

# Industrial Sector Initiative

*Market Progress Evaluation Report*

*prepared by*

**quantec**

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# Evaluation of Industrial Sector Initiative

Final

Prepared for

**Northwest Energy Efficiency Alliance**

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# Executive Summary

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The Industrial Efficiency Alliance (IEA) is the brand name for the Northwest Energy Efficiency Alliance's (the Alliance) Industrial-Sector Initiative (Initiative), which incorporates all of the Alliance's market transformation activities in the industrial sector. This Initiative is distinguished from traditional, technology-oriented market transformation programs in two primary ways:

- It is based on a “holistic” strategy that targets end-users, trade allies, and utilities to promote a whole-system, rather than component-based, approach to analyzing and exploiting energy efficiency opportunities.
- It attempts to encourage industrial trade allies to develop energy-efficiency products and services and industrial firms to incorporate continuous energy improvement processes into the very cultural fabric of how they manage and operate their business.

The Initiative recognizes the importance of coordination with and taking full advantage of opportunities for collaboration with regional market partners such as Bonneville Power Administration (Bonneville), the Energy Trust of Oregon and utilities.

## Intervention Strategies

The thrust of the IEA's market transformation strategy is to work directly with industrial firms within the food processing and pulp and paper sectors; their trade allies; and their utilities to help mitigate market barriers to making energy efficiency an integral part of corporate decision making and plant operations. IEA is envisioned as an ongoing process of education, training, and persuasion that seeks long-term impact on key industries and leaders – rather than expecting to yield immediate, measurable results typically found in a traditional, technology-focused program.

Based on its strategic plan, the IEA is expected to produce approximately 130 aMW of electricity savings during its ten-year planning horizon (2005 to 2015). Targeted savings are equivalent to under 9% of total electricity consumption in the pulp and paper and food processing industries. Nearly 45 aMW, or 35% of these savings, are expected to be achieved during the first five years of the Initiative's operation from 2005 to 2009. Vertical market interventions in the pulp and paper and food processing industries account for approximately 60% of these savings. The remaining 40% are expected to originate from cross-cutting technology systems interventions. According to the Initiative's strategic plan, slightly more than 9% of savings are attributed to naturally-occurring conservation resulting from market-driven efficiency gains. An additional 50% of these savings are attributable to programs offered by utilities and Bonneville.

## First Year Evaluation Findings and Results

The evaluation of the Initiative aims to document the Initiative's development and implementation processes and assess its performance in terms of market effects and energy savings during its first three years of funding. The results of the evaluation will be reported in

four Market Progress Evaluation Reports (MPERs). This document constitutes the first MPER and focuses on Initiative activities and progress during its first year of operation. The following is a synopsis of evaluation findings.

### **Program Logic and Market Transformation Hypothesis**

1. The Initiative program logic model and expected results chain appear reasonable and consistent with the Initiative's market transformation hypothesis.
2. The planned market intervention strategies are innovative and comprehensive and appropriately address market barriers that have a demonstrable role in impeding energy efficiency investments and hampering the industrial sector's adoption of energy management practices.

### **Central Technical Assumptions**

1. Estimates of the Initiative's expected long-term electricity savings are based on technical assumptions concerning the potential impacts of each intervention strategy and their corresponding market penetration rates. In the pulp and paper industry, the largest savings opportunities are assumed to be in pump system efficiency improvements and motor efficiency. Larger opportunities are expected to exist in the food processing sector, particularly in energy systems improvements, motor efficiency, and refrigeration. Given the inherent inefficiencies of the targeted systems and their associated energy loss factors demonstrated in national studies of industrial energy use, the Alliance's ACE model assumptions appear reasonable, particularly for motor-drive systems.
2. The assumed levels of energy-efficiency potentials available in the two targeted markets are consistent with other energy efficiency potentials study results in the Pacific Northwest and appear reasonable and achievable.
3. To gain additional perspective on the validity of these assumptions, it is instructive to consider the Initiative's energy savings goals from the bottom up and state them as follows: *Given current loads in the two vertical markets, what impacts does each intervention strategy need to produce if the Initiative is to meet its target savings of 130 aMW?* The evaluation results show that, given the end-use energy-efficiency potentials in the two vertical markets, the expected impacts appear realistic. This is particularly the case for the Initiative's systems-based components.

Quantec will make a systematic assessment of these assumptions as data become available during the second and third years of the Initiative's implementation.

### **Market Characterization**

The results of this evaluation, obtained from a survey of industrial firms and supply chain market participants in the Pacific Northwest, support the characterization of the vertical markets rendered in the Initiative's strategic plan:

1. Purchased electricity and gas are by far the most prominent sources of energy for Northwest industrial facilities; there is a high level of awareness among industrial firms concerning energy issues; and controlling energy costs is a high priority for most.
2. Energy efficiency improvement opportunities are perceived to be high, and many industrial firms have either taken, or are taking, steps to track and manage their energy costs, particularly through behavioral changes.
3. There is a deficiency of formal energy management planning and oversight among industrial customers. Only 25% of surveyed firms reported having an energy management plan in place, and only 13% had a formal energy use tracking procedure in place.
4. Training in general, and energy management training in particular, is a high priority in the industrial sector, and there is strong interest in information and education addressing energy-efficient technologies and practices. Perceived barriers to adopting energy efficient technologies and practices include absence of corporate commitment as well as resource constraints.
5. Surveys of market participants in the industrial supply chain as well as trade allies indicate that energy efficiency and optimized solutions are important to their clients; respondents also voiced a strong interest in technical training addressing energy use and efficiency.

## **First Year Processes**

In 2005, the Initiative made significant strides in cultivating its market strategy, establishing a cohesive organizational and management structure, recruiting and training for key positions, and developing the necessary administrative and information infrastructures to support its operation.

Due in part to its novel approach and the complexity of its strategy, organization of the Initiative proved more difficult than expected and so led to delays in formation and consolidation of the administrative structure. The organization's development into its current configuration was the result of an adaptive process that addressed needs as they emerged and also lessons learned during the early implementation phases. Following incremental adjustments throughout the year, in November 2005, the Alliance project manager oversaw a substantial reorganization intended to address specific operational and management issues. In our judgment, and based on feedback from the implementation team, the changes were positive and resulted in a more cohesive structure with clearer and more effective lines of communication.

The Initiative has been successful in developing and deploying the necessary support infrastructures including a Web site, data tracking system, and administrative support, particularly for channel management and training coordination. There is, however, the need for improved quality assurance and control, particularly in data tracking.

Early problems were effectively addressed with regard to messaging and communicating value propositions, and the marketing team succeeded in formulating and articulating more effective value propositions that appear to better resonate with all target audiences including industrial firms, trade allies and market partners.

Team members understand Initiative long-term goals and strategic intent. There does, however, appear to be persistent confusion among team members about the definition and relevance of established key performance indicators and how they correspond with the Initiative's intended market effects and energy savings goals.

During the early states of implementation, coordination with local utilities did not receive sufficient attention and resources. The result was apparent confusion among some utilities, and in some cases, strained relationships with a few utilities. Primary reasons for concern are lack of effective and timely communication with utilities, especially as it pertains to the IEA's direct contact and interaction with the utilities' customers. Some of the confusion and tension may have stemmed from not all of the utilities being involved in, or adequately informed about, the Initiative's goals and strategic intent during its design phase. The implementation team is aware of these issues and is addressing them by developing a coordinated customer strategy. However, at the time of this report, a full description of this strategy is not yet available.

### **Progress Toward Key Performance Indicators**

The IEA planning and implementation team developed a set of thirty-three Key Performance Indicators (KPIs) based on goals approved by the Alliance's Portfolio Committee during the first year of the Initiative. These KPIs measure both impact and activity. For example, facilitating the adoption of continuous energy improvement practices by 8% in the food processing sector indicates a transformation of that market while completing a specified number of demonstration projects (6) is a measure of activity. In reviewing the KPIs, it is important to distinguish between the two types of measures to understand the Initiative's performance or progress.

In general, the Initiative seems to be on schedule for many of the vertical market training and business practice goals, except for the KPIs tracking the actual adoption and implementation rates of energy management programs. Progress on KPIs related to demonstrations/case studies, product/service development for trade allies, and market/utility coordination, was markedly behind schedule. However, we do not consider behind-schedule progress as a concern at this stage of implementation, especially given the delayed commencement of implementation activities and the fact that the team has made many promising connections and market inroads. Regardless, in the next two years, the implementation team will need to demonstrate significant progress in these areas to ensure achievement of overall Initiative goals. For a summary of recommendations relating to KPIs, see Chapter 7.

While KPIs serve as a critical project management tool, they are not equivalent to market progress indicators. Based on the Initiative's logic model, the original ISI strategy, and observations of initial project implementation, the evaluation team developed a set of market progress indicators that will guide our assessment of the degree of transformation of the Northwest industrial sector (See Chapter 3 for a list of the market progress indicators). Future Market Progress Evaluation Reports will assess market progress based upon these indicators.

# 1- Introduction

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This document presents the findings and conclusions of the first Market Progress Evaluation Report (MPER) on the Northwest Energy Efficiency Alliance’s Industrial Sector Initiative (the Initiative), a three-year energy-efficiency market transformation program targeting the Pacific Northwest industrial market. The materials in this document are organized into seven chapters. Chapter One presents the introduction and is followed by Chapter Two, which is devoted to describing the Initiative’s background, its rationale, working hypotheses, market barriers it aims to overcome, and its short- and long-term goals and objectives. Chapter Three presents the plan and methods for evaluation of the Initiative. The market baseline assessment is presented in Chapter Four and an assessment of performance vis-à-vis the Initiative’s Key Performance Indicators (KPIs) is discussed in Chapter Five. A summary of the process evaluation, along with recommendations for the first year of the Initiative’s implementation, are reported in Chapter Six. Finally, Chapter Seven presents our conclusions. More detailed evaluation findings and supporting material are presented in the Appendices A through I.

## Northwest Energy Efficiency Alliance

The Northwest Energy Efficiency Alliance (Alliance) was founded in 1996 as a non-profit corporation with a mission of promoting the adoption of energy-efficient technologies and practices in the Pacific Northwest. It does this by working with various market participants to make affordable, energy-efficient products and services available in the marketplace, thus bringing about lasting transformation in targeted markets. The Alliance works in partnership with regional utilities, public benefits administrators, state governments, public interest groups and energy efficiency industry representatives, as well as many industry and trade associations. It serves Oregon, Washington, Montana, and Idaho. The Alliance is funded directly by the Bonneville Power Administration (Bonneville) and 11 regional electric utilities. The System Benefits Charge Administrators provide funding from a public purpose charge paid by customers of investor-owned utilities located in Oregon and Montana.

## Programs and Initiatives

The Alliance pursues a market transformation toward energy efficiency with a wide variety of programs and initiatives targeting the residential, commercial, agricultural, and industrial sectors, as well as technologies used across sectors. Within the industrial sector, the Alliance has used methods such as technology support, tools development, and information campaigns and training, all of which were designed to help change energy use practices. Some examples of the Alliance’s other initiatives include: Electric Motor Management Initiative, Evaporative Fan VFD Initiative, Just Enough Air, MagnaDrive, Microelectronics Industry Initiative, and SAV-AIR, as well as participation in the national Compressed Air Challenge collaborative.

The Industrial Sector Initiative is the framework for Alliance market transformation activities and programs in the industrial sector. It is marketed under the name of “Industrial Efficiency Alliance” (IEA), and was launched in 2005 with the mission of “providing the NW industrial market with tools and collaborative opportunities to support the incorporation of efficient energy

management practices into the normal course of their business.” The Initiative’s intent is to accomplish this mission by enhancing industrial firm performance with electrical systems and reducing production costs. For the near term, the Initiative’s efforts will be focused on two vertical markets (pulp and paper and food processing) and on four cross-cutting technology markets (compressed air, pumps, motors, and refrigeration). The Alliance Board decided in July 2004 to fund the project for three years beginning in 2005. In December 2004, the Alliance selected a contractor through competitive solicitation to implement and administer the Initiative.

## 2- The Industrial Efficiency Alliance

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### Background

The Industrial Efficiency Alliance (IEA) is the name for the Alliance’s Industrial Sector Initiative, which incorporates all of the Alliance’s market transformation activities in the industrial sector. The Initiative has its roots in the Alliance’s earlier work, beginning in 2002, to develop and implement a systematic plan for a coherent and concerted effort to reach the whole Pacific Northwest industrial sector with a clear and consistent message on energy efficiency. The Initiative’s conceptual framework is grounded in the findings of a two-year research and development effort to characterize the industrial market in the Pacific Northwest and an interest on the part of the Alliance to formulate a coherent market transformation strategy. This work resulted in the development of the “strategic plan” for the Initiative.<sup>1</sup> The plan was accepted, and the Alliance Board approved funding in July 2004.

Three salient features distinguish the Initiative from traditional, technology-oriented market-transformation programs. First, it is based on a holistic strategy that targets both the supply and demand side of the energy efficiency market. The thrust of the Initiative’s market transformation strategy is to include, motivate, and engage all market participants. This is accomplished by forging alliances with industrial firms, establishing close working relationships and joint marketing initiatives with ancillary market players, such as vendors and consultants, and coordinating closely with regional market partners such as utilities, professional organizations, government agencies, and non-governmental organizations engaged in energy efficiency.

Second, it integrates common (cross-cutting) industrial technologies into energy management practices unique to each vertical market sector through training, information, demonstrations, and the introduction of new products and services. The Initiative aims to stimulate demand for energy efficiency products and services by encouraging industrial firms to incorporate strategic energy management into the very cultural fabric of how they are managed and operated.

Finally, it involves a whole-system, rather than component-based, approach to energy management. For example, rather than simply focusing on replacing individual equipment, such as motors, industrial firms are encouraged to analyze and identify energy efficiency opportunities in the entire motor-drive systems.

### Rationale

The Pacific Northwest boasts a diverse industrial sector that, in aggregate, has been showing strong signs of recovery after a long period of relative stagnation. The industrial sector is the largest economic sector in the Northwest region. It employs over 560,000 workers with a total payroll of nearly \$2.6 billion and creates \$73 billion in value added services. Many factors

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<sup>1</sup> Northwest Energy Efficiency Alliance: Industrial Sector Initiative: “A Strategic Plan for Market Transformation in the Industrial Market in the Pacific Northwest 2004-2009,” Final Report, July 12, 2004.



contribute to the makeup of the region's economic base, notably a mild climate paired with an abundance of natural resources and relatively low power costs owing to the region's large hydroelectric resources.<sup>2</sup>

Based on data available from U.S. Census Bureau, in 2002, the industrial sector accounted for 62% of total regional employment, 69% of regional shipments, and nearly one-half of capital outlays in the Pacific Northwest. NEEA selected the pulp and paper and food processing industries as two key vertical target markets for its industrial Initiative based on research and criteria documented in the Initiative's Strategic Plan.<sup>3</sup>

## **Pulp and Paper**

The pulp and paper industry (NAIC 3221) is a key U.S. industry and one of the Pacific Northwest's largest manufacturing sectors. The industry produces many commodity and specialty products essential to everyday life. The majority of paper products produced in the U.S. are domestically consumed. In 2003, domestic paper and paperboard shipments totaled 88 million tons, with exports accounting for only 9.5 million tons or roughly 10% of total shipments. The industry relies on timber products in the form of wood chips, wood scrap, or recycled materials as primary raw-material input. Due to heavy timber dependence, the pulp and paper industry is concentrated in areas where timber resources are abundant, namely the Southeast and Pacific Northwest regions of the U.S. An abundance of low-cost raw material and other inputs, such as electricity, has made the Pacific Northwest an attractive location for pulp and paper mills.

The majority of pulp and paper firms are vertically integrated and produce both pulp, paper and lumber products. In the Pacific Northwest, the pulp and paper industry is comprised of a small number of large firms that have been consolidating over the past decade. In 2005, the Pacific Northwest was home to 28 pulp and paper plants that produced nearly 10% of all national pulp and paper sales. Estimates from Lockwood & Post (L&P), published in 2003, show that the Pacific Northwest produces 30,000 tons<sup>4</sup> of paper annually. The largest companies operating in the regional market, such as Weyerhaeuser, Georgia-Pacific, and Boise Cascade, typically own multiple mills. The pulp and paper industry is a leading exporter in the region. Based on the 2003 Annual Survey of Manufacturers, the industry employed over 20,000 workers in the Pacific Northwest region and produced \$8 billion in shipments. Oregon and Washington make up the majority of regional production and account for respectively 31% and 60% of total industry employment.

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<sup>2</sup> For the purpose of this study, the industrial sector is defined in terms of the North American Industrial Classification System (NAICS) and includes all manufacturing (NAICS 31 through 33) and mining (NAICS 212).

<sup>3</sup> "Industrial Sector Initiative: A Strategic Plan for Market Transformation in the Industrial Sector in the Pacific Northwest 2004-2009." July 12, 2004.

<sup>4</sup> This estimate excludes pulp production. The production numbers for mills producing more than one end product are considered additive regardless of product type.

Pulping, the process of separating wood fibers, takes place through either mechanical or chemical processes. The chemical process uses sodium hydroxide and sodium sulfate under high pressure to break down wood fibers. Only a few firms in the Pacific Northwest rely on the mechanical process.<sup>5</sup> In the pulp and paper industry, the majority of process-related energy use is consumed by machine drives (93%), followed by process heating (2.4%), and electro and chemical processes (2%).<sup>6</sup> Given the corrosive nature of chemicals used in the manufacturing process, the equipment needs to be frequently maintained or replaced. The industry as a whole appears to replace rather than to reuse or overhaul. When purchasing new equipment, primary considerations tend to be initial costs, operating costs, and reliability.<sup>7</sup>

## Food Processing

Unlike the pulp and paper industry, which is characterized by a relatively small number of large mills, the Pacific Northwest food processing industry (NAICS 311) is made up of more than 575<sup>8</sup> companies, employing upward of 75,000 employees. This market is relatively evenly divided between large<sup>9</sup> (55%) and medium/small<sup>10</sup> (45%) firms. According to the 2002 Economic Census, the Pacific Northwest food processing industry is the third largest manufacturing industry, both in terms of employment (9%) and value of shipment (14%). In terms of capital expenditure, the food processing industry ranks first, with nearly 13% of all regional capital expenditures in the Pacific Northwest manufacturing sector owing to the industry's rapid growth over the past decade. Large processors, in particular, have made significant efforts to cut costs and become more competitive, mainly through adoption of more efficient technologies and processes.

The industry requires large amounts of energy for processing, such as for thermal processing (cooking), dehydration (drying), food preservation, and safety.<sup>11</sup> Other energy uses are related to packaging and storage, specifically cold storage. For the industry as a whole, the majority of energy use is related to motor-drive systems (64%), followed by refrigeration (32%), and process heating (4%).<sup>12</sup> Based on vastly different processing and manufacturing requirements, energy needs vary widely across processes. Besides grain and oilseed milling, and dairy, fruit and vegetable processors have the highest energy needs.

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<sup>5</sup> Ducker Worldwide (2000) "Market Research Report: *Energy Efficiency within the Pulp and Paper, Water and Wastewater and Irrigation Markets in the Pacific Northwest.*"

<sup>6</sup> 2002 MECS end use data for NAICS 3221.

<sup>7</sup> Ducker Worldwide (2000): 63.

<sup>8</sup> Represents companies with more than 20 employees only. Based on Dun & Bradstreet (D&B) data.

<sup>9</sup> Companies with more than 250 employees, as based on D&B data.

<sup>10</sup> Companies with more than 20 but less than 250 employees, as based on D&B data.

<sup>11</sup> Okos, Martin., et al. (1998) *Energy Usage in the Food Industry*. American Council for an Energy-Efficient Economy.

<sup>12</sup> Based on 2002 MECS end-use energy data.

## Energy Use Trends

The industrial sector is energy-intensive. Based on Northwest Power and Conservation Council (the Council) data, non direct-service industries (DSI) consumed approximately 4,620 average megawatts (aMW) of electricity in 2004, equivalent to 27% of the region’s non-DSI electricity consumption. This is most pronounced in Idaho and Montana, where the industrial sector accounts for 36% and 35% of state energy consumption, respectively. According to the Council’s latest forecast, industrial sector loads are expected to increase by approximately 2,300 aMW by 2025, or about 1.58 % per year.

Data published by the Department of Energy (DOE) Office of Industrial Technologies indicate that over 80% of annual electric use in pulp and paper mills is for operating electric motors. There is a lack of reliable data on manufacturing energy use at the regional level. However, national statistics on energy use per employee and regional employment figures may be used with reasonable accuracy to approximate sector-specific energy use. Based on the Alliance’s market characterization studies, annual electricity consumption in the pulp and paper and food processing industries is estimated at 1,010 aMW and 425 aMW, respectively.<sup>13</sup>

Manufacturing Energy Consumption Survey (MECS) data, published by IEA, suggest a moderate decline in industrial sector energy use. Historical figures reported in the MECS indicate that total energy used in manufacturing, including on-site electric generation, declined at an average rate of under 1.5% per annum from 1998 to 2002. The data also show a significant decline in total employment. This information, coupled with reported increases in energy use per employee, suggests a trend toward adoption of more energy intensive, labor-augmenting technologies in the manufacturing sector. These trends, however, are industry-specific and vary significantly between the pulp and paper and food processing sectors. While increases in energy use per employee is similar in the two sectors, total energy use and employment both increased in food processing. See Table 1.

**Table 1. National Trends in Manufacturing Electricity Use (1998 to 2002)**

	Total Electric Consumption (TWh)			Number of Workers (1,000)			MWh per Worker		
	1998	2002	%Δ	1998	2002	%Δ	1998	2002	%Δ
All Manufacturing	1,025.1	966.2	(5.7%)	17,057	14,876	(12.8%)	60.1	64.9	8.1%
Food Processing	67.4	73.1	8.5%	1,501	1,508	0.5%	44.9	48.5	8.0%
Paper and Paper	124.1	114.9	(7.4%)	576	491	(14.6%)	215.4	233.7	8.5%

As shown in Table 2, MECS data also indicate that energy intensity reductions were relatively uniform across all end-uses. In terms of kWh use per real dollar of shipments, motor-drive systems show the highest energy efficiency gains, particularly in pulp and paper manufacturing.

<sup>13</sup> See “*Opportunities for Electric Motor Systems in the Pacific Northwest*,” Prepared by Easton Consultants and XENERGY, Northwest Energy Efficiency Alliance, 1999.

**Table 2. Average Annual Change in kWh per \$1,000 of Shipments (1998 to 2002)**

	Heating	Cooling	Motor Drive	Electro/ Chemical	Other
Total Manufacturing	-0.7%	-0.4%	-1.4%	-2.1%	-0.4%
Food Processing	-2.2%	-1.4%	-3.5%	-1.2%	-1.4%
Pulp and Paper	-2.6%	-2.4%	-11.2%	-2.6%	-1.9%

The Technical Association of the Pulp and Paper Industry (TAPPI), has observed that energy efficiency improvements are mainly due to process efficiency gains, such as using waste products as energy sources, rather than investing in energy-efficient equipment. Currently, about 60% to 70% of total plant energy consumption is generated from waste products.<sup>14</sup>

### **Energy Efficiency Opportunities**

Although energy costs typically account for a relatively small share of total industrial outlays, energy efficiency improvements can be expected to reduce overall production costs, thus enhancing the industrial sector's ability to compete in manufactured goods national and global markets.

Recent studies of the industrial sector at the national and regional levels have provided ample evidence showing considerable opportunities for energy efficiency improvements, which may be captured at low cost and with attractive paybacks to participants. In its *Fifth Regional Power Plan*, the Council has estimated that there is a minimum of 5%, and as much as 11%, economically achievable conservation potential in the industrial sector.<sup>15</sup> On the other hand, a recent study of industrial energy efficiency potentials sponsored by the Energy Trust of Oregon identified achievable potentials of about 23% in Oregon at a levelized cost of under \$0.002 per kWh.<sup>16</sup> The Alliance's industrial energy efficiency potentials analysis estimates 544 aMW of achievable potential (approximately 12% of the Pacific Northwest region's industrial load),<sup>17</sup> which corresponds closely with the results of several other recent conservation potential studies sponsored by Pacific Northwest utilities.<sup>18</sup>

Energy efficiency opportunities vary across industries depending on industry type, manufacturing processes, and production process energy intensity. However, it is clear that significant opportunities exist in the pulp and paper and food processing industries, particularly

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<sup>14</sup> Ducker Worldwide (2000) Market Research Report: *Energy Efficiency within the Pulp and Paper, Water and Wastewater and Irrigation Markets in the Pacific Northwest*.

<sup>15</sup> See "Conservation Resources," Fifth Regional Power Plan, NWP&CC, May 2005.

<sup>16</sup> "Energy Efficiency and Conservation Measure Resource Assessment for the Residential, Commercial, Industrial And Agricultural Sectors." Prepared for the Energy Trust of Oregon, Inc., by Ecotope, Inc., and Tellus Institute, Inc., January 2003.

<sup>17</sup> "Industrial Sector Initiative," Appendix F, Market Characterization, Northwest Energy Efficiency Alliance, Third Review Draft, May 22, 2004.

<sup>18</sup> See, for example, "Assessment of Technical and Achievable Demand-Side Resource Potentials," prepared for Puget Sound Energy by Quantec, LLC, April 2005.

in motor-drive systems, which account for over 93%<sup>19</sup> and 64%<sup>20</sup> of total electricity consumption, respectively.

## Market Transformation Hypothesis

Industrial consumers have been reluctant to invest in energy efficiency, thus creating an investment “gap,” which is evidenced by the difference between energy efficiency investment levels appearing cost-effective (based on engineering/economic analysis) and the actual, lower investment levels. This gap results from industrial consumers’ apparent willingness to invest in options offering a particular revenue stream and reluctance to invest in capital projects that deliver lower operating costs unless they promise substantially higher returns on investment. While investors theoretically should be equally willing to invest in options offering the same expected return for the same levels of risk and liquidity, it appears in reality that they are not.

While high up-front costs, lack of access to financing, and competing internal priorities have often been cited as the main energy efficiency investment impediments, there is a large body of evidence indicating that other, non-economic factors have at least as large of an influence on energy investment decisions.<sup>21</sup> These include, among other things, lack of awareness and information, uncertainty concerning the costs, returns and perceived risks of energy-management investments, inadequate knowledge of energy-efficiency technologies and practices, and institutional and cultural settings that guide business investment decisions. This is particularly the case for smaller manufacturing plants.

As a preparatory step for designing the Initiative, the Alliance conducted primary research to characterize the Pacific Northwest industrial market and identify barriers to adoption and implementation of energy-efficiency practices. The research findings suggested that the sub-optimal levels of energy efficiency investment stem mainly from three sources:

- Absence of corporate energy management policy and practices resulting from an apparent lack of awareness concerning energy use, energy efficiency, and potential returns at both the corporate and plant levels.
- Lack of technical know-how with identifying and addressing energy-efficiency opportunities.
- Low supply chain and trade ally interest in offering energy-efficient products and services.

These barriers form the foundation for the Initiative’s overall market intervention strategies and tactical elements.

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<sup>19</sup> Based on 2002 MECS end-use energy data.

<sup>20</sup> Based on 2002 MECS end-use energy data.

<sup>21</sup> See William H. Golove and Joseph H. Eto, “Market Barriers to Energy Efficiency: A Critical Reappraisal of the Rationale for Public Policies to Promote Energy,” Lawrence Berkeley National Laboratory, University of California, Berkeley, California, LBL-38059, March 1996.

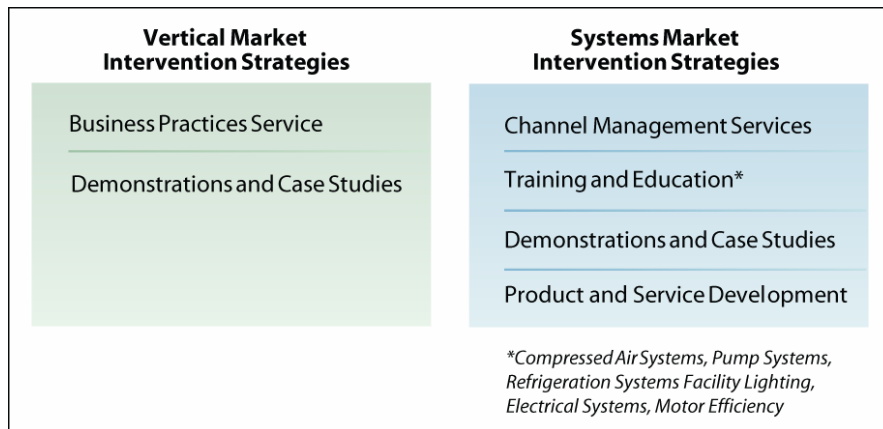
## Intervention Strategies

The thrust of the Initiative’s market transformation strategy is to work directly with industrial firms and their trade allies to help mitigate identified market barriers and make energy efficiency an integral part of corporate decision making and plant operations. This would result in a natural, market-based demand for system-oriented efficiency improvements.

The Initiative is envisioned as an ongoing process of education, training, and persuasion that seeks long-term impact on key industries and leaders – rather than expecting to yield immediate, measurable results typically found in a traditional, technology-focused program. At its core, the Initiative’s overall intervention strategy is anchored in two principal elements: vertical market interventions and cross-cutting technical services.

During its first three years of operation, the Initiative will focus on two vertical markets: pulp and paper and food processing. The targeted plant energy uses within these vertical markets are primarily motor-drive systems, facility lighting and HVAC, operations and maintenance (O&M), and, in the case of food processing, refrigeration. The vertical market intervention strategy will reinforce the cross-cutting intervention strategy by promoting a systems-based approach to energy management. Figure 1 shows a summary of the Initiative’s intervention strategies for the vertical and cross-cutting markets.

**Figure 1. Intervention Strategies**



### Vertical Market Interventions

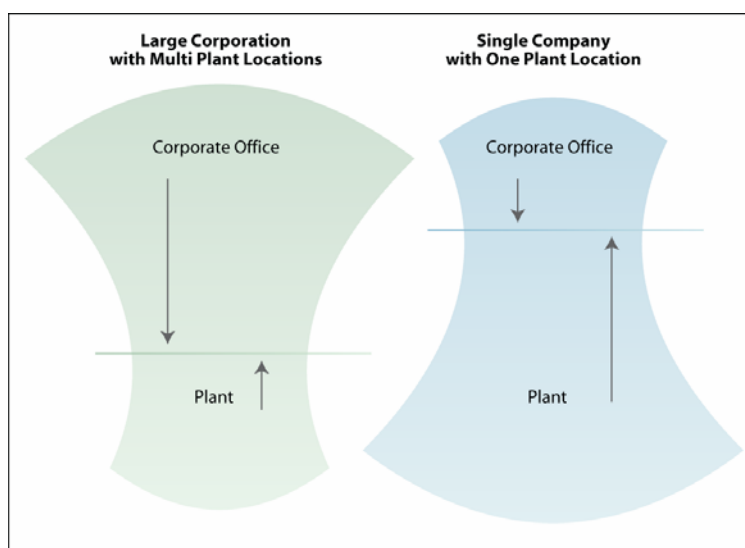
The vertical market intervention strategies provide services that are tailored to address the unique needs of the two vertical markets, pulp and paper and food processing, and incorporate two tactical elements: business practices services and demonstrations and case studies. Together with training and education, business practice services is one of the core strategic elements and primary sources for realizing energy savings.

## ***Business Practices Services***

This element of the vertical market intervention strategy focuses on mitigating corporate institutional barriers that impede adoption of efficiency-oriented energy management policies and practices. The Initiative’s strategic plan recognizes that addressing these barriers requires a combined top-down (corporate-level), bottom-up (plant and employee-level) approach. This approach can produce understanding and commitment at every level, from senior managers, who must provide the necessary leadership and financial resources, to line operators and individual employees, whose daily actions collectively result in improved energy performance.

In addition to working with both corporate- and plant-level staff, the Initiative is also focused on addressing and bridging communication barriers between them. Figure 2 illustrates the different types of firms encountered by the Initiative. Depending on the targeted firm corporate structure, the effort and resources associated with targeting either corporate or plant staff can vary widely.

**Figure 2. Initiative’s Top-Down/Bottom-Up Approach**



The necessity and importance of this top-down/bottom-up approach has been echoed in several industrial sector studies. For example, a report issued by the Conference Board, a non-profit research and development institute serving the U.S. manufacturing industry,<sup>22</sup> recognized this approach as a “critical component of developing an energy strategy and maintaining alignment throughout the organization.” Data from the ENERGY STAR<sup>®</sup> initiative report recognized that the rewards can be enormous for strategies aimed at changing such “cultural” practices, amounting to annual savings of up to 10% of energy operating costs. This study further recognized potential for widespread improvements, benefiting not only individual companies, but entire sectors, the broader economy, and the environment as well.

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<sup>22</sup> Charles Bennett and Meredith Armstrong Whiting, “Roadmap for Strategic Energy Planning and Management,” The Conference Board, R-1365-05-RR, 2005.

The advantages of instituting such an approach with developing energy-management policies and practices are also echoed in recommendations made in a recent National Association of Manufacturers (NAM) report. The report links existing sub-optimal energy management practices to widespread absence of energy-cost tracking and monitoring procedures and “outmoded” accounting practices, which focus on short-term capital outlays rather than long-term life-cycle costs.<sup>23</sup>

The benefits of corporate-wide energy management policies also extend beyond mere energy-cost savings. As indicated by the Conference Board, U.S. companies are increasingly adopting business postures sensitive to stakeholder concerns that extend beyond investors and regulators. In addition, there has been an increasing trend for companies to focus more attention on developing practices focused on sustainability, corporate citizenship, corporate social responsibility (CSR), or the environment. Regardless, energy efficiency-focused policies go far in demonstrating that the company takes actions to minimize its adverse impacts on and increase its contributions to environmental quality.

In the food processing sector, the Initiative’s intervention strategy relies primarily on the Northwest Food Processors Association’s communications channels to promote business practices within core target markets and facilitate spillover to the remaining food processors market.

### ***Demonstrations and Case Studies***

Demonstrations and case studies offer significant potential for showcasing the actual, tangible results of the Initiative’s offerings as they relate to both vertical markets and cross-cutting technologies. In addition to immediate savings from completed projects, demonstrations and case studies can produce spillover effects throughout vertical markets. Demonstration projects will be targeted at the motor drive, pumping, compressed air, process control systems technical markets and, in the case of food processing, at the refrigeration market. These demonstrations will help facilitate information about the effectiveness of under-utilized systems optimization technologies, measures, and practices. More importantly, they can serve as an effective medium for conveying the value of corporate-wide integration of practices reflecting commitment, execution and ongoing buy-in at all levels of corporate decision-making and plant operation. The Initiative envisions working closely with utilities and other market partners to fund and develop demonstration projects and case studies.

### **Systems Market Interventions**

The Initiative’s systems intervention mechanisms aim to promote adoption of energy-efficient technologies, procurement practices, and equipment maintenance and operation practices for generic industrial systems, namely motor equipment, pumping, air compression, and, in the case of food-processing, refrigeration. In the longer term, the Initiative will also develop process controls strategies. The Initiative’s strategy for systems technical services incorporates four

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<sup>23</sup> Efficiency and Innovation in U.S. Manufacturing Energy Use, The Manufacturing Institute, National Association of Manufacturers, 2005.



specific tactical elements: 1) Technical Training and Education, 2) Channel Management, 3) Product and Service Development, and 4) Demonstration and Case Studies.

### ***Technical Training and Education***

This intervention consists of a technical training and education effort targeted at technical and operational staff of industrial firms and trade allies that informs them about the energy and non-energy benefits of a systems-based approach. It focuses on total energy systems rather than particular components. It also provides the necessary tools and techniques to support that approach.

The rationale for focusing on systems springs from the fact that only a small fraction of total industrial production process energy inputs are converted into actual, useful work. As a recent study sponsored by the U.S. Department of Energy, Office of Energy Efficiency and Renewables, has shown, on-site losses, such as losses occurring within plant boundaries, account for about 32% of total energy loss. On-site losses occur throughout the manufacturing process and include distribution (steam traps, valves, pipes, and electric lines), energy conversion (process heating and cooling and conveyance), and motor systems. These losses generally tend to be industry-specific and may vary from plant to plant depending on equipment design and age and operations and maintenance practices.<sup>24</sup>

Motor-driven systems account for 12% of total energy used and more than 50% of total manufacturing electricity use<sup>25</sup>. Motor losses represent losses in motor windings, as well as in mechanical motor-driven systems, such as pumping, air compression, refrigeration, materials handling, and processing. As shown in Figure 3, losses in motor systems range between 5% for material handling and windings, to nearly 90% for material processing. These figures clearly indicate far greater opportunities for efficiency improvements in motor driven systems than in the motor equipment. Energy efficiency potentials studies have shown that, while efficiency opportunities of between 3% and 5% may exist for motor equipment, there is the potential of 20% to 50% savings in motor-drive processes and control systems that govern how these processes operate.<sup>26</sup>

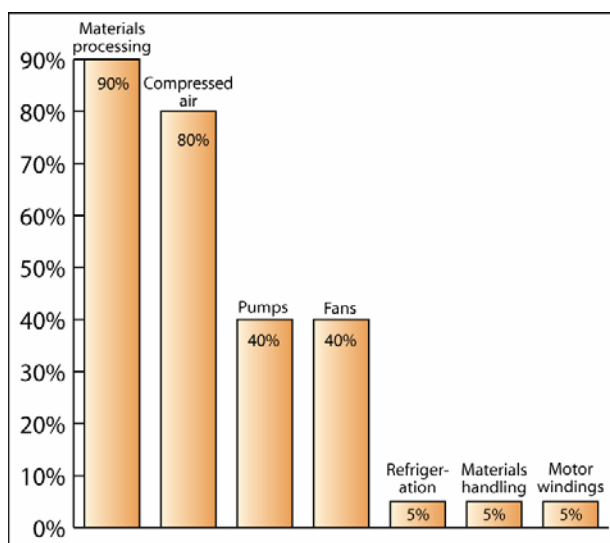
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24 “Energy Use, Loss and Opportunities Analysis: U.S. Manufacturing and Mining,” Prepared by Energetics and Prepared by Energetics, Incorporated and E3M, Incorporated for the U.S. Department of Energy Office of Energy Efficiency and Renewable Energy, Industrial Technologies Program, December 2004.

25 Ibid.

26 *Evaluation of the U.S. Department of Energy Motor Challenge Program*. Washington, DC: U.S. Department of Energy, prepared by Xenergy for the Oak Ridge National Laboratory, 2000.

**Figure 3. Energy Loss Factors In Industrial Motor Systems<sup>27</sup>**



Both targeted vertical markets will be offered customized education, training, and technical services focused on a “systems” approach to operation and maintenance of motor drive systems, pumping systems, compressed air systems, and, in the case of food processing, refrigeration systems. This intervention strategy has a strong technical emphasis, but ties directly into the business practices service component of the vertical markets strategy to engender a widespread and deep-seated cultural change and perspective in the way energy-efficiency matters are analyzed and addressed.

To the extent possible, the trainings will leverage existing programs and assessment tools, such as those developed under the U.S. Department of Energy’s Motor Challenge, Compressed Air Challenge, and Pumping System Assessment Tool (PSAT). Additional training curricula would be developed where necessary, in collaboration with other sponsoring organizations, such as utilities, trade associations, manufacturing extension services, universities, and trade allies. Trade ally training would include assistance with promoting a systems optimization approach for their client offerings.

### ***Channel Management Services***

Channel management is the most technically-oriented element of the systems intervention strategy and serves two functions. First, it provides necessary technical know-how and specialized expertise to support systems training activities in the vertical markets. Second, it works directly with industrial supply channels and trade allies to increase awareness and understanding of the systems optimization business case. It also encourages trade allies to provide these services as part of their normal client offerings. Channel management is an

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<sup>27</sup> “Energy Use, Loss and Opportunities Analysis: U.S. Manufacturing and Mining,” Prepared by Energetics and Prepared by Energetics, Incorporated, and E3M, Incorporated, for the U.S. Department of Energy Office of Energy Efficiency and Renewable Energy, Industrial Technologies Program, December 2004.

important instrument for extending the reach (spillover) of the Initiative's core intervention strategies to the broader market. This effort will also include pursuing joint market development and promotional opportunities with interested supply chain participants, such as equipment vendors, sales representatives, and technical consultants. The main purpose of channel management activities is to complement and facilitate greater penetration of system-based training and product and services.

### ***Product and Service Development***

This intervention will develop products and services to facilitate adoption of business practices and systems optimization in the marketplace. To the extent possible, this strategic element will encourage existing market channels to develop, market, and maintain necessary products and services. Opportunities in this area include, but are not limited to, analytical software tools, standardized technical specifications, and best practices manuals for Initiative-targeted systems. The Initiative's strategic plan has also identified areas where such efforts might be carried out in collaboration with industrial associations and trade allies, while working with utilities to incorporate them into their energy-efficiency program offerings.

### ***Demonstrations and Case Studies***

See the *Demonstrations and Case Studies* information in the vertical market strategy section above.

## **Marketing Coordination**

The Pacific Northwest has been one of the leading proponents of U.S. environmental protection and energy efficiency. Under the auspices of the Northwest Power and Conservation Council and Bonneville, and sponsorship of local investor-owned utilities, the region has been engaged in promoting energy efficiency and demand-side management since late 1970s. Many regional entities, including Bonneville, local utilities, and state System Benefits Charge Administrators, such as the Energy Trust of Oregon, currently promote energy conservation through various mechanisms, such as education, technical assistance, financial grants and loans, and tax credits. There are also other government agencies and non-governmental organizations with programs focusing on environmental protection, sustainability, and water conservation that are pursuing programs indirectly affecting energy usage.

In many respects, the Initiative's offerings and services offered through a number of these programs are complementary. This provides opportunities to exploit their synergies to generate mutually beneficial outcomes. For example, the Initiative could act as a clearing house for information on services offered through these other programs and leverage this information to structure energy efficiency projects that are financially more attractive to industrial decision-makers. Further, the Initiative could utilize existing communication channels, such as local utility key account management services, to advance its own marketing efforts. Opportunities also exist for collaboration in the areas of joint marketing, training, and demonstration project development.

The Initiative’s strategic plan recognizes the paramount importance of coordinating with such entities and other potential market partners, such as trade associations. For example, the Northwest Food Processors Association (NWFPA) functions as a strong advocate and resource for its members and represents food processors interests in Idaho, Oregon, and Washington. It has been identified as a key ally in the implementation process. While NWFPA’s member assistance spans a variety of topics such as technology, environmental issues, government affairs, and productivity issues, one of its key interests is energy efficiency promotion. Based on information provided on the Association’s Web site, NWFPA has more than 450 member companies, including 86 food processors with nearly 200 production facilities throughout the Pacific Northwest. Given that, the Initiative’s strategic plan considers close coordination with NWFPA a primary channel to the food processing market.

## Goals and Targets

Based on the Initiative’s strategic plan, it is expected to produce approximately 130 aMW of electricity savings during its ten-year planning horizon (2005 to 2015). Targeted savings are equivalent to under 9% of total electricity consumption in the pulp and paper and food processing industries and less than 24% of the sector’s region-wide achievable potential. Nearly 45 aMW (35%) of these savings are expected to be achieved during the first five years of the Initiative’s operation from 2005 to 2009. Vertical market interventions in the pulp and paper and food processing industries account for approximately 60% of these savings. The remaining 40% are expected to originate from systems interventions. According to the Initiative’s strategic plan, slightly more than 9% of savings are attributed to naturally-occurring conservation resulting from market-driven efficiency gains. An additional 50% of these savings are attributable to credited programs offered by utilities and Bonneville (see Figure 4).

**Figure 4. Distribution and Allocation of Expected IEA Savings by Intervention Strategy and Allocation (2015 aMW)**

	Naturally-Occuring Conservation	Utility/Bonneville Initiatives	Alliance Share	Total
Cross-Cutting Systems Intervention	5	27	22	54
Vertical Market Intervention				
Pulp and Paper	3	16	13	32
Food Processing	4	21	17	43
<b>Total</b>	<b>12</b>	<b>64</b>	<b>52</b>	<b>129</b>

Estimates of the Initiative’s expected long-term electricity savings are derived based on technical assumptions concerning the potential savings of each intervention strategy and expected market penetration rates. As indicated in the Alliance’s Cost-Effective (ACE) Model, savings estimates from the vertical market and systems intervention strategies are derived based on the expected

long-run maximum “technical” energy efficiency potentials of about 20% and 30% in the pulp and paper and food processing sectors, respectively (see Table 3). In the pulp and paper industry, the largest savings opportunities are assumed to be in pump system efficiency improvements and motor efficiency. Larger opportunities are expected to exist in the food processing sector, particularly in energy systems improvements, motor efficiency, and refrigeration.

**Table 3. Assumed Energy Savings Potentials By End-Use and Sector**

	Pulp and Paper	Food Processing
<b>Vertical Market Systems-Base Intervention</b>		
Pump System Efficiency	6.0%	3.0%
Fan System Efficiency	1.0%	0.1%
Energy Systems Improvements	0.8%	5.6%
Process System Improvements	1.5%	1.2%
Operations and Maintenance	2.5%	5.0%
Refrigeration		5.0%
<b>Total</b>	<b>11.80%</b>	<b>19.9%</b>
<b>Systems Technologies</b>		
Motors		
Motor Efficiency	5.0%	5.4%
Motor Downsizing	0.8%	1.4%
Rewind Improve	0.8%	0.7%
Compressors	0.7%	1.2%
Lighting	0.7%	2.0%
Electrical Systems	0.5%	0.1%
<b>Total</b>	<b>8.5%</b>	<b>10.8%</b>

Given the target systems’ inherent inefficiencies and the associated loss factors, (see Figure 3 discussion above), the ACE model assumptions are reasonable, if not conservative, particularly for motor systems. A recent study sponsored by the U.S. Department of Energy, for example, found total potential motor system efficiency savings to be as large as 15% of baseline energy usage. Motor system design and operation improvements, such as adding controls to compressed air systems or matching pump sizes to measured load, account for 10.5% of the savings and an additional savings of 4.5% for improvements to the inherent efficiency of motor equipment.<sup>28</sup> For specific motor-drive systems such as pumps, potential savings can be as large as 30% of baseline.<sup>29</sup> Similar savings are also possible in compressed air systems, where expected achievable average savings are equivalent to 7.5% of baseline.<sup>30</sup>

<sup>28</sup> U.S. Department of Energy, Office of Industrial Technologies, Motor Challenge Market Assessment Study, prepared by XENERGY for the Oakridge National Laboratory, 2000.

<sup>29</sup> U.S. Department of Energy, Office of Industrial Technologies, Evaluation of Motor Challenge Training Program, prepared by XENERGY, 2000.

<sup>30</sup> Evaluation of the Compressed Air Challenge Program, U.S. Department of Energy, Office of Industrial Technologies, Energy Information Administration, 2002.

To test the Initiative’s savings target validity, the Alliance conducted additional analyses to explore the practical implications of these targets in terms of the expected impacts of the Initiative’s main intervention strategies. This analysis, characterized in the Initiative’s strategic plan as a “bottom-up” approach, was intended to answer the following question: *Given current loads in the two vertical markets, what impacts does each intervention strategy need to produce, if the Initiative is to meet its target savings of 130 aMW?*

The results of that analysis, summarized in Table 4, show that the impacts appear realistic, given the end-use energy-efficiency potentials in the two vertical markets. This is particularly the case for the systems-based components of the vertical market interventions and the training and education component of the systems interventions. The assumed impacts of corporate energy policy and practices on energy consumption appear reasonable. However, due to the paucity of research results in this area, it is difficult to judge the validity of the assumed savings potentials at this point. A systematic assessment of these assumptions will be made as data become available during the second and third years of the Initiative’s implementation. Channel management activities aim to complement and expand systems-based training, thus the assumed savings for this intervention are set at the same level as systems-based intervention at 5% of plant consumption.

**Table 4. Assumed Energy Savings Impacts by Intervention Strategy**

Intervention Strategy	Percent Savings per Participant
<b>Vertical Market Intervention</b>	
Training	5%
Business Practices	15%
Systems-Based Training	5%
Refrigeration (Food Processing)	15%
<b>Systems Technologies</b>	
Training and Education	5%
Channel Management	5%
Product and Services Development	10%
Demonstrations and Case Studies	10%

Note: The shown savings fractions are not additive. Energy savings originate primarily from change in business practices and systems optimization; other interventions, such as channel management, act as “conduits” for business practices and systems optimization.

## Implementation Process

The Initiative implementation process has its primary basis in the program logic model. The implementation plan was designed to address identified market barriers through activities that, combined into specific intervention strategies, target identified market barriers. The key phases of the implementation process included establishing goals and identifying a set of representative key performance indicators (KPIs), developing the organizational structure, developing necessary infrastructures for internal and external communication, launching market intervention strategies, and finally, refining the implementation strategy based on feedback and lessons

learned from the earlier implementation phases. Following is a discussion of some of the key elements.

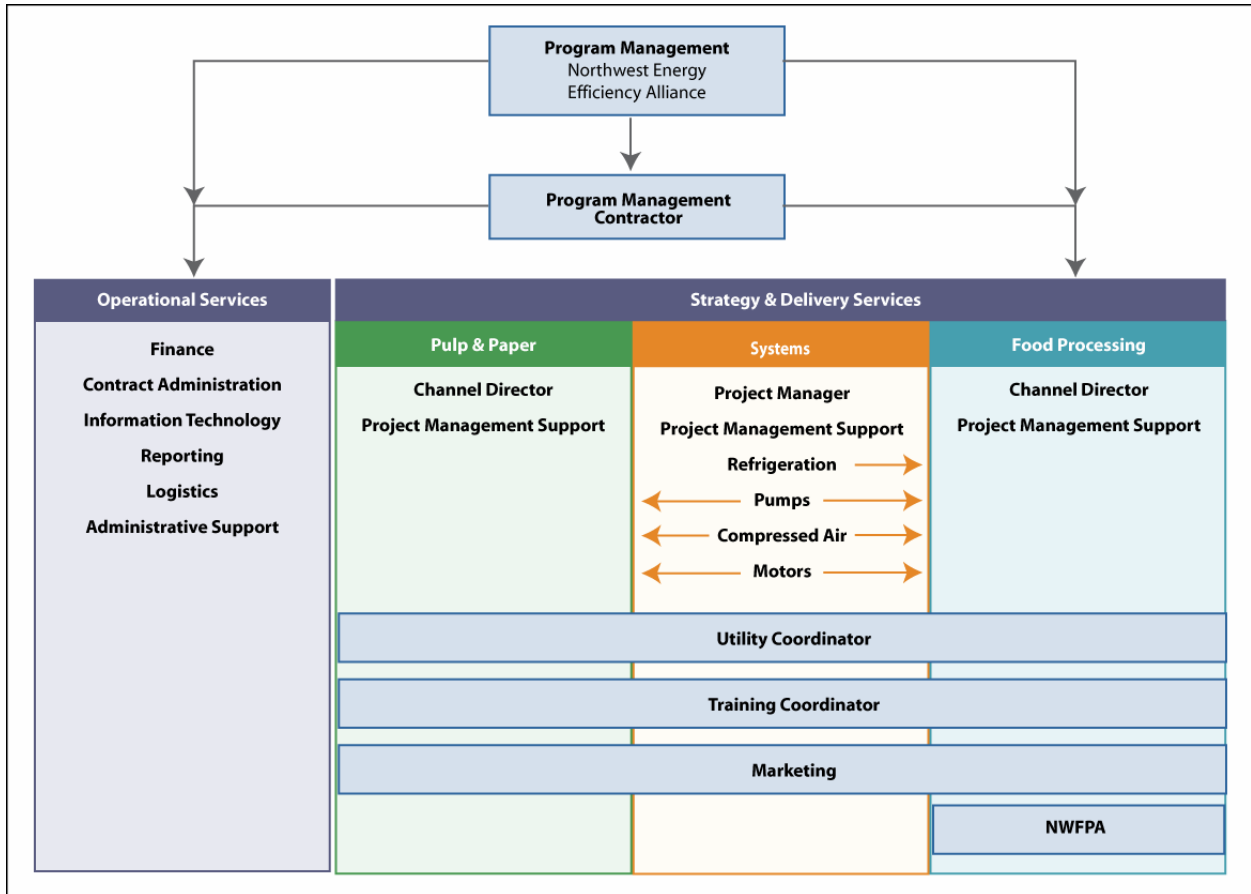
### **Establishment of Goals**

Successful Initiative implementation requires a set of activities, or tactical elements, that enable the effective deployment of market intervention strategies designed to overcome identified market barriers. Progress toward the long-term goal of market transformation is approximated by specific KPIs that track market actor participation in trainings, and adoption and implementation of energy management plans (i.e., purchase decisions, operations and maintenance). Using the best information available at the time, design team members and Alliance staff collaborated on developing the first set of KPIs with the understanding that the KPIs would be revised as more information became available during the first year of implementation.

### **Development of Organizational Structure**

Due to the size, scope, and complexity of the Initiative, its implementation requires a highly structured yet flexible organizational and management model. From a functional perspective, the Initiative team is comprised of Alliance program management, the project management contractor (PMC), including channel directors and other implementation staff, the Utility Coordinator, and the marketing team. See Appendix A for a more detailed description of IEA team members.

**Figure 5. Functional Organizational Chart of IEA**



### Development of Implementation Infrastructure

A necessary condition for Initiative success is effective communication among the implementation team and between the implementation team, Alliance staff, trade allies and market partners. While a variety of mechanisms are being used to address this need, the three main media for internal communication are meetings, documents, and the IEA Intranet (the Intranet). See Appendix B for an overview of the Initiative’s communication tools. In addition, a number of formal procedures were put in place to help manage the high volume of communication between the Initiative team (particularly channel directors and their target audiences), specifically the development of the online information tracking system (ITS). The ITS Web site was developed to provide the Initiative team with a central data entry and warehousing tool. It also serves as a contact relations management tool. The ITS represents one of the key data sources for the evaluation team to track and report Initiative activities. (See Appendix B for a more detailed discussion about ITS.)

The primary objective of external communications is to effectively disseminate information about the Initiative into the broader market in a manner that increases understanding, heightens interest, and encourages participation. The marketing team is leading the external



communications effort by providing services ranging from planning and strategic support (such as messaging, coordinating media contact, and assistance in developing effective value propositions) to developing a variety of marketing and collateral materials (such as brochures, presentations, fact sheets, and so forth). In addition, the marketing team developed and maintains the Initiative's Web site. The Web site is intended to provide general information about the Initiative, the types of customers it serves, and its benefits. The IEA Web site offers several specific resources, such as a regional training calendar and access to case studies and information about the EnVINTA<sup>31</sup> assessment tool (see Appendix B for a more detailed discussion of the Initiative's Web site).

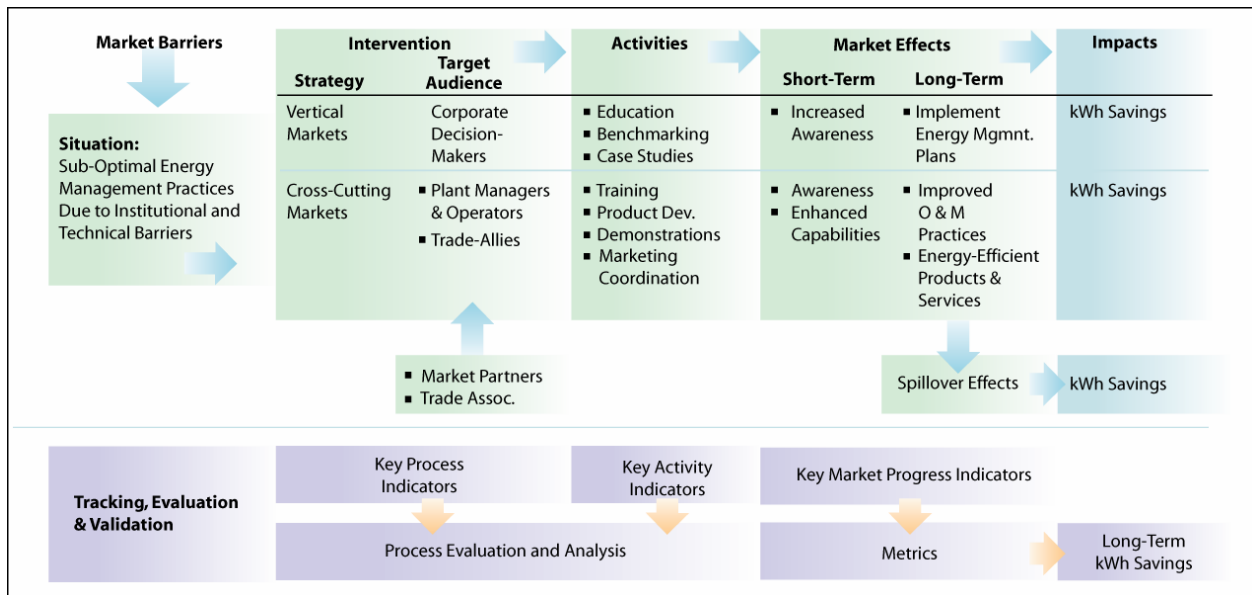
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<sup>31</sup> The EnVINTA One-2-Five is a comprehensive diagnostic tool that helps organizations evaluate their current energy cost control situation and identify opportunities for further reducing both facility energy use and greenhouse gas emissions. Specifically, the tool systematically investigates current corporate energy management systems, applies each category of collected information to a ranking scale, provides an overall organizational score (1 star through 5 stars), and offers a gap analysis and an industry-specific best practices action plan for each inventoried area. One-2-Five® also features an industry benchmarking tool that stores combined data, collected from multiple clients to produce industry-specific benchmarks. .

### 3- Evaluation Plan, Components, and Methods

As in all evaluations, development of a logic model, or results chain, based on the Initiative’s program theory, was a preliminary step in the Initiative evaluation. The main objectives in this task were to develop an understanding of and to articulate the conceptual underpinnings of the Initiative, provide a systematic framework for examining the planned activities, and determine how various activities are linked to the Initiative’s intended outcomes and impacts. The logic model also provided the basis for developing the evaluation plan. Figure 6 illustrates the principal components of the evaluation and their relationship with the Initiative’s program logic model.

**Figure 6. The Initiative’s Logic Model and Corresponding Evaluation Activities**



### Market Progress Indicators

Market Progress Indicators are measures of “market progress toward long-term project goals according to the project’s logic model/market transformation theory.”<sup>32</sup> These indicators are critical to evaluating the progress of market transformation projects during their implementation, because plain evidence of complete market transformation frequently is not seen for 5-10 years or longer—often in the post-funding period.

While evaluators use Market Progress Indicators to gauge the “effect” of the Alliance’s market intervention efforts, the IEA implementation team created 33 Key Performance Indicators (KPIs) to measure the project’s performance with respect to those market intervention efforts. The

<sup>32</sup> *Evaluation at the Northwest Energy Efficiency Alliance*, page 1. January 7, 2004

project team uses these KPIs to measure progress on the activities that will theoretically result in market transformation, according to the project's logic model.

Nine of the 33 KPIs overlap with the key market progress indicators listed below (the overlap is indicated in bold italics), while the other 24 KPIs measure participation levels, activity intensity and completion of demonstrations. (See Chapter 5 for an overview of the KPIs.)

## **Energy Management Plans**

- *Percent of Food Processing and Pulp and Paper Firms that Implement Energy Efficiency Policies and Practices [see KPI #'s 2, 3, 17, 18 and 19 – Appendix I]*
  - Policy Examples
    - Awareness of energy as a controllable cost.
    - Adoption of a corporate energy efficiency improvement plan with numeric goals and key performance indicators.
    - Assignment of authority and responsibility for company-wide improvement of energy efficiency.
  - Practice Examples
    - Structured assessment of energy efficiency.
    - Systems (as opposed to component) purchasing with an emphasis on life cycle costing or similar capital purchasing policy that looks beyond simple payback.
    - Integration of continuous energy improvement plans into existing management structure.
  
- *Percent of Industrial Firms from Non-Targeted Sectors that Implement Energy Efficiency Policies and Practices*

## **Improved Operations and Maintenance**

- *Percent of Food Processing Plants (by employment) and Pulp and Paper Mills That Adopt Improved Operations and Maintenance Techniques*
  - Technique Examples
    - Regular, plant level, reviews of energy use and cost.
    - Systems (as opposed to component) planning and management by senior plant or mill staff.
    - Energy efficiency training programs focused on developing expertise and accountability by plant management.
  
- *Percent of Industrial Firms from Non-Targeted Sectors that Adopt Improved Operations and Maintenance Techniques*
  
- *Percent of Food Processing Plant and Pulp and Paper Mill Managers Seeking Systems Optimization Services from Qualified Consulting/Engineering Firms*

## **New Marketing Methods for Energy Efficient Products and Services**

- *New sales tools/services that support energy efficiency practices are employed by trade allies to sell their goods or services. [see KPI# 30 - Appendix I]*
- *Additional Market Actors Offering Systems Optimization Services*
  - Service Examples:
    - Programs to develop continuous energy improvement/Best Practices.
    - Technical services to assess, monitor and analyze energy efficiency.

## **Market Partners**

- *Percent of Utilities and Public Benefit Administrators that coordinate the promotion of energy efficiency projects with government agencies, trade associations and trade allies. [see KPI#'s 7, 20, 31 - Appendix I]*
  - Coordination Examples:
    - Joint marketing materials.
    - Shared training programs.
- *Additional Trade Associations Promoting Energy Efficiency.*
  - Promotional Examples:
    - Inclusion in printed materials, trade show or website.
    - Incorporation of energy efficiency concepts into other service offerings.

Chapter 5 of this report reviews performance on the established KPIs based on data from the Industrial Tracking System. Future MPERs will also address market progress on the above indicators based on data collected from market actors.

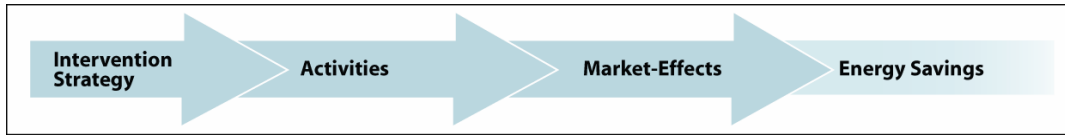
## **Evaluation Components**

The principal impacts of the Initiative are expected to originate from five specific intervention mechanisms in the vertical and systems markets:

- Business Practices Service
- Channel Management Services
- Training and Education
- Product and Service Development
- Demonstrations and Case Studies

As illustrated in Figure 7, evaluation of the Initiative progress and performance will be carried out for each intervention mechanism by monitoring three sets of indicators: 1) activity level, 2) market effects, and 3) energy savings.

**Figure 7. Key Activity, Market and Energy Savings Indicators**



The evaluation effort comprises seven elements, each designed to assess and report on specific areas of the Initiative’s activities, progress, and accomplishments:

- Review of Initiative’s Strategy and its Technical and Market Assumptions
- Market Characterization
- Performance Tracking (KPIs)
- Process Evaluation
- Training Evaluation
- Determination of Market Effects and Market Progress, and
- Validation and Estimation of Energy Savings.

The objectives and methodologies for addressing each of these evaluation elements are discussed below.

### **Review of Strategy and Technical and Market Assumptions**

All Alliance initiatives are required to demonstrate their cost-effectiveness. This is accomplished through the Alliance Cost-Effectiveness (ACE) Model. Cost-effectiveness is based on a set of technical, economic, and market saturation assumptions that underlie the electricity savings calculation. Clearly, the validity of these assumptions has a direct effect on cost-effectiveness and the Initiative’s ultimate benefit to regional stakeholders. For the first year, this review focuses on examining the Initiative’s overall strategy and “face validity” of the basic technical and market assumptions that provide the basis for its justification. An evaluation of the ACE Model, its methodology for calculating energy and economic impacts, and its underlying assumptions will be conducted in the second year and rely on the expert opinion of Quantec personnel.

### **Market Characterization**

The main purpose in this effort is to profile the Pacific Northwest industrial sector and to provide context for the Initiative. The market characterization relies on data available from secondary sources to describe the structure and composition of the Pacific Northwest’s industrial market in terms of key economic indicators, such as size, concentration, employment, contributions to the regional economy, and energy use trends.

Information on prevailing energy management practices was assessed through surveys of Pacific Northwest industrial firms and supply chain market participants, with an emphasis on the pulp

and paper and food processing industries. These surveys were completed immediately after Initiative launch<sup>33</sup>.

## Performance Tracking (KPIs)

This component of the evaluation will focus on contractor performance throughout the implementation process with regard to account management and account planning with industrial end-users, trade allies and utilities. Using the following engagement status indicators, market progress resulting from business practices and channel management services will be tracked based on the status of targeted firms in the marketing “pipeline”:

- **Not Interested:** The firm has been approached but expressed no interest in further Initiative involvement.
- **Aware:** The firm staff is generally aware of the Initiative’s mission and offerings.
- **Receptive:** The Channel Director has been engaged in one-on-one meetings with key staff and had opportunities to both provide information about the Initiative as well as to gather information regarding the firm’s specific needs.
- **Interested:** A firm has shown interest in learning more about the Initiative’s offerings and how they may pertain to the firm’s situation, however is not yet ready to dedicate time and resources to a more detailed assessment.
- **Engaged:** A firm is participating in the assessment process to identify specific opportunities such as an EnVINTA One-2-Five or other structured assessment processes.
- **Committed:** A firm has dedicated resources (e.g., staff and time) to work with the Initiative to address its needs, including energy management plan development, specific trainings, and so forth, focused on making energy efficiency an integral part of operations and management.
- **Practicing:** A firm is implementing the specified action plan and is actively practicing energy efficiency as a core business value. Key indicators may include the firm’s staff having high awareness levels of energy efficiency issues; establishment, measurement and ongoing monitoring of KPIs; and the existence of a comprehensive energy management plan that covers issues such as energy policies and capital expenditures, among others.

Practicing, that is the adoption of a corporate energy management plan, will be the ultimate measure of a successful intervention strategy. To qualify as an agent of change in corporate energy management practices, such a plan would necessarily include quantifiable goals, adequate funding, commitment of personnel, and a well-designed tracking and monitoring component. Performance will be evaluated through ongoing monitoring and tracking of various implementation activities. The Initiative’s Information Tracking System (ITS), will serve as the primary source for this information.

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33 In all, 64 industrial firms and 21 industrial trade allies were surveyed. Due to the relatively small samples of survey participants, we do not consider the results of these surveys to be statistically significant. Thus, the results are better described as being indicative, rather than conclusive. See Appendix C for a more detailed discussion of the market baseline assessment.

## Process Evaluation

The process evaluation is an integral component of Initiative planning and implementation. It evaluates progress and provides ongoing feedback on vital Initiative tactical components. The process evaluation will address all Initiative key elements, including marketing efforts, business practices services, demonstrations and cases studies, technical training and education, channel management services, and product and service. The process analysis and documentation helps provide perspective and background for interpreting and explaining Initiative impacts and observed outcomes.

This first evaluation report includes process findings based on the following data collection activities:

- Twelve formal interviews with Alliance staff and key implementation team members;
- The evaluator's observations during internal meetings, Initiative-sponsored events, and informal interviews with industrial users, utility representatives, and trade allies; and
- Evaluation exit surveys of 164 training participants attending seven trainings in 2005.

To inform process evaluation efforts in the remaining evaluation reports, formal interviews will be conducted with market actors and targeted end-users.

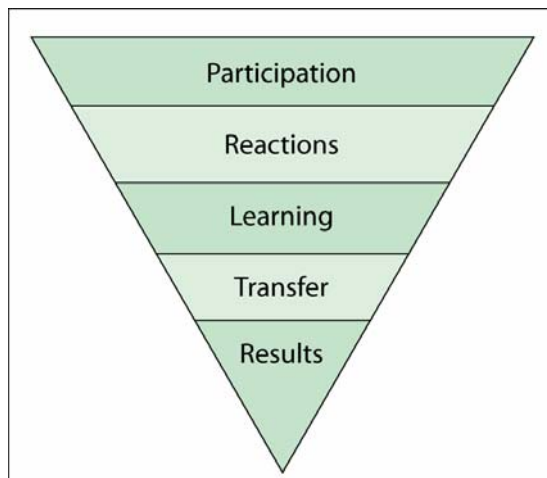
## Training Evaluation

Technical training is a key Initiative element, and is expected to account for a significant portion of its projected energy savings. Training effectiveness evaluation and results will be based on a modified training evaluation model developed by Donald Kirkpatrick. As illustrated graphically in Figure 8, training evaluation involves a set of qualitative and quantitative indicators and begins with an assessment of the Initiative's ability to draw participants. The evaluation then moves sequentially through systematic appraisals of participant reactions, the amount of learning, how acquired knowledge and skills are transferred or translated into concrete actions, and, finally, the actual results of such actions. The information from each prior level serves as the basis for the next level's evaluation. Thus, each successive level represents a more precise measure of training effectiveness.<sup>34</sup>

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<sup>34</sup> Kirkpatrick, D.L. (1994). Evaluating Training Programs: The Four Levels. San Francisco, CA: Berrett-Koehler.

**Figure 8. The Training Evaluation Pyramid**



**Participation:** At this level, the evaluation will primarily be concerned with identifying market response to subject matter, which is simply a measure of the relevance of and demand for the training. Participation levels are determined by tracking the number of participants in each session.

**Reactions:** Evaluation at this level measures participant reaction to and satisfaction with the training. It involves determining the participant’s perceived value of training and its relevance to their work. This information is gathered via analysis of training evaluation forms.

**Learning:** This evaluation component again relies on post-training (follow-up) surveys to assess how the training helped participants advance their skills and effectively change their energy management practices.

**Transfer:** This element measures the transfer that has occurred in the participant’s behavior resulting from the training program and attempts to answer the question: “Are the newly acquired skills and knowledge or attitude changes being used in the participant’s everyday work environment?” Both learning and transfer are evaluated through follow-up participant surveys.

**Results:** This level of the evaluation is concerned with the training assessment in terms of actual business results – the bottom line – and how these results are directly linked with training. In the case of Initiative-related training, this level of evaluation focuses on determining actual energy savings through in-plant interviews and on-site technical assessment of sample participants. The participants will be identified by means of a Web-based follow-up survey conducted for all trainings approximately three months after the training.

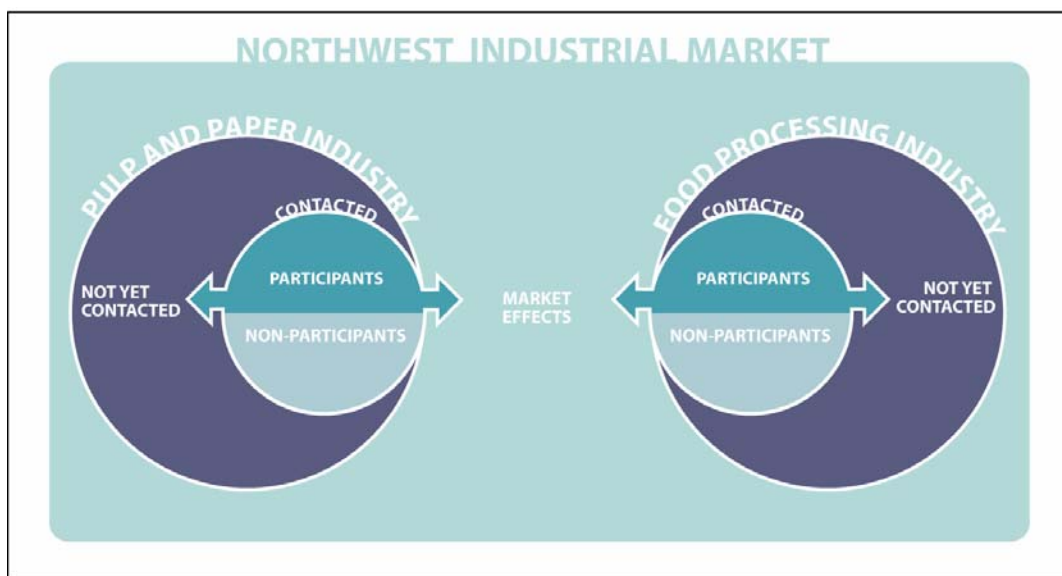
This MPER focuses on the first two elements of the training evaluation—participation and reaction—as part of the process evaluation. Follow-up surveys attempting to measure learning and transfer are currently underway. The results will be reported in MPERs 3 and 4.



## Determination of Market Effects and Market Progress

Figure 9 illustrates the Northwest Industrial market and the two vertical target markets. Each of the two markets are comprised of two types of industrial end-users (the target audience) — those who have been contacted by the Initiative and those who have not yet been contacted. Contacted firms are expected to fall into two groups: participants and non-participants. For the purpose of this evaluation, “participants” are defined as industrial firms that have been contacted by the Initiative and have become *engaged*. We use the term “non-participant” to designate those firms that have been contacted but are not yet *engaged*.

**Figure 9. Expected Market Effects and Energy Savings Impacts**



Market effects stemming from the Initiative are expected to fall into two categories: direct and indirect.<sup>35</sup> Direct effects are those attributable to participant actions that result from either the Initiative’s training or business practices component. Indirect effects are defined as indirect impacts of the Initiative on non-participants and the industrial market outside of the targeted sectors. The latter impacts are expected to result from actions taken by non-participants, and the industrial market as a whole, that may have been induced by the Initiative’s offerings, particularly in the areas of demonstrations and case studies and channel management activities.

The assessment of actual market effects will be carried out through surveys of statistically representative participant and non-participant samples within the two vertical markets and other industries to capture both direct and indirect impacts of training, business practices services, and

<sup>35</sup> Indirect effects are generally referred to as “spillover” effects in traditional utility resource acquisition program evaluations, reflecting the fact that those programs often produce market effects even when they use direct incentives as a primary tool. Market transformation projects, which are generally designed to produce such indirect effects, typically refer to direct and indirect market effects collectively as “market effects.” The term “spillover” is not used because the project logic is explicitly designed to produce indirect effects.

channel management, as described below. Specifically, two types of target audience surveys will be conducted: 1) Follow-up Surveys, and 2) Market Effect Surveys. (Figure 10 illustrates the target audiences captured by each survey as well as an overview of the how and when the survey results will be reported.)

**Figure 10. Summary of Surveys—Target Audience and Timeline**

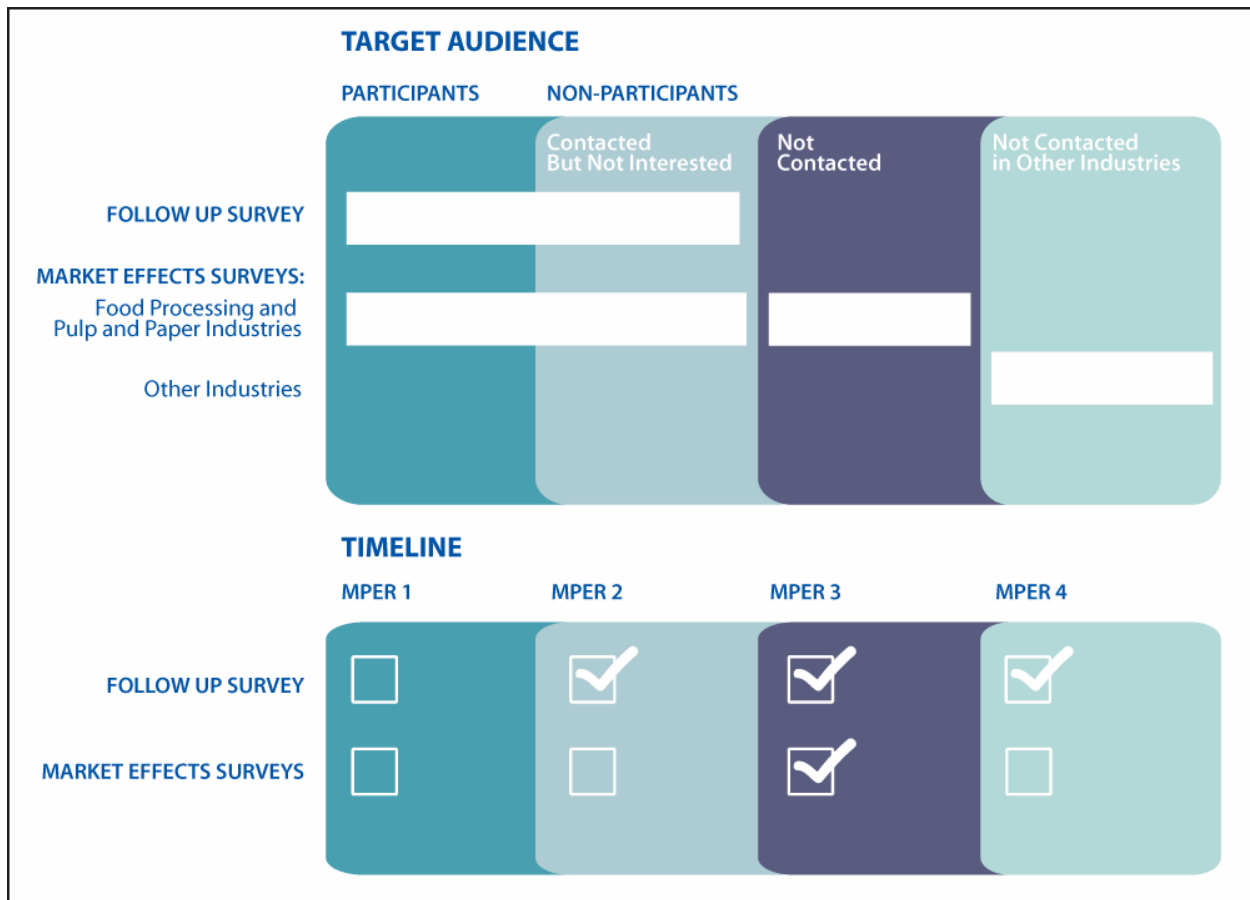


Table 5 presents additional information for each type of survey including purpose, evaluation subjects, and expected results.

**Table 5. Overview of Market Progress and Effects Surveys**

Survey Name	Primary Audience	Primary Inquiry	Evaluation Subjects	Expected Results	Time Frame	Resulting Steps
Target Audience Follow-Up	End-users and trade allies	Reactions to and satisfaction with IEA	Program effectiveness (channel management, marketing, utility coordination)	Determine program progress and market reaction	On-going 2006-2007	Recommendations for adaptive management, if necessary
Target Audience—Market Effects	End-users and trade allies	Have firms made changes due to IEA intervention?	Energy savings and extent of market transformation	Validation and estimation of savings. Confirmation of Market Transformation Hypothesis.	2007	Site visits
Non-Target Audience—Market Effects	End-users	Are firms aware of IEA's message? What changes have been made without IEA's influence?	Reasons for not participating	Market effects	2007	Compare market transformation effect and energy savings measures to "natural trends"

Follow-up surveys will be conducted with participants<sup>36</sup> and non-participants, as defined above. Participant surveys will focus on obtaining information on reactions to and satisfaction with the Initiative's services and determination of concrete actions taken by participants, particularly the adoption and implementation of a "corporate energy management plan." Non-participant surveys will elicit information on reactions to the Initiative and barriers that may have impeded participation. The target audience for these surveys consists of all industrial firms and supply chain/trade-ally market participants who have been contacted by the Initiative (see Figure 10). These surveys will be conducted quarterly throughout the second and third evaluation years. Summary findings from the target audience follow-up surveys will be included in the third and fourth MPER.

While the primary purpose of the target audience follow-up surveys is to collect feedback, the primary purpose of the target audience market effect surveys is to identify industrial customers who have implemented business practices changes (i.e., implemented an energy management plan) and observed energy or other resource savings as a result of this change. The gathered survey information will help identify potential targets for on-site savings verification. These surveys will be conducted in both vertical markets, as well as in the Northwest industrial sector in general, to capture any other indirect market effects (Non-target audience market effect surveys).

The non-target audience market effect surveys (i.e., all industries except those targeted by the Initiative) will focus on determining awareness of the Initiative among the non-targeted sectors as well as potential indirect or spillover effects, resulting from the Initiative and its offerings.

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<sup>36</sup> Referencing the engagement status indicators used by the implementation team, participants are defined as industrial users who reached the *engaged* participation status.

The results of these surveys will serve as the principal means of identifying any spillover or indirect market effects resulting from the Initiative. Regardless of the target audience, the market effect surveys will be conducted once during the third year of implementation (in early to mid-2007).

To ensure that information is statistically reliable and results are representative of the target markets, sample selection of appropriate size will be essential. Planned sample sizes of the target audience follow-up and market effects survey are shown in Tables 6 and 7 below.

**Table 6. Summary of Sample Sizes for Follow-Up Surveys**

Target Audience	Sample Size by Year	
	2006	2007
<b>Pulp &amp; Paper</b>		
Participants	Census (approx. 5)	Census (approx. 15)
Non-Participants	Census (approx. 15)	Census (approx. 15)
<b>Total</b>	<b>20</b>	<b>30</b>
<b>Food Processing</b>		
Participants	Census (approx. 10)	Census (approx. 20)
Non-Participants	Census (approx. 30)	Census (approx. 30)
<b>Total</b>	<b>40</b>	<b>50</b>
<b>Supply Chain/Trade Allies</b>	Census*	Census*
Motors	15	15
Pumps	15	15
Refrigeration	15	15
Compressed Air	15	15
<b>Total</b>	<b>60</b>	<b>60</b>

Note: Final sample sizes will depend on actual progress.

\* Includes participants and non-participants

**Table 7. Summary of Sample Sizes for Market Effect Surveys and Other Industry Surveys**

Target Audience	Sample Size	Site Visit
<b>Pulp &amp; Paper</b>		
Participants	Census	TBD
Non-Participants	Census	NA
Not-Yet Contacted	Census	NA
<b>Total</b>	<b>28 / 28</b>	
<b>Food Processing</b>		
Participants	Census	TBD
Non-Participants	Census	NA
Not-Yet Contacted	TBD	NA
<b>Total</b>	<b>75 / 286<sup>37</sup></b>	
<b>Other Industries</b>	<b>75 / 1759<sup>38</sup></b>	<b>NA</b>
<b>Supply Chain/Trade Allies</b>		
Motors	20 / 40 <sup>39</sup>	NA
Pumps	20 / 20 <sup>40</sup>	NA
Refrigeration	20 / 20 <sup>41</sup>	NA
Compressed Air	20 / 20 <sup>42</sup>	NA
<b>Total</b>	<b>80 / 100</b>	<b>NA</b>

The indicated sample sizes are designed to provide results at a 90% level of confidence with a margin of error of 10% percent or better for each target group.

### Estimation and Validation of Energy Savings

The ultimate objective of the Initiative is to encourage adoption of policies and practices that lead to continuous efficiency improvements in the way that industrial firms use electricity. Therefore, the ultimate measures of the Initiative’s effectiveness are actual efficiency gains and resulting electricity savings.

<sup>37</sup> Estimate based on data contained in ITS.

<sup>38</sup> Ibid.

<sup>39</sup> **Approximate estimate only.** A formal market definition is not available at this point. This is based on data provided by the Channel Manager, IEA staff, and other NEEA sources. Includes major motor repair shops (n=30) and motor manufacturers (n=9).

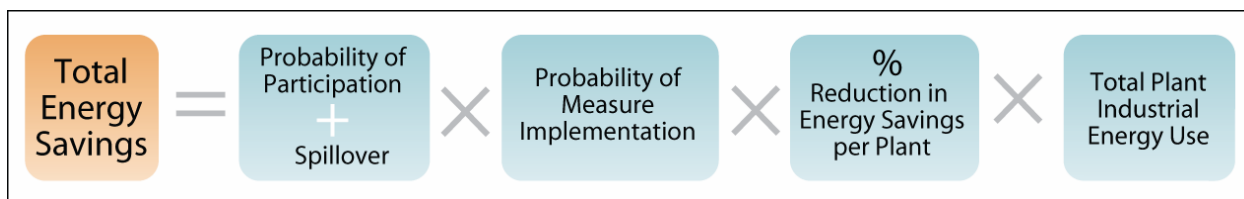
<sup>40</sup> **Approximate estimate only.** A formal market definition is not available at this point. This is based on data provided by the Channel Manager, evaluation team research. A market definition will be completed for MPER#2.

<sup>41</sup> **Approximate estimate only.** This is based on data provided by the Channel Manager. The market definition includes control vendors, mechanical refrigeration contractors, compressor OEMs, condenser OEMs, and Evaporator OEMs. Estimate limited to key market players only. There is a number of smaller market players that are unknown at this point.

<sup>42</sup> **Approximate estimate only.** This is based on data provided by the Channel Manager. The market definition includes consultants, vendors, and manufacturer representatives. This estimate is limited to key market players only. There are a number of smaller market players that are unknown at this point.

The methodology for savings estimation and validation springs directly from the Initiative’s logic model and will be based on a sequential assessment of activities, market effects and potential energy impacts of intervention strategies. For each intervention strategy, electricity savings validation will be based on an on-site assessment of the intervention’s energy efficiency impacts. The results will then be extrapolated to the broader market using a “probabilistic” approach, as illustrated in Figure 11.

**Figure 11. Methodology for Estimating Energy Savings**



This methodology formulation simply states that total energy savings likely to result from the Initiative are a function of the number of participants in various Initiative elements (e.g., training and business practices services), the probability of adopting and implementing energy management practices (e.g., systems optimization and energy management plans) as determined by the percent of participants who do so, and actual savings resulting from such practices. In assessing the Initiative’s energy savings impacts, it is important to distinguish among three types of impacts: short-term, long-term and naturally occurring savings.

### ***1- Short-Term Savings***

Short-term energy savings are savings that result from the Initiative during its first three years of operation. The methodology for estimation of these savings will be implemented in four steps:

1. Based on the results of the market effects surveys, determine the market penetration of various intervention strategies among participants, non-participants and the industrial market as a whole based on actual activity (e.g., the number of firms participating in training or business practices services).
2. Estimate the fraction of participants who report taking concrete energy-savings actions as a result of IEA services (e.g., the number of trainees implementing system improvements) to determine the probability of measure implementation based on the follow-up surveys.
3. Obtain estimates of typical electricity savings resulting from either training or adoption of energy management practices through on-site interviews and technical assessments.
4. Extrapolate the results to the market at large (in terms of number of employees) to determine total direct and spillover energy savings both within the two vertical market segments and the industrial market as a whole.

Based on the general methodology describe above, the evaluation will determine energy savings attributable to the Initiative during the three years of its operation due to both direct and indirect effects.

## **2- Long-Term Savings**

Arguably, lasting, long-term market effects and energy savings are the linchpins of energy efficiency market transformation hypotheses and the principal rationale for such programs. Empirical verification of these impacts, however, are difficult at best, particularly in programs involving behavior modification and change in energy management practices.<sup>43</sup> In the Initiative's case, long-term savings are saving that may be expected to continue beyond the first three years of its operation. Clearly, such savings depend in large part on penetration and diffusion of the Initiative's market effects after 2007. Where appropriate, Quantec will provide the Alliance with revised data estimates to update the Initiative's ACE Model.

### ***Recommendation:***

Since future market diffusion rates are uncertain, they must be either inferred from the observed short term trends through extrapolation, or by making certain assumptions concerning future adoption "rates" for various Initiative components. In either case, it is reasonable to assume that the long-term market effects are best treated as a stochastic (probabilistic) outcome, which may be formulated as follows: *Given the observed Initiative energy savings impacts, what market penetration rate does the Initiative need to achieve in order for the projected long-term savings to be realized, and what is the probability of this event actually occurring.*

For the purpose of this evaluation, we recommend that the expected future market penetration rates be assessed using the Monte Carlo simulation technique, the most commonly applied method for assessing future impacts under conditions of uncertainty.<sup>44</sup> The main advantage of this approach<sup>45</sup> is that it will provides a more realistic "range" (instead of point estimates) for

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<sup>43</sup> See for examples Duke, Richard and Daniel Kammen, "The Economics of Market Transformation Programs," *The Energy Journal*, Vol. 20, No. 4, 1999; and Horowitz, Marvin, "Economic Indicators of Market Transformation: Energy Efficient Lighting and EPA's Green Lights," *The Energy Journal*, Vol. 22 No. 4, 2002.

<sup>44</sup> As the term implies, "Monte Carlo" simulation methods are stochastic techniques, meaning they are based on using random numbers and probability statistics. This technique is used in many disciplines to investigate problems under conditions of uncertainty. It is used to obtain approximate solutions to problems with inherently probabilistic outcomes. In the utility industry, the technique is often used for forecasting and assessment of risks in integrated utility resource planning. It was also recently adopted by the California Public Utility Commission to investigate the risks associated with energy efficiency programs and as a means of allocating evaluation resources.

<sup>45</sup> In general, Monte Carlo analysis uses computerized simulation based on randomly drawn observations from a specified distribution of likely values for specific variables (e.g. market penetration). The randomly-generated drawing are repeated based on a specified number of iterations that may typically range from few hundred to thousands. Using probability distributions, instead of single point estimates, recognizes the fact that calculation of expected energy savings depends on several variables and assumptions that can takes a range of values. Because of this, the expected savings may also be assumed to take on a wide range of values with different probabilities of occurrence. For example, likely energy savings associated with training is a function of total training participants, energy savings per training participant (savings estimate), the number of participants actually making changes to their plant (market penetration rate) and any spill over effect. Aside from total training participation, both the savings estimate and the market penetration rate have unique probability distribution functions (e.g., normal, logistic, etc.) associated to them. After identifying and assigning the appropriate statistical probability distribution functions, computer models are used to draw repeated samples from each distribution function, run the drawn values through the energy savings equations, and record the outcome. Combination of the outcomes collected in this fashion will provide a likely range of energy savings

potential long-term savings and will provide an estimate of the likelihood that the projected savings of the Initiative will fall in this range.

### 3- Naturally-Occurring Savings

Finally, naturally occurring savings are gains in energy efficiency that may be expected to result from factors unrelated to the Initiative such as energy price-induced effects. The evaluation will rely on historical energy use data available from U.S. DOE, Manufacturing Energy Consumption Survey and assumptions made in the Initiative’s strategic plan to make the necessary adjustments for naturally-occurring effects.

### Reporting

The evaluation effort will be a three-year undertaking, and its results will be reported in four MPERs. Table 78 presents an overview of key evaluation tasks and products during each year.

**Table 8. Schedule of Evaluation Activities and Products by Year**

Evaluation Activities	MPER#1 (March '06)	MPER#2 (September '06)	MPER#3 (March '07)	MPER#4 (March '08)
Review of Strategy and Assumptions	☑		☑	☑
Baseline Market Characterization and Updates	☑			
Performance Tracking/Key Performance Indicators	☑	☑	☑	☑
Process Evaluation	☑	☑	☑	☑
Training Evaluation	☑		☑	☑
Determination of Market Effects and Market Progress	☑		☑	☑
Validation and Estimation of Savings				
From Training		☑	☑	☑
From Business Practices Services				☑

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associated to the Initiative’s training activity and the likelihood that the savings by assumed by the Initiative’s strategic plan would fall in that range.





## 4- Market Baseline Surveys

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Quantec conducted two structured, in-depth telephone surveys with decision-makers at industrial companies and supply-chain market participants. These participants included equipment suppliers and construction and engineering firms active in the Northwest pulp and paper and food processing industries. .

The surveys were intended to provide a baseline for assessing the Initiative’s future market effects in the areas of corporate energy management and the offering of systems-focused energy efficiency services and products by trade allies. In addition, these surveys were intended to augment the market characterization, help validate some of Initiative’s market assumptions, and guide the Initiative planning and marketing activities.

### Corporate Energy Management Survey

For the survey focused on the corporate energy management practices, we used the Dun & Bradstreet (D&B) industrial database and local directories to develop a sample that was stratified by employment and industry as shown in Table 9.

**Table 9. Sampling Plan for Corporate Energy Management Survey**

Number of Employees	Food Processors	Pulp & Paper *	Other
<b>Population</b>			
>50 and <250	216	8	1,422
>=250	70	19	337
<b>Total</b>	<b>286</b>	<b>27</b>	<b>1,759</b>
<b>Percent of Market Employment</b>			
>50 and <250	75.5%	29.6%	80.8%
>=250	24.5%	70.4%	19.2%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>
<b>Targeted Sample</b>			
>50 and <250	23	6	16
>=250	7	14	4
<b>Total</b>	<b>30</b>	<b>20</b>	<b>20</b>

\* For the purpose of the baseline surveys, P&P mills who previously participated in EnVINTA assessments were excluded.

\*\* The sample was stratified by employment. For the purpose of establishing a baseline, only companies with more than 50 employees were considered to avoid longevity problems typically associated with smaller companies.

The survey was designed to generate statistically significant results with approximately  $\pm 10$  level of precision at the 90% confidence level for the Northwest industrial market as whole. The survey was not intended to generate statistically significant results specific to the food processing and pulp and paper sectors. Table 10 presents an overview of the survey results, including the number of completed surveys and the associated precision. As the results indicate, the findings

from the corporate energy management baseline surveys have a precision of 10% at the 90% confidence level.

**Table 10. Table Precision of Survey Estimates at 90% Level of Confidence**

Market	Market Size	Survey Goal	Target Precision	Attempted Surveys'	Completed Surveys	Baseline Precision
Food Processing	286	30	15%	200	30	15%
Pulp & Paper	28	20	10%*	26	5	33%*
Other	1,759	20	15%	207	29	15%
<b>Total Market</b>	<b>2,073</b>	<b>70</b>	<b>9%</b>	<b>433</b>	<b>64</b>	<b>10%</b>

\* Adjusted by Finite Population Correction Factor

While the corporate energy management baseline survey results can be considered statistically representative of the overall market, the results cannot be used to make statistically significant inferences for the targeted sectors. Thus, the results are better described as being indicative, rather than conclusive.

However, because the initial survey design did not target statistical significance on a market basis, it is possible to improve precision for each market by adding the results of the target audience follow-up surveys together with participants and non-participants. Table 11 below shows the possibilities of improving precision assuming all follow-up survey participants could be used to augment the baseline.

**Table 11. Potential Impact of Augmenting Survey Sample on Precision by Market Level**

Market	Market Size	Completed Surveys	Baseline Precision	Target Audience Follow-Up Survey	Total Completes	Precision
Food Processing	286	30	15%	40	70	10%
Pulp and Paper	28	5	33%	20	25	5%
Other	1,759	29	15%	NA	29	15%
<b>Total Market</b>	<b>2,073</b>	<b>64</b>	<b>10%</b>	<b>60</b>	<b>124</b>	<b>7%</b>

If, however, the target audience participants are found to be statistically different from the baseline participants, they will not be used to augment the baseline survey. In that case, the evaluation team may need to conduct additional baseline surveys.

Following is a summary of our findings for the corporate energy management practices survey for the Northwest Industrial market as a whole. (See Appendix C for a more detailed discussion of the market baseline assessment.)

***1- Purchased electricity and gas are by far the most prominent sources of energy for industrial facilities in the Pacific Northwest:*** All surveyed industrial facilities rely on purchased electricity, and 78% on purchased gas as their main source of energy. Only 5% of respondents reported using biomass (residual wood waste), diesel, or oil as major fuel sources.

**2- There is a high level of awareness among industrial utility customers in the Pacific Northwest concerning energy issues, and controlling energy costs is a high priority for most:** Nearly 90% of respondents stated that controlling energy costs was either a “high priority” (59%) or “somewhat of a priority” (30%). The high level of concern regarding energy-related issues is consistent with recent trends in rising energy costs, particularly in the Pacific Northwest, where electricity cost for industrial users has risen at a rate of nearly twice the national average since 2000.<sup>46</sup>

**3- Opportunities for improving energy efficiency are perceived to be high:** Survey respondents generally acknowledged that opportunities existed for their companies to reduce future energy consumption through energy efficiency. Nearly 75% of respondents believed there to be at least some energy savings opportunity.

**4- Many of the industrial firms either have taken, or are taking, steps to track and manage their energy costs:** Forty-three percent of respondents report to be “engaged in” controlling energy costs. Approximately one-third of this percentage cited behavioral changes, such as turning off lights and shutting down equipment when not in use, as the main measures for controlling energy use.

**5- There is a deficiency of formal energy management planning and oversight among industrial customer:** Only 25% of surveyed firms reported having an energy management plan in place, and only 13% tracked energy costs through a formal “score card” or established energy key performance indicators. The existing plans also tended to be generally informal in and without appropriately assigned accountability within the firm. For example, only one-half of the firms with an energy management plan actually had a numeric energy cost reduction goal as part of the plan, and only four respondents could remember the goal.

**6- Training in general, and energy management training in particular, is a high priority in the industrial sector, and there is a strong interest in information and education:** The majority of respondents (82%) reported offering some type of training for their employees on various industrial systems, such as motor management (44%), compressed air systems (55%), and process controls (42%). Respondents also expressed a strong interest in energy management support and receiving additional information. Respondents indicated that the two most valuable items to improving energy efficiency were information on energy management best practices in their industry (64%) and new information on energy efficiency technologies (64%).

**7- The prevalence of widespread quality management and continuous improvement principles among the Pacific Northwest’s industries provides a setting for adoption and implementation of corporate energy-management practices:** Nearly three-quarters of participating firms report having a continuous improvement practice (CIP) in place, and 79% have an environmental management system (EMS), and energy management is viewed as an important component of overall quality management practices.

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<sup>46</sup> Based on the latest data from the Energy Information Administration, electric rates in the U.S. have risen by approximately 4% per year on average and by nearly 8% in the Pacific Northwest since 2000.

**8- Lack of information on energy-efficient technologies and practices, absence of corporate commitment, and resource constraints continue to be perceived as barriers to adopting energy-efficient technologies and practices:** The survey results indicated that, lack of knowledge on energy management methods and technologies, low priority vis-à-vis other concerns such as production, health, and safety, and lack of commitment management, are the most common barriers to adopting energy management practices among industrial firms.

## Supply Chain Surveys

The supply chain survey was intended to establish a baseline of the regional supply chain market that can be used to evaluate the market effect of the Initiative’s channel management activities over time. The Initiative’s channel management efforts are designed to be in support of the Initiative’s business practice efforts with industrial firms. As such, while vitally important to the Initiative’s overall implementation strategy, no energy savings are assumed to be directly attributable to the Initiative’s work with trade allies. Instead, the energy savings associated with trade allies offering more energy-efficient products and services are expected to be captured as part of the energy savings associated with the business practice element. (See Chapter 3 for a discussion on the calculation and validation of energy savings.) Given that, the scope of the supply chain surveys was designed to be less than that of the Energy Management Policy Surveys.

In compliance with the requirements set forth in the evaluation request for proposals (RFP), the surveys were targeted at 15 non-participating supply-chain market actors<sup>47</sup> (distributors, manufacturers, A&E firms, and engineering consultants) to assess the baseline market practices of supply chain actors.

Table 12 provides an overview of the targeted and completed surveys.

**Table 12. Summary of Supply Chain Survey Results**

Market	Target	Attempted	Completed	Follow Up Surveys
Refrigeration	**	5	5	15
Compressed Air	**	6	5	15
Pumps	**	4	3*	15
Motors	**	0	0	15
Food Processing	**	4	4*	
Pulp & Paper	**	4	4	
<b>Total</b>	<b>15</b>	<b>23</b>	<b>21</b>	<b>60</b>

\* Includes 2 responses from same company, regional and national levels.

\*\* Separate target count numbers not available

In order to develop a representative market baseline despite the small sample size, Quantec worked closely with the members of the implementation team to identify key market actors for the surveys. For instance, in the technical consultant market serving the pulp and paper market, two of the four interviewed firms belong to the top four firms making up roughly 80% of the

<sup>47</sup> For the purpose of the supply chain survey, motor trade allies were excluded due to the availability of information on the motor trade ally market collected as part of NEEA’s Drive Power Initiative survey.

regional market. As another example, in the case of the refrigeration supply chain market, which can be grouped into five categories,<sup>48</sup> care was given to survey at least one of the key market players within each category, representing between 20% and 40% of their respective markets, as identified by the refrigeration Channel Director. Using this approach and the market-specific expertise of the channel directors, we believe the survey results to be representative of the supply chain market. Given the lack of exact market definitions for most of the cross-cutting technical markets, the exact precision and significance of the resulting estimates cannot be determined at this point.

Similar to the case the energy management policy surveys, the sample size could be potentially augmented by the results of the trade ally follow-up surveys. The proposed sample sizes for the follow-up surveys are shown in Table 12 above. In order to offer a defensible evaluation of the supply chain market actors (also known as “Trade Allies”), future MPER’s should develop more refined market maps and pursue this augmentation plan.

Following is a summary of our findings. A more detailed discussion of the survey responses is presented in Appendix C.

***1- There is a strong perception among supply chain respondents that energy efficiency and optimized solutions are important to their industrial clients:*** Ninety percent of respondents consider energy costs as being either “very” (38%) or “somewhat” (52%) important to their customers when making purchasing decisions. On average, vendors indicated that they include energy efficiency options on about one-half of their projects based on client requests. In a little over 60% of cases, when offered, clients tend to prefer more efficient options over standard efficiency equipment. Nearly 80% of respondents rate the potential for energy efficiency and systems optimization opportunities as “great,” and not one respondent rated the potential as “none” or “minimal.” Respondents were nearly unanimous (95%) that promoting energy efficiency can “definitely” or “somewhat” provide a their business with a competitive edge.

***2- There is a strong interest in technical training among industrial supply chain participants:*** Most respondents (67%) reported that they or their staff attended a training course in the last 12 months. When asked whether there was interest in additional training, over three-quarters (77%) reported as being either “very” or “somewhat” interested in future trainings that would help them promote energy efficient equipment or systems optimization.

***3- Supply chain respondents perceive that cost is the primary market barrier:*** According to supply chain respondents, cost considerations and investment criteria such as payback and ROI (81%) and lack of awareness (24%) are the main barriers to industrial firms adopting energy efficient equipment.

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<sup>48</sup> Controls Vendors, Mechanical Refrigeration Contractors, Compressor OEMs (NW Regional Reps), Condenser OEMs (NW Regional Reps), and Evaporator OEMs (NW Regional Reps.) Based on information provided by the refrigeration Channel Director.



## 5-Performance Assessment (KPIs)

The Initiative established 33 KPIs based on the goals approved by the Alliance’s Portfolio Committee. While not formally identified as such by the Initiative, close KPI review suggests that, in general, the KPIs appear to belong to one of two categories, market progress KPIs and Initiative performance KPIs. In terms of their relevance to the Initiative’s overall goals, not all of the KPIs are of equal importance. For instance, comprehensive energy management plan adoption and implementation (e.g., KPI#3) is a better indicator of the Initiative’s ability to achieve energy savings than KPIs tracking the development of demonstration projects (KPI#9). However, for the purpose of this evaluation, all KPIs with available data were evaluated.

Few exceptions notwithstanding, the Initiative has made steady progress toward meeting its 2005 targets<sup>49</sup>. In general, progress seems to be on schedule for many the vertical market training and business practice goals, except for the KPIs tracking the actual adoption and implementation rates of energy management programs. KPIs showing generally behind schedule progress tend to focus on demonstrations/case studies, product/service development, and market/utility coordination, where 2005 progress was markedly behind schedule. However, at this stage of implementation, we do not consider behind schedule progress as a concern at this point, especially given the delayed commencement of implementation activities and the fact that the team has made many promising connections and market inroads. Regardless, in the next two years, the implementation team will need to demonstrate significant progress in these areas to ensure achievement of overall Initiative goals.

Table 13 presents an overview of the KPIs, their definitions, progress indicators, and status. Following Table 13 is a discussion of select KPIs, specifically those ones most indicative of achieving energy savings as well as those requiring attention or additional resources. Appendix I contains similar corresponding discussions of all 33 KPIs.

**Table 13. Summary of Evaluation of Progress Toward Meeting the 2007 KPIs**

ID	Mkt	Type	KPI Definition	Progress Indicators	Status
1	PP	TR	One or more individuals of firms representing 45% of P&P market (by production) or 9 mills participate in systems optimization and market specific training.	10 mills, representing 53% of the marked (based on production) participated in systems optimization and market training. KPI has been met.	Ahead of schedule.
2	PP	BP	2 mills participate in business practice service each year as indicated by the engaged status indicator	2 mills (9% of market) are participating at engaged status or higher.	On schedule.

<sup>49</sup> KPI progress was ahead of schedule for two, on schedule for 13, and behind schedule for 13. In five cases, formal evaluation of a given KPI is pending additional data.



ID	Mkt	Type	KPI Definition	Progress Indicators	Status
3	PP	BP	2 mills implement action plans each year as indicated by the practicing status indicator.	No mills were participating at the practicing status in 2005.	Behind schedule.
4	PP	BP	30% of technical service consultants have spent resources on joint marketing activities promoting energy management and business practices (demonstration projects, co-sponsoring/giving training or joint sales calls)	1 of the 4 key market players at engaged status. Evaluation of market percentage pending finalized definition of market.	On schedule.
5	PP	BP	30% of technical service consultants promote energy management and efficiency as part of their normal sales and marketing activities	1 of the 4 key market players at engaged status. Evaluation of market percentage pending finalized definition of market.	On schedule.
6	PP	MC	All mills are aware of IEA at end of Year 1	12 of 28 mills (50% of market based on production) rated as aware. All mills introductory letters.	Behind schedule.
7	PP	MC	Channel Director, in combination with utility account representative, will contact 10 mills per year.	3 <sup>50</sup> out of 10 meetings completed with 2 scheduled as of February 2006.	Behind schedule.
8	PP	MC	Utilities serving 15% of PP market actively participate in promoting training.	10 <sup>51</sup> utilities participated in the promotion of training. Market percentage made up by these utilities currently is not yet available.	On schedule.
9	PP	DC	6 case studies or demonstration projects.	No demonstration projects or case studies to date.	Behind schedule.
10	FP	TR	1 or more individuals of firms representing 24% of FP market (based on employment) attend system and/or food processing training activities.	59 firms, representing 19% of food processing market (based on employment) had one or more individuals attend systems and/or food processing trainings.	On schedule.
11	FP	TR	75 system operators or system owners attend refrigeration system operation training.	35 <sup>52</sup> system operators or system owners attended refrigeration system operation training. <sup>53</sup>	On schedule.
12	FP	TR	30 vendors/consultants attend refrigeration system operation training.	9 <sup>54</sup> vendors or consultants attended refrigeration system operation training.	Behind schedule.
13	FP	TR	60 employees RETA certified.	Evaluation pending information from RETA.	Status unknown.
14	FP	TR	15% of large food processors and cold storage firms (by employment) support (send employees to) RETA certification.	3 large food processors (5% of market share) sent at least one employee to RETA training.	On schedule.
15	FP	TR	Distribute 80 refrigeration best practices manuals per year.	42 <sup>55</sup> best practice manuals have been distributed.	On schedule.

<sup>50</sup> Based on information provided by the Utility Coordinator. Reflects status as of February 21, 2006.

<sup>51</sup> Represents utilities that sponsored/promoted trainings regardless of target market. Estimate not specific to pulp and paper market. Based on information provided by Initiative staff as part of the Portfolio Update document, dated March 9, 2006.

<sup>52</sup> Evaluation was limited to refrigeration classes for which participant evaluation forms were available (2 classes held in October and November 2005).

<sup>53</sup> Based on training evaluation form information for two classes. Thirty-five total respondents, including 14 refrigeration operators, four maintenance supervisors, six plant/corporate engineers, one plant managers, and 10 refrigeration end users.

<sup>54</sup> Evaluation was limited to refrigeration classes for which participant evaluation forms were available (2 classes held in October and November 2005).

<sup>55</sup> As of December 31, 2005.

ID	Mkt	Type	KPI Definition	Progress Indicators	Status
16	FP	BP	18% of large food processors (based on employment) participate in business practices initiative/services as indicated by engaged indicator.	2 large food processors, representing 9 locations and 11% <sup>56</sup> of the market share, participate in business practice initiative/services on an engaged status level.	On schedule.
17	FP	BP	8% of large food processors (based on employment) implement action plans as indicated by practicing indicator.	None are participating at practicing level.	Behind schedule.
18	FP	BP	6% of small-medium food processors (based on employment) participate in business practices initiative/services as indicated by engaged indicator.	11 Firms representing 4% of medium/small food processing market participate in business practice initiative/services on an engaged status level.	On schedule.
19	FP	BP	2% of small-medium food processors (based on employment) implement action plans as indicated by practicing indicator.	None are participating at practicing level.	Behind schedule.
20	FP	MC	Utilities serving 15% of FP refrigeration load market specify a uniform systems approach analysis for refrigeration efficiency programs analysis of refrigeration efficiency programs.	Ongoing discussions but, to date, none of the utilities have adopted components or systems specifications for refrigeration efficiency programs.	Behind schedule.
21	FP	DC	Average of 4 motor systems case studies or demonstration projects per year targeted at large industrial firms.	No demonstration projects or case studies to date.	Behind schedule.
22	FP	DC	Average of 3 refrigeration systems case studies or demonstration projects per year targeted at large industrial firms.	No demonstration projects or case studies to date.	Behind schedule.
23	CC	TR	30% of the Motor Trade Allies market (based on repairs) participated either in taking, marketing, or offering courses.	7 employees, representing 6 motor trade allies participated in training. Comprehensive market share information not available <sup>57</sup> . 3 firms engaged. Evaluation pending data development.	Status unknown.
24	CC	TR	30% pump allies market (based on sales/employment) participated either in taking, marketing, or offering courses.	12 employees, representing 6 pump trade allies participated in training. 1 firm each engaged and committed. Evaluation pending data development.	Status unknown.
25	CC	TR	45% compressed air trade allies market (based on sales) participated either in taking, marketing, or offering courses.	Trade allies representing 50% of the market have attended trainings. Trade allies representing 65% of the market are committed.	Ahead of schedule.
26	CC	CM	Firms representing 30% of the motor trade allies market (based on repairs) spent resources on joint marketing activities.	3 firms at <i>engaged</i> status. Evaluation pending data development.	Status unknown.
27	CC	CM	Firms representing 30% of the pump allies market (based on sales/employment) spent resources on joint marketing activities.	1 firm each <i>engaged</i> and <i>committed</i> . Evaluation pending data development.	Status unknown.

<sup>56</sup> The pipeline report reports engagement status only on a corporate level, not at a plant level. Given the available data, the market share percentage assumes all locations of a given corporation have reached a given status. This may overstate the actual market percentage captured by the Initiative.

<sup>57</sup> The implementation team provided a list of key market players in the motor repair sector along with associated market share percentages. Cross-reference of the firms who sent employees to attend motor trainings in 2005, yielded only one match, with an estimated market share of 2.9%.

ID	Mkt	Type	KPI Definition	Progress Indicators	Status
28	CC	CM	Firms representing 45% of the compressed air trade allies market (based on sales) spend resources on joint marketing activities.	One key market player has committed to training audit staff on systems approach. 2 trade allies <i>committed</i> , 1 <i>engaged</i> .	On schedule.
29	CC	PS	9 products/services developed or disseminated and applicable to at least one of the vertical markets	No products or services developed or disseminated.	Behind schedule.
30	CC	MC	IEA actively works with utilities/others to sponsor trainings, demos and product and service development	10 utilities are supporting and promoting appropriate training for their customers.	On schedule.
31	CC	MC	6 utility or other organizations actively participating in product and service development (adopt specifications, provide incentives, technical support, etc.).	1 utility has agreed to adopt standards for compressed air systems. Working with EASA to reinforce support for rewind standards.	Behind schedule.
32	CC	MC	6 presentations at local/regional meetings per year.	Channel directors have given presentations at 6 local/regional meetings.	On schedule.
33	DC	MC	Majority of market aware of demonstration projects through case studies, journal articles, etc. (by survey).	No demonstration projects or case studies to date.	Behind schedule.

## Pulp & Paper

### Training

**KPI #1--One or more individuals of firms representing 45% of pulp and paper market (by production) or 9 mills participate in systems optimization and market specific training:** Based on data contained in the ITS as of December 31, 2005, 10 mills representing approximately 53% of the market, based on production, have sent one or more employees to participate in training. Given a KPI goal of 45% of market share, the three-year KPI was met during the first year of operation. Given that the KPI was exceeded during the first year of operation, the 45% goal may have been too conservative.

### Business Practices

**KPI#2--2 mills participate in business practice service each year as indicated by the *engaged* status indicator.** As part the Initiative team's internal tracking and communication tools, each targeted industrial firm is assigned one of seven status indicators.<sup>58</sup> Using the information contained in the ITS as of February 2006, two mills were identified as being at least in the *engaged* status (one mill *engaged* and two *committed*), representing roughly 9% of the market based on production. Given the annual goal of two mills being at the *engaged* status, the target was met in 2005. This finding is, in part, supported by feedback from the implementation team that indicates that two EnVINTA assessments were completed. One additional session was

<sup>58</sup> See Chapter 3 for a definition of the seven status indicators: *Not Interested*, *Aware*, *Receptive*, *Interested*, *Engaged*, *Committed*, and *Practicing*.

confirmed, and three sessions are currently being planned. This progress suggests that the KPI target is likely to be met in 2006 as well.

**KPI#3--2 mills implement action plans each year as indicated by the *practicing* status indicator.** The second KPI is designed to measure the team's progress in guiding mills to fully implement and practice, on an ongoing basis, a corporate-wide approach to continuous energy improvement. Using the engagement status indicators, this goal represents the highest engagement status of *practicing*. However, while the pulp and paper team identified one mill at the preceding engagement status of *committed*, to date, none of the mills have reached the *practicing* stage. However, promising progress includes the pulp and paper team working closely with one mill on developing a strategy energy management plan. In our judgment, this KPI's slower than expected progress does not merit concern at this stage of implementation for two reasons:

- The pulp and paper market is finite, and the Channel Director has established strong personal ties to many mills.
- The limited progress is likely due to significant lead-time associated with overcoming corporate requirements, especially in larger firms.

The evaluation team anticipates that significant progress toward this KPI is unlikely (in either pulp and paper or food processing) until late 2006.

**KPI#4--30% of technical service consultants have spent resources on joint marketing activities promoting energy management and business practices (demonstration projects, co-sponsoring/giving training or joint sales calls):** In addition to working directly with mills, engaging technical service consultants is a key element to sending a consistent message to the market. This KPI requires that 30% of the technical service consultants spend resources (staff, time, or money) on the joint marketing activities promoting energy management and business practices. Based on information provided by the pulp and paper Channel Director, 80% of the market is made up of four key firms. However, it is currently unknown what percentage of the market share is held by each company. The evaluation team is currently collecting more detailed market information. In addition, the ITS does not currently track information regarding technical service consultants' resource dedication to joint marketing activities. While the lack of necessary data prohibits formal evaluation of this KPI in this MPER, information in the February pipeline document suggests ample progress in that the status indicators of the four key firms indicate one company as being *aware*, two *interested* and one firm *engaged*. This suggests promising progress toward meeting the specified goal. A formal evaluation of this KPI will be presented in MPER#2 with an expected publication date of September 2006.

## Utility and Market Coordination

**KPI #6-- All mills are aware of IEA at the end of Year 1:** With regard to generating awareness of the Initiative and its offerings, ITS records show that the Channel Director mailed 70 personalized letters introducing the Initiative, its goals, and products and services to key staff in all 28 mills. In addition, the pulp and paper channel team has held meetings and discussions with a variety of plant and corporate staff. Based on the engagement status indicators, 10 mills or 50% of the market, based on production, are identified as having a status of *aware* or better. The

pulp and paper channel team has additionally made formal presentations to technical, educational, and trade associations including TAPPI and the Washington Pulp and Paper Foundation. Comparing this progress against the goal of all mills being aware of the IEA at the end of the first year, this KPI was not met and may require additional attention.

**KPI#7—The Channel Director, in combination with utility account representatives, will contact 10 mills per year:** Based on records provided by the Utility Coordinator, the pulp and paper team, in association with a utility account representative, has conducted meetings with t firms, with 2 scheduled as of February 21, 2006. Given an annual goal of 10 combined meetings, the yearly goal was not met. This KPI may require additional attention during 2006.

## Food Processing

### Training

**KPI#10--1 or more individuals of firms representing 24% of the FP market (based on employment) attend system and/or food processing training activities:** Based on ITS data, as of December 31, 2005, 59 food processors, representing approximately 19% of the market (based on employment) have sent one or more employees to participate in training. Given a KPI goal of 24% of market share, the progress to date suggests that the three-year KPI will, in all likelihood, be met.

**KPI#11--75 system operators or system owners attend refrigeration system operation training:** Based on the information collected from training participant surveys during 3<sup>59</sup> refrigeration classes, 35<sup>60</sup> participants identified themselves as refrigeration operators, maintenance supervisors, plant/corporate engineers, plant managers, or refrigeration end-users. Given the lack of a specific designation capturing system operators and/or system owners on the survey forms, the above categories were assumed to represent system operators and/or system owners. Given a three-year goal of 75, the progress made to date suggests that the KPI is likely to be met.

**KPI#12--30 vendors/consultants attend refrigeration system operation training:** Based on information from available training evaluation forms, 9 participants identified themselves as vendors or consultants. Given a three-year goal of 30, achieving this KPI may require additional focus on targeting vendors and consultants to attend refrigeration trainings during 2006 and 2007.

### *Business Practices*

**KPI#16--18% of large food processors (based on employment) participate in business practices initiative/services as indicated by the *engaged* indicator:** Based on the status indicators captured in the February 2006 pipeline report, two firms representing 9% and 11% of

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<sup>59</sup> Analysis of this KPI requires training evaluation forms. At the time of this analysis, evaluation forms were only available in digital format for 3 classes in 2005.

<sup>60</sup> Descriptions of participants' jobs and/or responsibilities were only available for 2 of the 3 trainings.

the large food processing market (>250 employees), were identified as being at least at an *engaged* participation status. The pipeline report indicates engagement status only on a corporate (not plant) level. Given the available data, the market share percentage assumes all locations of a given corporation have reached a given status. This assumption may result in the actual market percentage captured by the Initiative as being overstated. However, given a three-year goal of 18%, progress during the first year of implementation appears to be on target to meet the KPI goal by the end of 2007.

**KPI#17--8% of large food processors (based on employment) implement action plans as indicated by the *practicing* indicator:** Similar to the progress in the pulp and paper market, to date, no companies have reached the *practicing* engagement status. There has, however, been partial progress toward reaching this goal. At least one firm is currently identified as being at the *committed* state of engagement. In the opinion of the evaluation team, lack of progress on this KPI does not merit concern at this point.

**KPI#18--6% of small-medium food processors (based on employment) participate in business practices initiatives/services as indicated by the *engaged* indicator:** Based on the status indicators captured in the February 2006 pipeline report, four firms representing 4% of the small to medium food processing market ( $\leq 250$  employees) and 10 plant locations, were identified as having at least an engaged participation status. The pipeline report reports engagement status only on a corporate level, not at a plant level. Given the available data, the market share percentage assumes all locations of a given corporation have reached a given status. This assumption may result in the actual market percentage captured by the Initiative as being overstated. Regardless, given a three-year goal of 6%, progress to date suggests that the KPI is likely to be met by 2007.

**KPI#19--2% of small-medium food processors (based on employment) implement action plans as indicated by the *practicing* indicator:** Similar to the progress in the pulp and paper market and the large food processing firms, to date no small to medium food processing firms have reached the *practicing* engagement status. There is partial progress toward reaching this goal. At least one firm has been identified as being at the *committed* state of engagement. In the evaluation team's opinion, lack of progress on this KPI does not merit concern at this state of implementation. However, we would expect to document progress toward this KPI during the end of 2007.

## Utility and Market Coordination

**KPI#20-- Utilities serving 15% of the FP refrigeration load market specify a uniform systems approach analysis for refrigeration efficiency programs analysis of refrigeration efficiency programs:** While to date, no utilities have committed to requiring refrigeration efficiency programs to meet specific component or system specifications, the food processing technical team has been in discussions with at least seven utilities. The ITS does not currently include information that ties firms, and the utilities that serve them, together. Lack of this data has impeded the evaluation team's efforts to evaluate this and other utility-related KPIs. The PMC is currently working on adding this information to the activity tracking database. A formal evaluation of this KPI is expected to be presented as part of MPER#2.

## Systems Markets

### Training

**KPI#23--30% of the motor trade allies market (based on repairs) participate either in taking, marketing, or offering courses:** In 2005, the Initiative offered three motor trainings. Based on participant registration data, employees of 6 motor trade allies attended the trainings. According to estimates provided by the Channel Director, the estimated motor repair market in the Pacific Northwest is approximately 90,000 repairs per year. However, cross-referencing the firms who sent employees to attend motor trainings in 2005 yielded only one match, with an estimated market share of 2.9%. The Initiative is currently still working on finalizing the market definitions. Also, based on the February 2006 pipeline report, 3 motor service companies are shown as being *engaged*, representing roughly 6% of the regional motor repair market. In addition, the implementation team is currently working on collecting data reflecting trade allies' "marketing and/or offering" trainings. Formal evaluation of this KPI is pending the completion of this work. Given the lack of data and outstanding issues, evaluation progress for this KPI is difficult. In general, progress appears to be made, with continued attention necessary to ensure that the KPI will be met.

**KPI#24--30% pump allies market (based on sales/employment) participate either in taking, marketing, or offering courses:** In 2005, the Initiative offered 6 pump trainings. Based on participant registration data, 12 employees of 6 pump trade allies attended the trainings. While the lack of data on the regional pumps market prohibits a formal evaluation of this KPI at this point, of the 6 firms, 2 represent the 2 largest pump manufacturers in the region. To address this issue, the evaluation team is currently developing a market profile of the pumps market. Furthermore, based on the February 2006 pipeline report, 2 companies are shown as having at least *engaged* with 1 company being *committed*. In addition, the implementation team is currently working on collecting data reflecting trade allies' "marketing and/or offering" trainings. Formal evaluation of this KPI is pending the completion of this work as well as the completion of the market definition. Given the lack of data and the outstanding issues, evaluation progress for this KPI is difficult. In general, progress appears to be made, with continued attention necessary to ensure the KPI will be met.

**KPI#25--45% of the compressed air trade allies market (based on sales) participate either in taking, marketing, or offering courses:** In 2005, the Initiative offered three compressed air trainings. Based on participant registration data, employees of 12 trade allies attended the trainings representing roughly 50% of the market, based on market share information provided by the Technical Director. Based on the February 2006 pipeline report, two manufacturers and one consultant have reached the *committed* engagement level representing roughly 65% of the market. One additional trade ally is shown at an *engaged* level. In addition, the implementation team is currently working on collecting data reflecting trade allies' "marketing and/or offering" trainings. Overall, the progress made in the compressed air channel appears strong with the KPI having been met in the first year.

## Channel Management

**KPI#26-- Firms representing 30% of the motor trade allies market (based on repairs) spent resources on joint marketing activities:** Given the current lack of a finalized market definition of the motor market, along with lack of data on which trade allies “spent resources on training,” the evaluation of this KPI is pending development of these data. However, as of February 2006, at least three trade allies were identified as being *engaged*.

**KPI#27-- Firms representing 30% of the pump allies market (based on sales/employment) spent resources on joint marketing activities:** Given the current lack of a finalized market definition of the pump market, along with lack of data on which trade allies “spent resources on training,” the evaluation of this KPI is pending development of these data. However, as of February 2006, at least one pump trade ally each was identified as being *engaged* and *committed*.

**KPI#28-- Firms representing 45% of the compressed air trade allies market (based on sales) spend resources on joint marketing activities:** Given the current lack data on which trade allies “spent resources on training,” the evaluation of this KPI is pending development of these data. However, as of February 2006, the implementation team identified two trade allies as being committed and one as being *engaged*. Given the solid progress in the compressed air market, the evaluation team assumes that meeting this KPI by 2007 will be likely.

## Utility and Market Coordination

**KPI#31--6 utility or other organizations actively participating in product and service development (adopt specifications, provide incentives, technical support, etc.):** Based on information provided by the implementation team, one utility has agreed to adopt compressed air standards. The Initiative is also currently coordinating with EASA to reinforce regional support for Northwest motor repair shops as well as to make rewind standards potentially considered at the national level. Meeting the three-year KPI of six utilities and/or other organizations would require more intensive effort and possibly the dedication of additional resources.





## 6-Process Evaluation

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Owing to its scope and complexity, the Initiative lends itself to a large number of observations and feedback opportunities. Consistent with the principle of continuous improvement process (CIP) embraced by the Initiative, the evaluation team worked closely with the Initiative design and implementation staff and provided feedback and support throughout the first year of the Initiative’s operation. The observations and recommendations offered hereafter focus on key elements of the Initiative’s design and implementation with the purpose of identifying areas and opportunities for improvement.

The observations and recommendations in this chapter are based on information gathered by the evaluation team from a variety of sources that include, but are not limited to, the following (see Table 14 for sample size information):

- Detailed process interviews with Initiative team members;
- Survey of training participants;
- Firm, trade ally, and utility feedback collected as part of informal interviews, follow-up, calls, or informal conversations at a variety of events attended by the evaluation team;
- Attendance at Initiative meetings and sponsored events.

**Table 14. Summary of Data Collection Activities and Sample Sizes**

Data Collection Activity	Targeted Sample	Number Attempted	Number Completed
IEA Implementation Team Interviews	12	12	12
Training Exit Surveys	175	175	164

The Initiative made significant strides toward meeting its targets during the first year of implementation. The review of the implementation process, however, shows that progress in some areas fell short of expectations. This conclusion was echoed during interviews with the Initiative team members who generally regarded progress in some areas slower than expected, owing mainly to the Initiative’s complexity and novelty of its approach.

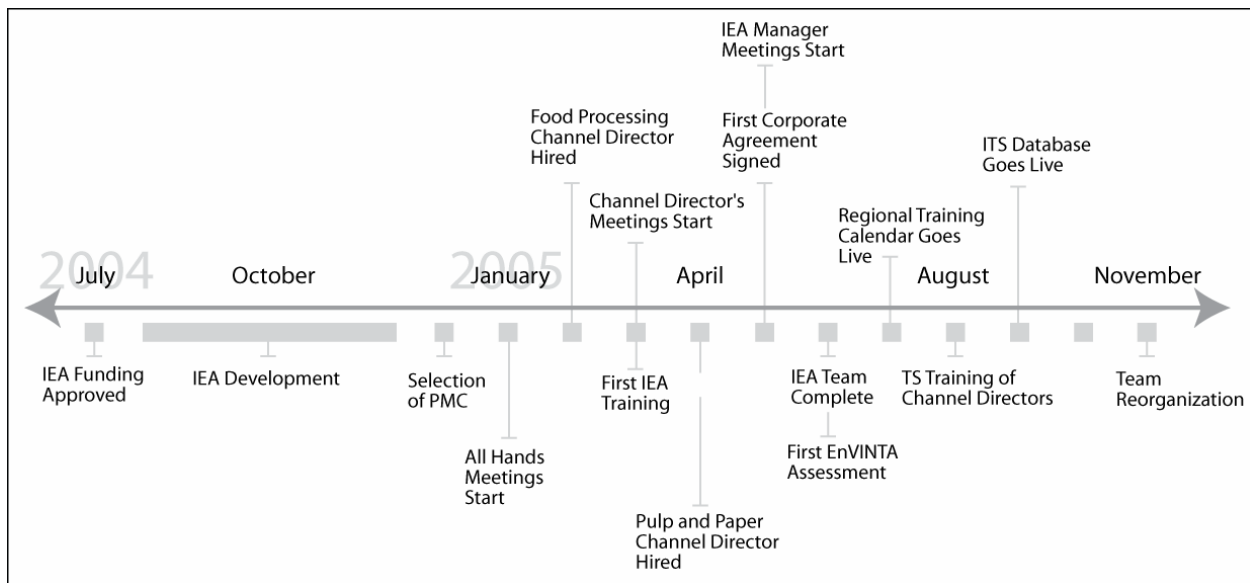
Following is an overview of key events during the first year of implementation, as well as observations and recommendations regarding various components of the implementation process.

### Key Events

Given the operational uncertainties inherent in pursuing a project of this magnitude, the implementation process was conceived as a “phased” undertaking to be completed in several stages. The primary focus of the first year was team establishment, testing, and refining the Initiative’s messaging and offerings, as well as recruiting firms for participation. Given the importance of the vertical markets in reaching the Initiative’s goals, priority was given to vertical

market development. The systems technical markets, while not the primary focus in year one, would be brought along with the goal that year two would heavily focus on systems technical market development. Following the first two years, the Initiative is expected to have developed a sufficient foothold in all target markets to continue its work in the vertical and systems markets simultaneously and synergistically. Figure 12 of the key implementation activity and event timing.

**Figure 12. Initiative Implementation Timeline**



***Actual sales cycle length proved to be significantly longer than expected.*** One of the key elements contributing to the slower than expected project ramp-up was the fact that the “sales cycle” length, driven by specific market conditions and implementation barriers, greatly exceeded what was initially assumed. Adjusting the Initiative’s implementation strategy to account for this difference required the dedication of additional time and resources to both vertical channels. The sales cycle length, among other factors, is one of the key assumptions underlying the Initiative’s first year goals, as defined by the KPIs. The variance between the assumed and actual timing in the sales cycle is one likely reason for the Initiative having missed some of its first year implementation targets with regards to business practices.

***Operations ramp-up began slowly with noticeable acceleration toward the end of the year.*** In light of the fact that the implementation team was not fully staffed until June 2005, and most of the implementation tools were not fully operational until late 2005, the operational activity ramp-up took longer than initially anticipated. Examples include channel director identification and recruitment, team building, development and implementation of operational and management tools such as ITS, and getting channel directors up-to-speed on the Initiative’s concept and strategy. However, once the Initiative was up and running, key implementation tasks were rolled out in short order. By the end of 2005, the majority of the Initiative’s key implementation elements were in place and operational. Despite initial delays, the implementation team,

specifically in the two vertical markets, was successful in making significant inroads into the target markets during the last quarter of 2005 (see Chapter 5 for details).

## Establishment of Goals

***The long-term IEA goal of market transformation is well understood by IEA team members:*** Based on feedback from Initiative team members, the general consensus regarding the Initiative's key goal is to raise awareness in the industrial sector about how energy is used, impacting industrial firm behavior, and leading to a decrease in energy consumption per unit of plant output. When asked about what differentiates the Initiative from other energy efficiency programs in the Pacific Northwest and the rest of the U.S., team members highlighted the Initiative's focus on continuous energy improvement and a systems-based approach to energy efficiency. While the overarching goal of the IEA appeared to be well understood, team members expressed confusion about the KPIs' purpose and definition and how they would be tracked.

## Definition of Key Performance Indicators

Key performance indicators are crucial Initiative elements. They are the principal linkages between the Initiative's implementation activities and its market effects and, ultimately, energy savings. They also provide standards against which the Initiative's progress can be tracked and evaluated. KPI development was an important undertaking during the first year of implementation. A detailed description of KPIs, by market target, established as of March 15, 2006, and the progress for each KPI during the first year of implementation are presented and discussed in Appendix I of this report.

***Proper KPI definitions occurred too late in the implementation process:*** Although the initial set of KPIs were reviewed and adopted by the Portfolio Committee in July 2005, the some KPI definitions were not finalized until well into the first quarter of 2006. In several cases, the PMC is still working on developing effective data collection and storage protocols. This process is anticipated to be completed by the end of the second quarter of 2006. Similar to the impacts related to missing KPI definitions and data, the delayed KPI finalization interfered with the effective integration of the KPIs into both operational and management tools as well as the proper data tracking needed for KPI evaluation.

### ***Recommendation:***

- For the purpose of developing and implementing KPIs for other markets or similar initiatives, NEEA and the implementation contractor should take care to develop clear definitions for all KPIs and identify data sources and measurement methodologies prior to implementation activity commencement.

***Many KPIs either lacked proper definition or were ambiguously defined:*** For example, in several cases, the KPIs were specified as a percentage (share) of the market without providing a clear definition of the actual market size.<sup>61</sup> For example, one of the original training KPIs for the

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<sup>61</sup> This applied to both vertical markets and all four systems markets.

pulp and paper marketed used to read: “45% of market (by load) or 9 mills participate in systems optimization and market specific training.” As stated, this definition was confusing. Specifically, the fact that the KPI is specifies “a target of 45% of the regional load or 9 mills” appears inappropriate, especially in light of the significant variation in products, output, production processes and therefore energy use among Pacific Northwest mills. Depending on which 9 mills were targeted, the load represented by these mills could vary greatly.

In addition, to issues related to the KPI definitions, throughout much of the year, there was persistent confusion over who should take responsibility for developing market definitions. It appears that the initial assumption was that the channel directors would provide key players with market definitions, as well as estimates of market shares. While draft definitions for the majority of markets have been developed, a number of markets, such as the pump market and the trade ally market serving pulp and paper,<sup>62</sup> are still lacking proper definition.

The lack of properly defined KPIs has had significant ramifications for the implementation process. First, it resulted in a certain degree of confusion and frustration for some Initiative team members, particularly the channel directors who were charged with developing work plans and prioritized key account lists that would meet KPI goals. Second, it prevented the PMC from effectively integrating the KPIs into the implementation process. For example, the lack of clear definition resulted in confusion over how to best integrate the KPIs into the channel directors’ work plans. Further, the IEA was not fully staffed until the end of June, 2005. These, in addition to other operational factors, resulted in the work plans not being completed until well into the third quarter of the first year. Finally, the lack of properly defined KPIs made it difficult to integrate the KPIs into the ITS so that their progress could be tracked effectively. Furthermore, the lack of properly defined KPIs required both the implementation and evaluation teams to dedicate significant resources toward fine-tuning the definitions as well as dealing with the development or extraction of the data from the ITS. Lastly, the evaluation team’s ability to evaluate the KPIs was impacted significantly resulting in delays and additional resources having to be spent on working with numerous interim KPI definitions. As reported in Chapter 5 of this MPER, in some cases, formal evaluations are still pending the development of data.

### ***Recommendations:***

- Ensure all data required to evaluate KPI progress are identified and tracked using the ITS. In cases where tracking data within the ITS is impractical, the PMC should provide an alternative data tracking mechanism that allows easy data extraction.
- Develop a reference document that identifies, for each KPI, the location (database field), data format, and usual update frequency of data within the ITS and/or other data sources. Update this reference document to account for any changes in the ITS (e.g., structural or naming convention changes).

***KPI ownership responsibility was unclear during much of the first year:*** Much of the KPI-related problems are likely attributable to the lack of assigned KPI ownership. Throughout most of the year, KPI ownership and responsibility was unclear. This resulted in a lack of attention

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<sup>62</sup> In both cases, the evaluation team is currently conducting research to develop the missing market definitions.

and time dedicated to outstanding issues related to KPI establishment. It is our understanding that the responsibility for the KPIs rests with the Program Manager and a member of the former design team.

***Recommendation:***

- For the purpose of developing and implementing KPIs for other markets or similar initiatives, it is important that the KPI development responsibility is assigned to one individual or specific group.

## **Development of Organizational Structure**

***Organizational challenges were addressed in a timely and effective manner:*** The Initiative's organizational structure was the result of several iterations of alternative administrative and reporting arrangements. The organization's development into its current configuration resulted from an adaptive process that responded to needs as they emerged and lessons learned from the early implementation phases. This change in organizational structure was prompted by a variety of operational concerns including the attempt to avoid confusion about key team member roles and responsibilities. For example, a number of team members had expressed confusion over the role of the design team since they were perceived as not having any formal responsibilities, yet were remaining actively involved. Some channel directors expressed confusion and frustration about lack of a clear management and support structure. Several team members also mentioned the absence of clear reporting relationships.

Following incremental adjustments throughout the year, in November 2005, the Alliance Program Manager oversaw a substantial reorganization of the team intended to address specific operational and management issues. (See Appendix A for more information.) Initiative management made every effort to quickly implement the changes to avoid confusion, uncertainty, and inefficiencies that could potentially cause distractions from organizational goals. In all, Initiative team member feedback, specifically from channel directors, indicated that the net effect of the changes were positive.

From an evaluation point of view, the key question regarding the need and/or effectiveness of an organizational change is to assess whether an organizational structure fits into and supports the program logic underlying the Initiative implementation. Our observations indicate that, by and large, the revised structure is consistent with the logic model requirements.

***Resource needs need to be continuously assessed, and resources need to be reallocated or augmented if necessary:*** Most channel directors indicated that they had sufficient resources to get their job done. In a few cases, however, they believed that current resources will have to be augmented as more participants and trade allies become interested and engaged in the Initiative. Project management has indicated an awareness of this issue and, if necessary, is prepared to allocate additional staff to assist channel directors as it becomes necessary. Examples of how project management has addressed past resource needs includes hiring a full-time training coordinator, developing a service center, and hiring coordinator staff dedicated to channel directors.

### ***Recommendations:***

- Continuously monitor, adjust resources as necessary to ensure efficient rollout of implementation strategies.
- If possible, make the Utility Coordinator position full-time. Implementation team feedback suggests that the Initiative has not been spending enough time and resources on utility coordination and relations management. Several team members commented that, while the Utility Coordinator had been doing an excellent job providing the needed support, the part-time nature of his position severely limited his ability (and that of the Initiative team as a whole) to foster stronger local utility ties.

## **Internal Communications**

Initiative management and implementation team members held the view that, despite the team's large size, internal communications were functioning relatively well. Our own observations indicate that improving internal communications was one of the key challenges for the PMC. While improvements have been made, communication among the implementation team could be further improved, especially between systems and vertical channel management.

### **Meetings**

***Meetings have become more effective and targeted:*** Face-to-face meetings and team workshops were the key tools for coordinating activities, establishing priorities, developing operational procedures, and team building, especially during the early implementation stages. These meetings were important given the diversity of many team members' professional backgrounds, particularly the channel directors, and the fact that many team members were unaccustomed to working closely within such a large, interdependent team. Team member feedback during this period indicates that, despite the large number of meetings, they were generally found to be well organized, productive, and useful. Initiative team management has since then implemented changes to streamline the type and number of meetings, as well as the key target audience to attend them. Most team members view the reduction in meetings as positive.

### **Intranet**

***The Intranet is an effective tool but needs to be used more consistently and better integrated with the activity tracking system:*** Team member feedback indicates that most find the Intranet a useful tool, especially for scheduling meetings and transferring documents. However, many confessed to lacking time or inclination to develop consistent usage patterns, specifically with updating and managing documents. A few expressed levels of frustration about the Intranet and the activity tracking system not being linked. Likely consequences of the observed Intranet under-utilization are reduced communication efficiency, specifically among the channel directors, sub-optimal internal communication of key information, as well as a lack of a central data depository system. PMC staff indicated that efforts are underway to address these issues and to expand the site's usability and functionality.

### ***Recommendations:***

- Identify barriers to effective utilization of the tool. Assess Intranet usefulness to channel directors and the rest of the implementation team as a tool of improving implementation process efficiency and effectiveness. Develop and implement modifications to the tool to enhance usability.
- Provide clear instruction to the entire team on purpose, usage, and importance of use.

### **Activity Tracking (ITS)**

As is common with any interactive software tool, the ITS has been a work in progress for much of 2005, with the ITS team addressing issues related to usability and content. For instance, as the KPIs have taken on more concrete definitions, the Initiative team has been updating the ITS to more closely reflect and track KPI data. Based on channel director feedback, the ITS is generally thought of as being a useful tool, especially for tracking communication “threads,” particularly for the Alliance PM and the PMC. While a number of users complained about the user-unfriendliness of the system, follow-up interviews in the latter part of the year indicated that updates and changes, as well as increased comfort and familiarity with the tool, has significantly increased its usage.

***Data quality is inconsistent and needs improvement:*** The data tracking system is an important tool for the operation and evaluation of the Initiative. Not all relevant data are currently properly tracked. The list of KPI’s details the untracked data related to these measures and the evaluation team will provide a memo to the Alliance on the remainder. The system also suffers from data quality issues, specifically in the case of contact information for training participants, which have hampered training activity tracking and evaluation. This information also forms the basis for the on-site savings verifications. Lack of contact information (specifically, e-mail addresses and phone numbers) are a substantial impediment to this effort and may prevent the evaluation team’s ability develop savings estimates associated with training.

***ITS is not being consistently used by all team members:*** While several channel directors are effective and detail-oriented when adding data to the ITS, intermittent and inconsistent ITS usage by others has resulted in the lack of complete data. The resulting data quality issues affect both project management’s ability to track progress on a real-time basis, as well as the evaluation team’s ability to obtain the data necessary to evaluate some KPIs.

### ***Recommendations:***

- Ensure that all channel directors and/or training staff are using the ITS to track data in an accurate and timely fashion.
- Develop and integrate data screening routines to check for entry errors and incomplete records on a regular basis.
- Monitor and complete training participant contact data, where appropriate.



## External Communications

### Marketing

***Problems with messaging and value propositions were effectively addressed:*** Based on feedback from industrial users, trade allies and utility representatives, the initial marketing material and messaging rollout, which focused primarily on Initiative structure and function, was ineffective. This was further evidenced by the fact that the many potential participants were not pursuing Initiative involvement. The feedback indicated confusion about the Initiative’s mission, its offerings, and value to various audiences and how it fit into the existing market for energy efficiency services offered by utilities.

In response, the marketing team led a two-day workshop in July 2005 during which channel directors, supported by design and management team members, developed market-specific value propositions that would become the basis for all of the Initiative’s marketing material and messaging. Following the workshop, the marketing team launched a comprehensive re-tooling of the Initiative’s collaterals and marketing products. As the result of these efforts, all external messaging now focuses on three main Initiative benefits: improved competitiveness, profitability, and the potential for non-energy benefits.

***Marketing team has been effective at adjusting its offerings to meet the needs of channel directors:*** The marketing team’s initial role was envisioned to focus primarily on strategic marketing tasks, messaging, and outreach. However, shortly after operations commenced, the need for significant support services related to developing presentations, handouts, and customer-specific marketing materials became apparent. The marketing team since then has broadened its service offerings to provide channel directors with the needed support and services (see Appendix E for a summary of marketing materials developed during 2005). Channel director feedback indicates that the marketing team’s efforts have significantly improved the channel directors’ ability to carry out their outreach responsibilities.

### The Initiative Web Site

***The Web site is effective, provides useful information, and is being more heavily used:*** The Initiative promotes its Web site through a number of channels including a variety of marketing materials, presentations, and direct contact with the target audience members and market partners. Based on basic Web site traffic statistics, available from launch through December 1, 2005, it appears that the site had over 3,000 unique visitors, or an average of 13 visits per day, with users spending an average of 5:13 minutes on the site.<sup>63</sup> The majority of these visitors (73%) were from within the U.S. Non-U.S. site visitors were from Canada (5.7%), the United Kingdom (2.9%), and India (1.4%). During the same time period, site statistics indicate that the most popular pages were the “Resource,” “About Us,” and “Training” pages. Out of these pages,

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<sup>63</sup> Cumulative site statistics further indicate that 8,460 total downloads were requested, or an average of 36 requests per day. Common search terms used by visitors bringing them to the site included “industrial,” “refrigeration,” “alliance,” and “efficiency.”

viewers spent the longest time (five minutes) viewing the training calendar, followed by the resources page (four minutes). The Web site appears to be effective and is gaining popularity. Continued efforts to keep the Web site data current and relevant, as well as direct and indirect promotion of the Web site through marketing materials and implementation activities, is likely to further improve tool usage and effectiveness.

## Coordination with Market Partners

***Vertical Channel Directors and Systems Technical Directors did not establish relationships with utilities at the onset of the Initiative:*** Our review of implementation activities and Initiative team member opinions suggest that, during early implementation, the Initiative's directors did not make sufficient efforts to coordinate their work with local utilities. The result was apparent confusion amongst market partners, and in some cases, a strained relationship with one or two utilities. Interviews with Initiative team members and anecdotal evidence offered by some market partners, suggest that lack of effective and timely communication and education might have been to blame. Another reason for the apparent confusion is that not all utilities perceived that they were involved in, or adequately informed about, the goals and strategic intent of the Initiative during the design phase.

Coordination between Initiative outreach and utility key account management activities was a major area of concern for utilities. In many large utilities, energy efficiency staff and account management services belong to distinctly different corporate structures and often have different reporting relationships. Initially, much of the Initiative's outreach efforts were focused on working with efficiency staff. However, account managers bear the responsibility for customer relations management. Further complications arose due to the fact that the Initiative was targeting the customers' corporate officers, while utility account manager contacts are generally focused on the local representatives. To address these challenges, the Initiative team, led by the Utility Coordinator, undertook a concerted effort to shift its perspective to recognize utilities as members of a specialized target audience. (See Appendix H for a discussion of the efforts conducted to address some of these challenges.)

Informal and anecdotal information from a small number of utilities indicates that utilities are generally beginning to have a greater appreciation for the Initiative's strategy and recognize its potential to offer real value to their industrial customers. To gain a better perspective on utility perception of the Initiative, the evaluation team will conduct a comprehensive utility survey that will target utilities serving customers within the Initiative's target markets. The findings from this survey will be published in MPER #2.

### ***Recommendation:***

- Consider expanding the Utility Coordinator position to full-time.

***Role and operation of utilities not clear to all team members:*** Based on our interviews with implementation team members, it appears that the role of utilities, and the nature of the relationship between the Initiative and utilities, was not entirely clear to all Initiative team members. Interviews with Initiative team members indicate a common misconception of the role

of utilities as mere “sources for funding” of the Initiative, rather than partners and a principal conduit for marketing and communications with firms.

***Recommendation:***

- Consider providing additional training to all IEA team members on utility-related issues, especially as they pertain to establishing and maintaining effective working relationships with the Initiative.

***Successful development of relationships with trade and professional organizations:*** The Initiative has been very successful at forging effective relationships with a number of key trade and professional organizations in the vertical markets as well as the Systems markets. Examples include the NWFPA,<sup>64</sup> the Technical Association for Pulp and Paper Industry (TAPPI),<sup>65</sup> the Washington Pulp and Paper Foundation (WPPF),<sup>66</sup> the Electrical Apparatus Service Association (EASA),<sup>67</sup> and Refrigeration Engineers & Technical Association (RETA),<sup>68</sup> to name a few. Development of these relationships will likely be helpful in promoting the Initiative and its offerings (i.e., training, EnVINTA, and business practices), as well as gaining market information and access to industrial users.

***Recommendation:***

- In addition to focusing on trade and professional organizations, consider working more closely with other agencies pursuing energy efficiency and resource efficiency in general to exploit potential synergies. These may include, among others, water utilities and state departments of ecology and environmental quality.

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<sup>64</sup> The NWFPA has strongly embraced Initiative goals and committed to promoting them as part of its outreach to existing and potential members. For instance, NWFPA visits approximately 10 customers per month as part of its outreach and regularly shares information about the Initiative with these customers, generating approximately two to three sales leads per month for the food processor Channel Manager. Also, the current president and former president of the NWFPA have actively engaged their companies with the Initiative.

<sup>65</sup> The Initiative has put on approximately 12 seminars for the Technical Association for Pulp and Paper Industry (TAPPI). In November 2005, the Initiative collaborated with TAPPI’s Pacific Section to present an energy efficiency-focused section meeting that was attended by local pulp and paper firms, vendors, service providers, and utilities.

<sup>66</sup> The pulp and paper Channel Director has been working with the Washington Pulp and Paper Foundation (WPPF) to develop focused presentations to the students of the Washington State University’s pulp and paper-focused engineering program.

<sup>67</sup> The Electrical Apparatus Service Association (EASA) is now promoting rewind practices for motors based on Initiative influence.

<sup>68</sup> The Initiative is working with the Refrigeration Engineers & Technical Association (RETA) to coordinate on a number of issues, including RETA certification.

## Market Intervention Elements

### Training

The Initiative developed its approach to offering technical trainings based on findings from a gap analysis conducted by the team. One of the Initiative's key goals is to create a continuum of courses, from introductory to more advanced, and to thus optimize the delivery and value of all training offered in the region. (See Appendix F for a summary of the specific trainings offered by the IEA in 2005.) The second goal was to develop effective training focusing on continuous energy management and a systems approach to energy efficiency. Conceptually, the offered training can be divided into four categories 1) Best Practice,<sup>69</sup> 2) Series-Specific,<sup>70</sup> 3) Site-Specific,<sup>71</sup> and 4) Industry-Specific trainings.<sup>72</sup>

Given the importance of training to the Initiative strategy for reaching both industrial firms and trade allies, the Initiative team developed a multi-pronged approach to offering trainings that addressed focus, location, advertisement and recruitment. While the initial offerings were focused on industrial refrigeration and pump systems, the Initiative quickly expanded its offerings in response to its gap analysis regarding training in a systems approach to energy efficiency. In 2005, the Initiative offered 21 training sessions including training in four targeted systems markets, ranging from basic and introductory in nature (e.g., Pumps 101) to advanced course such as Advanced Management of Compressed Air Systems. (See Appendix F for more information.)

In addition to offering attractive and helpful courses, one key element ensuring good training attendance was offering training in a variety of Pacific Northwest locations. This strategy was aimed at reducing attendance barriers related to sending employees to longer-distance trainings. Working closely with local utilities, trade allies, trade and professional organizations (e.g.,

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<sup>69</sup> These training sessions focus on general system users for a variety of cross-cutting technologies. Examples include Compressed Air 1 and 2. These sessions are typically offered by DOE and facilitated through WSU's Extension Energy Education Program. The Initiative co-sponsors these trainings to avoid duplication.

<sup>70</sup> These courses are designed to frame DOE's best practices trainings. For instance, in the case of pumping, the Initiative would offer Pumps 101 prior to DOE offering its PSAT and PSAT Specialist trainings. In addition, the Initiative might offer a number of site-specific classes.

<sup>71</sup> These trainings are frequently driven by the interests and training needs of a particular firm. For instance, one food processing firm requested that the Initiative offer an on-site training combining the curricula of Pumps 101 and DOE's PSAT class. Other examples include a request by a major pulp and paper firm to provide on-site compressed air training for its operators. The benefit of this type of training is that training materials and methods can be tailored to the target audience, which not only increases the transfer and retention of knowledge, but presumably also increases the likelihood of participants using the knowledge in their work.

<sup>72</sup> Instead of conveying mostly theoretical information to training participants as part of classroom trainings, industry-specific trainings combine pre-classroom homework assignments aimed at participants to collect system-specific data, in-class room instruction and a plant-tour to provide training participants with an effective mix of theoretical and practical knowledge. In addition, the trainings entail development of participant-specific "to do" list that participants can take back to their plant and implement. The first of these classes was focused on the refrigeration industry. The training was well-received by both participants and corporate representatives alike. The Initiative has since added this type of training to its potential offerings and is actively searching for opportunities to offer additional trainings of this sort.

NWFPA), the Initiative offered trainings throughout the states of Washington, Oregon, Montana and Idaho. Training locations were generally identified based on the concentration of pulp and paper and/or food processing plants.

The following are our observations related to the IEA training efforts. (See Appendix F for a more thorough discussion on training.)

***The Initiative made significant progress toward developing a regional solution to training coordination:*** Based on industry input, Initiative team identified the key barrier to training as being a largely uncoordinated gamut of technical trainings offered by a variety of providers that frequently left potential trainees confused and struggling to identify the most appropriate training for their needs. To avoid redundancy, improve effectiveness, and increase attendance, industrial firms indicated at the outset that close coordination with other training sponsors would be a critical element of offering effective trainings. In response to the need for close regional coordination, the Initiative developed a regional training calendar aimed at providing users with a comprehensive overview of training courses being offered in the region, regardless of sponsor.<sup>73</sup> This calendar supplies information for each training, including a course description, cost, target audience, and a list of specific benefits from attending the course. Based on initial feedback, the market, especially utilities, view this resource as both positive and helpful. (See Appendix F for more detail.) Based on our review of the Initiative's efforts in developing and promoting its regional training calendar as well as information feedback collected as part of our evaluation activities, the following three recommendations aimed at further improving the level of used of the calendar throughout the region.

***Recommendation:***

- Ensure that the regional training calendar is comprehensive and up-to-date and continue working with utilities, trade allies, and other market partners to promote the calendar.
- Continue calendar promotion efforts to utilities, trade allies, trade associations, and industrial users. Work with interested parties on adding the training calendar to their respective Web sites.
- Include information about the regional training calendar in general marketing and promotional materials for end-users and utility staff and/or in periodic e-mail newsletters to utility staff.

***The Initiative has effectively addressed the initial challenges in training promotion and recruitment:*** Three mechanisms are being used to promote and advertise trainings: 1) direct marketing to industrial firms and trade allies using print media, such as announcement flyers, 2) working closely with utilities and trade allies to identify and contact industrial firms, and 3) personal phone calls from channel directors to invite targeted participants. Notwithstanding these efforts, attendance in earlier training sessions tended to be low (10 to 12 vs. a target of 40), resulting in the cancellation of some sessions. Other challenges included recruiting participants who matched the Initiative's target audiences for a given training. For instance, using participant

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<sup>73</sup> In the Pacific Northwest, trainings are offered and/or sponsored by a number of different parties including but not limited to: WSU's Extension Energy Education Program, DOE, utilities, and trade associations.

data provided via the training evaluation forms, it appears that trainings have been well attended by operations, maintenance and engineering staff, the number of management staff and consulting engineers and trade allies participating in the classes has been limited. However, participant data provided for trainings conducted in late 2005 indicate a trend toward higher participation by trade allies and consulting engineers. To address these and other training-related issues, the Initiative has since hired a full-time training coordinator.

**Recommendation:**

- Continue efforts to enhance training advertisement and recruitment effectiveness and efficiency, with particular focus on key target audience recruitment.

Following completion of each training, attendees were asked to fill out an evaluation form. The evaluation forms were designed to address both general questions concerning the training quality and specific questions pertinent to session topic areas. While the Initiative started offering their training and workshops as early as March 2005, the first training followed-up using evaluation forms wasn't until June 2005. Given that the Initiative had offered several trainings prior to that date, for the purpose of this MPER participant feedback was only available for seven of those classes representing 175 attendees, or roughly 24% of attendees. As shown in Table 15, the findings have a precision of +/- 6% at a 90% level of confidence. Thus, the evaluation team considers the participant answers to be representative of all trainings during 2005.

**Table 15. Precision of Training Exit Survey Estimates at 90% Level of Confidence**

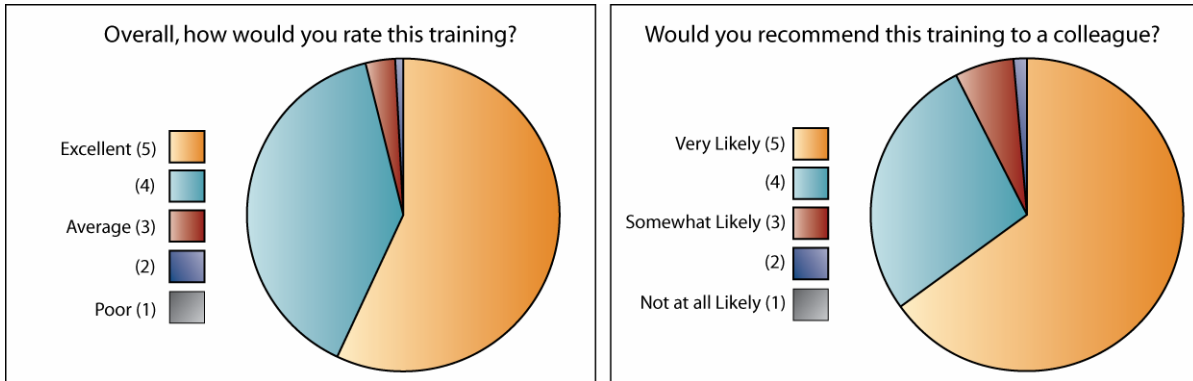
Market	Number of Classes	Number of Participants	Number of Completed Surveys	Precision
All Classes	21	716	164	6%*
Evaluated Classes	7	175	164	

\*Adjusted by Finite Population Correction Factor

The following observations are based on the participant answers provided on the evaluation forms.

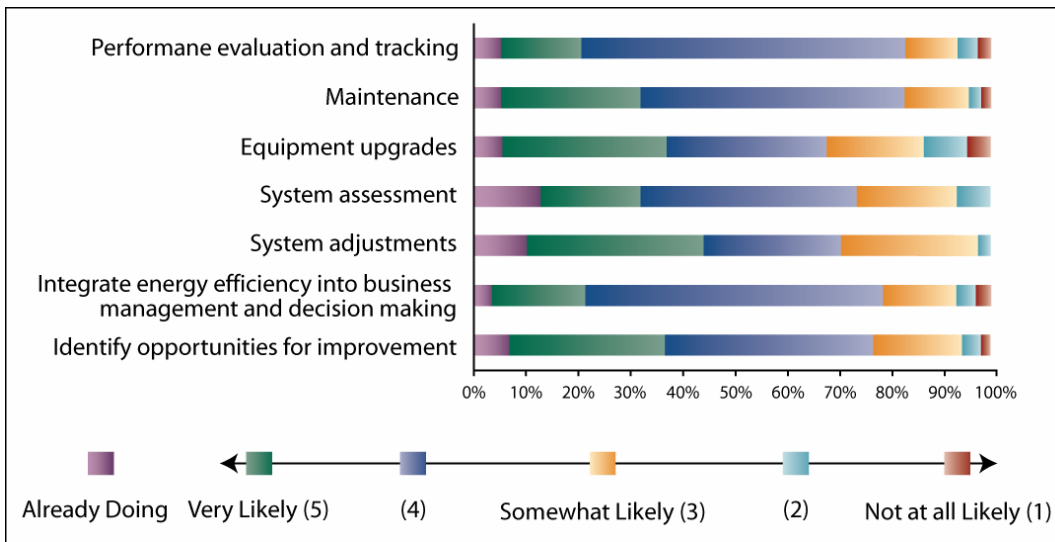
**Participants responded favorably to trainings:** Based on participant feedback, trainings by and large had high satisfaction ratings. Respondents rating the training “excellent” ranged from 37% for pumps to 90% for refrigeration training, with an average across all training sessions of 57%. Furthermore, over 93% of respondents said it was more than somewhat likely that they would recommend the training to a colleague. Figure 13 illustrates the responses regarding the overall rating of the trainings and the likelihood of recommending the training to a colleague.

**Figure 13. Participant Rating of Training and Likelihood of Recommendation**



**Training enabled participants to better perform their work:** The results of training evaluations, summarized in Figure 14, indicate that trainees are more likely to take steps to track performance (78%) or take additional maintenance steps (78%) as a result of the training.

**Figure 14. Likelihood of Participants Taking Action Based on Training**



**Technical subject matter and level of instruction was generally well-tailored to the audience:** For training sessions attended by evaluation staff, training materials were found to be well-suited to the audience with adequate time allotted to cover them during the training session. Instructors made ample use of project examples with a focus on what worked and what did not.

**Training usefulness could be further improved by greater emphasis on financial analysis:** While all trainings emphasized a systems optimization approach for analysis, none sufficiently addressed how to use economic analysis to develop a convincing business case for marketing project ideas to upper management. While case studies presented during training were

technically excellent, the only mention of economic analysis was a simple payback approach instead of a more detailed life cycle costing method.

***Recommendation:***

- Where appropriate, integrate a discussion on the different types of economic analyses (specifically life cycle costing) and their use in developing a convincing business case to financial decision makers.

**Business Practices**

Due primarily to their personal contacts and experience, the two vertical channel directors have been effective at entering their respective markets and approaching targeted firms. In general, the Initiative's efforts in business practices appear effective in both increasing awareness of the Initiative in the two vertical markets as well as in engaging industrial users.

***Quick identification of the key contact is the biggest challenge:*** Based on feedback from the implementation team, quick and accurate identification of the right target audience (e.g., plant manager, energy efficiency manager, etc.) has been the most challenging task, especially in light of the variety of firm structures and corporate configurations. Given the Initiative's focus on a combined top-down/bottom-up approach, the time and work associated with identifying and approaching the appropriate parties varied greatly.

***Each market requires customized approach:*** Based on feedback from implementation staff, customized approaches had to be developed for each market. In the case of food processing, a heavy focus on the top-down approach is required to achieve movement toward a corporate commitment. In contrast, experience in the pulp and paper channel has shown that a combination of top-down and bottom-up approach is most effective.

***Time and effort related to getting industrial users engaged is greater than initially anticipated:*** Both of the vertical channel directors have exhibited a strong understanding of their respective markets and how to target and engage industrial firms. However, both have indicated that time and effort related to guiding firms to the *engaged* and *committed* states of participation have been significantly greater than initially anticipated. As a result, progress in securing corporate commitments has been slower than expected. Based on feedback from industrial users and other Initiative team members, both vertical channel directors have been highly effective in adapting a needs-based sales approach for targeted firms to ensure all offerings, whether training or technical support from the systems channel directors, is addressing the unique needs of targeted firms.

***Company size and corporate structure are generally inversely related to the speed of reaching corporate commitment:*** Reflecting on the differences in effort related to varying firm and corporate structures, a general observation made by the food processing team has been that the smaller/medium companies are typically able to move more quickly toward making a corporate commitment, while the administrative, corporate, and coordination requirements of working with larger corporations, especially those with multiple plants, makes working with them a more time- and resource-intensive process. As a case in point, while several large companies have shown



interest in the Initiative, in some cases, Initiative efforts have stalled or been postponed for a variety of organizational and operational reasons. Given that the business practice KPIs are expressed as a percent of market share, meeting the goals may require additional efforts on securing commitments from larger firms.

## **Channel Management Services**

***In spite of the slow initial ramp-up, channel management activities have been successful:*** While confusion regarding the proper roles and responsibilities of the systems channel directors may have resulted in a slower than expected ramp-up in channel management, most channel directors have been successful at making inroads into their respective technical markets. In addition to formulating market-specific value propositions and contacting trade allies directly, the Initiative team organized two successful trade ally breakfasts at which the team introduced the Initiative, its offerings and goals, and provided valuable face-to-face time with trade ally staff and made contacts for future follow up. The trade ally breakfasts were well attended and generated positive feedback from trade allies. In general, the Initiative's efforts in the trade ally market appear to be gaining traction. The Initiative's progress during 2005 suggests that focus on trade allies during 2006 is likely to generate significant opportunities.

***Trade Ally market appears receptive to the Initiative:*** Leveraging the Initiative's close ties with the NWFPA, the Initiative team hosted a number of events target at trade allies including two trade ally breakfasts and active participation in the NWFPA 2006 Conference. Information feedback gathered by the evaluation team during these events suggests that the majority of interviewed vendors and suppliers were aware of the Initiative and/or were already participating in training or recommending Initiative training to their clients.

## **Products and Service Development**

***Progress in products and services development has been slow:*** Given that year one of implementation was mainly focused on the vertical markets, as well as on initial Initiative ramp-up, no products or services have been developed or were distributed in 2005. However, based on feedback from the systems channel directors, several opportunities have been identified.<sup>74</sup> The evaluation team does not consider the lack of concrete progress in this intervention as a major cause of concern at this state of the implementation. It is expected that the increased focus on systems markets in 2006 will provide ample opportunity for the systems technical team to develop new products and services or distribute existing ones.

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<sup>74</sup> One such opportunity is marketing and distribution of *em2solutions* motor management software,<sup>74</sup> which was developed by the Motor Channel Director with partial funding provided by the Alliance. Designed for use by maintenance managers and other technical staff, the software is an easy-to-use survey and evaluation tool for three phase motors aimed at improving the reliability and efficiency of a fleet of motors. However, while at least one firm was provided with an evaluation copy of the software, to date, no firms targeted by the Initiative have fully started using the software.

## **Demonstrations and Case Studies**

*Progress with development of demonstrations and case studies has been slow:* Given the Initiative's focus on showcasing business practices and a systems approach to energy efficiency, as well as their early stage of implementation, no demonstration projects or case studies have been completed to date. However, the team is actively identifying potential opportunities that could result in successful demonstration projects and case studies in implementation years two and three.



## 7-Conclusions and Recommendations

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Based on our review of the Initiative's first year of implementation, we conclude that in 2005, the Initiative made significant strides in developing its market development strategy, establishing a cohesive organizational and management structure, recruiting and training for key positions, and developing the necessary administrative and information infrastructures to support its operation.

1. Due in part to the novelty of its approach and complexity of its strategy, organization of the Initiative proved more difficult than expected and so led to delays in formation and consolidation of the administrative structure. The organization's development into its current configuration was the result of an adaptive process that responded to both needs as they emerged and lessons learned during the early phases of implementation. Following incremental adjustments throughout the year, in November 2005, the Alliance Project Manager oversaw a substantial reorganization to address specific operational and management issues. In our judgment, and based on feedback from the implementation team, the net effect of the changes were positive and resulted in a more cohesive structure with clearer and more effective lines of communication.
2. The Initiative has been successful in developing and deploying the necessary support infrastructures including a Web site, data tracking system, and administrative support, particularly for channel management and training coordination. There is, however, the need for improved quality assurance and control, particularly in data tracking.
3. Early problems with messaging and value propositions were effectively addressed, and the marketing team has succeeded in formulating and articulating more effective value propositions that appear to better resonate with all target audiences including industrial firms, trade allies and market partners.
4. Long-term goals of the Initiative and its strategic intent are well understood by team members. There does, however, appear to be persistent confusion among team members about the definition and relevance of the established key performance indicators and how they correspond with the Initiative's intended market effects and energy savings goals.

### Progress Toward Key Performance Indicators

The IEA planning and implementation team developed a set of thirty-three Key Performance Indicators (KPIs) based on goals approved by the Alliance's Portfolio Committee during the first year of the Initiative. These KPIs measure both impact and activity. For example, facilitating the adoption of continuous energy improvement practices by 8% of the food processing sector is a transformation of that market. Completing a specified number of demonstration projects (6) is only a measure of activity. In reviewing the KPIs, it is important to distinguish between the respective measures to understand the Initiative's performance or progress.

In general, the Initiative seems to be on schedule for many of the vertical market training and business practice goals, except for the KPIs tracking the actual adoption and implementation rates of energy management programs. Progress on KPIs related to demonstrations/case studies,

product/service development for trade allies, and market/utility coordination, was markedly behind schedule. However, we do not consider behind-schedule progress as a concern at this stage of implementation, especially given the delayed commencement of implementation activities and the fact that the team has made many promising connections and market inroads.

Regardless, in the next two years, the implementation team will need to demonstrate significant progress in these areas to ensure achievement of overall Initiative goals. The following is a summary of process recommendations from Chapter 6:

### **Definition of Key Performance Indicators**

1. For the purpose of developing and implementing KPIs for other markets or similar initiatives, NEEA and the implementation contractor should take care to develop clear definitions for all KPIs and identify data sources and measurement methodologies prior to implementation activity commencement.
2. Ensure all data required to evaluate KPI progress are identified and tracked using the ITS. In cases where tracking data within the ITS is impractical, the PMC should provide an alternative data tracking mechanism that allows easy data extraction.
3. Develop a reference document that identifies, for each KPI, the location (database field), data format, and usual update frequency of data within the ITS and/or other data sources. Update this reference document to account for any changes in the ITS (e.g., structural or naming convention changes).
4. For the purpose of developing and implementing KPIs for other markets or similar initiatives, it is important that the KPI development responsibility is assigned to one individual or specific group.

### **Development of Organizational Structure**

5. Continuously monitor, adjust resources as necessary to ensure efficient rollout of implementation strategies.
6. If possible, make the Utility Coordinator position full-time. Implementation team feedback suggests that the Initiative has not been spending enough time and resources on utility coordination and relations management. Several team members commented that, while the Utility Coordinator had been doing an excellent job providing the needed support, the part-time nature of his position severely limited his ability (and that of the Initiative team as a whole) to foster stronger local utility ties.

### **Internal Communications**

7. Identify barriers to effective utilization of the tool. Assess Intranet usefulness to channel directors and the rest of the implementation team as a tool of improving implementation process efficiency and effectiveness. Develop and implement modifications to the tool to enhance usability.
8. Provide clear instruction to the entire team on purpose, usage, and importance of use.

9. Ensure that all channel directors and/or training staff are using the ITS to track data in an accurate and timely fashion.
10. Develop and integrate data screening routines to check for entry errors and incomplete records on a regular basis.
11. Monitor and complete training participant contact data, where appropriate.

### **Coordination with Market Partners**

12. Consider expanding the Utility Coordinator position to full-time.
13. Consider providing additional training to all IEA team members on utility-related issues, especially as they pertain to establishing and maintaining effective working relationships with the Initiative.
14. In addition to focusing on trade and professional organizations, consider working more closely with other agencies pursuing energy efficiency and resource efficiency in general to exploit potential synergies. These may include, among others, water utilities and state departments of ecology and environmental quality.

### **Market Intervention Elements**

15. Ensure that the regional training calendar is comprehensive and up-to-date and continue working with utilities, trade allies, and other market partners to promote the calendar.
16. Continue calendar promotion efforts to utilities, trade allies, trade associations, and industrial users. Work with interested parties on adding the training calendar to their respective Web sites.
17. Include information about the regional training calendar in general marketing and promotional materials for end-users and utility staff and/or in periodic e-mail newsletters to utility staff.
18. Continue efforts to enhance training advertisement and recruitment effectiveness and efficiency, with particular focus on key target audience recruitment.
19. Where appropriate, integrate a discussion on the different types of economic analyses (specifically life cycle costing) and their use in developing a convincing business case to financial decision makers.

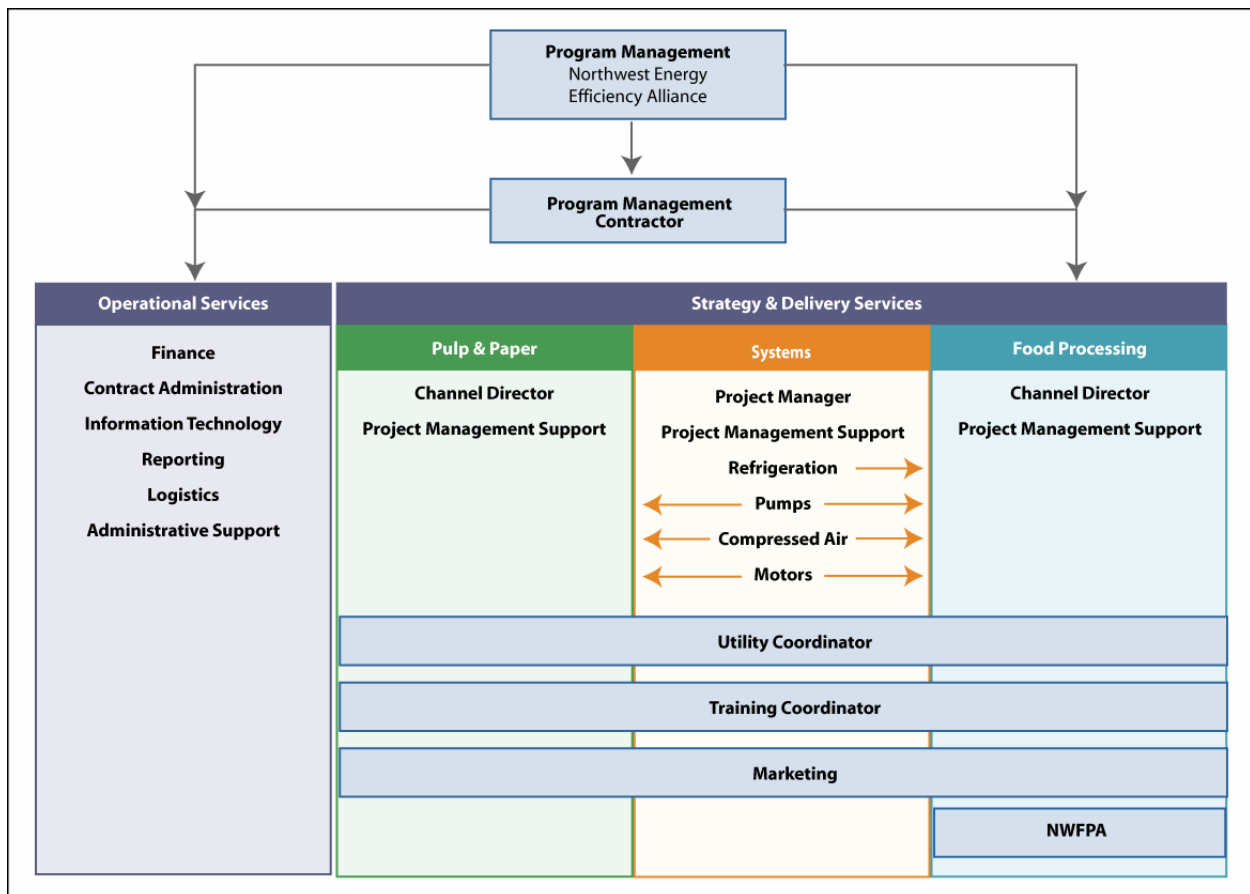
While KPIs serve as a critical project management tool, they are not equivalent to market progress indicators. Based on the Initiative's logic model, the original ISI strategy, and observations of initial project implementation, the evaluation team developed a set of market progress indicators that will guide our assessment of the degree of transformation of the Northwest industrial sector (See Chapter 3 for a list of the market progress indicators). Future Market Progress Evaluation Reports will assess market progress based upon these indicators.



# Appendix A. IEA Organizational Overview

Due to the size, scope, and complexity of the Initiative, its implementation requires a highly structured yet flexible organizational and management model. From a functional perspective, the Initiative team is comprised of Alliance program management, the project management contractor (PMC), including channel directors and other implementation staff, the Utility Coordinator, and the marketing team. Following is an overview of the Initiative’s current organizational structure functional perspective including brief descriptions of the key organizational components..

**Table A-1. Functional Organizational Chart of IEA**



## *Program Management*

The Alliance’s Industrial Sector Initiative Senior Manager is ultimately responsible for all aspects of Initiative planning and implementation, including overall project management team management, budget oversight, and reporting progress to the Alliance management.



Initiative implementation and day-to-day operation is the responsibility of a Program Management Contractor (PMC). The Alliance selected ECOS Consulting as the PMC through a competitive solicitation in late 2004. The PMC provides all management, technical, operational, and support staff related to Initiative implementation.<sup>75</sup> Key PMC functions fall into two general areas: strategy and delivery services and operational services.

### **Strategy and Delivery Services**

Given the Initiative's target markets, the strategy and delivery services group combines technical and strategic staff focused on the pulp and paper and food processing markets, as well as cross-cutting technology channels. The team is led by a project director responsible for planning, team coordination, and team resource management.

The technical staff consists of seven channel directors – two for the vertical markets and five in the cross-cutting markets. Vertical channel directors provide expertise in the pulp and paper and food processing markets and act as leads for and the liaison between the Initiative and the vertical markets. Cross-cutting channel directors constitute the core technical resources of the Initiative and focus on one industrial system (motors, pumps, compressed air, and refrigeration<sup>76</sup>).

### **Operational Services**

The operational services group combines organizational functions, such as finance, information technology, reporting, logistics, training coordination, marketing, and utility coordination. The operational services project manager works closely with the Strategic and Delivery Services group to assure that channel directors have needed support, including marketing, utility coordination, training, and other incidental support, such as information technology and budgeting.

- *Utility Coordination.* The role of the Utility Coordinator is to facilitate introductions and make key connections between the Initiative channel directors and local utilities. The Utility Coordinator is also responsible for updating utilities on Initiative progress and identifying opportunities for increased coordination with existing utility-sponsored industrial-sector demand-side management programs. The Utility Coordinator also facilitates better working relationships between the Initiative and regional utilities.
- *Marketing.* The marketing team consists of Alliance's Marketing Director and professionals from the public relations and advertising firm of Fleishman-Hillard in Portland. The Marketing Director functions as a liaison between the Alliance PM, PMC staff, and Fleishman-Hillard on planning and budgeting, as well as product and service development.

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<sup>75</sup> While the majority of staff associated with these functions are employees of the PMC and thus report to the PMC, the utility coordinator and the marketing team members report directly to the Alliance's Program Manager.

<sup>76</sup> There are currently two channel directors involved in refrigeration.

## Appendix B. Overview of Communication Tools

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Effective communication among the implementation team, on the one hand, and between the implementation team, alliance members, trade allies and market partners, on the other, is a necessary condition for Initiative success.

### Internal Communications

While a variety of mechanisms are being used to address this need, the three main media for internal Initiative communication are meetings, documents, and the Intranet.

#### Meetings

Given the complexity of the Initiative and the large number of staff involved in implementing it, the Implementation team holds a variety of different meetings (operational, managerial, etc.) aimed to facilitate effective communication among team members, between the PMC and the Alliance, and between the Initiative and its stakeholders. Table B-1 provides an overview of the different types of meetings held, as well as their frequency and typical participants.

**Table B-1. Overview of Meetings**

Type of Meeting	Frequency	Participants
Operational Meetings	2-3 times a week	As needed
Managers Meeting	Weekly	Alliance PM, Operations PM, Strategy & Delivery Services PM
Channel Director's Meeting	Weekly	Channel Directors, Marketing, utility Coordinator, Operations PM, Strategy & Delivery Services PM
Channel-Specific Team Meetings	Monthly or as needed	Channel Teams, Marketing, Training Coordination as needed.
Utility Stakeholder Call	Every 2 Months	Alliance PM, Utility Coordinator, Operations PM, Strategy & Delivery Services PM
All Hands Meeting	Quarterly or Semi-Annual	Entire IEA Team, Evaluation, NWFPA, Others based on Invitation

#### Documents

In addition to meetings, the Initiative team relies heavily upon a number of project management documents to help the team track, guide, and update their approach to a given market sector or firm. Examples include Channel Director workplans, project pipeline reports, and management scoping briefs. Following are brief descriptions of each type of document.

- *Channel Director Work Plans.* Each channel director has a set of specific goals and primary objectives, as identified by the KPIs. Using the KPIs developed for the Initiative, the channel

directors, with strategic support from Initiative management and technical advisors, developed work plans, including key account identification, setting yearly achievement goals, as well as development of a detailed budget for each channel. The work plans are used as a general roadmap and are periodically reviewed and updated.

- *Project Pipeline Reports.* To better focus the implementation team's resources and efforts, the Initiative team maintains a project pipeline document that contains, by target market, a prioritized list of key accounts, account status, identification of opportunities, etc. The project pipeline for the two vertical channels also identifies and tracks efforts and opportunities to integrate cross-cutting technologies, information and involvement for utilities serving key customers. Based on feedback from channel directors the status of each account is updated on a continuous basis.
- *Management Scoping Briefs.* In an effort to improve all team members' understanding of how different events or activities fit into the Initiative's overall strategy, the management team is now developing Management Scoping Briefs following all program activities (e.g., a trade ally breakfast). Specifically, the purpose of the brief document is to achieve the following three objectives:
  - Clearly connect the activity with the project strategy (Why are we doing this?)
  - Assign an owner to the activity (Who's in charge? Who's responsible?)

Outline the tasks or steps necessary to complete the activity (What did we learn? What works? What didn't work?)

## **Intranet**

In light of implementation team size and geographic dispersion, as well as in an effort to reduce unnecessary paperwork and minimize distribution of information and documents via e-mail, the PMC developed an intranet (IEA Intranet). This site functions as a central node for internal communication and repository for related documents. Team members can use the site for a variety of purposes, including viewing and scheduling team meetings, sending invitations to review certain files uploaded to the site, assigning and managing tasks, uploading or downloading project-related documents.

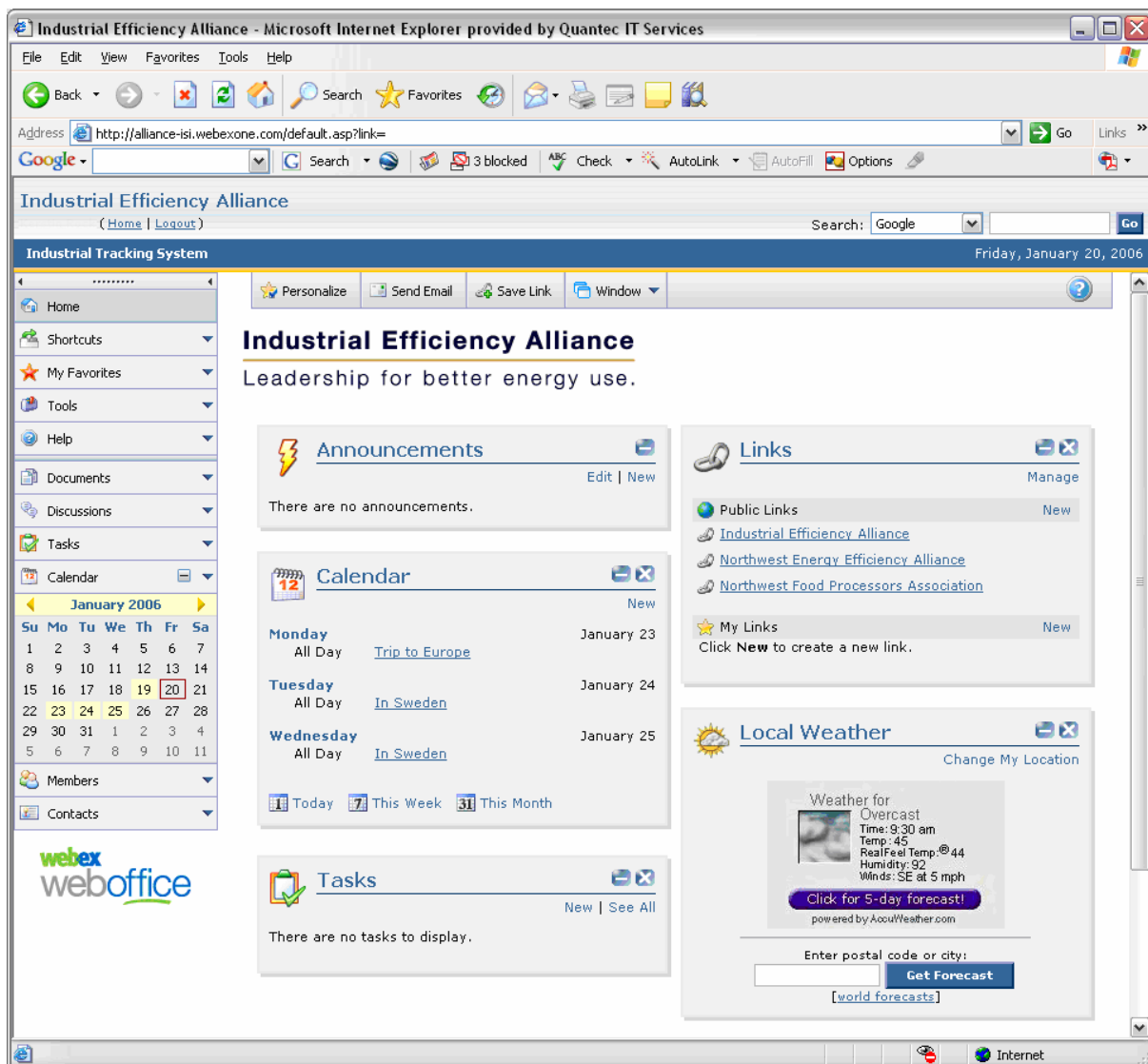
Using the site's document repository, users can post, view, download, or delete documents. Information contained in the repository is organized by team and market and can include documents such as work plans, budgets, customer documents, or marketing collateral. The site also provides an online discussion forum that allows users both to view current conversation threads, as well as to post to them.

The task feature of the site allows team members to assign and manage tasks on an individual or team basis. The site's calendar feature permits users to view calendars for other team members to determine their availability and schedule meetings. Figure B-1 provides a screenshot of the Intranet login page.

The IEA Intranet provides users with access to contact information for all IEA team members and related contacts. In addition, the site allows users to share their non-team contact information with other team members.

Feedback from team members indicates that most find the Intranet to be a useful tool, especially for scheduling meetings and downloading documents. However, many confessed to lacking the time or inclination to develop consistent usage patterns, specifically with updating and managing documents. A few expressed a level of frustration about the Intranet and the activity tracking system not being linked. PMC staff indicated that efforts are being made to address these issues and to expand the site's usability and functionality.

Figure B-1. IEA Intranet

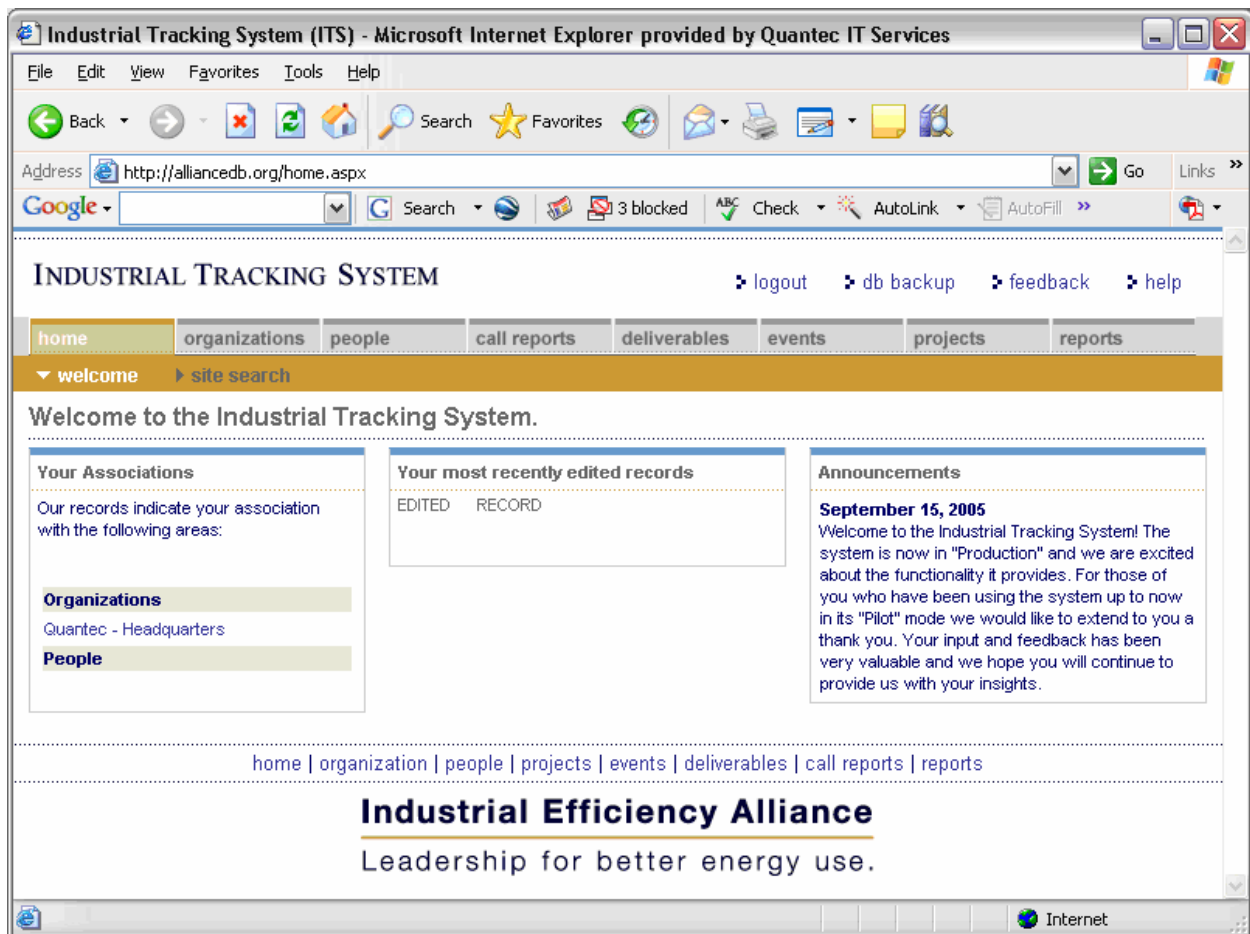


## Activity Tracking

A number of formal procedures were put in place to help manage the high volume of communication between the Initiative and their target audiences, most specifically the development of the online information tracking system (ITS).

The ITS was developed to provide the Initiative team with a central data entry and warehousing tool. In addition to being used by the implementation team, the ITS represents one of the key data sources for the evaluation team to track and report Initiative activities. The site, first launched in July 2005, has undergone a number of upgrades to improve its functionality and data tracking options. Using this site, users can access, input, or query a variety of data related to interacting with target market actors (at the firm and personnel levels), client data (in the form of call reports), or deliverables or events. The screenshot in Figure B-2 provides an overview of the system choices.

**Figure B-2. Industrial Tracking System**



The two key functions of the site are data query and adding of Initiative-specific client and project management data. For example, users can search for industrial organizations based on an

organization's name, its city or the ZIP code, or business type (customer-industrial, utility or ally). Alternatively, a user can query the site's contact list page either by name or ZIP code.

An example of how the team uses the site includes the call reports feature used to track calls involving firms, utilities, or trade ally contacts. This feature captures key information, comments, and any follow up requirements. Other information that can be added to the site or updated by channel directors or other team members includes deliverables, events (e.g., trainings, conferences), or projects. In all cases, once added to the site, the Initiative team can query this information using a variety of data filters, such as call type, user's name, or data type. In addition to basic data queries, the ITS site *Reports* tab lets users view system reports, such as stakeholder activities or account summaries.

The site's "events" tab allows users to access the current month's calendar and lists events for that month identified by type, such as training, special event, or seminar. Users can view other calendar months and query events related to a particular month/year and state. Other options on this page include viewing events by list and an adding an event to the calendar.

As is common with any interactive software tool, the ITS site has been a work in progress for much of 2005, with the ITS team addressing issues related to usability and content. For instance, as the KPIs have taken on more concrete definitions, the Initiative team has been updating the ITS to clearly reflect and track KPI data. Based on feedback from channel directors, the ITS is generally thought of as being a useful tool, especially for tracking communications "threads," particularly for the Alliance PM and the PMC. While a number of users complained about the user unfriendliness of the system, follow up interviews in the latter part of the year indicated that ITS updates and changes, as well as increased comfort and familiarity with the tool, has significantly improved usage. However, based on feedback from the operations team, one of its main goals in 2006 is to ensure that all channel directors use the tool consistently and all outstanding content and data quality issues are addressed.

## External Communications

### Identity Materials and Marketing Collateral

One of the first steps of the marketing team was to develop a logo and tagline. It has two forms, as shown below.

**Industrial Efficiency Alliance**  
Leadership for better energy use.

**Industrial  
Efficiency  
Alliance** | Leadership  
for better  
energy use

The logo can be downloaded from the IEA Internet, along with a branding guide explaining its use. The marketing team also developed a stationery package and business cards, which helps the group – comprised of many individuals and organizations – present a unified front to customers. To provide the Initiative team, and specifically the channel directors, with ready access to available marketing materials, all relevant materials are stored on the IEA Intranet from which

team members can download, print, email, and, where appropriate, modify materials as needed. Examples of the ready-to-print materials include channel fact sheets, team biographies, and value propositions.

In addition, the marketing team developed a template to allow channel directors to generate for each channel case studies, as well as customized PowerPoint presentation templates.

## **Media Relations and Promotions**

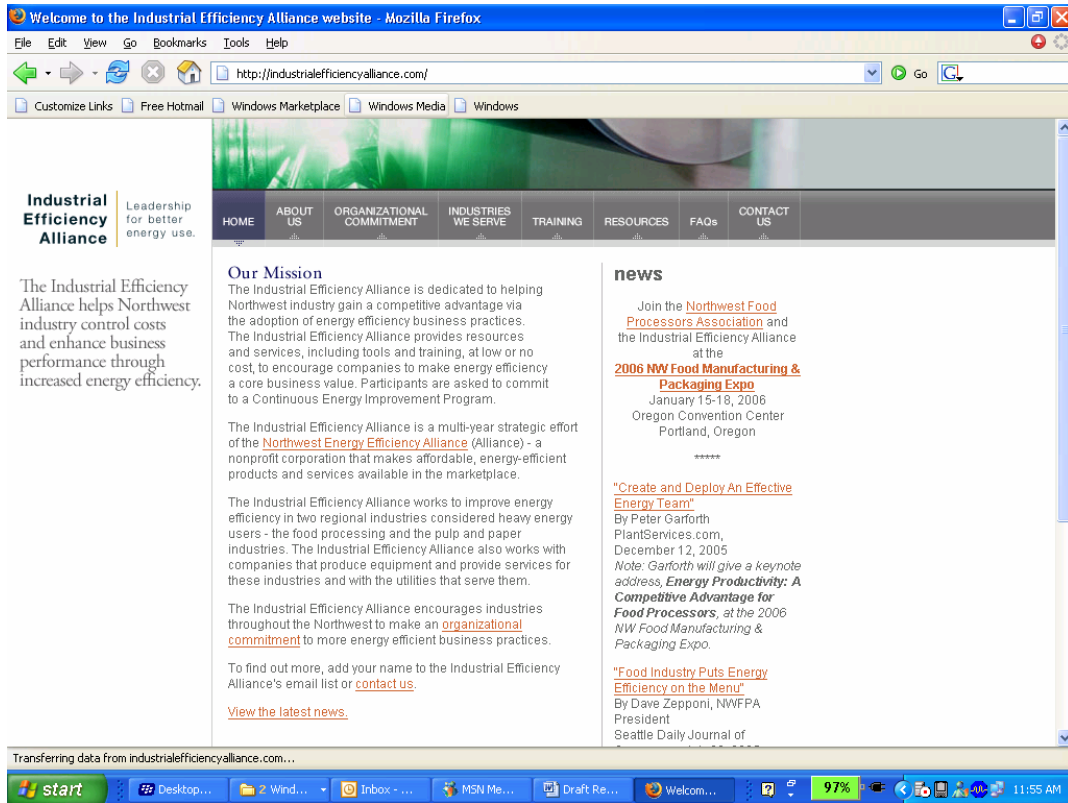
While the marketing team anticipates that most media and promotion work will take place in the second and third year of Initiative implementation, the marketing team worked on the following items in 2005:

- A press release announcing the Initiative on April 19, 2005. It was distributed via the PR Newswire and resulted in coverage in 62 media outlets, most of which are online, ranging from DairyNetwork.com to Forbes.com.
- An article in the *Daily Journal of Commerce* on July 28, 2005, developed in coordination with David Zepponi of the Northwest Food Processors Association.
- A premier technical Q&A column edited and submitted for publication in *Chemical Engineering Progress Magazine*. The article is scheduled for publication in September 2006.
- In addition, the marketing team developed guidelines for talking to and working with media with regard to the Initiative.

## **Web Site**

Developed and maintained by the marketing team, the Initiative's Web site was launched April 12, 2005, under the Web address: [www.industrialefficiencyalliance.org](http://www.industrialefficiencyalliance.org). The Web site is intended to provide general information, including an overview of the Initiative, the types of customers it serves, and Initiative benefits. The IEA Web site offers several specific resources, such as a regional training calendar and access to case studies and information about the EnVINTA assessment tool. The messaging and language used on the initial IEA Web site were updated August 2005 to reflect the Initiative's new messaging, value propositions, and language.

Figure B-3. IEA Web Site







## Appendix C. Overview of Market Baseline Assessment

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To gain a better perspective on current conditions and to establish a baseline for energy management practices in the regional industrial market, two structured, in-depth telephone surveys were administered to decision-makers at industrial companies and at supply-chain market participants, representative of the IEA's target markets. These surveys were intended to augment the market characterization, help establish baselines for several key market indicators, and guide the planning and marketing activities of the Initiative. The methodologies, key findings, and conclusions of the two surveys are summarized below.

### Corporate Energy Management Practices

Information on corporate energy management policies and practices was obtained through structured, in-depth interviews with decision-makers most knowledgeable about energy matters within each company. The surveys collected information on energy issues in general, and energy management, planning, monitoring, and reporting practices, in particular.

Using the Dun & Bradstreet (D&B) industrial database as the sample frame, surveys were conducted with 64 respondents in the following categories: pulp and paper (6), food processing (31), and other (27). In terms of employment, participating firms represent approximately 12% of pulp and paper, 11% of food processing, and less than 2% of all other industries in the Pacific Northwest. The particular group of respondents was selected in order to achieve the objective of tracking market transformation within the region. Participating firms will have ongoing dialog with their suppliers and other industry partners, resulting in shared resources across a spectrum of related firms. Subsequent surveys may be undertaken in order to reach a larger sample size of target industry firms, however establishing a general market starting point was an important element in the scope of work.

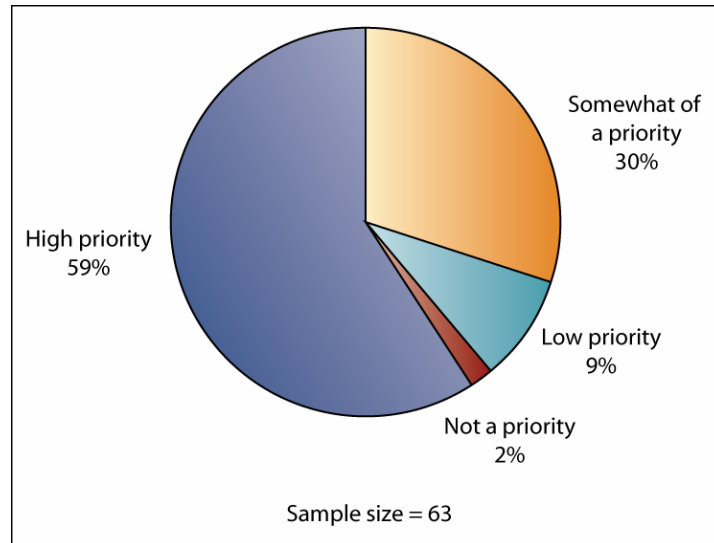
With respect to respondents, plant or facilities managers represented approximately half of the respondents (47%), followed by plant or corporate engineers (17%), and senior management (11%). Fifty-five percent of respondents reported making decisions at the plant/corporate level, and 45% "provided input into energy decisions." The following are the main findings of the corporate surveys.

***1- Purchased electricity and gas are by far the most prominent sources of energy for industrial facilities in the Pacific Northwest.*** All industrial facilities included in the survey rely on purchased electricity and 78% on purchased gas as their main source of energy. Use of other fuels is relatively uncommon. Only 5% of respondents reported using biomass (residual wood waste), diesel, or oil as major fuel sources.

***2- There is a high level of awareness among industrial utility customers in the Pacific Northwest concerning energy issues,*** and controlling energy costs is a high priority for most. As shown in Figure C-1, nearly 90% of respondents stated that controlling energy costs was either a "high priority" (59%) or "somewhat of a priority" (30%). The high level of concern regarding energy-related issues is, of course, not surprising given the dramatic rise in energy costs in

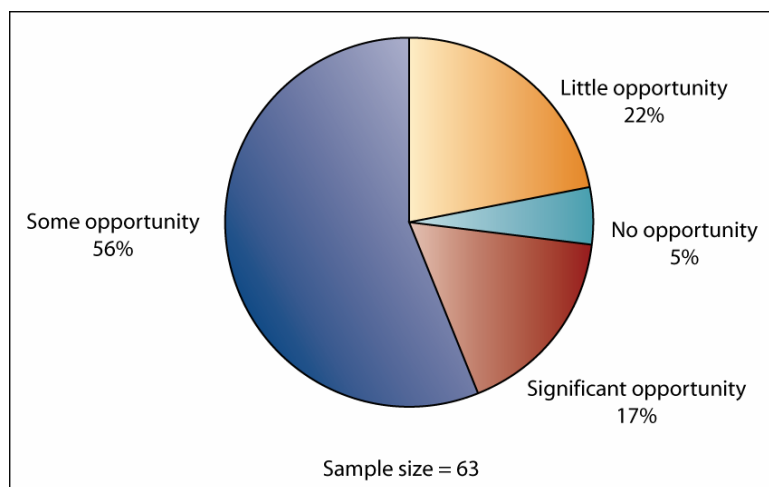
general, and electricity and gas costs in particular, in recent years. This has been particularly the case in the Pacific Northwest, where cost of electricity to industrial users has risen at a rate of nearly twice the national average since 2000.<sup>77</sup> These results are also consistent with the findings of recent surveys by Pacific Power, Energy Trust of Oregon, and BC Hydro in British Columbia.

**Figure C-1. Importance of Controlling Energy Costs**



**3- Opportunities for improving energy efficiency are perceived to be high.** Survey respondents generally acknowledged that opportunities existed for their companies to reduce future energy consumption through energy efficiency. Nearly 75% of respondents believed there to be at least some opportunity for energy savings. See Figure C-2.

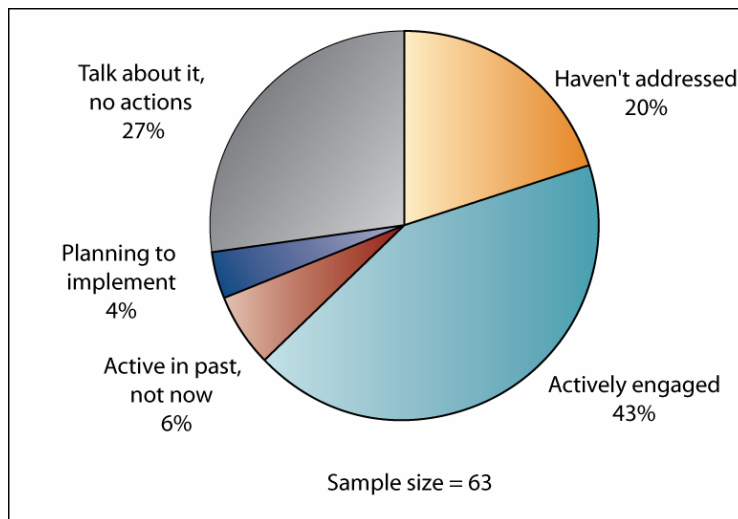
**Figure C-2. Opportunity to Improve Energy Efficiency**



<sup>77</sup> Based on the latest data from the Energy Information Administration, electric rates in the U.S. have risen by approximately 4% per year on average, and by nearly 8% in the Pacific Northwest, since 2000.

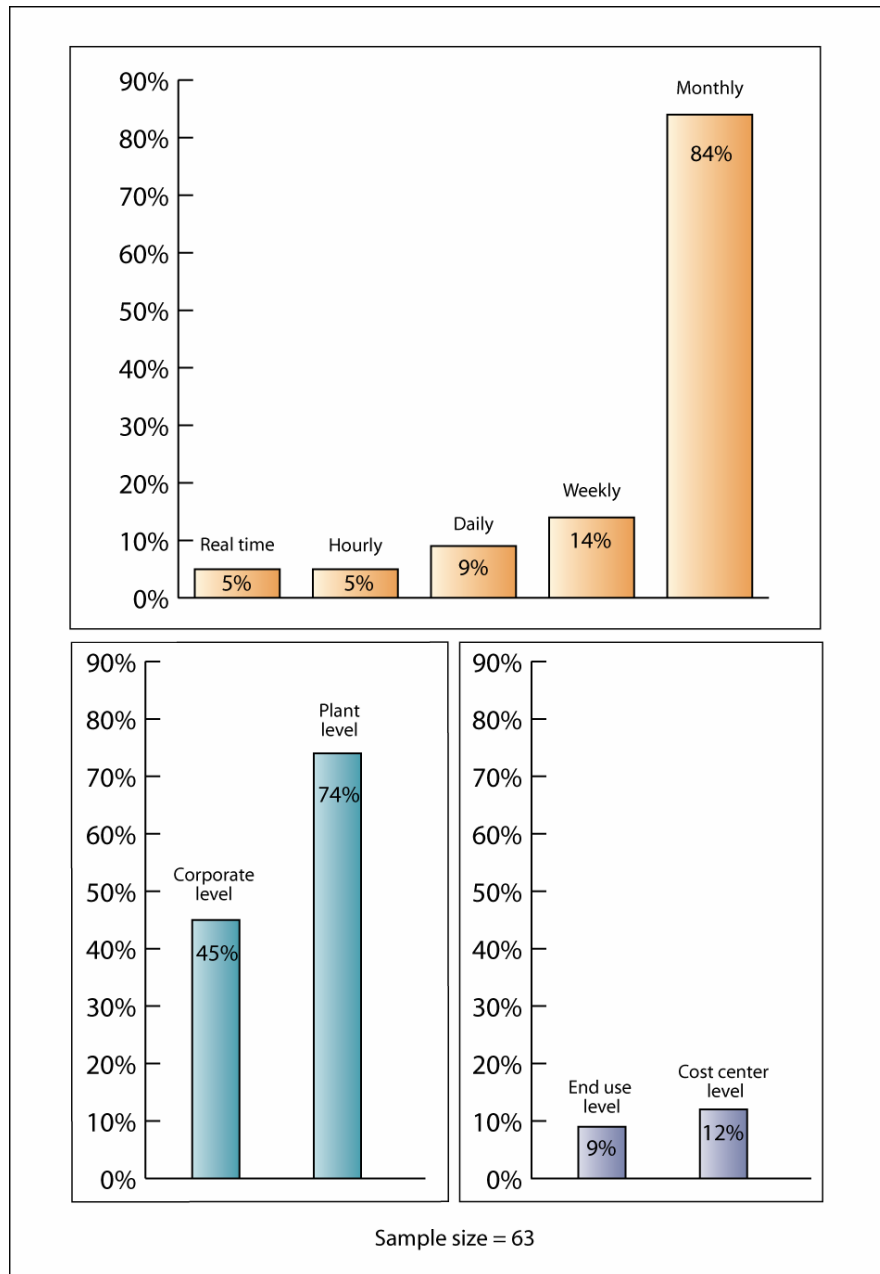
**4- Many of the industrial firms either have taken, or are taking, steps to track and manage their energy costs.** Forty-three percent of respondents report to be “engaged in” controlling energy costs. The remainder indicated that they either “have not” addressed energy cost management (20%), are “talking about it without taking action” (27%) or “are no longer pursuing it actively.” Only 4% percent of respondents stated that they “are planning” to implement energy management practices. See Figure C-3.

**Figure C-3. Corporate Energy Management Activities**



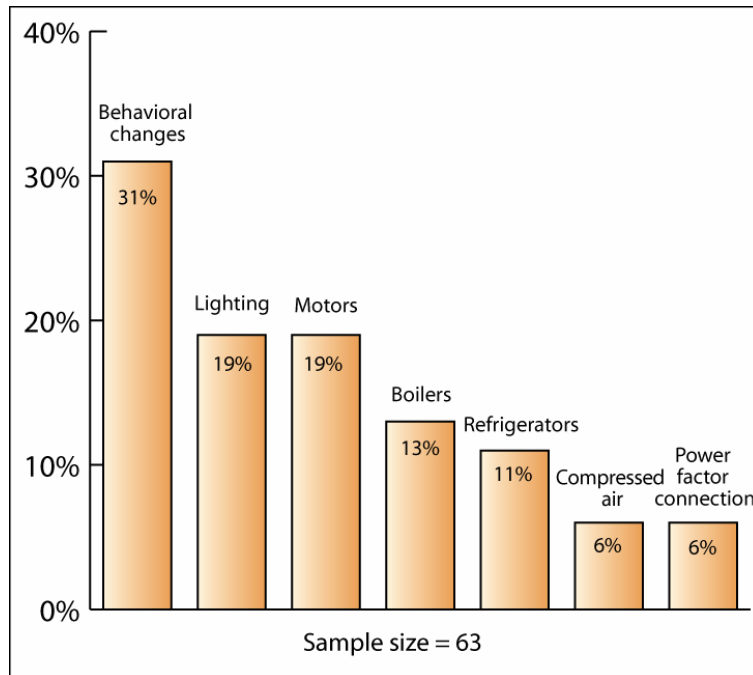
As can be seen in Figure C-4, there appears to be a large variation in rigor levels of energy cost tracking and monitoring. Although 84% of respondents reported tracking costs at least monthly, only a small fraction of respondents (9%) track energy costs at the end-use level and about one-half of these do so in real time. While regular monthly tracking is clearly better than none at all, the details provided by more frequent monitoring provide more robust direction for future improvements.

**Figure C-4. Frequency and Level of Energy Cost Tracking**



**5- Current energy management activities generally tend to be either behavioral or end-use focused.** When probed about the main activities that are either being or have been recently undertaken to control energy costs, approximately 31% of the respondents cited behavioral changes, such as turning off lights and shutting down equipment when not in use. As illustrated in Figure C-5, facility lighting and motors were most frequently affected by these measures (19% each), followed by boilers (13%) and refrigeration (11%). Only in 6% of cases, energy management measures were focused on air compression and power-factor correction.

**Figure C-5. End-uses Impacted by Specific Actions**

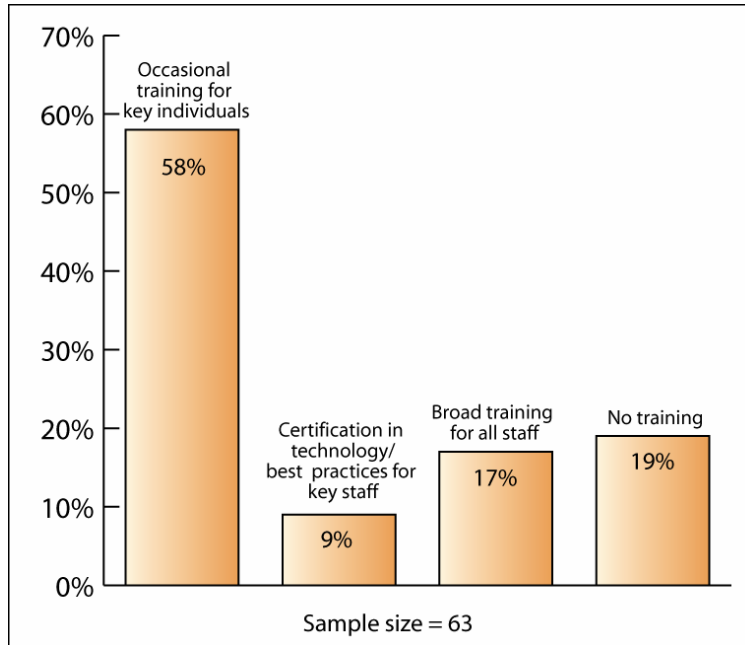


**6- There is a deficiency of formal energy management planning and oversight among industrial customers.** Only 25% of firms participating in the survey reported having an energy management plan in place, and only 13% track energy costs through a formal “score card” or established key performance indicators for energy. The existing plans also tend to be informal in general and without appropriately assigned accountability within the firm. More than half of the firms who have an energy management plan actually had a numeric energy cost reduction and goal as part of the plan, and only four respondents could remember the goal. Moreover, only in one-third of cases, respondents reported having a staff position devoted to energy management and analysis (typically the respondent).

**7- Training in general, and energy management training in particular, is a high priority in the industrial sector,** and there is a strong interest in information and education. The majority of respondents (82%) report to have offered some type of training for their employees on various industrial systems, such as motor management (44%), compressed air systems (55%), and process controls (42%). As shown in Figure C-6, more than one-half (58%) of trainings are offered “occasionally” and only to key staff such as facility engineers. A number of firms also offer broad training for all staff (17%), while fewer companies (9%) focused on certification for technologies and best practices. Nineteen percent of the respondents reported offering no training at all.

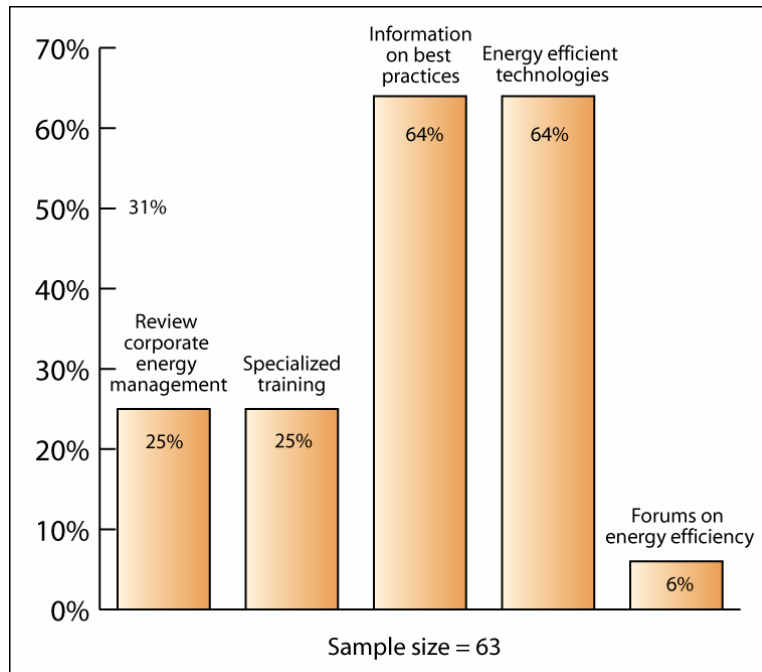
Respondents expressed a strong interest in energy information as part of the training programs they attend. Seventy-five percent of the respondents said it was either “very important” (25%) or “somewhat important” (50%) that trainings include an energy use and efficiency component.

**Figure C-6. Training Practices**



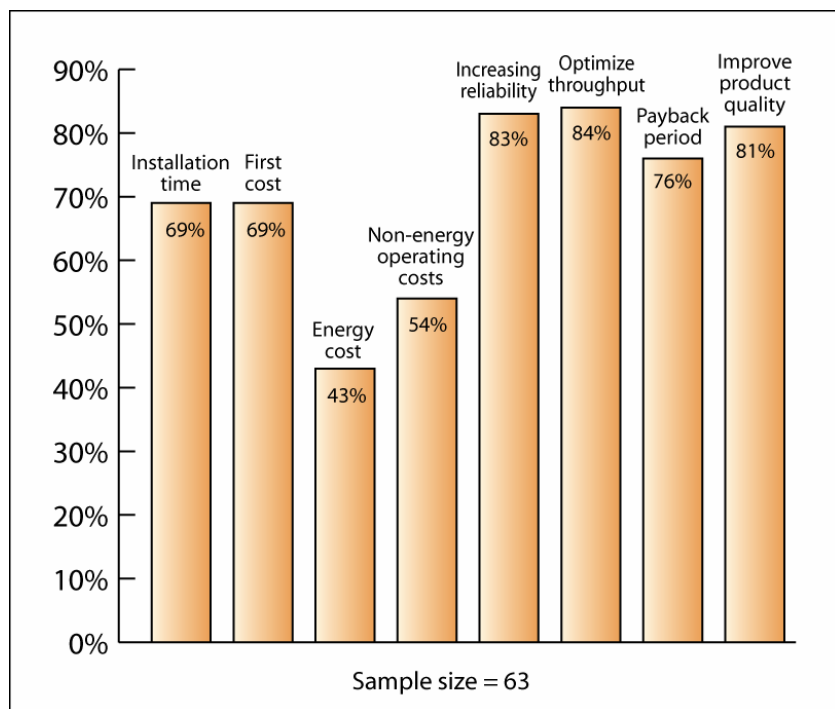
Respondents also expressed a strong interest in energy management support and additional information. As shown in Figure C-7, respondents indicated the two most valuable items to improving energy efficiency were information on energy management best practices in their industry (64%) and new information on energy efficiency technologies (64%).

**Figure C-7. Types of External Support that Would be Most Valuable to Improve Energy Efficiency**



**8- When making purchase decisions on major equipment upgrades or retrofits, production factors take precedence over other factors.** As Figure C-8 illustrates, the most important factors when undertaking major equipment upgrades or retrofits were optimizing throughput of the system (mentioned as “very important” by 84% of the respondents), increasing the reliability of the system (83%), and improving product quality (81%). Production concerns were followed by cost issues, including the equipment payback period (76%) and first cost (69%). Energy costs, however, were substantially less important than these other factors. Only 43% of respondents called them “very important.”

**Figure C-8. Importance of Factor When Making Major Equipment Upgrades or Retrofits**



**9- The prevalence of widespread quality management and continuous improvement principles among the Pacific Northwest’s industries provides a setting for adoption and implementation of corporate energy management practices.** Nearly three-quarters of participating firms report having a continuous improvement practice (CIP) in place, and 79% have an environmental management system (EMS). Energy is viewed as an important component of overall quality management practices. The formality of these policies, however, varied. For example, some respondents (27%) practiced formal CIPs such as ISO (9000, 14000, or 14001), Six Sigma, or Total Quality Management, while others reported them to be more informal, company-specific process improvement approaches.

Moreover, nearly all respondents (97%) had preventative/scheduled maintenance policies (e.g., regular and periodic lubrication, part replacement, and filter cleaning), while 67% had predictive maintenance policies (e.g., maintenance techniques that inspected an asset to predict if a failure would occur, such as lubrication analysis, infrared analysis, and vibration analysis).



**10- Lack of information on energy-efficient technologies and practices, absence of corporate commitment,** and resource constraints continue to be perceived as barriers to the adoption of energy-efficient technologies and practices. Nineteen percent of respondents also mentioned that awareness and knowledge of energy cost tracking methods, efficiency measures, and potential savings posed an important barrier to energy efficiency. Thirty-four percent of respondents reported that other priorities, including production, health, and safety issues, took precedence over energy efficiency concerns. Thirteen percent of respondents cited lack of commitment, or buy-in from management and staff as an important market barrier.

## **EnVINTA Assessments**

As part of the market research for this Initiative, the Alliance contracted with Australia-based EnVINTA to conduct energy management assessment workshops at ten firms falling within the two vertical markets. The research was focused on involving multiple levels of the organization at each firm to identify internal barriers and productivity improvement opportunities. To conduct this research, EnVINTA used its proprietary software tool, *One-2-Five<sup>®</sup> Energy (One-2-Five<sup>®</sup>)*, a comprehensive diagnostic tool that helps organizations evaluate their current energy cost control situation and identify opportunities for further reducing both facility energy use and greenhouse gas emissions. Specifically, the tool systematically investigates current corporate energy management systems, applies each category of collected information to a ranking scale, provides an overall organizational score (1 star through 5 stars), and offers a gap analysis and an industry-specific best practices action plan for each inventoried area. *One-2-Five<sup>®</sup>* also features an industry benchmarking tool that stores combined data, collected from multiple clients, to produce industry-specific benchmarks.

In addition to the ten assessment workshops funded by the Alliance, EnVINTA completed an additional 22 workshops with a number of other U.S. companies between October 2001 and April 2005. Some of these workshops were with companies belonging to the two target markets. Using these data, EnVINTA developed industry-specific benchmarks that could be used to evaluate the relative performance of the participating companies. Out of the 32 total workshops, 13 were with food processing related businesses, and five represented pulp and paper mills in the Pacific Northwest. Using this information, the following general conclusions about the target markets can be drawn:

1. Northwest pulp and paper companies are generally focused on implementation of energy waste reduction at higher levels than indicated by benchmark. Of the five participating pulp and paper mills, the majority exceeded the average benchmark (1.4 stars) with an average star rating of 1.8. A benchmark of 1 identifies energy use improvement needs, with a 2-star rating noting implementation of waste reduction policies.
2. Food processors are in the process of moving from identifying energy use improvement needs to implementing waste reduction policies. The average rating of participating companies was 1.5 stars, which exceeded the average benchmark of 1.2 stars for the same companies.

Due to confidentiality concerns, detailed outcomes were not available. However, general findings appear to underscore the results from the Corporate Energy Policy Survey, in that pulp and paper firms, on average, have a greater level of interest in energy management than the average food processing firm. The findings also suggest that both industries have opportunities to further address energy management, and are thus potentially receptive markets for the Initiative.

## Trade Ally Survey

In order to understand how energy efficient products and services are being delivered to Pacific Northwest industrial firms, Quantec conducted a baseline study that examined product offerings, marketing practices, and attitudes toward energy efficiency among suppliers of energy-using equipment to the Pacific Northwest industrial market.

To reflect the Initiative's target audiences, the survey targeted two vertical markets (pulp and paper and food processing) and three cross-cutting technologies (pumps, compressed air, and refrigeration). A total of 21 telephone surveys were completed with equipment vendors and service providers. The respondent sample was comprised of pump suppliers (3), compressed air suppliers (6), refrigeration equipment suppliers (5), engineering and construction firms specializing in pulp and paper (4), and/or food processing (3). Respondents were screened for staff most knowledgeable about energy efficiency and energy management. Eight of the respondents were owners or managers, seven were in sales/business development, three were engineers, and three were technical sales support staff. Input from vendors and service providers affords an indication of changes within the larger market that includes the primary targets.

The principal results of the supply chain surveys are as follows.

***1- There is a strong perception among supply chain respondents that energy efficiency and optimized solutions are important to their industrial clients.*** Ninety percent of the respondents consider energy costs as being either “very” (38%) or “somewhat” (52%) important to their customers when making purchasing decisions. On average, vendors indicated that they were asked to include energy efficiency options on about one-half of their projects. In slightly over 60% of cases, when offered, clients tend to prefer more efficient options over standard efficiency equipment. Respondents were asked to rate energy efficient products and optimized solution potential in the market segments they serve. Seventy-nine percent rate the potential as “great,” and not one respondent rated the potential as “none” or “minimal.” Respondents were nearly unanimous (95%) in that promoting energy efficiency can “definitely” or “somewhat” provide a competitive edge to their business.

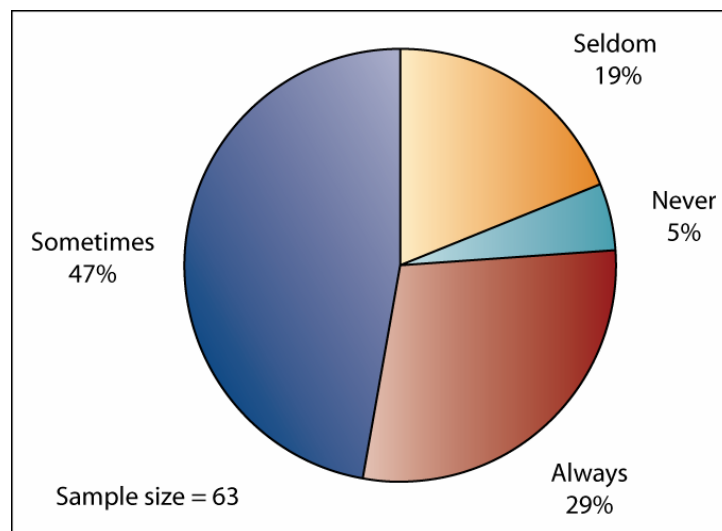
***2- The majority of supply-chain participants do offer energy-efficient options,*** but these tend to be technology-oriented, rather than system-oriented. More than half (57%) of respondents reported that they typically include energy efficiency options as part of their marketing and sales activities. However, only 30% percent “always” offer their clients a range of choices based on energy efficiency. Nearly two-thirds (64%) offer energy-efficient options either “seldom” or “sometimes” (see Figure C-9).

Although almost half of the respondents (48%) saw offering system optimization services as a promising area for their businesses, only three (15%) of the respondents reported offering these

services now, and only five (23%) currently plan to offer system optimization in the future. Training and incentives for energy studies were seen as the best ways to drive the systems optimization market.

**3- There is a strong interest in technical training among industrial supply chain participants.** Most respondents (67%) report that they or their staff attended a training in the last 12 months. When asked whether there was interest in additional training, over three-quarters (77%) reported being either “very” or “somewhat” interested in future trainings that would help them promote energy efficient equipment or systems optimization.

**Figure C-9. How Often Do You Give Customers a Range of Choices Based on Energy Efficiency?**



**4- Supply chain respondents perceive that cost is the primary market barrier.** Cost (including payback/ROI concerns) was by far the most commonly cited reason (81%) that energy efficient equipment was not selected by their customers, followed by lack of awareness (24%). Respondents gave numerous examples of customers with payback/ROI thresholds that made it extremely difficult to justify the incremental cost of energy efficient equipment. End-use customers, on the other hand, felt cost was extremely important, but reported that the lack of time and having other priorities was an equal, if not more important, energy efficiency equipment installation barrier.

## **Appendix D. Elements of Operational Reorganization**

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While feedback from IEA team members indicates that the current organizational structure appears to be working well, is it significantly different from the one originally conceived. Following incremental adjustments throughout the year, in November 2005, the Alliance PM oversaw a substantial reorganization of the team intended to address specific operational and management issues. Some of the changes included the following.

- In order to streamline and simplify the lines of responsibility, management authority, and Initiative project administration within the Alliance, one person was assigned responsibility for overall project management.
- One of the former design team members was assigned to oversee the Strategy and Delivery Services Group, including all channel directors and other technical and strategic staff.
- Other former design team members were given prescribed roles that would integrate them as central parts of the implementation team, in such roles as technical advisors and project managers, to ensure continuity between the design and implementation processes. This was intended to allow the vertical channel directors to focus on selling projects without having to get too involved in the day-to-day management of individual projects.
- The vertical channel directors continue to supervise the same markets, but are now being given more accountability in terms of implementing projects. They will both “own the relationship” with participating industrial customers and be responsible for the outcomes.
- The principal roles and responsibilities of the cross-cutting channel directors were clarified to be primarily focused on working with trade allies and market actors in their respective channels and secondarily supporting vertical channel directors.
- The marketing team now works closely with the channel directors and provide sales support services that include, but are not limited, to communication and presentation materials, Web sites, training materials, marketing collateral, articles, and press releases.
- A full-time Training Director, supported by service center staff, has assumed responsibility for all training-related tasks. The Training Director focuses on planning and scheduling and technical aspects of all training services.



## Appendix E. Overview of 2005 Marketing Materials

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- General IEA Collateral
  - 2 FAQs
  - About IEA
  - Bios
  - Draft message documents
- 8 Communication Platforms/Value Propositions
  - Refrigeration
  - Pump Systems
  - Motors
  - Food Processing
  - Training
  - Compressed Air
  - Pulp & Paper
  - Utilities
- 8 Fact Sheets
  - Refrigeration
  - Pump Systems (2)
  - Motors
  - Food Processing
  - Pulp & Paper
  - Compressed Air (2)
- Presentation Design and Editing
  - New slide graphics
  - Table top presentation
  - 151 slides for TAPPI fall meeting
  - 9 master templates
  - 4 major presentations
  - 2 minor presentations
  - PowerPoint Service Bureau document
- Training
  - Advancing By Degrees logo
  - 9 Course Descriptions for:
    - Industrial Refrigeration Energy Efficiency Seminar
    - Blower Systems & Dust Collection Efficiency Seminar
    - Compressed Air Challenge I
    - Electric Motor Systems Management
    - Industrial Pump Systems 101

- Training Binders
  - Refrigeration Systems Energy Management Seminar
  - First phase of training binder redesign
    - Cover
    - Table of Contents
    - Tab Reorganization
- Cluster Training
  - 3 Forest Grove Cluster Training documents
- November-January Refrigeration Seminar Calendar
- Amalgamated Sugar
  - Continuous Improvement: Pump Systems, 4-pager
  - Presentation formatting and editing
- System Assessments
  - Compressed Air
- Name tags
  - 30 Individual IEA name tags
  - 2 name tag template designs
- IEA Style Guide master and updates
- 3 Contributed Articles
  - Seattle Daily Journal of Commerce (Food Processing)
  - Energy Insider (Food Processing)
  - Ask The Expert (Compressed Air – edited only)
  - Tips for submitting bylined articles
- Trade Ally Breakfast Invitation
- Welcome Signage
- Trade Panel design
- Low Pressure Blower Systems Best Practices Guide, Cover Design
- Industrial Refrigeration Energy Efficiency Champion Sticker
- TAPPI CD Label
- IEA Case Study Templates
- Regional training calendar logo
- Coordination of 2005 NWFPA Expo
  - On site event management
  - Banners/signage
  - Logo development
  - Handouts/booth prep and management
  - Support for invitations
- 2005 Preparation for 2006 NWFPA Expo
  - 4 invitations

- Co-branded 4-pager
- 1 announcement press release
- Media lists
- Media (interview) opportunities
- Announcement coverage report
- Web site design, original content and monthly upkeep
  - Resource Web site and main page updates
- Utility newsletter templates and content support





## Appendix F. Overview of IEA Training Activities

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Training is a key Initiative component, designed to draw participation from a substantial portion of each targeted market and provides a venue for conveying information on the energy and non-energy benefits of systems optimization, as well as the technical knowledge and tools necessary for attendees to make system optimizing changes to their own systems. In addition, training sessions are also intended to present the energy efficiency business case. Secondly, trainings also serve as a way for representatives of industrial firms, trade allies (e.g., manufacturers, distributors, and consulting engineers), and utility representatives to interact. They further offer a chance for trade allies to see the interest that industrial customers have in efficiency, and thus make energy efficient products and service a priority.

Many training sessions are jointly sponsored by utilities who have helped to recruit participants and host many of the trainings. The Initiative training emphasis has been on real world problem solving. The industry-focused and site specific classes are generally conducted on-site at facilities and seek to offer immediate solutions to problems. The best practices training is of particular value in that it serves as a means of introducing the Initiative goals to a broader audience.

Based on feedback from both industrial firms, utilities, and trade allies, some of the barriers faced by the Initiative with training strategy deployment are:

1. A largely uncoordinated gamut of technical trainings offered by a variety of providers, which leaves potential trainees confused and struggling to figure out which classes to take
2. Many, especially small to medium end-users, are less likely to send employees to trainings if additional time and money are required for travel to the training location
3. Fear of potential competition and client retention issues causes some trade allies to not recommend trainings to their customers if the training is taught by a competitor

Over the past year, IEA has been working on developing appropriate measures to overcome these barriers.

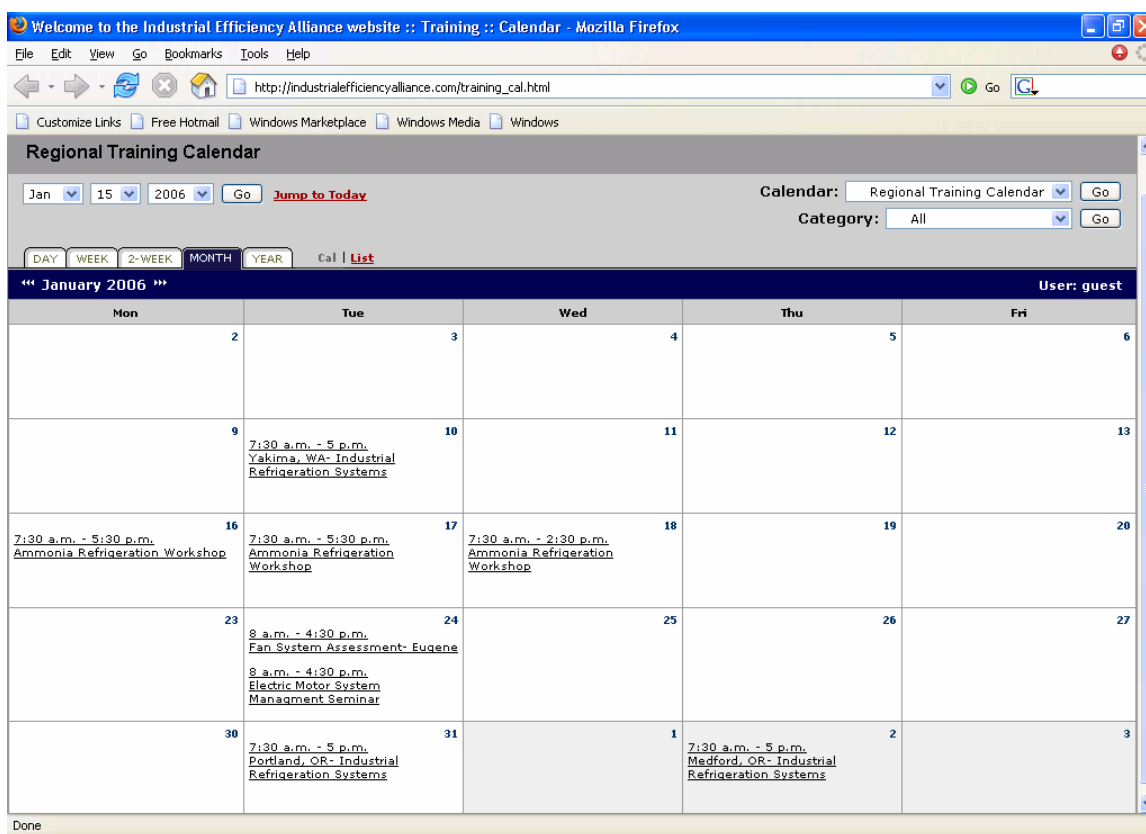
### **Regional Training Coordination**

In an effort to promote energy efficiency, providing technical training to industrial firms has long been one of the key offerings of a variety of federal, state, non-profit, and private organizations throughout the Pacific Northwest. Classes focusing on various aspects of energy efficiencies have been successfully offered by the U.S. Department of Energy (USDOE), the Washington State University (WSU) Extension Energy Education Program, utilities, and trade organizations (e.g., NWFPA) for many years. While many types of training are offered, the lack of regional coordination has left many potential training participants struggling to identify the most appropriate training for their needs. Because a continued trend in staff reductions will further diminish available resources for research and analysis at industrial firms, the Initiative can help identify and offer training curricula tailored to regional industry needs. To avoid redundancy of

training sessions, and therefore increase attendance, the Initiative team recognized at the outset that close coordination with other training sponsors would be a critical element of offering effective trainings.

In response to the need for close regional coordination in with training, the Initiative developed a regional training calendar aimed at providing users with a comprehensive overview of training courses offered by the Initiative, WSU’s Extension Energy Education Program,<sup>78</sup> DOE, and other partnering utilities and trade associations. Launched on July 15, 2005, the calendar provides information about each training, including course description, cost, target audience, and a list of specific benefits from attending the course. Registration forms can be downloaded directly from the Initiative’s Web site.

**Figure F-1. Regional Training Calendar**



78 Coordination with WSU’s Extension Energy Education Program initially proved to be strenuous primarily due to concerns about competitions and redundancy. Outreach efforts by a variety of Initiative staff, including frequent personal visits, created an effective working relationship with WSU. The Initiative team is hopeful that these arrangements will contribute to a high-caliber and coordinated training effort by integrating and promoting existing and effective training offerings from other providers and adding trainings focused taking a systems approach to energy efficiency.

In an effort to make the training calendar regional in both scope and distribution, the main calendar page does not include any IEA-specific branding so as to allow sponsoring agencies to add the calendar itself or links to the calendar to their respective Web sites. Based on Initiative team feedback, the calendar has not yet been institutionalized regionally. To date, only the NWFPA has integrated the calendar into its own Web site. However, the Initiative team members are hopeful that continued marketing and close coordination with other market partners will continue to increase the calendar's use and promotion.

Based on feedback from implementation staff, calendar upkeep, specifically ongoing coordination with regional training providers, is time- and resource-intensive. To address this issue, as well as to provide needed staff resources required by the Initiative to ramp-up training offerings over the next year, the PMC has hired a full-time training director and several support staff.

## **Training Locations**

In addition to offering attractive and helpful courses, one key element ensuring good training attendance was offering training in a variety of Pacific Northwest locations. This strategy was aimed specifically at reducing the barrier to attendance related to additional time and resources associated with sending employees to longer-distance trainings. Working closely with local utilities, trade allies, trade and professional organizations (e.g., NWFPA), the Initiative offered trainings throughout the states of Washington, Oregon, and Idaho. Training locations were generally identified based on the concentration of pulp and paper and/or food processing plants. The relatively low level of Montana-based target firms was one of the key reasons why no training sessions were offered in Montana during 2005. However, given the Initiative focus on cross-cutting technologies during 2006, the Initiative team expects to evaluate the potential for system-specific training in Montana during 2006. In the case of site-specific trainings, locations were identified in collaboration with the industrial firm for whom the training was developed. The Initiative's approach to assuring trainings are offered throughout the region indicates alignment with the Portfolio Committee's requirements of geographic balance and customer reach.

Figure F-2 shows the 2005 geographical distribution of the training locations.

**Figure F-2. IEA Training Locations in 2005**



### **Flexibility in Trainer Selection**

Depending on the specific service or products offered by a particular trade ally, some portion of allies will either recommend or provide specific training to their customers. However, several trade allies expressed disapproval of any training taught by a member of a competing firm, regardless of instructor’s qualifications. Similarly, at least one utility approached the Initiative with the specific request not to use trainers associated with a particular trade ally. Interviews with the Initiative team indicated a high degree of flexibility to address these concerns. For instance, in the case of the utility-sponsored training, the Initiative team collaborated with the utility to identify and engage an instructor who was not native to the Pacific Northwest. However, based on feedback from the Initiative team, the general quality and professionalism of instructors was found to be more important than their affiliation with a particular company. Regardless, the Initiative team is committed to addressing specific concerns and offering high-quality, technically sound, and unbiased trainings.

### **Advertisement and Participant Recruitment**

The Initiative’s training advertisement uses a three-pronged approach:

1. Direct marketing to industrial firms and trade allies using print media, such as announcement flyers
2. Working closely with utilities and trade allies to identify and contact industrial firms
3. Personal phone calls from channel directors to invite targeted participants

In many cases, follow-up phone calls had to be placed shortly before the training to ensure participants had actually signed up. During the process interviews, several Initiative team members expressed hope that trade allies will start playing a greater role in the training promotion and marketing. This is especially important given that trade allies are highly knowledgeable about who at customer sites should be attending classes and what type of classes should be attended. One team member noted, “*Market transformation is engaging the market, and we need to get the trade allies to sell this to their customers and bring their own staff as well to make sure that we’re educating the entire market. If their pump trade ally says this is worth taking and you really ought to know about this, they’re going to take it.*” Progress during 2005 suggests that some trade allies are starting to become active in participating in the promotion of training.

Notwithstanding these efforts, Initiative team feedback indicates that one of the big challenges has been to get enough early registrations for each class. Given a rough attendance target of 15 to 20 people, the team has struggled when the number of registered attendees was only five or seven just one week prior to a class. In a few cases, this led to training cancellation. In others, the channel directors conducted a concentrated outreach and recruiting effort, which in some instances, resulted in class sizes exceeding 30 people. However, Initiative team members expressed confidence that the addition of a full-time Training Director and support staff, as well as training calendar development using a three-month horizon, rather than a one- to two-weeks, will help elevate these problems in 2006.

Another challenge has been ensuring that the right people attend classes. The introductory overview classes are intended to include not only junior engineers, but management. There has also been limited participation by consulting engineers, another group that the Initiative would like to see participating. And, while many of the best practices classes have had full enrollment (40 participants), some have fallen short of this goal and only had 10 to 12 participants.

## **Training Offerings**

Training sessions were organized based on gap analysis findings by the Initiative and were prioritized based on perceived needs and the apparent lack of existing training opportunities offered by other entities, such as DOE and WSU. One of the Initiative’s key goals is to create a continuum of courses from introductory to more advanced, and thus to optimize delivery and value of all training offered in the region. The second goal, given the Initiative’s objective of making continuous energy management part of every day business management, was to develop effective training focusing on continuous energy management and a systems approach to energy efficiency.

Conceptually, the offered training can be divided into four categories:

1. *Best Practices.* These training sessions focus on general system users for a variety of cross-cutting technologies. Examples include Compressed Air 1 and 2. These sessions are typically offered by DOE and facilitated through WSU’s Extension Energy Education Program. The Initiative co-sponsors these trainings to avoid duplication.
2. *Series-Specific Training.* These courses are designed to frame DOE’s best practices trainings. For instance, in the case of pumping, the Initiative would offer Pumps 101 prior

to DOE offering its PSAT and PSAT Specialist trainings. In addition, the Initiative might offer a number of site-specific classes.

3. *Site-Specific Training.* These trainings are frequently driven by the interests and training needs of a particular firm. For instance, one food processing firm requested that the Initiative offer an one-site training combining the curricula of Pumps 101 and DOE's PSAT class. Other examples include a request by a major pulp and paper firm to provide on-site compressed air training for its operators. The benefit of this type of training is that training materials and methods can be tailored to the target audience, which not only increases the transfer and retention of knowledge, but presumably also increases the likelihood of participants using the knowledge in their work.
4. *Industry-Specific Training.* Instead of conveying mostly theoretical information to training participants as part of classroom trainings, industry-specific trainings combine pre-classroom homework assignments aimed at participants to collect system-specific data, in-class room instruction, and a plant-tour to provide training participants with an effective mix of theoretical and practical knowledge. In addition, the trainings entail development of participant-specific "to do" list specific that participants can take back to their plant and implement. The first of these classes was focused on the refrigeration industry. The training was well-received by both participants and corporate representatives alike. The Initiative has since added this type of training to its potential offerings and is actively searching for opportunities to offer additional trainings of this sort.

Given the importance of training to the Initiative strategy for reaching both industrial firms and trade allies, the PMC developed a multi-pronged approach to offering training that addressed focus, location, advertisement and recruitment. While the initial offerings were focused on industrial refrigeration and pump systems, the PMC quickly expanded its offerings, in response to its gap analysis regarding training in a systems approach to energy efficiency. To date, the Initiative has offered 21 training sessions during 2005, including training in four targeted cross-cutting markets, ranging from basic and introductory in nature (e.g., Pumps 101) to advanced course such as Advanced Management of Compressed Air Systems. Table F-1 provides an overview of the offered training along with location, date, and number of attendees.

**Table F-1. 2005 IEA Training Courses**

Subject	Title	Location	Date	Number of Attendees
Comp. Air	CAC Advanced	*	6/22/05	73
	CAC Fundamentals	*	6/21/05	65
	CAC Training	Tacoma	11/16/05	34
Motors	Motor System Training	Ontario	8/23/05	28
	Motor Systems Management	*	4/27/05	30
	Motor Systems Management Seminar	Jerome	6/13/05	46
Pumps	Industrial Pump Systems 101	Longview	10/19/05	14
	Pump System Assessment	Longview	11/16/05	33
	Pumping Systems	*	5/4/05	46
	Pumps 101	Longview	9/28/05	15
	Pumps 101 PSAT Training	Nampa	12/13/05	15
Refrigeration	Cluster Training	Forest Grove	10/19/05	11
	Industrial Refrigeration Systems	Boise	3/23/05	27
	Industrial Refrigeration Systems	Jerome	3/22/05	37
	Industrial Refrigeration Systems	Seattle	6/10/05	41
	New Seasons Foods Continuous Energy Improvement Program	Forest Grove	6/29/05	25
	RETA Certification Class	Portland	1/18/05	28
	RETA Certification Class	Wenatchee	1/21/05	30
	Refrigeration Best Practices	Salem	11/17/05	34
	Refrigeration Best Practices	Pocatello	12/1/05	6
Steam	Steam Systems	*	6/15/05	78

\* Location information not available in ITS.

In addition to developing training that would be well-attended and effective in conveying useful information about approaching energy efficiency from a systems perspective, the Initiative team identified the addition of concrete suggestions for training attendees as a key area by which to add significant value to the trainings.

## Participant Response

Following completion of each training, attendees were asked to fill out an evaluation form.<sup>79</sup> The evaluation forms were designed to address both general questions concerning the training quality and specific questions pertinent to session topic areas. While the Initiative started offering their training and workshops as early as March 2005, the first training followed-up using evaluation forms wasn't until June 2005. Given that the Initiative had offered several trainings prior to that date, participant feedback is only available for seven of those classes representing 175 attendees, or roughly 40% of attendees. Of the 175 attendees, 164 completed evaluation forms, representing a relative response rate of 94%. Based on Quantec's analysis of the returned evaluation forms, the following represents the key findings:

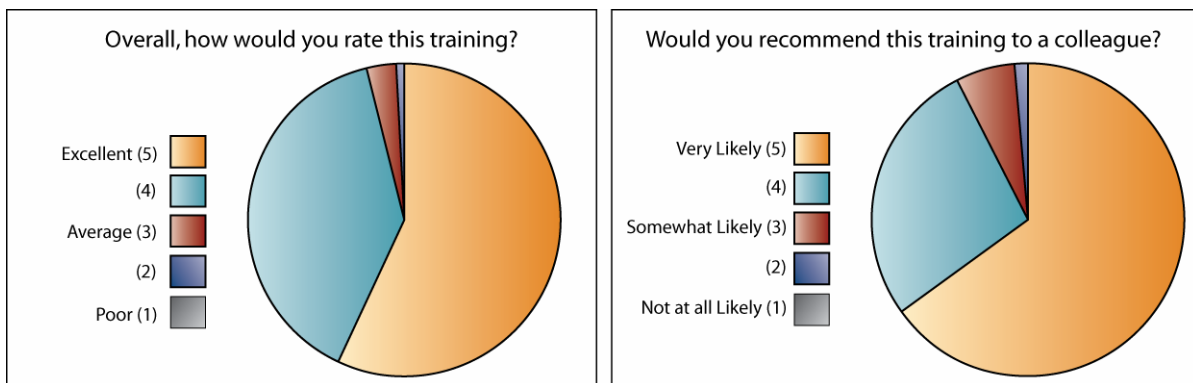
<sup>79</sup> See Appendix G for a sample evaluation form.



**System End-Users comprised the majority of the most common attendees.** Across the board, system end-users made up the majority (63%) of attendees. Other attendee types included utility staff (9%), consultants/contractors/vendors (9%), and supervisors (11%). Most attendees had heard of the training from their supervisors (43%), while some attendees heard of the program from utility staff (10%) or through mailings/e-mail (17%).

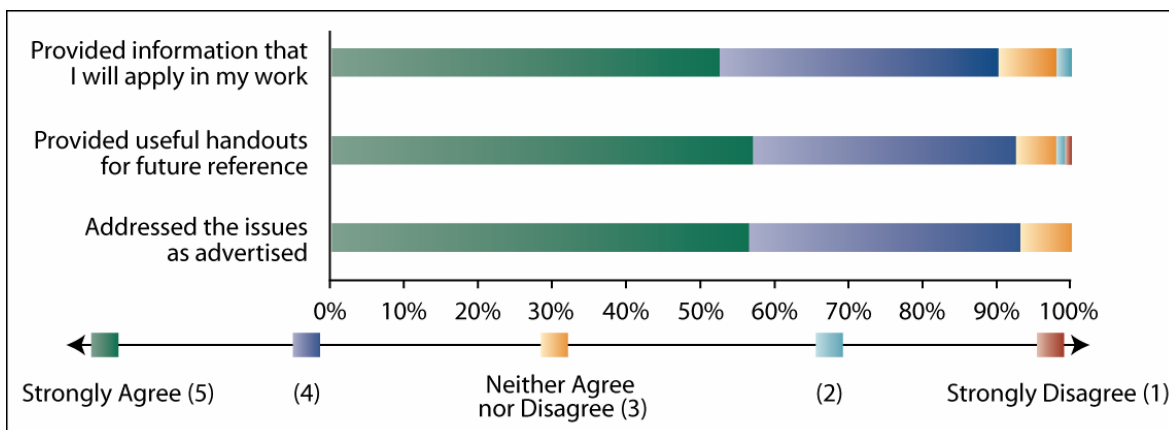
**Trainings were well-received and liked by participants.** By and large, attendees gave the trainings high ratings. The range of respondents rating the training excellent ranged from 37% for pumps to 90% for refrigeration training, with an average across all training sessions of 57%. Only one respondent out of 158 rated the training (cluster refrigeration) below average. Furthermore, over 93% of respondents said it was more than somewhat likely that they would recommend the training to a colleague. Figure F-3 illustrates the responses regarding the overall rating of the trainings and the likelihood of recommending the training to a colleague.

**Figure F-3. Participant Rating of Training and Likelihood of Recommendation**



In addition, respondents were asked about the training content. By and large, attendees found the training content relevant to their work (90%).

**Figure F-4. Participant Perception of Training Content**

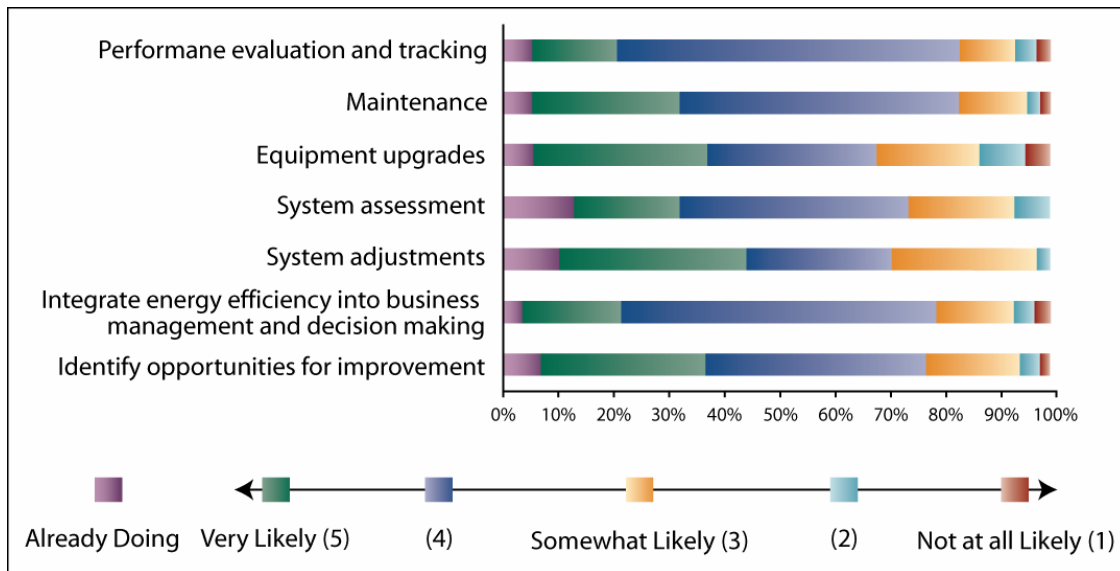


**Instructors were perceived as being knowledgeable and effective.** Instructors for all trainings received high marks. Ninety-nine percent of respondents agreed that their instructor was knowledgeable and possessed effective presentation skills.

**Training enabled participants to perform their work better.** Participants were asked specific questions concerning the effects of training on their ability to perform certain tasks related to efficiency in their job. Questions were tailored to the topic of the training and the particular technologies addressed. On the whole, 85% of all trainees agreed that they were better able to perform these tasks at their work as the result of training. For example, attendees at the Motor training were asked, “As a result of this training, I am better able to identify opportunities to improve the motor efficiency of my plant.” In response, 92% of the trained agreed that, as a result of the training, they were better able to identify opportunities to improve the motor efficiency at their plant.

Likelihood of participants taking specific actions at the plant were typically focused on data collection or maintenance procedures rather than changes or upgrades to equipment. Respondents were asked how likely they were to apply certain actions to their plant or business as a result of this training. Because questions varied by training session, they have been categorized into question types. Figure F-5 summarizes the findings. Overall, respondents are more likely to take steps to track performance (78%) or take additional maintenance steps (78%) as a result of the training. While many respondents said it was likely they would make changes to the system (62%) or upgrade equipment (61%), the likelihood was smaller.

**Figure F-5. Likelihood of Participants Taking Action Based on Training**



**Training focus and targeting could be improved.** A recurring suggestion was to invite management or other decision makers to participate in the trainings. Additionally, offering training at different skill levels (e.g., introductory, intermediate, advanced) would allow participants to attend the most appropriate class and allow training materials to be more focused.

In a few cases, the evaluation team received similar feedback as part of phone interviews with company representatives who had sent staff to attend Initiative trainings.

***Training participants requested additional courses.*** Participant feedback regarding additional training included:

- Pumps – Introduction to System Head Software
- Pumps – Certified Pump Hydraulics
- BMP for Public Buildings
- Motor Inventory
- System-Specific Measurement Techniques
- Pumps – More Advanced Analysis
- HVAC Systems
- Pump and Vacuum Controls
- Motors – Bonding and Grounding
- Motor Failures

***For training relying heavily upon detailed graphics, participants expressed preference for color graphics.*** Participants in the pump training indicated a preference for color rather than black and white handouts to make graphics easier to decipher.

***Training content could be more specific, practical, and concise.*** From the Compressed Air class, one respondent would have liked the training materials be more concise and less general in nature, “*Skip the overview and get right to the point. Where and how can I save money in air usage?*” One respondent suggested more payback calculations, “*Return on investment calculations for efficient compresses system upgrades.*” At the Motor Training, one attendee suggested, “*For lunch, include a movie about motors.*” Several attendees from the refrigeration training mentioned there being a shortage of time. One attendee specifically suggested, “*Possibly allow more time for training, or split training into two portions.*” Lastly, an attendee from the pumps training suggested, “*Take the show on road the to various mills - it would be good for engineers and maintenance folks.*”

To assess training quality, including session focus, materials, instruction, and audience responses, Quantec staff attended a number of Initiative-sponsored trainings. As a matter of reference, Quantec staff also attend a few DOE-sponsored trainings covering similar subject matter to gain perspective on the training quality offered by other organizations. Following is a summary of our findings.

***Experienced, knowledgeable instructors have a keen understanding of the specific industry.*** The instructors appeared experienced and knowledgeable, which was generally well-received by participants. Instructors solicited participant questions throughout the course and provided comprehensive and technically sound answers, presented in terminology specific to the industry and application.

***Technical subject matter and level of instruction was generally well-tailored to the audience.*** For attended classes, training materials were found to be audience-appropriate with adequate time allotted to cover them during the training session. Instructors made ample use of applicable efficiency project examples with a focus on what worked and what didn’t. In one case, the presented technical material was slightly above roughly 40% of the audience’s technical level of understanding. In response, the instructor explained the material thoroughly, encouraging and answering participant questions.

***Usefulness of training could be further improved by greater emphasis on economic analysis.*** While all attended trainings emphasized a systems optimization approach for analysis, none sufficiently addressed how to use economic analysis to develop a convincing business case and market to upper management. While case studies presented during training were technically excellent, the only mention of economic analysis was a simple payback approach instead of also highlighting approaches, such as life cycle costing. More importantly, it would be helpful to include sample “forms” for presentation to management.

***Fine-tuning of training delivery could improve effectiveness.*** In some cases, evaluation forms were passed out to participants during the last break of the day, which resulted in participants filling out forms during the last topic presentation (O&M practices). This distraction may have resulted in missed maintenance tips and might be prevented by handing out evaluation forms at the end of the training. Also, adding periodic reviews of key items throughout the presentation to gauge understanding level before moving on to next topic may improve participant understanding of presented materials. While in one case, a good set of review questions were presented at the end of the class, most participants appeared anxious to leave and did not pay close attention. Lastly, addition of post-class homework assignments maybe helpful for participants as a way of applying the class materials to their respective plants.



## **Appendix G. Sample Training Evaluation Form**

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## Appendix H. Tactical Steps to Address Utility Relationships

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To address the Initiative's challenges with establishing and maintaining utility relationships, the Initiative team, led by the Utility Coordinator, was involved in a concerted effort to shift its perspective to recognize utilities as members of a specialized target audience. Several key actions were taken to integrate this change in perspective into the Initiative's implementation strategy.

The Utility Coordinator drafted a set of three questions that Initiative team members had to ask themselves prior to contacting prospects:

- Has the utility (and Bonneville, if applicable) been informed of our intention to approach their customer?
- Has the utility been notified and given the opportunity to contribute to or participate in the meeting?
- What utility resources are available to the customer?

Although the Alliance Board adopted an official policy stating that the Initiative needs to give utilities three days prior notice before contacting any of their customers, the Initiative chose a more stringent policy in which they would not contact utility customers until the utilities provided permission and gave the utility the option to be involved in the communication.<sup>80</sup> The Initiative developed a more cooperative and strategic approach.

With assistance from the marketing team, the Initiative developed a set of value propositions tailored for utilities:

- Help customers remain competitive, allowing a stable source of income and jobs for the community (a benefit that offsets reduced utility revenue).
- Provide technical resources to augment or support the utility's efficiency or conservation programs, including the EnVINTA technical assessment.
- Assist the utilities in meeting energy savings goals.
- Improve the utility's load factor.
- Generate positive public relations and an improved customer relationship.
- Provide coordination and implementation of regional technical training.
- Bi-weekly conference calls were arranged with utility staff, involving both efficiency staff and key account managers, to discuss project activities. Participation in these meetings varied, but averaged about 10 to 12 utilities.

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<sup>80</sup> For cases where a customer has multiple plants that span multiple utilities, and one utility has denied access, the Initiative has asked the customer to directly request participation from the dissenting utility.



- The Initiative began working directly with account managers to develop a common account plan for their largest customers.
- The Initiative has reiterated to utilities that the program is in early stages, and currently, the goal is to only enroll a few customers per year.

# Appendix I. Evaluation of KPIs

This appendix presents a summary of progress observed toward meeting the KPIs in 2005.

**Table I-1. Summary of Evaluation of Progress Toward Meeting the 2007 KPIs**

ID	Mkt	Type	KPI Definition	Progress Indicators	Status
1	PP	TR	One or more individuals of firms representing 45% of P&P market (by production) or 9 mills participate in systems optimization and market specific training.	10 mills, representing 53% of the marked (based on production) participated in systems optimization and market training. KPI has been met.	Ahead of schedule.
2	PP	BP	2 mills participate in business practice service each year as indicated by the engaged status indicator	2 mills (9% of market) are participating at engaged status or higher.	On schedule.
3	PP	BP	2 mills implement action plans each year as indicated by the practicing status indicator.	No mills were participating at the practicing status in 2005.	Behind schedule.
4	PP	BP	30% of technical service consultants have spent resources on joint marketing activities promoting energy management and business practices (demonstration projects, co-sponsoring/giving training or joint sales calls)	1 of the 4 key market players at engaged status. Evaluation of market percentage pending finalized definition of market.	On schedule.
5	PP	BP	30% of technical service consultants promote energy management and efficiency as part of their normal sales and marketing activities	1 of the 4 key market players at engaged status. Evaluation of market percentage pending finalized definition of market.	On schedule.
6	PP	MC	All mills are aware of IEA at end of Year 1	12 of 28 mills (50% of market based on production) rated as aware. All mills introductory letters.	Behind schedule.
7	PP	MC	Channel Director, in combination with utility account representative, will contact 10 mills per year	3 <sup>81</sup> out of 10 meetings completed with 2 scheduled as of February 2006.	Behind schedule.
8	PP	MC	Utilities serving 15% of pulp & paper market actively participate in promoting training	10 <sup>82</sup> utilities participated in the promotion of training. Market percentage made up by these utilities currently is not yet available.	On schedule.
9	PP	DC	6 case studies or demonstration projects	No demonstration projects or case studies to date	Behind schedule.
10	FP	TR	1 or more individuals of firms representing 24% of FP market (based on employment) attend system and/or food processing training activities.	59 firms, representing 19% of food processing market (based on employment) had one or more individuals attend systems and/or food processing trainings.	On schedule.

<sup>81</sup> Based on information provided by the Utility Coordinator. Reflects status as of February 21, 2006.

<sup>82</sup> Represents utilities who sponsored/promoted trainings regardless of target market. Estimate not specific to pulp and paper market. Based on information provided by Initiative staff as part of the Portfolio Update document, dated March 9, 2006.

ID	Mkt	Type	KPI Definition	Progress Indicators	Status
11	FP	TR	75 system operators or system owners attend refrigeration system operation training	35 <sup>83</sup> system operators or system owners attended refrigeration system operation training. <sup>84</sup>	On schedule.
12	FP	TR	30 vendors/consultants attend refrigeration system operation training	9 <sup>85</sup> vendors or consultants attended refrigeration system operation training.	Behind schedule.
13	FP	TR	60 employees RETA certified	Evaluation pending information from RETA.	Status unknown.
14	FP	TR	15% of large food processors and cold storage firms (by employment) support (send employees to) RETA certification	3 large food processors (5% of market share) sent at least one employee to RETA training.	On schedule.
15	FP	TR	Distribute 80 refrigeration best practices manuals per year	42 <sup>86</sup> best practice manuals have been distributed.	On schedule.
16	FP	BP	18% of large food processors (based on employment) participate in business practices initiative/services as indicated by engaged indicator.	2 large food processors, representing 9 locations and 11% <sup>87</sup> of the market share, participate in business practice initiative/services on an engaged status level.	On schedule.
17	FP	BP	8% of large food processors (based on employment) implement action plans as indicated by practicing indicator.	None are participating at practicing level.	Behind schedule.
18	FP	BP	6% of small-medium food processors (based on employment) participate in business practices initiative/services as indicated by engaged indicator.	11 Firms representing 4% of medium/small food processing market participate in business practice initiative/services on an engaged status level.	On schedule.
19	FP	BP	2% of small-medium food processors (based on employment) implement action plans as indicated by practicing indicator.	None are participating at practicing level.	Behind schedule.
20	FP	MC	Utilities serving 15% of FP refrigeration load market specify a uniform systems approach analysis for refrigeration efficiency programs analysis of refrigeration efficiency programs.	Ongoing discussions but, to date, none of the utilities have adopted components or systems specifications for refrigeration efficiency programs.	Behind schedule.
21	FP	DC	Average of 4 Motor Systems case studies or demonstration projects per year targeted at large industrial firms	No demonstration projects or case studies to date.	Behind schedule.
22	FP	DC	Average of 3 refrigeration systems case studies or demonstration projects per year targeted at large industrial firms.	No demonstration projects or case studies to date.	Behind schedule.

<sup>83</sup> Evaluation was limited to refrigeration classes for which participant evaluation forms were available (2 classes held in October and November 2005).

<sup>84</sup> Based on training evaluation form information for two classes. Thirty-five total respondents, including 14 refrigeration operators, four maintenance supervisors, six plant/corporate engineers, one plant managers, and ten refrigeration end users.

<sup>85</sup> Evaluation was limited to refrigeration classes for which participant evaluation forms were available (2 classes held in October and November 2005).

<sup>86</sup> As of December 31, 2005.

<sup>87</sup> The pipeline report reports engagement status only on a corporate level, not at a plant level. Given the available data, the market share percentage assumes all locations of a given corporation have reached a given status. This may overstate the actual market percentage captured by the Initiative.

ID	Mkt	Type	KPI Definition	Progress Indicators	Status
23	CC	TR	30% of the Motor Trade Allies market (based on repairs) participate either in taking, marketing, or offering courses.	7 employees, representing 6 motor trade allies participated in training. Comprehensive market share information not available <sup>88</sup> . 3 firms engaged. Evaluation pending data development.	Status unknown.
24	CC	TR	30% Pump Allies market (based on sales/employment) participate either in taking, marketing, or offering courses.	12 employees, representing 6 pump trade allies participated in training. 1 firm each engaged and committed. Evaluation pending data development.	Status unknown.
25	CC	TR	45% Compressed Air Trade Allies market (based on sales) participate in either taking, marketing, or offering courses.	Trade allies representing 50% of the market have attended trainings. Trade allies representing 65% of the market are committed.	Ahead of schedule.
26	CC	CM	Firms representing 30% of the Motor Trade Allies market (based on repairs) spent resources on joint marketing activities.	3 firms at <i>engaged</i> status. Evaluation pending data development.	Status unknown.
27	CC	CM	Firms representing 30% of the Pump Allies market (based on sales/employment) spent resources on joint marketing activities.	1 firm each <i>engaged</i> and <i>committed</i> . Evaluation pending data development.	Status unknown.
28	CC	CM	Firms representing 45% of the Compressed Air Trade Allies market (based on sales) spend resources on joint marketing activities.	One key market player has committed to training audit staff on systems approach. 2 trade allies <i>committed</i> , 1 <i>engaged</i> .	On schedule.
29	CC	PS	9 products / services developed or disseminated and applicable to at least one of the vertical markets	No products or services developed or disseminated.	Behind schedule.
30	CC	MC	IEA actively works with utilities / others to sponsor trainings, demos and product and service development	10 utilities are supporting and promoting appropriate training for their customers.	On schedule.
31	CC	MC	6 utility or other organizations actively participating in product and service development (adopt specifications, provide incentives, technical support, etc.)	1 utility has agreed to adopt standards for Compressed Air systems. Working with EASA to reinforce support for rewind standards.	Behind schedule.
32	CC	MC	6 presentations at local/regional meetings per year	Channel Directors have given presentations at 6 local/regional meetings.	On schedule.
33	DC	MC	Majority of market aware of demonstration projects through case studies, journal articles, etc. (by survey)	No demonstration projects or case studies to date.	Behind schedule.

<sup>88</sup> The implementation team provided a list of key market players in the motor repair sector along with associated market share percentages. Cross-reference of the firms who sent employees to attend motor trainings in 2005, yielded only one match, with an estimated market share of 2.9%.

## Pulp & Paper

### Training

**KPI #1:** Based on data contained in the ITS as of December 31, 2005 10 mills representing approximately 53% of the market, based on production, have sent one or more employees to participate in training. Given a KPI goal of 45% of market share, the three-year KPI was met during the first year of operation. Also, given that the KPI was exceeded by the end of the first year of operation, the 45% goal may have been too conservative.

### Business Practices

**KPI#2.** As part the Initiative team's internal tracking and communication tools, each targeted industrial firm is assigned one of seven status indicators.<sup>89</sup> Using the information contained in the ITS as of February 2006, two mills were identified at being at least in the *engaged*<sup>90</sup> status (one mill *engaged* and two *committed*<sup>91</sup>), representing roughly 9% of the market based on production. Given the annual goal of two mills being at the *engaged* status, the target was met in 2005. This finding is in part supported by feedback from the implementation team that indicates that two EnVINTA assessments were completed. One additional session was confirmed, and three sessions are currently being planned. This progress suggests that the KPI target is likely to be met in 2006 as well.

**KPI#3.** The second KPI is designed to measure the team's progress in guiding mills to fully implement and practice, on an ongoing basis, a corporate-wide approach to continuous energy improvement. Using the engagement status indicators, this goal represents the highest engagement status of *practicing*.<sup>92</sup> However, while the pulp and paper team identifies one mill at the preceding engagement status of *committed*, to date, none of the mills have reached the *practicing* stage. However, promising progress includes the pulp and paper team working closely with one mill on the development of a strategy energy management plan. In our judgment, slower than expected progress on this particular KPI does not constitute reason for concern at this stage of implementation for two reasons:

- a) The pulp and paper market is finite, and the Channel Director has established strong personal ties to many mills.

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<sup>89</sup> Not Interested, Aware, Receptive, Interested, Engaged, Committed, and Practicing.

<sup>90</sup> The engaged status indicator is defined as: End-user is participating in the assessment process to identify specific opportunities such as an EnVINTA One-2-Five<sup>®</sup> or other structured assessment processes.

<sup>91</sup> The committed status indicator is defines as: End-user has dedicated resources (e.g., staff and time) to working with IEA to address needs, including the development of energy management plans, specific trainings, etc., focused on making energy efficiency an integral part to operations and management.

<sup>92</sup> This status is defined as: End-user is implementing the specified action plan and is actively practicing energy efficiency as a core business value. Key indicators may include high level of awareness of energy efficiency issues by all staff, establishment, measurement and ongoing monitoring of KPIs, existence of comprehensive energy management plan, covering issues such as energy policies and capital expenditures, among others.

- b) The limited progress is likely due to significant lead-time associated with overcoming corporate requirements, especially in larger firms.

The evaluation team anticipates that significant progress toward this KPI is unlikely (in either pulp and paper or food processing) until late 2006.

**KPI#4:** In addition to working directly with mills, engaging technical service consultants is key to sending a consistent message to the market. This KPI requires that 30% of the technical service consultants spend resources (staff, time or money) on joint marketing activities promoting energy management and business practices. Based on information provided by the pulp and paper Channel Director, 80% of the market is made up of four key firms. However, it is currently unknown what percentage of the market share is held by each company. The evaluation team is currently collecting more detailed market information. In addition, the ITS does not currently track information regarding technical service consultants' resource dedication to joint marketing activities. While the lack of necessary data prohibits a formal evaluation of this KPI in this MPER, information contained in the February pipeline document suggests ample progress in that the status indicators of the four key firms indicate one company as being *aware*, two *interested* and one firm *engaged*. This suggests promising progress toward meeting the specified goal. A formal evaluation of this KPI will be presented in MPER#2 with expected publication date of September 2006.

**KPI#5:** Similar to KPI#4, lack of adequate data regarding the market makeup, as well as actual actions on the part of technical service providers, this KPI will be evaluated as part of MPER#2. However, current progress with four of the key market players (representing roughly 80% of the market) suggests that it is likely that the target for this KPI will be met.

## Utility and Market Coordination

**KPI #6:** With regard to generating awareness of the Initiative and its offerings, ITS records show that the Channel Director mailed 70 personalized letters introducing the Initiative, its goals, and products and services to key staff in all 28 mills. In addition, the pulp and paper channel team has held meetings and discussions with a variety of plant and corporate staff. Based on the engagement status indicators, 10 mills or 50% of the market based on production are identified as having a status of *aware* or better. The pulp and paper channel team has additionally made formal presentations to technical, educational, and trade associations including TAPPI and the Washington Pulp and Paper Foundation. Comparing progress during 2005 to the goal of all mills being aware after the first year, this KPI was not met and may require additional attention.

**KPI#7:** Based on records provided by the Utility Coordinator, the pulp and paper team, in association with a utility account representative, has conducted meetings with 3 firms, with two scheduled as of February 21, 2006. Given an annual goal of 10 combined meetings, the yearly goal was not met. This KPI may require additional attention during 2006.

**KPI#8:** With regard to the KPI tracking utility involvement in sponsoring and promoting the Initiative trainings, four utilities have been actively promoting trainings to the pulp and paper mills in their respective service territories. ITS does not currently include information that ties firms, and the utilities that serve them. Therefore, the market share percentage represented by

these utilities cannot be determined at this point in time. However, based on the information provided by the implementation team, 10 utilities became actively engaged in the promotion of training during 2005.

## Demonstrations and Case Studies

**KPI#9:** As of January 2006, no demonstration projects were completed for the pulp and paper channel. In our opinion, this does not necessarily constitute reason for concern since 2005 was the Initiative's ramp-up phase characterized largely by activities focusing on establishing market awareness and fine-tuning messaging. However, this KPI may require additional attention during 2006 and 2007. Based on information provided by the pulp and paper Technical Director, at least three or four viable opportunities have been identified.

## Food Processing

### Training

**KPI#10:** Based on data contained in the ITS as of December 31, 2005, 59 food processors, representing approximately 19% of the market (based on employment) have sent one or more employees to participate in training. Given a KPI goal of 24% of market share, the progress to date suggests that the three-year KPI will in all likelihood be met.

**KPI#11:** Based on the information collected from training participant surveys during 3<sup>93</sup> refrigeration classes, 35<sup>94</sup> participants identified themselves as refrigeration operators, maintenance supervisors, plant/corporate engineers, plant managers, and refrigeration end-users. Given the lack of specific designation identifying system operators and/or system owners on the survey forms, the above categories were assumed to represent system operators and/or system owners. Given a three-year goal of 75, the progress made to date suggests that the KPI is likely to be met.

**KPI#12:** Based on information from available training evaluation forms, 9 participants identified themselves as vendors or consultants. Given a three-year goal of 30, achievement of this KPI may require additional focus on recruiting vendors and consultants to attend refrigeration trainings during 2006 and 2007.

**KPI#13:** The implementation and evaluation teams are currently coordinating with RETA to receive statistics regarding the number of certifications bestowed on participants of Initiative trainings. However, between January 2005 and March 2006, the Initiative has offered 3 RETA certification classes with total attendance of 74. While not all who participate in a RETA certification class will be certified, a large percentage of participants is anticipated to receive certification within one year of taking the class. Given a three-year goal of 60 participants also

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<sup>93</sup> Analysis of this KPI requires training evaluation forms. At the time of the is analysis, evaluation forms were only available in digital format for 3 classes in 2005.

<sup>94</sup> Descriptions of participants' jobs and/or responsibilities were only available for 2 of the 3 trainings.

receiving RETA certifications, progress to date, while not conclusive, is indicative of this target being met.

**KPI#14:** During the first year of implementation, 3 companies, representing approximately 5% of the large food processing market sent at least one employee to a RETA training class. Given a three-year target of 15%, the progress to date appears to be in line with what is required to meet the goal at the end of 2007.

**KPI#15:** As of December 31, 2005, a total of 42 best practice manuals were distributed, which is slightly more than half of the three-year KPI target. Progress to date appears sufficient for this KPI to be met over the three-year time frame.

### ***Business Practices***

**KPI#16:** Based on the status indicators captured in the pipeline report for February of 2006, two firms representing 9% and 11% of the large food processing market (>250 employees), were identified as being at least at an *engaged* participation status. The pipeline report indicates engagement status only on a corporate (not plant) level. Given the available data, the market share percentage assumes all locations of a given corporation have reached a given status. This assumption may result in the actual market percentage captured by the Initiative as being overstated. However, given a three-year goal of 18%, progress during the first year of implementation appears to be on target to meet the KPI goal by the end of 2007.

**KPI#17:** Similar to the progress in the pulp and paper market, to date, no companies have reached the *practicing* engagement status. There has, however, been partial progress toward reaching this goal. At least one firm is currently identified as being at the *committed* state of engagement. In the opinion of the evaluation team the lack of progress on this particular KPI does not constitute reason for concern at this point.

**KPI#18:** Based on the status indicators captured in the February 2006 pipeline report, four firms representing 4% of the small to medium food processing market ( $\leq 250$  employees) and 10 plant locations, were identified as having at least an engaged participation status. The pipeline report reports engagement status only on a corporate level, not at a plant level. Given the available data, the market share percentage assumes all locations of a given corporation have reached a given status. This assumption may result in the actual market percentage captured by the Initiative as being overstated. Regardless, given a three-year goal of 6%, progress to date suggests that the KPI is likely to be met by 2007.

**KPI#19:** Similar to the progress in the pulp and paper market and the large food processing firms, to date no small to medium food processing firms have reached the practicing engagement status. There is partial progress toward reaching this goal. At least one firm has been identified as being at the committed state of engagement. In the opinion of the evaluation team, lack of progress on this particular KPI does not constitute reason for concern at this state of implementation. However, we would expect to document progress toward this KPI during the end of 2007.



## Utility and Market Coordination

**KPI#20:** While to date no utilities have committed to requiring refrigeration efficiency programs to meet specific component or system specifications, the food processing technical team has been in discussions with at least seven utilities. The ITS does not currently include information that ties firms, and the utilities that serve them, together. Lack of this data has impeded the evaluation team's efforts to evaluate this and other utility-related KPIs. The PMC is currently working on adding this information to the activity tracking database. A formal evaluation of this KPI is expected to be presented as part of MPER#2.

### *Demonstrations and Case Studies*

**KPI#21:** To date, no demonstration projects or case studies have been developed for motor systems. While we do not regard the lack of progress on this particular KPI at this stage of implementation as a major concern, we do expect to see significant progress toward this KPI toward the end of 2006.

**KPI#22:** To date, no demonstration projects or case studies have been developed for refrigeration systems. However, based on feedback from the food processing technical team, several promising opportunities have been identified. Similar to KPI#21, the lack of progress to date is not considered alarming, however, significant progress is expected during 2006 and 2007.

## Systems Markets

### Training

**KPI#23:** In 2005, the Initiative offered three motor trainings. Based on participant registration data, employees of 6 motor trade allies attended the trainings. According to estimates provided by the Channel Director, the estimated motor repair market in the Pacific Northwest is approximately 90,000 repairs per year. However, cross-referencing the firms who sent employees to attend motor trainings in 2005 yielded only one match, with an estimated market share of 2.9%. The Initiative is currently still working on finalizing the market definitions. Also, based on the February pipeline report, 3 motor service companies are shown as being "engaged," representing roughly 6% of the regional motor repair market. In addition, the implementation team is currently working on collecting data reflecting trade allies "marketing and/or offering" trainings. Formal evaluation of this KPI is pending the completion of this work. Given the lack of data and outstanding issues, evaluation progress for this KPI is difficult. In general, progress appears to be made, with continued attention necessary to ensure the KPI will be met.

**KPI#24:** In 2005, the Initiative offered 6 pump trainings. Based on participant registration data, 12 employees of 6 pump trade allies attended the trainings. While the lack of data on the regional pumps market prohibits a formal evaluation of this KPI at this point, of the 6 firms, 2 represent the 2 largest pump manufacturers in the region. To address this issue, the evaluation team is currently developing a market profile of the pumps market. Furthermore, based on the February pipeline report, 2 companies are shown as having at least *engaged* with 1 company being *committed*. In addition, the implementation team is currently working on collecting data

reflecting trade allies “marketing and/or offering” trainings. Formal evaluation of this KPI is pending the completion of this work as well as the completion of the market definition. Given the lack of data and the outstanding issues, evaluation progress for this KPI is difficult. In general, progress appears to be made, with continued attention necessary to ensure the KPI will be met.

**KPI#25:** In 2005, the Initiative offered three compressed air trainings. Based on participant registration data, employees of 12 trade allies attended the trainings representing roughly 50% of the market, based on market share information provided by the Technical Director. Based on the February pipeline report, 2 manufacturers and one consultant have reached the *committed* engagement level representing roughly 65% of the market. One additional trade ally is shown at an *engaged* level. In addition, the Implementation team is currently working on collecting data reflecting trade allies “marketing and/or offering” trainings. Overall, the progress made in the compressed air channel appears strong with the KPI having been met in the first year.

## Channel Management

**KPI#26:** Given the current lack of a finalized market definition for the motor market, along with lack of data on which trade allies “spent resources on training,” the evaluation of this KPI is pending development of these data. However, as of February 2006, at least three trade allies were identified as being *engaged*.

**KPI#27:** Given the current lack of a finalized market definition for the pumps market along with lack of data on which trade allies “spent resources on training,” the evaluation of this KPI is pending development of these data. However, as of February 2006, at least one pump trade ally each was identified as being *engaged* and *committed*.

**KPI#28:** Given the current lack data on which trade allies “spent resources on training,” the evaluation of this KPI is pending development of these data. However, as of February 2006, the implementation team identified 2 trade allies as being committed and one as being *engaged*. Given the solid progress in the compressed air market, the evaluation team assumes that meeting this KPI by 2007 will be likely.

## Products and Services Development

**KPI#29:** To date, the systems directors have not yet developed or disseminated any specific products or services. However, based on feedback from the systems channel directors, several opportunities have been identified. One such opportunity is the marketing and distribution of *em2solutions* motor management software,<sup>95</sup> which had been developed by the Motor Technical Director with partial funding provided by the Alliance.

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<sup>95</sup> <http://www.em2solutions.com>

## Utility and Market Coordination

**KPI#30:** Based on information provided by the implementation team, at least 10 utilities are supporting and promoting various training activities for their customers. Given a total of 26 targeted utilities, engaging 10 by the end of the first year suggests satisfactory progress and that the KPI target is likely to be met in 2007, assuming the same level of effort.

**KPI#31:** Based on information provided by the implementation team, 1 utility has agreed to adopt compressed air standards. The Initiative is also currently coordinating with EASA to reinforce regional support for NW motor repair shops as well as to make rewind standards potentially considered at the national level. Meeting the three-year KPI of 6 utilities and/or other organizations would require more intensive effort and possibly the dedication of additional resources.

**KPI#32:** Based on data provided by the implementation team as well as data available in ITS, it appears that among all technical directors (vertical and systems) at least 6 presentations were given during 2005 at a various venues. This suggests that the KPI target for the first year has been met.

## Demonstrations and Case Studies

**KPI#33:** Given that no demonstration projects or case studies have been developed in any markets, the evaluation of this KPI is pending the completion and publication of demonstrations and case studies. Given the lack of progress during 2005, the Initiative may need to focus additional time and resources at demonstrations and case studies in 2006 and 2007 in order to meet the KPI target.