

# Breakthrough for Industrial Energy Management

*EnVINTA Corporation*

## ABSTRACT

In recent years, EnVINTA (an industry-leading energy management solutions organization) has greatly increased its understanding of processes to achieve lasting energy efficiency improvements in industry. The lessons are based on the application of a continuous improvement (CI) methodology, similar to the programs widely used in industry for quality, safety, environmental, and reliability management.

The promise of this approach is to capture the full range of cost-effective energy savings, including savings in core processes, from operations and maintenance improvements to equipment retrofits. Furthermore, CI programs offer savings which are sustained and continually enhanced over time, and ensure that future savings are captured from specifying energy-efficient equipment and processes.

This article summarizes the lessons that EnVINTA has learnt through the use of its One-2-Five® Energy CI program within industry. The principles discussed are illustrated with a series of short case studies highlighting successes and lessons learned from applying this approach over the past four years. These case studies cover individual company experiences as well as program outcomes. Results are drawn from programs in the northwest, Ohio, Illinois, Connecticut, Maine, Wisconsin, Iowa and others, as well as from companies like BP, Simplot, and Stora Enso.

## GENERAL INTRODUCTION

About seven years ago, EnVINTA became increasingly concerned about the way in which it was delivering energy management to its

customers. The EnVINTA team felt there was something fundamentally deficient in the services that the energy consulting industry was providing its customers.

The company gained some important insights when asked by the manager of an iron foundry in Australia to prepare a quote for a comprehensive energy audit. EnVINTA had conducted a detailed audit five years earlier and had implemented the entire range of recommended measures over the following three years. When assessing the improvements made over this timeframe, the EnVINTA project manager was astounded to find that nearly every measure they had installed had either been bypassed, replaced, become faulty through lack of maintenance, or not used due to no ownership of the output.

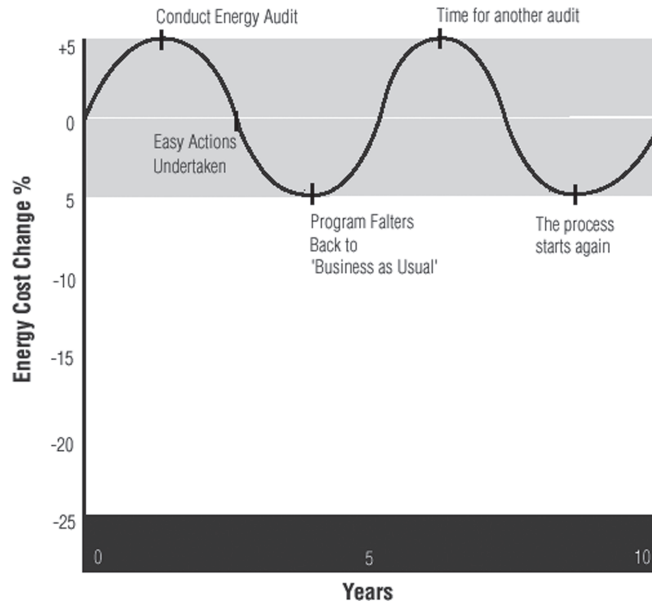
Instead of offering another technical study, EnVINTA suggested that the organization build a system that would mirror that currently used for quality. The system would incorporate energy management and build tools that would help them to continuously improve energy use. EnVINTA drew on the basic structure and philosophy of ISO 9000/14001 to facilitate the integration of energy into the strategies core of companies. That was the beginning of EnVINTA's new approach, called "One-2-Five® Energy," and the understanding of an improved way to address energy from a strategic standpoint.

## PRINCIPLES OF CONTINUOUS IMPROVEMENT

Many organizations will recognize the energy management rollercoaster which reflects the energy outcomes generally achieved by the "traditional" energy audit methodology (see Figure 1). In this scenario, companies have a short-term focus on energy which will gain some benefits. These benefits are quickly lost due to no management commitment or change in business practices to ensure ongoing improvement.

In contrast, the continuous improvement (CI) methodology has an entirely different process for driving change (see Figure 2). The process gains top management buy-in early, and corporate/plant management commitment to implement cost-effective changes on a five-year+ horizon. Early (low hanging fruit) savings are locked in place through formal operating and maintenance procedures.

Operations staff is given accountabilities, performance metrics (and rewards), tools, and training to allow them to identify new savings

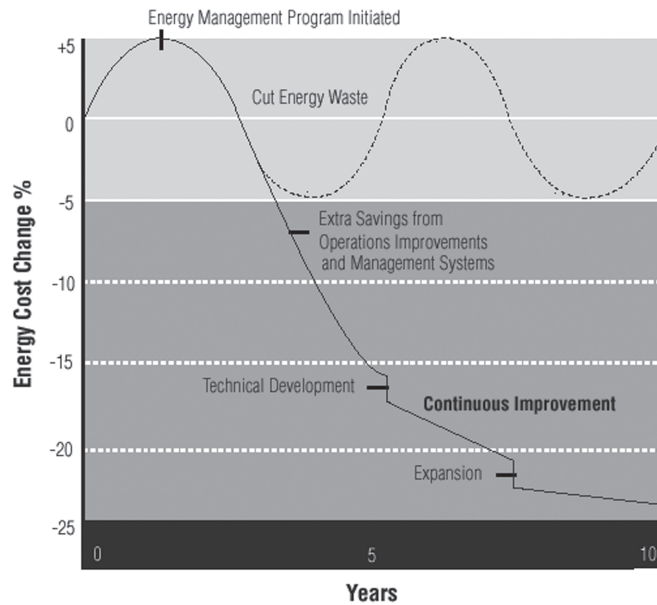


**Figure 1. Traditional Approach to Energy Management**

in their day-to-day operations, further driving down costs. When new equipment is purchased or a new plant installed, they are necessarily energy efficient because this is part of their formal business practices and culture.

Some of the basic features of the CI methodology are:

- Long-term top management commitment, initially gained through a diagnostic process and signing of a corporate commitment/partnering agreement.
- A focus on building internal competency in companies—i.e. teach the person to fish, rather than giving them fish (or long-term rebates).
- Integrates energy into other existing CI programs to utilize existing infrastructure to drive change.
- It is an ongoing process rather than a series of one-off projects.
- Captures the full range of savings available; i.e., it helps companies focus on energy savings in core processes using their internal skills



**Figure 2. Continuous Improvement Approach to Energy Management**

and know-how (rather than focusing on ancillaries that often use a small fraction of total energy, the outcome of many utility programs), and effectively addresses operations and maintenance savings, not just hardware retrofits.

- Deals with causes/cures rather than just symptoms; e.g., it helps determine that the energy opportunity is gained through solving a materials handling problem causing variable drier output, rather than installing variable speed drives on the dryer fans to treat the symptom.

#### ENVINTA'S INITIAL EXPERIENCES USING THE ONE-2-FIVE® ENERGY DIAGNOSTIC TOOL

EnVINTA developed a change management methodology focused on energy. As part of this methodology, the company developed a diagnostic and planning tool for its customers.

The initial concept was to develop a rating tool which would examine aspects found in a quality or other CI program, but for energy. The tool was facilitated by trained professionals with the company's senior management team (at site; the plant, operational, energy and financial managers, key engineering/maintenance staff; and at corporate level; vice presidents in these same areas) and delivered a one- to five-star rating for their practices for managing energy (hence the One-2-Five® name).

The One-2-Five® diagnostic quickly came to be used not only as a tool for larger energy-using companies, but also as a tool used by energy utilities with their business customers to reposition themselves as a proactive partner. The tool is also used by utilities to efficiently gain crucial customer information.

One-2-Five® usage has rapidly increased as energy is an issue that has become a significant business concern. There was a gap in the market for business tools to help companies quickly come to grips with their needs to define the best way to improve and measure progress.

The fact that this process can be conducted in two hours, including the review of results and the provision of an immediate action plan, has made it an awareness and planning tool that is extremely popular among customers, utilities, and agencies. It has also been well received for its great ability to attract and involve senior management in the process.

One-2-Five® software also provides automatic benchmarking of customer results against business practices reported by a further 1,300 that have completed the diagnostic. The benchmarking feature can provide a company with the tools to benchmark against a specific industry (down to four-digit SIC), or country.

EnVINTA found early on that it was important to conduct a follow-up management session within a week or two of the initial diagnostic to reinforce the diagnostic results and lock in place an initial plan of action. The company used the availability of benchmarking results as the hook to get managers back to the follow-up meeting.

#### EXPERIENCE USING ONE-2-FIVE® METHODOLOGY TO DRIVE CONTINUOUS IMPROVEMENT

A series of projects with the Northwest Energy Efficiency Alliance and other agencies confirmed that conducting the One-2-Five®

diagnostic alone was highly valuable in bringing energy management to the attention of senior managers. It was effective for generating an action plan, but there is also a need for active follow-up to support the diagnostic to ensure that companies implement the plan and initiate a genuine continuous improvement program.

EnVINTA found that to drive change in this area requires an ongoing support process to be effective. The company therefore developed a basic “coaching” methodology to help companies establish a continuous improvement process (see Figure 3).

EnVINTA also found that One-2-Five® can be a powerful tool to transform the existing array of technical, stove-piped utility programs into integrated and more effective activities. The company began to work with a number of proactive utilities that were open to this new methodology. These utilities (including both energy and water utilities) invested a considerable amount of their own time and initiative into getting the implementation process right. As a result, the One-2-Five®

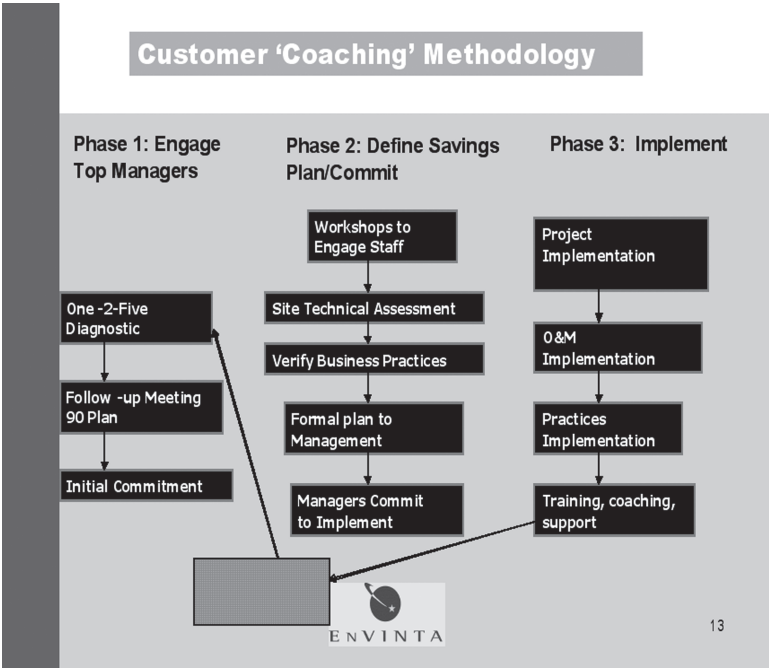


Figure 3. Customer “Coaching” Methodology

methodology has become one of the most popular elements in industrial energy efficiency and DSM programs across the country. These programs include activities managed by utilities, energy agencies, public utilities commissions, and other NGOs.

## ONE-2-FIVE® ENERGY CASE STUDIES

### 1. Stora Enso North America

Stora Enso North America is an integrated paper, packaging, and forest products company that is focused on levels of energy use and greenhouse gas emissions. The company is using One-2-Five® to bring all of its mills to a common level of management practices for energy.

The One-2-Five® sessions have shown that Stora Enso mills score above average as compared to the North American paper industry, but at the same time defined areas where improvements were possible. Stora Enso is acting on these recommendations to bring the mills to a consistent four-star rating during the next year. This would put them among the top 2 percent of industrial sites evaluated globally. The diagnostic process also allows businesses to benchmark their energy practices against 1,300 other sites and down to a four-digit SIC code on the One-2-Five® information base.

Tom Scharff, director of power and energy for Stora Enso North America stated, "The One-2-Five® program ranks the business practices of each site objectively, benchmarks the sites against each other as well as over the wider paper industry, and helps to focus each site on their critical actions to improve. It also allows us to regularly track how effectively each site is implementing the action plans developed from the diagnostics."

### 2. Xcel Energy

In 2002, Xcel Energy in Wisconsin established an integrated customer-partnering program utilizing One-2-Five® and Energy Achiever™ as the common introductory process for all customers to enable them to define customer needs. The company then packaged the EnVINTA programs with customer training, interactive software, collaborative account management planning and coordination with the State of Wisconsin's "Focus on Energy" program.

Xcel Energy account managers delivered this integrated program

in a small utility service territory, and in the first year the 18 involved customers achieved the following results:

- Committed projects annual energy savings: 9,178,032 kWh and 895,254 therms.
- Implemented projects annual energy savings: 8,351,695 kWh and 1,289,101 therms.

In addition to the fact that over 75 percent of customers engaged in the process are conducting implementation projects, the program has significantly increased customer satisfaction with a Wisconsin utility that was already achieving strong customer satisfaction ratings before it started One-2-Five®.

Bob Schultz, the Xcel Energy account manager for the WI region area talks about past programs run by Xcel WI for their business customers that provided technical energy audits and how they now engage customers more effectively through One-2-Five®: "The problem was, due to other priorities, organizations would pick out a couple of suggestions and then move on to other priority issues. Today, we engage the customer more effectively and involve more of their staff. We call this a 'teach-to-fish' approach."

### **3. NorthWest Energy Efficiency Alliance and J.R. Simplot**

The Northwest Energy Efficiency Alliance (NWEAA) has adopted One-2-Five® for use in its industrial programs being launched across the four northwestern states in 2005.

In a case study for the NW Energy Efficiency Alliance, the J.R. Simplot Company applied One-2-Five® Energy to six sites across its entire potato division. Achieving initial energy cost savings of over \$400K/yr through improvements in operating procedures, and identifying far larger savings (presently being implemented), the company committed to a corporate energy management program with targets, funding allocations for capital works, and metering and monitoring for energy management. The company is confident of achieving 10 percent+ savings across the food division in the next three years using this continuous improvement process.

David Hawk, director of energy natural resources for J.R. Simplot, said, "I am particularly enthusiastic about the way in which One-2-Five® involves all plant personnel, provides an analysis of plant and



corporate cultures and climates, allows us to create intra-company and industry benchmarks and the process through which One-2-Five® helps us to implement a sustained energy conservation and efficiency program. In truth, I would recommend One-2-Five® as the first step for anyone with a manufacturing plant who wants to have a legitimate sustained energy management program.”

#### **4. Illinois DCEO’s**

##### **Manufacturing Energy Efficiency Program (MEEP)**

The DCEO’s MEEP program aims to reduce the cost of doing business in Illinois by reducing energy costs and thereby protecting manufacturing jobs. MEEP involves key decision-makers in Illinois’s manufacturing facilities and focuses on measures that can bring high returns with modest investments. Initially, DCEO helps firms identify best practices in energy management that can be rapidly incorporated through EnVINTA’s One-2-Five® and Achiever™ tools.

Estimated savings for the five companies involved in the initial pilot program to test the methodology was \$1.75M.

“By providing businesses with this integrated program incorporating One-2-Five® and Achiever™ diagnostic tools with the services of energy professionals and detailed technical assessments, MEEP aims to make a profound impact on business energy efficiency in Illinois,” said DCEO Director Jack Lavin.

#### **5. State of Ohio’s Department of Development (ODOD)**

##### **Economic Development Program**

As part of its manufacturing economic development and retention program, the State of Ohio has funded activities to improve the competitiveness of local industries through improved energy efficiency and business management practices. Initially the program focused on energy audits and technical support but had limited success. ODOD was therefore looking for a complementary approach to help it engage companies from top management down to achieve sustained energy savings.

In 2002, following a successful pilot, ODOD contracted EnVINTA to license its One-2-Five® Energy process and software as the centerpiece of its customer contact program.

Program Manager Tony Sutor has been involved with the One-2-Five® Program from the beginning of its use at ODOD. “Previously the

department had run purely technical programs based around energy audits and we found that these identified savings were largely never implemented. We were looking for a process to convince the management teams for Ohio's manufacturers to engage in an ongoing sustainable approach to managing energy, which would deliver sustained results."

"We are confident that with the One-2-Five® approach we are on the right path. Our experience with the One-2-Five® program is that the customers engaging in the diagnostic and follow-up services actually implement the energy management strategies and technical projects. It's no longer just another report on the shelf," added Sutor.

One company involved in the ODOD initiative is Samuel Adams Brewery (Cincinnati). For 2004, the company's annual energy utility cost savings were 12 percent relative to 2001, and represented a savings of \$96,000 per year.

#### **6. MidAmerican Energy**

MidAmerican Energy, the highest ranked utility in the nation for business customer satisfaction (according to the J.D. Power and Associates 2005 Electric Utility Business Customer Satisfaction survey) is using the One-2-Five® process to partner with business customers and help them boost their profitability by improving energy efficiency.

Rick Leuthauser, MidAmerican Energy's manager for energy efficiency, stated that the One-2-Five® process "Provides the missing element to fully engage companies at the senior management level and helps our customers continuously improve management of energy resources."

#### **7. Sydney Water Corporation's "Every Drop Counts"**

Sydney Water, a leading Australian Water Utility, is running an aggressive and highly successful water efficiency program for its industrial customers, built around One-2-Five® Energy and Energy Achiever™ (a cut-down version of One-2-Five® for smaller companies) tools, but for water.

For many years Sydney Water offered free audits/technical services. These delivered limited savings as few companies involved implemented any recommended measures. Budgetary constraints and operating conditions combined with market volatility for their businesses were the common reasons given as to why they could not implement saving

measures.

The program was revamped three years ago with a strong emphasis on corporate commitment through the use of the One-2-Five® diagnostic, the development of an improvement plan, and the provision of services to help participating companies overcome the barriers in place to improve water performance.

Mohan Seneviratne, Sydney Water's business program manager says, "We are not only achieving a greater uptake of sustainable water conservation improvements with our commercial and industrial customers, but we are also enjoying stronger relationships and very high customer satisfaction results with our major customers."

The 262 companies involved in the program to date have achieved water savings of over 20 percent, or 15 Megalitres (over four million gallons) of water per day! The success has been so outstanding that other Australian water utilities that are running water DSM programs have identified Sydney Water's program as a benchmark program, and many have since integrated One-2-Five® and Achiever™ into their own programs.

Customers greatly appreciated the program, and to quote Justin Malcolm, director of Six Sigma, Westin Hotel (one of Sydney's most exclusive hotels): "The 'Every Drop Counts' business program is possibly the best program of its type I have seen offered by a utility. The program focuses on increasing awareness, producing immediate and reasonable action plans whilst moving forward towards sustainable savings."

## SUMMARY

1. The One-2-Five® Energy facilitated diagnostic has proven to be effective in engaging senior managers in the context of their continuous improvement activities. It is well accepted by senior managers of companies at all levels of sophistication and energy costs up to the very largest companies. Note that successful One-2-Five® facilitators have been accredited from the ranks of energy using company staff, public agency and utility staff, and many private consultants.
2. EnVINTA's experience across 20 major programs and nearly 2,000 diagnostic sessions shows that:
  - Companies that conducted One-2-Five® diagnostic sessions that

included senior managers and follow-up/planning meetings achieved about 10-15 percent savings and resulted in ongoing savings activity.

- Where the diagnostic session is closely linked with implementation/coaching support services and good account management, savings will increase to 50-75+ percent.
3. For companies without any structured approaches to managing any aspect of the business, it is a challenge to deliver the CI approach for energy.
  4. It is easier to achieve results if you can integrate energy management with existing CI programs (quality, safety, environment, plant reliability, maintenance, etc.) which already have an accepted methodology, management support, and the infrastructure to support change, such as awareness and training, measurement, and reporting processes. For example, it is easier to incorporate energy training in existing quality circles than as a stand-alone program. This is particularly true today as many companies are suffering from “change overload.”
  5. One-2-Five® is not for every company. It has good applicability across industry for sites using over \$0.5M of energy (EnVINTA uses Achiever™ for companies using \$50k-500k), but you can usually screen out 25 percent of customers that will not be well suited to a formalized CI approach. These are companies that have a “seat of the pants” management culture which is very informal and unstructured. Good prospects have existing CI programs, a sense of direction and good morale/teams. EnVINTA avoids using One-2-Five® with companies struggling to survive.
  6. The One-2-Five® energy management methodology can deliver effective and measurable energy efficiency savings.  
In EnVINTA’s opinion, all energy projects, be they operations and maintenance-based or related to a capital investment must have:
    - Written procedures incorporated in plant operating procedures;
    - Procedural training given to staff;

- Measurement on energy/utility use where feasible; e.g., compressed air consumption;
- A formal audit procedure to ensure the measures are still being implemented/equipment used as designed; and
- Have the practice incorporated in an energy management program with formal accountabilities and performance indicators.

## CONCLUSION

Since its launch, the One-2-Five® process has been integrated into energy management programs globally, and continues to pave the way for continuous improvement in energy management. One-2-Five® has transformed the way many organizations manage their energy and the way that many utilities engage their business customers in programs to reduce energy consumption. Due to the remarkable results achieved, business-practice focused and continuous improvement approaches to energy management are now becoming mainstream in the USA and around the world.