identification.
- Obtain management “**buy-in**” before concluding the assessment.
- Have Site Energy Leaders (SEL) schedule status **review meetings** with management.
- Announce acceptance of findings **formally**.
- Praise** the plant participants.
- Publicize **best practices** found.
- Assign **accountability** for each recommendation.
- Lead discussions with “**benefits**” not features.
- Talk **\$\$\$** not Btu or kWh.
- Have Site Energy Leaders get a “**seat at the table**” (at budget meetings).
- Identify the “**Prize**” (answers WII FM – What’s in it for me?).
- Facilitate developing an “**elevator speech**” – brief interest grabber.
- Give priority to “**big ticket**” items that are easy to explain.
- Assign **owners** for each project and publicize this information.
- State planned **completion dates**.
- Review **funding** options, rebates, incentives, and potential assistance.
- Discuss project **tracking** mechanisms.
- Consider **scorecard** approaches like the “thermometer”.
- Plan **recognition** for accomplishments.
- Share **100% Completion Award** template.
- Encourage identifying **PR** resources and communication opportunities.
- Educate** SEL about implementation issues.
- Share a copy of the **checklist**.

XII. Appendix F: ESA Report Template Excerpts

Following are excerpts from the Energy Savings Assessment (ESA) Report Template. These excerpts provide sample language and templates for next-step implementation activities, as well as the agreement and sign off on implementation projects and their completion timeframes.

Next Steps toward Implementation

Several key next steps were identified for each energy saving opportunity found during your assessment, as summarized in the table below. Upon finalization of this report, your Technical Account Manager will contact you to discuss current progress towards achieving these next steps. In addition, a simple system has been established through the *Save Energy Now* Portal. This will allow you to provide feedback and report progress toward the implementation of your energy saving opportunities.

ESO #	Title of Energy Saving Opportunity	Next Steps
1	Test Expert Recommendation #1	
2	Test Expert Recommendation #2	

Agreement of Identified Assessment Opportunities

The following energy saving opportunities have been discussed, and the viability of these opportunities has been agreed upon by plant personnel. Signing next to an identified opportunity indicates that the signer understands and agrees with the estimated savings estimates for the proposed opportunity, and that the opportunity has significant potential to be implemented. By signing, there are no implied contractual agreements to implement the proposed opportunity.

Identified Energy Saving Opportunity	Potential Timing for Implementation	Plant Contact Signature
Test Expert Recommendation #1	May 2013	Bob
Test Expert Recommendation #2	May 2013	Bob

XIII. Appendix G: Project Scorecard

ASSESSMENT PROJECT IMPLEMENTATION SCORECARD								
			<table border="1"> <tr> <th>GRACE PERIOD (DAYS)</th> </tr> <tr> <td>10</td> </tr> </table>				GRACE PERIOD (DAYS)	10
GRACE PERIOD (DAYS)								
10								
			STATUS					
Project Description	Subtask	Project Manager	Initial Assesment Due/Completed	Project Submitted Due/Completed	Project Implemented Due/Completed	Project Follow-Up and Verification Due/Completed		
Steam System Repair		John Smith	9/1/2009	10/1/2009	12/31/2009	1/31/2009		
			9/12/2009	10/3/2009	10/4/2009	10/5/2009		
			10/6/2009	10/3/2009	10/4/2009	10/5/2009		
			10/10/2009	10/14/2009	10/12/2009	10/13/2009		
			10/10/2009					
			10/10/2009	10/11/2009	10/12/2009	10/13/2009		
			10/10/2009	10/11/2009	10/12/2009	10/13/2009		



- ON TIME
- GRACE PERIOD
- LATE

XIV. Appendix H: Project Tracking Tool

Project Tracking Tool

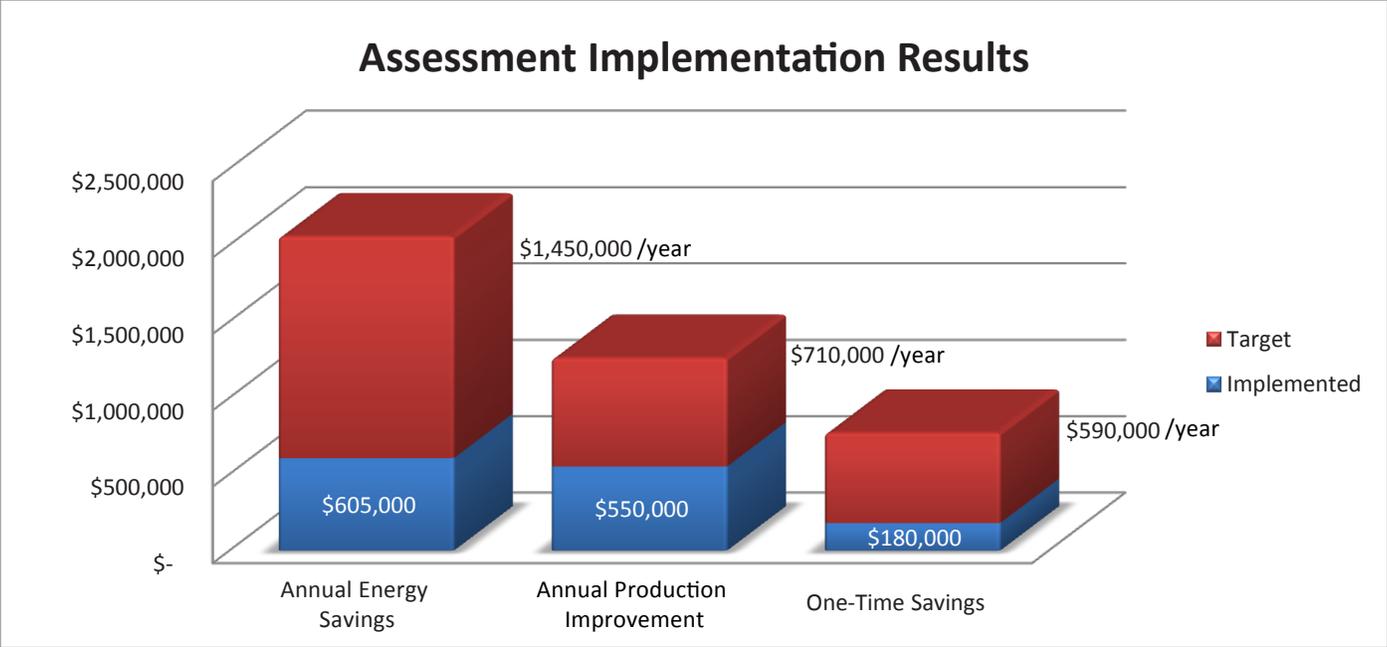
Project #	Plant	Division	Business	Project Description	Owner	Technology	Annual Savings Estimate
1	Houston	Glass	Automotive	Reduce Pressure	John Smith	Compressed Air	\$10,000

Project #	Cost to Implement Estimate	Implementation Status	Funding Status	Project Origination	Electricity Savings (kWh)	Natural Gas Savings (MMBtu)
1	\$5,000	Planned	Funding Requested	Plant Audit		

XV. Appendix I: Thermometer Graph

This thermometer graph can be modeled to measure progress toward targeted implementation results.

Thermometer Graph



XVI. Appendix J: Prize Tool

The “PRIZE”

To get senior management’s attention, you should identify the “PRIZE.”

- This will answer the question “What’s in it for Me?” (WII-FM: management’s favorite radio station)
- The following describes a method to identify the “PRIZE.” Use the space in the appropriate box to plug-in the values for your company and calculate your “PRIZE.”

STEPS	EXAMPLE	WORK SPACE
1. Determine the company’s annual energy expense	Assume energy expenses total \$100,000,000 per year	\$
2. Set a long-term energy expense reduction goal	3% per year usage reduction for 5 years means usage will be 15% lower in Year 5 than if there was no program	%
3. Multiply the annual expense by the cumulative goal to get the \$ savings in the last year	$\$100,000,000 * 15\% = \$15,000,000$	\$
4. Determine the company’s annual revenue or sales \$	Assume \$5,000,000,000	\$
5. Determine the company’s net profit	Assume \$250,000,000	\$
6. Determine the company’s margin on sales \$ by dividing the profit (Step 5) by the revenue (Step 4)	$\$250,000,000 / \$5,000,000,000 = 5\%$	\$
7. Divide the savings (Step 3) by the margin (Step 6) to identify equivalent sales \$ required to provide the same impact on the “bottom line”	$\$15,000,000 / 5\% = \$300,000,000$	\$
OPTIONAL (Equivalent Units of Sale)		
8. Determine price per unit	Assume price is \$50,000	\$
9. Divide equivalent sales \$ (Step 7) by unit price (Step 8) to identify equivalent unit sales	$\$300,000,000 / \$50,000 = \$6,000$	\$

XVII. Appendix K: 100% Completion Award



Certificate of Commendation

_____ Commends the Management and Staff of
Company Name

Plant Name

City, State

for successfully implementing one hundred percent of the recommendations for improving energy efficiency arising from the _____ 11/10 On-Site Energy conducted by the

Insert Company Name

Organization

Name

Date

Title

XVIII. Appendix L: Template Letter of Appreciation from Corporate

Date

Name

Title

Organization

Address 1

Address 2

City, State Zip

Dear Name:

On behalf of (company name), it is my privilege to formally recognize your efforts to achieve company-wide energy efficiency and cost savings. Your dedication to finding ways to conduct processes more efficiently will help our company remain economically strong in both the short- and long-term.

(Explanation/description of effort being acknowledged)

Once again, I would like to thank you for your efforts. I would also like to take this time to reaffirm (company name)'s appreciation and recognition of your commitment to implementing energy- and cost-saving projects.

Warmest Regards,

Name

Title

XIX. Appendix M: Outline for Communicating Accomplishments

Sample Outline for Communicating Implementation Accomplishments to Stakeholders

The following outline provides an overview of the types of information to be included when communicating implementation accomplishments. This correspondence may come from the company's senior management, energy manager, project lead, or communications team. The correspondence may come in the form of a letter or memorandum.

1. Overview of Project
 - a. Purpose of project
 - i. Objective of project
 - ii. System(s) analyzed
 - iii. How this effort benefits stakeholders, if necessary/appropriate
 - b. Participating departments and/or individuals
2. Results
 - a. Expected results
 - b. Results to date
3. Next Steps
4. For More Information
 - a. Contact information
 - b. URL/Intranet location, if available

XX. Endnotes

¹ Energy Information Administration. “Table S1. Energy Consumption Estimates by Source and End-Use Sector, 2008.” Downloaded from http://www.eia.doe.gov/emeu/states/sep_sum/html/pdf/sum_btu_1.pdf. Accessed on November 23, 2010.

² U.S. Department of Energy, Industrial Technologies Program. “Ask the Expert: Proper Preparation Is the Key to Good Performance.” Downloaded from <http://www1.eere.energy.gov/industry/bestpractices/energymatters/archives/spring2010.html>. Accessed on November 2, 2010.

³ Presentation by Larry Fabina on September 8, 2010

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