

# BetterBricks Building Operations Initiative

## *Market Progress Evaluation Report*

PREPARED BY

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Final Report

# Market Progress Evaluation Report #1 BetterBricks Building Operations Initiative

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## Executive Summary

The Northwest Energy Efficiency Alliance's BetterBricks Building Operations Initiative was slated to begin in January 2006. Personnel changes delayed the start of development activities for several months. The initiative has benefited from a foundation established through its predecessor, the pilot Building Performance Services (BPS) initiative, particularly with respect to the relationships with key service providers in the region. Beyond these relationships and efforts initiated under BPS, however, the new initiative has made less progress than anticipated in the 2006 activity indicators. Key materials to make the case for improved building operations and maintenance are still in development. Relationships with key service providers have continued to be developed and these firms are showing enthusiasm and support for expanding their building operations service offerings but because of the lack of a well-developed business case and supporting materials there has been little substantive engagement.

### Market Support Materials

The majority of education and training, marketing and other initiative materials, including the value proposition, toolkit and business case to service providers are still in development. Initiative materials that clearly lay out the business case, and the product and service offerings available through the initiative are essential for the initiative to enter new projects in the vertical markets, approach new candidates for special firm focus relationships, and continue training and education efforts in the broader market.

***Recommendation:** The value proposition, business case and other elements of the Toolkit for service providers should be completed to allow for the initiative to progress.*

### Firm Focus Relationships

Firm focus efforts are concentrated on three major service providers that participated in the BPS initiative but have not yet resulted in case studies or materials that can be used to promote initiative objectives to the broader market. Also, no other firm focus firms have been recruited, falling short of the progress indicator goal of 4-5 firms. The key limitations to expanding the pool of firm focus firms cited by staff and contractors were a lack of advisory resources and the above-mentioned business case materials. Contracted business advisors have not yet been significantly involved in these relationships, but are expected to assist firm focus in developing activity plans and implementation of those plans.

***Recommendation:** Complete the business case, and solicit additional advisory resources to rapidly move existing firm focus firms toward the completion of projects that can be used to make the case to the broader market. Expansion to other firms should be done cautiously, ensuring that sufficient resources are available and that implementers use the experience gained with the existing firms to better understand their needs and refine the initiative's tools, materials and business advice.*

There is confusion among service providers with respect to how the Building Operations Initiative will or does relate to other energy efficiency initiatives and even how it differs from the BPS initiative. One firm focus firm was unclear as to what the new initiative had to offer compared to BPS, and many service providers interviewed in the baseline study were unclear as to how the Building Operations Initiative would relate to other energy efficiency programs in the region. As the initiative reaches out to the broader market, either in recruiting for firm focus or other activities, it will have to clearly distinguish what it has to offer.

***Recommendation:** The initiative should openly communicate with firm focus with respect to the new role and objectives of the Building Operations Initiative and collaborate with complementary or existing utility programs to diminish the effects of market confusion. Also, increased coordination with similar utility programs will help diminish market confusion and build on enthusiasm generated by these programs.*

## **Technical Advisors and the Vertical Markets**

Collaboration with the vertical markets, specifically hospitals, has been important for the initiative's progress to date. The relationships with Market Specialists have been positive, but there is room for improvement through greater coordination, team building, and clarifying roles and responsibilities. One role that specifically needs to be clarified is that of the Technical Advisors working on vertical market projects. Their role as a provider of technical assistance to the completion of the project is clear, but their responsibilities for building technical capacity among the service providers and facility staff is not clear, and they have had little direction from the initiative. Technical advisors have not been effective in bringing existing service providers into the preliminary facility assessment activities, and there has been at least one instance where a firm focus service provider saw the technical advisor as a competitor rather than a partner. Early and open communication with service providers to clarify the role of all parties involved in the project must be a priority for all vertical market projects.

***Recommendation:** The initiative needs to provide clear direction to technical advisors outlining their responsibilities for building technical capacity among the service providers and facility staff in the form of written, formal guidelines.*

Technical advisors and the rest of the vertical market project team members have never been brought together for formal training to clearly address roles, responsibilities, coordination accountability, and resources.

***Recommendation:** Before additional vertical market projects are acquired, technical advisors, market specialists, and initiative management need to be brought together to better define roles, relationships and strategies for efficiently meeting initiative objectives.*

## Baseline

One of the major efforts for the MPER was to conduct a baseline assessment of the market as a means to measure initiative progress in the future. The two key findings are: first, the building operations and maintenance service market is customer demand driven; and second, many service providers address customer demands directly and view offering enhanced services as risky unless the customer requests such a service.

***Recommendation:** Offer service providers concise, trustworthy, independent materials to effectively present the value proposition to the customer without appearing to be self-serving. Design materials so that they can be easily integrated into their existing proposal formats.*

All service providers understand that there are business and customer benefits to taking a systems approach and offering comprehensive service to customers, but they are typically only providing these services to a small portion of their customer base. Greater provision of these services relies on the ability to encourage demand. Service providers serve an important education role in the market, but they cannot be expected to move this market on their own and will need substantial education and market development efforts on the demand side before they can be successful. Service providers will not push this market without successful demand stimulation efforts.

***Recommendation:** The initiative can continue assisting service providers in clearly making the value proposition to their customers to sell enhanced services, but simultaneously building demand through outreach to facility managers and building owners and operators is critical for market adoption.*

Service providers typically believe that their approach to the customer, which is based on successful corporate history and philosophy, is the best for their market and are apprehensive about following other firm's leads as assumed in the initiative theory. Changes in business practices to sell more of the enhanced services encouraged by this initiative will have to respect existing business approaches and practices. Service providers in the broader market will be more accepting of success stories they perceive as directly applicable to their customer base rather than to their competitor's successful business model. If a case study has information on the success of a competitor's performance, it will not be used by other service providers and will not be shared with their customers. In fact, just the opposite will occur, it will be discarded so that there is no potential for it to be seen by one of their customers.

***Recommendation:** Materials for marketing the initiative and to present the business case should focus on the benefits to the bottom line, benefits to the customers, and be structured to build customer demand for a service that may not be seen as necessary by the majority of the customers. Avoid materials that identify service providers so they can be used by all service providers. Equally important, concepts for both education and training efforts and tools and materials should be reviewed by service providers to ensure that they resonate with and provide value for the intended audience.*

## Initiative Theory

The initiative has a reasonably well-developed initiative theory and logic model. The logic model does not address specific barriers and methods of addressing each barrier, which could help the initiative in directing its actions.

***Recommendation:** The initiative staff should incorporate the barriers identified in this report as well as methods to address each barrier into the logic model.*

# 1. Introduction

The Northwest Energy Efficiency Alliance (NEEA) is a non-profit corporation supported by the Bonneville Power Administration, electric utilities, public benefits administrators, state governments, public interest groups and energy efficiency industry representatives. These entities work together to make affordable, energy-efficient products and services available in the marketplace.<sup>1</sup>

This first Market Progress Evaluation Report (MPER #1) documents the progress of the BetterBricks Building Operations Initiative. The current initiative was approved by the Board and has been active since January 1, 2006.

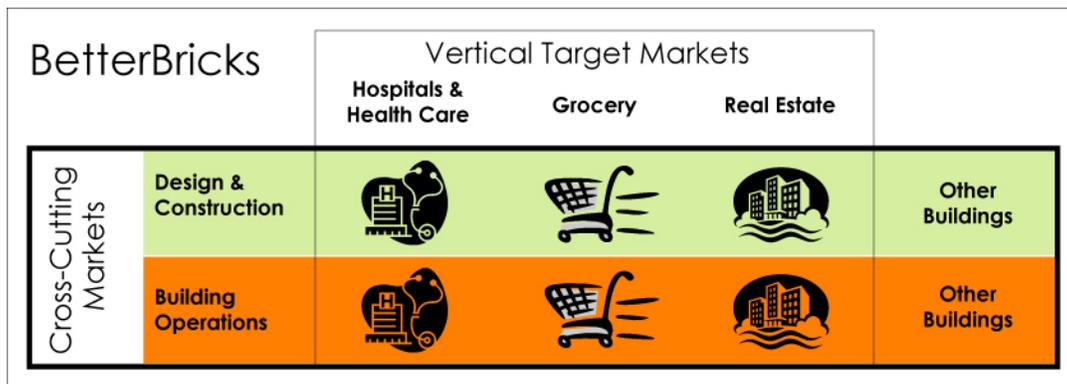
BetterBricks comprises all of NEEA’s commercial sector activities. It seeks to:

*Make energy efficiency an integral part of business decision-making. Within targeted vertical markets, change energy-related business practices to achieve energy efficiency in design and construction, and in building and facility operations. Create natural market demand for related trade ally products and services<sup>2</sup>.*

The changes in business practices will result in facilities that achieve reductions in energy-related capital and operating costs, as well as potential non-energy benefits, such as occupant comfort and productivity, and an alignment of design and construction projects with industry best practices.

BetterBricks currently addresses three “vertical” markets (hospitals and health care, groceries, and commercial real estate) and two “cross-cutting” markets (design and construction, and building operations). As shown in Figure 1, the vertical and cross-cutting markets overlap, representing the relationship between the supply (cross-cutting) and demand (vertical) sides of a given market.

**Figure 1: BetterBricks**



<sup>1</sup> See the website at [www.nwalliance.org](http://www.nwalliance.org).

<sup>2</sup> Northwest Energy Efficiency Alliance. 2006. *Commercial Sector Initiative 2006-2008 Project Description (July 5, 2005)*. Portland, Ore.: Northwest Energy Efficiency Alliance, p. 6. See: <http://www.nwalliance.org/proposals/rfps/CSIProjectDescriptionForRFP.pdf>.

The first NEEA effort in the building operations market was the Building Performance Services (BPS) pilot that was active from September 2001 through December 2005. BPS promoted energy efficiency through improved operations and maintenance practices among service providers and facility owners and operators. The pilot program focused on five core activities for implementing BPS in targeted buildings:

1. **Screening** – Identifies buildings most likely to benefit from improvements to operating performance (high priority buildings).
2. **Scoping** – Identifies and recommends opportunities for performance improvements in high priority buildings through an on-site review. Scoping is a high level analysis that identifies areas of potential benefits, but purposely does not include in-depth diagnostic testing, which is included in Energy Tune-Up.
3. **Enhanced Operations and Maintenance (EO&M) Practices** – Reviews and revises current O&M practices to make them sustainable; recommends training for in-house staff and needed adjustments to outside service contracts. Assessment of existing O&M practices is included in this activity.
4. **Energy Tune-Up** – Identifies and implements operational changes that reduce building energy costs. These strategies usually require relatively small investments, such as adjustments to or reprogramming existing building controls and equipment. Diagnostic testing is included in this activity.
5. **Commissioning** – Systematically investigates a facility's systems and equipment to fix chronic problems that tune-ups cannot adequately address. This formal process is appropriate when building owners/operators accept the amount of time, effort and expense involved.

In addition to the five core activities, BPS promoted the need to identify equipment that needs replacement because it is obsolete, no longer functional, or when changing out equipment makes strong financial sense. Although equipment replacement was not an official component of BPS, candidates for equipment replacement were referred for analysis to existing utility technical assistance and financial incentive programs.

## Initiative Description

The current Building Operations Initiative builds on NEEA's BPS experience. Relationships established during BPS with three major mechanical service providers (Siemens, McKinstry, and Control Contractors, Inc.) in the region have been maintained and have acted as a foundation for continued progress. Several projects carried over from the BPS pilot have also served to test new methods and approaches for the new effort. Following is a description of the technical aspects of the new initiative developed by the Initiative Manager:

Better Building Operating Performance will result from two types of service activities, Enhanced O&M and Building Tune-up. Better performance leads to a

reduction in operating cost through improved reliability, occupant satisfaction and reduced energy use.

Enhanced O&M are routine actions and practices, implemented by trained staff or service technicians, that improve the energy-efficient operation of building systems and sustain the performance over time. Elements of Enhanced O&M may include:

- Reporting and tracking of building energy use,
- Improving system documentation,
- Monitoring of key indicators of equipment and system performance,
- Modifying PM routines to maintain 'tuned' performance, and
- Developing staff technical expertise.

A Building Tune-up is a periodic process intended to fix problems and to identify the most cost-effective operational improvements. Implemented every 2-3 years, a tune-up typically requires a more systematic approach and the broader skill set of an engineering professional. Elements of a Building Tune-up may include:

- Systematic problem diagnosis and repair,
- Specific operational changes,
- Control optimization,
- Equipment scheduling, and
- Identification of key performance indicators.

The business case for service providers and owners to change business practices is still in development.

The initiative is focused on the service provider section of the market, specifically mechanical and controls contractors, who have a large share of the O&M market and typically hold contracts for the larger commercial buildings targeted by the initiative (>100,000 sq ft). Market research used to develop BPS found that the market did not have a clear path by which to provide *commissioning-like* services for existing buildings (Dethman and Associates, 2005, 11). There was a lack of qualified service providers, and a lack of awareness among owners and operators of the opportunities that may exist through improved operations and maintenance. This market condition is still largely true today. Consequently, the new Building Operations initiative continues its focus on service providers as a major change agent for building operations service delivery. A significant addition to the pilot initiative is the cross-cutting element where Building Operations is working with the BetterBricks vertical markets of hospitals and real estate to develop facility manager technical capability and service provider expertise through work on specific projects.

## Roles and Responsibilities

NEEA's Building Operations **Initiative Manager** is responsible for all day-to-day activities. She was hired in February 2006 and has hired technical advisors and business advisors to develop and implement the initiative.

**Technical Advisors** played a key advisory role in developing the initiative tools and materials described in Section 4. As implementers, they provide technical assistance on specific projects. These have included completing projects carried over from the BPS pilot and directly assisting in BetterBricks vertical market projects in collaboration with the Hospital Initiative's Market Specialists.

**Business Advisors** are to be responsible for coordinating the firm focus activity. They are to promote the business case for changing business practices, and provide business planning assistance to these service providers. They are also to assist the technical advisors with efforts in the vertical markets. To date, the role of the two business advisors has been developmental, providing market research and starting to develop the business case.

**Firm focus** are service providers that have made a formal agreement with the Building Operations Initiative to work together to develop their service offerings and capacity to include more building performance services and to effectively deliver these services to the market.

**Vertical Market Specialists** are responsible for promoting, gaining adoption of, and supporting implementation of SEMP's (Strategic Energy Management Plans) in the BetterBricks vertical markets. The Market Specialists' main activities are making the business case for strategic energy planning to decision makers on the supply side. The Market Specialists work closely with targeted organizations and technical advisors to articulate the value proposition for improved operations and maintenance services as part of the SEMP and use a variety of tools and materials developed by the Initiative to support their efforts. Technical advisory services may be used in such activities as assisting an organization in energy benchmarking or in developing high-efficiency design alternatives for a new building. They can also play a vital role in demonstration projects which concretely illustrate the benefits being promoted through the SEMP.

The Initiative is supported by a **Marketing** team and an **Education & Training** team. The Marketing team's activities falls into three main categories: developing the BetterBricks.com website which has a dedicated building operations page, developing materials for use by firm focus, and disseminating success stories and lessons learned throughout the building operations market to speed market transformation. The Education & Training team develops curricula and delivers them both to technical and business-related audiences within the building operations market.

**Utilities**, in addition to being the primary source of funding for the Northwest Energy Efficiency Alliance, coordinate with the initiative to promote energy efficiency through complementary initiatives.

A BetterBricks **tracking system** has been developed to collect data on both projects and organizations. The system includes progress indicators for firm focus firms. Technical and Business Advisors are supposed to input data in the system, but it is currently used infrequently and inconsistently.

## Initiative Goals

The initiative has three market transformation goals:

1. Building owners and managers value, demand and expect a high level of building operating performance.
2. Service providers recognize the business opportunity, promote better building operating performance, and offer clearly defined products and services to improve building operating performance.
3. Service providers and in-house facility staff capabilities result in a high level of building operating performance.

There are four initiative objectives for 2010 which were presented to and approved by the Board in July of 2005. These are:

1. NW service provider decision makers representing 50% of market share are aware of the business opportunity and customer benefits from improving building operating performance.
2. Service providers representing a significant percentage of the building operations market adopt business approaches that promote building operating performance.
  - a. 40% of healthcare market share
  - b. 20% of targeted office real estate market share
3. A significant percentage of service providers have staff capability to tune building energy systems and provide enhanced O&M services.
  - a. 40% of healthcare market share
  - b. 20% of targeted office real estate market share
4. A significant percentage of in-house facility staff is capable of providing or obtaining building energy system tune-ups and enhanced O&M services.
  - a. 40% within hospitals and healthcare
  - b. 20% within targeted office real estate

While these objectives were approved by the Board, NEEA staff noted that clear definitions for key terminology like “business approaches” and “building operating performance” have not been developed.

## Initiative Theory

The Building Operation Initiative's official market transformation hypothesis, approved by the Board in July of 2005, is the following:

*The approach is to simultaneously encourage demand for improved building operating performance while building service provider capabilities to supply appropriate services. A service infrastructure can be encouraged by clearly defining and differentiating service offerings with viable market value. Service providers responsible for building operations (i.e., mechanical service contractors, building control system companies, equipment manufacturers and commissioning agents) must be made aware of the business opportunity and encouraged to evolve their business practices and develop enhanced service capabilities. Capability can be built by developing support tools and technical skills, and by working with service providers and facility staff.*

The Initiative Manager and the key advisor are still confident in this market transformation hypothesis based on the program activity to date.

The initiative theory is presented in graphic format in Figure 2. TecMarket Works collaborated with NEEA staff in early 2006 to develop this Building Operations activities flow model to accurately reflect the initiative's activities as carried out by the Technical and Business Advisors to ultimately achieve the initiative's goals and objectives.

The beginning of program intervention in 2006 is symbolized by the horizontal line in the upper half of Figure 2. Above that line, organizations implement projects and receive technical assistance on a project-specific basis. Projects that were started under the BPS pilot but have been completed with the help of the Building Operations Initiative are represented in the box above the Technical Advisors. Above the line also indicates where the initial relationships with the firm focus firms started during BPS but have evolved into signed participation agreements since the initiative has started. This pre-program activity is represented in the box immediately above the Business Advisors.

The beginning of this initiative's effort is characterized by the introduction of Technical Advisors to assist with service provider projects, and the Business Advisors' work with the firm focus firms. Both technical and business advisors contribute to education and training tools and materials that can reach the wider building operations market or be used in supporting efforts in the firm focus or vertical market activities. Contributions to these materials are represented by the box below and between the Technical and Business Advisors.

Technical advisors' responsibilities are to provide technical support to firm focus firms and support the vertical market specialists, vertical market clients and service providers outside of the firm focus relationships (i.e. service providers that are already working with the vertical target partners). As they are assigned to these projects (by the initiative manager), technical advisors provide technical building performance expertise and support education and training to operations staff and service providers. Their activities

in these projects have the dual purpose of creating greater awareness among target market clients as to the value of quality building performance services and building capacity of existing service providers to meet those needs. These activities are presented in the left hand column under Technical Advisors.

Business advisors support the initiative's goals by identifying market opportunities and developing relationships with the firm focus. They are the ones that are to make the business case to the firm focus by identifying the opportunities for and benefits of offering more comprehensive operations and maintenance services in the market. Within the partnership, business advisors are to work with these firms to develop strategies to develop and successfully offer these operation and maintenance services to the market. These activities are presented in the right hand column under Business Advisors.

The firm focus effort is intended as a short-term market stimulation strategy, not a long-term market building strategy. However, considering the time that it takes to bring about a change of this magnitude, a true paradigm shift, these relationships may need to continue for a long time, even when the firms are motivated and willing to make the changes recommended by the Initiative. How effectively the firm focus firms can demonstrate successful integration of these services into their business is also a determining factor of how useful they will be in promoting the recommended practices to the wider market.

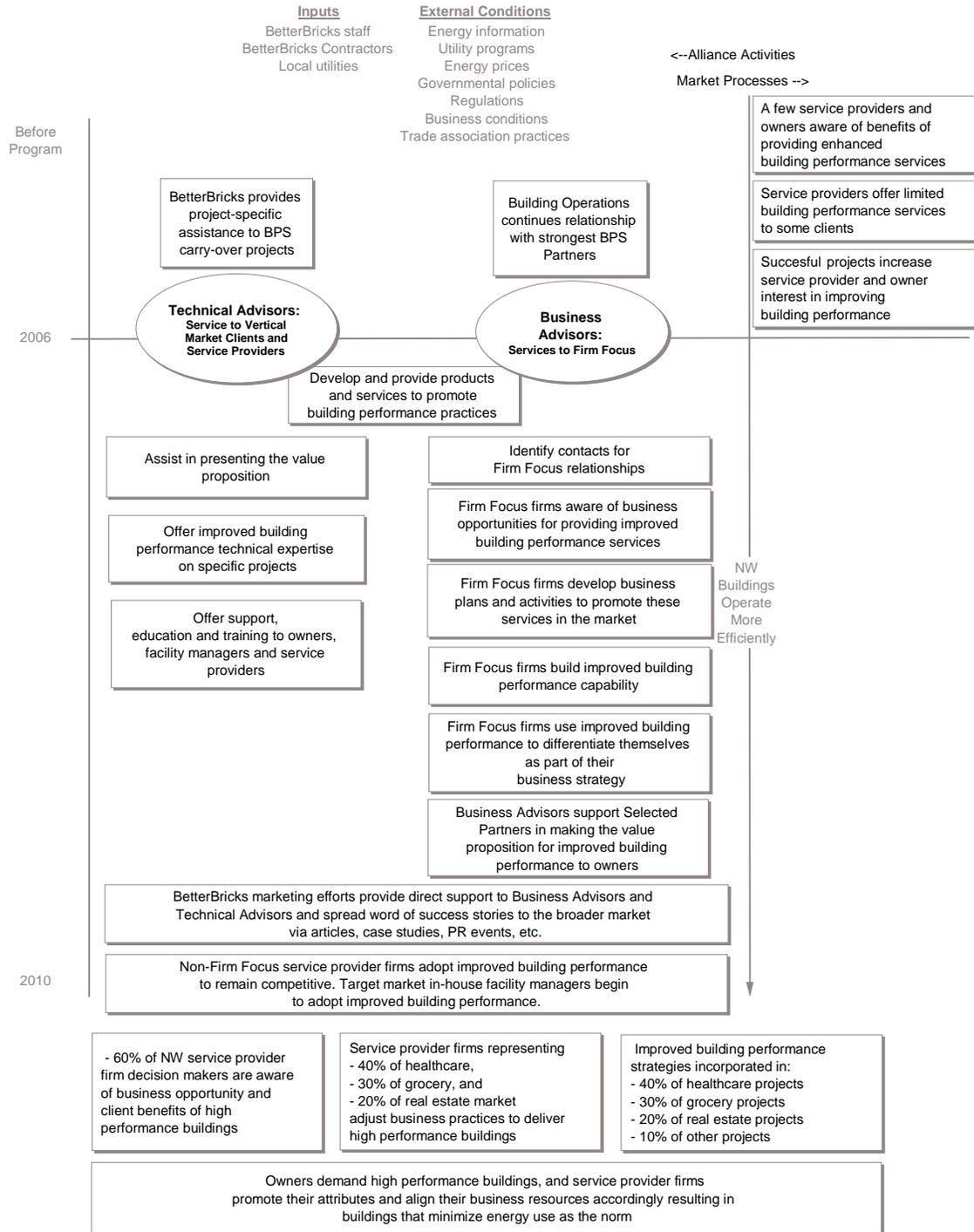
Through both vertical market and firm focus efforts the Initiative's focus is on building individual relationships. Success on these two fronts is intended to provide demonstrations and case studies of successful applications of the initiative's preferred approach to the sale and provision of enhanced operations and maintenance services that will lead to energy savings. BetterBricks marketing efforts will work to disseminate this information in the market for greatest impact; this is represented by the wide box toward the bottom of the figure with the text beginning, "BetterBricks marketing efforts...".

Active promotion of the successes of firm focus firms, owners and managers (vertical markets), and other service providers is intended to encourage wider application and capacity to deliver services via these preferred approaches and including the recommended program elements. This market adoption follows from the marketing efforts described above, and is highlighted in the next wide box down.

The last two rows in the model show the expected outcomes in terms of specific market transformation goals and the overall intent of the initiative to result in a demand for high performing buildings and a market able to effectively meet that demand.

While Figure 2 adequately presents the theory of the initiative, it became clear during TecMarket Works' research for this MPER that it would be improved by the addition of the specific market barriers faced by the initiative and the specific methods and approaches that are being used to address those barriers. The initiative team should expand the model to convey market barrier knowledge and describe key activities that will be undertaken to reduce the influence of those barriers.

**Figure 2. NEEA Building Operations Initiative Activities Flow**



## **Market Progress Indicators**

TecMarket Works, working in coordination with initiative staff, developed a set of market progress indicators to measure progress toward market transformation goals. These metrics were used to develop the baseline evaluation of the service provider market. In order to effectively use these metrics the initiative team still needs to specify definitions for terms used in the indicators: benefits, best practice standards, specific staff skills, or the “right reasons” for promoting the initiative. Developing these definitions is critical to understanding how the Initiative may transform the market and will allow for more clarity in assessing Initiative accomplishments.

It is premature to assess progress on these market progress indicators, but the results of the baseline survey, included in this report, provide preliminary information about the market status with respect to these indicators. Further measurement of progress will be done in the subsequent MPER.

**Table 1. Market Progress Indicators<sup>3</sup>**

Objective for 2010	Market Progress Indicators
1. Northwest service provider decision makers representing 50% of market share are aware of the business opportunity and customer benefits from improving building operating performance.	<ul style="list-style-type: none"> <li>a. Majority of service providers can identify specific benefits<sup>a</sup> of “enhanced”<sup>b</sup> O&amp;M and building tune-up to <u>customers</u>.</li> <li>b. Majority of service providers can identify specific benefits<sup>a</sup> of “enhanced” O&amp;M and building tune-up to their <u>business</u>.</li> </ul>
2. Service providers representing a significant percentage of the building operations market adopt business approaches that promote building operating performance. [40% hospitals; 20% targeted office real estate market share]	<ul style="list-style-type: none"> <li>a. Service providers differentiate themselves in the market by selling “enhanced” building operations and building tune-up services and including these in their marketing materials.</li> <li>b. Service providers identify changes in business practices to provide “enhanced” O&amp;M and building tune-up services per Alliance involvement.</li> <li>c. Practices of service providers meet many best practice standards<sup>c</sup></li> </ul>
3. A significant percentage of service providers have staff capability to tune building energy systems and provide enhanced O&M services. [40% hospitals; 20% targeted office real estate market share]	<ul style="list-style-type: none"> <li>a. Service providers identify staff or business partners with specific skills<sup>d</sup> to provide “enhanced” O&amp;M and building tune-up services.</li> </ul>
4. A significant percentage of in-house facility staff is capable of providing or obtaining <sup>e</sup> building energy system tune-ups and enhanced O&M services. [40% hospitals; 20% targeted office real estate market share]	<ul style="list-style-type: none"> <li>a. Facility managers identify staff with specific skills<sup>d</sup> to provide “enhanced” O&amp;M and building tune-up services or can articulate the specific services they want included when they seek out service providers.</li> </ul>

<sup>a</sup> Specific benefits expected will be developed with initiative staff.

<sup>b</sup> See page 6 for definitions of enhanced O&M and building tune-up.

<sup>c</sup> Best practice standards will be defined by initiative staff

<sup>d</sup> Specific staff skills expected will be developed by initiative staff.

<sup>e</sup> Building operators and facility staff need to be looking for the “right” set of services for the “right reasons” as defined by the initiative staff.

<sup>3</sup> Detailed indicators or revisions to these indicators will be developed in conjunction and coordination with Alliance staff and the evaluation team.

## 2. Evaluation Methodology

Evaluation of the Building Operations Initiative employs a multi-faceted approach, with a large dependence on interviews with key initiative players. The main goal is to assess market progress per the indicators outlined earlier in the report. Activity indicators for 2006, used to track initiative activities rather than market changes, were also developed. For this first MPER, assessment of progress on these activity indicators is an important measure of success because it is much too early in the Initiative's development to expect to see market level changes. Another major focus of this first MPER is establishing a baseline to measure the initiative's impact on the market.

The tasks covered in this first MPER, as well as those for the two planned MPERs, are displayed in Table 2, Table 3 and Table 4 which show the specific activities that will be conducted and the data sources that will be used for each MPER.

**Table 2. BetterBricks Building Operations Initiative Evaluation Tasks**

<b>Component</b>	<b>MPER #1</b>	<b>MPER #2</b>	<b>MPER #3</b>
	Q107	Q108	Q109
Market Characterization	X	X	X
Assess Logic Model	X	X	X
Assess Market Progress	X	X	
Assess Progress Towards Goals		X	X
Process Evaluation	X	X	X
Estimate/Validate Savings Impact		X	X
ACE Model Review		X	X

**Table 3. Building Operations Initiative Evaluation Activities and Contacts**

Activities	Data Sources	MPER #1	MPER #2	MPER #3
		Q107	Q108	Q1 '09
Literature review	Industry journals	X	X	X
Interviews	Initiative Staff	X	X	X
	Service Providers	X	X	X
	Firm focus firms' staff		X	X
	Business Advisors		X	X
	Technical Advisors	X	X	X
	Utilities		X	X
	BetterBricks E&T Manager	X	X	X
	E&T Presenters		X	X
	E&T Participants		X	X
	E&T Developers	X	X	
	BetterBricks Marketing Manager	X	X	X
	Marketing contractor		X	X
	P&S developers		X	
	Targeted audiences/product users		X	X
Document review	NEEA initiative documents	X	X	X
	Proposals for services, policies/procedures	X	X	X
	Session evaluation forms		X	X
	Tools and materials		X	X
	Marketing products		X	X
	Logic models	X	X	X
Theory review	All progress indicators	X	X	X
Baseline Surveys	Facility managers		X	
	Facility directors		X	
	Service Providers	X	X	
Database review	Tracking System, project documents		X	X

The data analysis methods used in this study include analyzing in-depth interviews of market conditions with key service providers and of initiative activities with the initiative manager and contractors. The information collected during the interviews is reviewed to ensure:

- The Initiative is operating in a manner consistent with its current theory,
- The efforts outlined in the initiative's work plan are being conducted,
- Progress is made with respect to the initiative's activity indicators, short-term objectives and long-term market transformation goals.

**Table 4. Matrix of Progress Indicators vs. Data Sources<sup>4</sup>**

<b>Market Progress Indicators</b>	<b>Interviews with Alliance Staff and Contractors</b>	<b>Interviews with Technical Advisors</b>	<b>Interviews with Firm Focus Firms</b>	<b>Interviews with Facility Staff</b>	<b>Market Survey</b>	<b>SP Marketing Materials</b>
Majority of service providers can identify specific benefits of “enhanced” O&M and building tune-up to <u>customers</u> .	X		X		X	
Majority of service providers can identify specific benefits of “enhanced” O&M and building tune-up to their <u>business</u> .	X		X		X	
Service providers differentiate themselves in the market by selling “enhanced” building operations and building tune-up services and including these in their marketing materials.	X		X		X	X
Service providers change business practices to provide “enhanced” O&M and building tune-up services.	X		X		X	X
Practices of service providers meet many best practice standards.	X	X	X		X	
Service providers identify staff with specific skills to provide “enhanced” O&M and building tune-up services	X	X	X		X	
Facility managers identify staff with specific skills to provide “enhanced” O&M and building tune-up services or seek out those services.	X	X		X	X	
<b>Other Evaluation Objectives</b>						
Process Evaluation	X	X	X	X	X	
Energy Savings Impact			X	X	X	

<sup>4</sup> Footnotes from Table 1 also apply to this table.

### 3. Market Characterization

This section of the report provides an overview of the size of the market targeted by the initiative and industry trends and concerns that may or may not be directly related to energy or energy efficiency but could have an influence on the initiative's progress. The sources of the material reviewed for this section are shown in Appendix A.

#### Market Profile

Demand for O&M services is partially a function of the size, scale and use of the building stock. The commercial building stock in the Pacific Northwest was estimated to be approximately 2.4 billion square feet in 2001 (Kema-Xenergy, 2004, 3-2). Extrapolating the historic growth rate from 1987 to 2001 of 2% per year (and applying a demolition rate of 0.44 percent per year), floor space in 2006 may be around 2.6 billion square feet. The Initiative's focus is primarily on larger buildings (>100,000 sq. ft.). In 2001 these buildings made up about 25 percent of the commercial building stock. Office and Retail account for over one-third of the commercial floor space.

Market research conducted for NEEA's Building Operator Certification program evaluation estimated the total number of facilities with building operators at more than 5,000 for the four state region, and over 90,000 building operators. The average number of in-house operators reported by building supervisors was 17 per building (Peters, 2001). Quantum (2005) estimated an average of 7 FTE per facility, which would mean roughly 35,000 building operators in the region. These studies used different samples and survey instruments which likely accounts for the large discrepancy.

Commercial building owners and operators in the PNW outsource most of the operation and maintenance services for their building systems. About 80 percent of large buildings contract with service providers for O&M services. Responsibilities for O&M for equipment and controls are typically split in the large facility PNW market among in-house personnel and service providers. Office and retail facilities are more likely to outsource all O&M services. The contracted services are typically comprehensive but concentrate on HVAC/controls followed by water heating equipment, lighting, and refrigeration (Quantum, 2005 p 4-19)

Market research conducted by Quantum (2005) found through interviews with facility owners and property managers that the "overwhelming majority" of the O&M service providers are mechanical contractors. Interviewees in the Quantum study identified over 100 separate providers in the Pacific Northwest, and 60 percent of them were only mentioned once leading the researchers to conclude that no single contractor appears to control more than a 6 percent share of the overall O&M market in the Pacific Northwest. However, market share is more concentrated when considering specific markets such as hospitals and commercial real estate markets or when looking at markets in specific urban areas (Vanderford, 2006 and Blakey, 2006).

Total revenue for mechanical contractors for 2005 from the top 22 firms was \$669 million including design and construction activities<sup>5</sup>. There are two firms that accumulated roughly 44 percent of the mechanical contracting market revenue for 2005 in the states of Washington, Oregon and Alaska. These were McKinstry Co. of Seattle and JH Kelly, LLC of Longview, WA (Northwest Construction, 2006). A market study prepared for NEEA that was specific to the Puget Sound market identified many of the same market players, noting that McDonald Miller and McKinstry each hold a third of the Seattle O&M service market respectively (Blakey, 2006).

In Oregon JH Kelly, LLC, Kinetic Systems, Inc., Emcor Group, Inc and Streimer Sheet Metal Works, Inc. were the top four firms providing mechanical contracting services, and made up roughly 62 percent of the market revenue for 2005. (Northwest Construction, 2006)

Based on internal market studies prepared for NEEA, the initiative has identified about 68 percent of Washington's mechanical contractor market (based on 2005 revenue reported in Northwest Construction, 2006) and roughly 61 percent of the Oregon market. Markets in Montana and Idaho are likely smaller players compared to these two major metropolitan states. According to market research of O&M service providers in the Pacific Northwest, roughly 48 percent of service provider revenue is drawn from O&M services and the remainder comes from equipment sales and related labor (Quantum, 2005).

The major controls contractors in the region have also been identified in this market research. They include Johnson Controls, Siemens, Control Contractors, Inc., Clima-Tech, Alerton, Trane, and Carrier. Johnson Controls and Siemens are national corporations, and the primary leaders in the control industry nationwide with branch offices in the Pacific Northwest. These two firms in addition to ATS Automation and Control Contractors Inc. are the major suppliers of building automation and controls in the Puget Sound Market (Blakey, 2006). They also hold the majority of the market for controls O&M services for the Portland market. (Vanderford, 2006)

## Industry Trends Concerns

To identify industry trends and concerns the evaluators looked at a variety of professional organization publications, conferences, existing NEEA market research, and other related materials. We also asked about industry trends in our interviews with service providers, NEEA Staff and their advisors.

### Demand Side

Market and industry trends and concerns for facility managers that extend beyond energy savings are well summarized in findings of the Forecasting Report (2005) developed by IFMA (International Facility Management Association). These include:

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<sup>5</sup> Revenue specific to operations and maintenance services offered by mechanical or controls contractors was not available. For many of these companies, design and construction services make up the majority of their revenue. There are many companies, however, that focus on operations and maintenance services that would not show up in the Northwest Construction data.

1. Consolidation of mature American industries such as financial services, and telecommunications where square footage is likely to decline and efforts to squeeze efficiencies will be made in every aspect of operations including the facility side.
2. Pharmaceutical, biotechnology and healthcare will see growth in both square footage and in the complexity of tasks demanded on the part of facility managers working in those fields.
3. Commercial real estate market is shortening lease cycles as business demands ways to respond more quickly to changes in business conditions (upsizing and downsizing quickly).
4. Security and terrorism.
5. Intelligent buildings and building automation systems are becoming increasingly important due to the upward trend in petroleum prices.
6. The sustainability and green movement (LEED, corporate, state, utility energy efficiency initiatives)
7. Organizational and workplace trends that support employees work behaviors to improve productivity and satisfaction
8. Outsourcing where the facility management unit is only a contractor managing multiple vendors and partners.

More specific concerns were highlighted in the IFMA Facilities Industry Study (2004). This was a survey of 3,140 members from the six leading facility management associations. The top five challenges facing facilities managers were: balancing the facilities budget, deferred funding/maintenance backlog, meeting tenant/customer expectations, lack of time to complete work, and being understaffed. The top five items cited as highest priority on their agenda today were: aging buildings and/or building equipment, acquiring and maintaining quality staff, diminishing budgets, energy management, and growth/expansion. Among the “issues of tomorrow” they cited: outsourcing, changing demographics of the workforce, increased globalization, mergers/acquisitions and their effect on facilities, and labor shortages. The top five skill sets they identified were: customer service, operations and maintenance, communications, project management and general management. (IFMA Facilities Industry Study, 2004)

The Building Owners and Managers Association (BOMA) held its Commercial Real Estate Congress in 2006. Sessions at this conference reflected the importance of energy efficiency in improving building operations. They had three sessions that were specifically geared toward energy improvements (through operations and maintenance) and also guidelines for participating in the LEED initiative for existing buildings. BOMA also offered a special session on hospital real estate highlighting the increased importance of this market for the industry. (BOMA, 2006)

### **Supply Side**

Some specific trends on the supply of O&M services were identified in existing market research prepared for NEEA. First, O&M service providers reported that their contracts typically call for energy savings O&M improvements 65 percent of the time (compared

to 40 percent reported by owners and decision makers). Much of the service provider market already believes that they are implementing enhanced O&M services. Roughly 48 percent of their revenue is drawn from O&M services with the remainder coming from equipment sales and related labor. (Quantum, 2005, 4-20) Many of the service providers interviewed for the baseline presented in this study suggested a smaller portion of revenues being generated from equipment sales, and the majority of their sales being related to the services they provide.

Service providers interviewed in this baseline study also identified some challenging market trends like finding qualified staff to meet the mechanical and technical needs of the industry. Trends in sustainability, energy efficiency, and energy costs are affecting demands from customers. Customers may be interested in LEED-EB (Existing Buildings) building certification but may not fully understand what that will entail from an on-going maintenance perspective. The economy is in a healthy position right now and customers are ready to invest in their buildings, which can increase demand for long-neglected operations and maintenance services.

Other trends in the service provider industry were identified through the activities of their representative trade organizations. In March 2006, ASHRAE, one of the largest and most influential trade organizations for building engineers, adopted a new Strategic Plan that represents a significant shift in its direction. Specific strategies in various parts of the plan are especially relevant to the Building Operations Initiative and mesh well with the initiative's direction. These include:

1. Provide training, guidance and tools for building operators
2. Conduct research and develop guidance to enhance the effectiveness of maintenance procedures.
3. Partner with organizations that have expertise in the development and delivery of education and certification initiatives;
4. Develop and promote certification initiatives for the HVAC&R industry and
5. Create educational initiatives that can be offered by ASHRAE chapters.

In August 2006, ASHRAE also updated its standard on energy conservation in existing buildings, designed to help owners maximize efficiency by improving operation, maintenance and energy monitoring [ANSI/ASHRAE/IESNA Standard 100-2006, Energy Conservation in Existing Buildings].

## 4. Initiative Activities

This section of the report reviews the current status of the initiative elements based on interviews with NEEA staff and advisors.

### Core Activities

#### Service Provider Firm Focus Firms

The firm focus effort of the initiative is intended to bring influential O&M service providers into a formal relationship with the initiative in order to develop and enhance their current service offerings with the help of the initiative's technical advisors. There are also opportunities for firms to be connected with projects in the BetterBricks vertical markets through this relationship.

Building Operations is currently engaged with the Portland and/or Seattle offices of three major mechanical or control contractors. (Expansion plans for Idaho and Montana are not a priority until early 2007.) As of January 2007, two have signed agreements to participate as firm focus firms and one has verbally committed to sign an agreement. Since relationships have just begun, no evaluation was conducted on the impacts of the firm focus relationships. This will be done for future MPEs.

These firms all participated in the earlier Building Performance Services (BPS) pilot and have independently pursued building performance service development within their firms since the conclusion of the BPS pilot. Their willingness to continue work with BetterBricks in this area indicates that they have recognized the value in further developing their O&M service offerings. BetterBricks staff note this as a major accomplishment to date.

Two of the firm focus are in the process of developing specific building operations-oriented service offerings with the assistance of the initiative. One is planning to develop a training service offering that includes a mentoring relationship with a facility manager and an O&M expert on the facility manager's staff. The other is rolling out a pilot service offering specifically designed to address building performance in the Portland area. They purposefully chose to launch the pilot in Portland to build on synergies created in the market by NEEA's building operations activities.

The two business advisors contracted by the initiative were not significantly involved in building the relationships with the firm focus but will soon be in charge of those relationships. To date, business advisors have contributed to the effort mainly in the form of market research and by identifying prospective candidates for future firm focus relationships. One of the business advisors is currently working on the business case for service providers, and both will work with the firm focus in developing activity plans and implementing these plans to expand and enhance their building performance service offerings.

## Technical Advisors

The BetterBricks Building Operations Initiative currently has contracts for technical advisory services in place with four companies. Identifying and contracting with these advisors was one of the major activities of the initiative manager during 2006. One of the technical Advisors' primary responsibilities is to support vertical market activities. Almost all the work they have done to date has been within the BetterBricks Hospitals vertical market.

Activity in the hospitals market has been encouraging. Working in collaboration with the Hospital Market Specialists and facility personnel, seven building assessment walk-throughs had been completed as of September 2006. They have all resulted in proposals to conduct follow-on work, though this work has not started. One hospital was so pleased with the work that they requested the services for another facility, independent of initiative funding.

Another very large medical services company, targeted by the vertical market initiative, agreed to identify "internal systems champions" (people responsible for the successful operations of specific internal systems) within their facility. The "systems champions" strategy is being pursued by the Building Operations Initiative to encourage overall facility performance through personal accountability for specific systems. A Portland-area hospital is building a strategic energy management plan that emphasizes building operations. This resulted from good coordination between the hospital market specialists and the building operation technical advisors in presenting important building operations components to vertical market target clients.

The Initiative Manager and the Technical Advisors noted that it has been difficult to engage existing service providers in the hospital assessment process and that there is a lack of clarity in their roles and responsibilities relative to those of the BetterBricks vertical market contractors. These two challenges, as described by the initiative staff, are presented in Section 6.

## Support Activities

### Tools and Materials Development

The work plan for the Building Operations Initiative identified three key tools or materials which are integrated into all aspects of the delivery strategy. The status of each of these was reviewed with NEEA Staff and advisors.

#### 1. Business case for service providers

Describes the opportunities for selling enhanced O&M services in the market. This element is still in development. It is a major component of the Toolkit (see below) and the first Education & Training Module.

## 2. Toolkit

This is the primary resource for service providers and facility managers and major resources are being devoted to its development. A paper toolkit was developed for the BPS pilot but the evaluation found that it did not provide an easily usable framework for implementing BPS and it received limited use despite compliments about it being a great resource. The new toolkit addresses both the service provider and the facility manager /owner operator perspectives. It will be web-based and will address the issues noted in the evaluation such as providing shorter explanations of the initiative's technical approach, explaining the value-proposition to facility managers / owners operators and providing marketing documents that effectively present the business case to service providers. The initiative contractors are working on how to best present this material through the website.

## 3. Other product and service development

The Initiative Manager has a strong interest in promoting the use of a “dashboard”, a software program which would allow facility managers to quickly track their energy use and flag possible trouble areas. “Energy Expert”, developed by Northwrite, has been selected as a potential product. They are currently looking for a project where they can test it. If it works as envisioned, the initiative will help market it.

There were also plans to promote a remote diagnostics tool but these have been put aside for the time being, because feedback from service providers indicated that the software packages that are available in the market are not suitable for service providers.

One of the firm focus firms is developing a specific service offering that would include a series of internal training courses, and a mentoring initiative between facility managers and the service provider. If successful, this may be a product or service that could be replicated by other service providers.

## Education and Training

Three training topics are the current focus:

1. *Developing Opportunities in the Building Operations Market*. Targeted to service providers, the core objectives are to present the business case and technical opportunities and to develop the value proposition for customers and service providers.
2. *Operations-Based Energy Efficiency Services*. Targeted to technical advisors, service providers, and utility staff this will present the specific products and services that can be used to improve a building's operating performance.
3. *Operations-based Energy Efficiency Services – Services Proposal Development*. Targeted to technical advisors, service providers and utilities this will review proposal development for operations based energy efficiency scoping activities.

The modules were to be completed by the end of 2006 but the schedule has slipped significantly. As of January 2007, the first one is in draft form but the others are still in development.

Development of internal training and education efforts for firm focus firms are anticipated and will be based in part on specific requests from the firms.

## **Marketing**

Marketing activities for the Building Operations Initiative have been limited, reflecting both its early stage of development and the fact that building operations had no earlier marketing efforts under the BetterBricks brand. Building Performance Services, the initiative's precursor, operated outside BetterBricks and had no marketing activities.

With respect to firm focus, the marketing staff is aware of the firms that have been selected and internal discussions have been held about what marketing could potentially do but no actions have been taken. Building operators and managers have been included in the past two BetterBricks Awards presented annually by the BetterBricks marketing team. Tellingly, there was difficulty last year in identifying qualified nominees, indicating a lack of innovation in the building operations market. The Building Operations presence on the BetterBricks website is being expanded (largely through development of the Toolkit) and is envisioned as a key resource for service providers and facility managers in the vertical markets and firm focus.

Though identified in the work plan, no articles have been placed, publications identified, nor have materials been developed to include in articles. Case studies to feed this type of PR have been identified but not developed yet. Again, this is largely a reflection of the initiative's stage of development.

## **Utility Coordination**

The initiative has had regular meetings with funding utilities and the Energy Trust of Oregon, but no concrete coordination of the Building Operations Initiative and utility incentive programs has emerged.

## **5. Assessment of Accomplishments**

### **Progress on 2006 Activity Indicators**

Given the early stage of the initiative, measurement of progress based on the recently developed market progress indicators is not possible. In the absence of market-level indicators, we reviewed activity indicators that were developed by the BetterBricks senior manager and approved by the Board in 2005. Table 5 presents the initiative objectives, associated activity indicators and a description of progress as of January 2007.

**Table 5. Building Operations Progress on 2006 Activity Indicators as of January 2007**

2010 Objectives	2006 Activity Indicators	Status MPER 1
<p>NW service provider decision makers representing 50% of market share are aware of the business opportunity and customer benefits from improving building operating performance.</p>	<ul style="list-style-type: none"> <li>• Develop and begin to deploy marketing collateral, ads, events and public relations targeting service provider decision-makers.</li> <li>• Business and technical advisors are adept in messaging and communicating the value of building operating performance to service provider decision-makers.</li> </ul>	<ul style="list-style-type: none"> <li>• Marketing materials are being developed; none have been deployed. Service providers were included in the annual BetterBricks Awards.</li> <li>• No official messaging and communications platform has been developed. Business and technical advisors promote building operating performance but it is not clear that this is done in a consistent manner.</li> </ul>
<p>Service providers representing a significant percentage of the building operations market adopt business approaches that promote building operating performance.</p> <ul style="list-style-type: none"> <li>• 40% of healthcare market share</li> <li>• 20% of targeted office real estate market share</li> </ul>	<ul style="list-style-type: none"> <li>• A complete range of building operating performance expertise is available through the advisor network.</li> <li>• A formal business relationship with 4-5 high priority service providers has been established through Firm focus.</li> <li>• Advisory capability is demonstrated through:                             <ul style="list-style-type: none"> <li>○ business planning assistance</li> <li>○ professional development activities</li> <li>○ project technical advisory support.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• There have been difficulties recruiting technical advisors as market demand for them is high. Greatest current expertise lies in commissioning and system operations which are not focuses of the initiative. More expertise in O&amp;M planning would be valuable.</li> <li>• Two contracts are signed, one is pending formalization.</li> <li>• Advisory capability:                             <ul style="list-style-type: none"> <li>○ A second business advisor was hired at the end of 2006. He has just begun providing assistance.</li> <li>○ Minimal professional development activities have taken place. Technical advisors have provided some advice working with firm focus firms.</li> <li>○ Technical advisors worked on approximately 10 projects in 2006.</li> </ul> </li> </ul>

2010 Objectives	2006 Activity Indicators	Status MPER 1
<p>A significant percentage of service providers have staff capability to tune building energy systems and provide enhanced O&amp;M services.</p> <ul style="list-style-type: none"> <li>• 40% of healthcare market share</li> <li>• 20% of targeted office real estate market share</li> </ul>	<ul style="list-style-type: none"> <li>• Identify, develop and begin to implement building operating performance education &amp; training curriculum.</li> <li>• Provide building operating performance technical assistance with service providers on 10 projects region-wide (half or more within vertical markets).</li> <li>• Document project outcomes in terms of energy performance and costs.</li> </ul>	<ul style="list-style-type: none"> <li>• Topics have been identified and curriculum development is underway. Nothing has been implemented.</li> <li>• Technical advisors have provided technical assistance with service providers actively engaged in 3 of the 10 projects. In the other projects they were present at one or more stages but did not actively participate at the level hoped for by the technical advisors.</li> <li>• There is no formal or consistent documentation of project outcomes. Three projects identified as case studies will be formally documented in terms of energy performance and cost. Most of this information is included in the proposals for follow-on work, but most projects have not passed beyond the proposal stage.</li> </ul>
<p>A significant percentage of in-house facility staff is capable of providing or obtaining building energy system tune-ups and enhanced O&amp;M services.</p> <ul style="list-style-type: none"> <li>• 40% within hospitals and healthcare</li> <li>• 20% within targeted office real estate</li> </ul>	<ul style="list-style-type: none"> <li>• Identify, develop and begin to implement building operating performance education &amp; training curriculum.</li> <li>• Provide building operating performance assistance to in-house facility staff on 10 projects region-wide (half or more within vertical markets).</li> <li>• Document project outcomes in terms of energy performance and costs.</li> </ul>	<ul style="list-style-type: none"> <li>• Topics have been identified and curriculum development is underway. Nothing has been implemented.</li> <li>• Diagnostic walk-throughs have been completed in 10 hospitals.</li> <li>• There is no formal documentation of project outcomes. Three projects identified as case studies will be formally documented in terms of energy performance and cost. Most of this information is included in the proposals for follow-on work, and most projects have not passed beyond the proposal stage.</li> </ul>

## 6. Service Provider Baseline

### Methodology

We interviewed twenty-one of the largest mechanical contractor and control contractor service providers in the Portland (9), Seattle (9), and Boise (3) metropolitan areas in order to understand existing building and business practices. The same service providers will be interviewed from one year to the next to measure changes in activities related to the initiative or other market influences. Additional sample will be drawn from the eastern states of Montana and Idaho as necessary when initiative activities are finalized for those areas. This is not expected until late 2007.

The sample is not statistically representative of the service provider or facility manager population, but the sample was selected to represent many of the largest service provider companies<sup>6</sup> in the region to reflect the initiative strategy of targeting the largest service providers to affect market change. Firms with the largest market share in their respective states were identified based on estimates from internal market research (Vanderford, 2006; Blakey, 2006) and cross-referenced against general market data on firm revenue from Northwest Construction (2006). The evaluation team consulted with the program manager and advisors to ensure the sample was reflective of their target market. A total of 29 service providers were contacted to participate, and data was collected from 21 firms. The response rate is presented in Table 6.

**Table 6. Response Rate by Metro Area**

Metro Area	Interviews	
	Conducted	Response Rate
Portland	9	64% (14 contacted)
Seattle	9	81% (11 contacted)
Boise	3	75% ( 4 contacted)

The service providers interviewed represent over \$63 million dollars in service and maintenance revenues (with only 2/3 providing specific information) and over 3,600 commercial customers in the Pacific Northwest in FY2006. The total size of the service and maintenance market is unknown, but the total mechanical contracting revenue for the states of Oregon and Washington, which includes new construction, were estimated to be about \$943 million in FY2006 (Northwest Construction, 2006).

Evaluators met for a one-hour interview with staff familiar with the products and services offered in the market, and their firm's approach and rationale for the market. In most cases this was a group of management-level individuals, in a few cases it was the owner of the firm. The interview focused on three major topic areas:

1. What maintenance and operations services they provide,
2. How they provide and present those services to their customers, and

<sup>6</sup> Providers of mechanical contracting services and controls contracting services.

3. What benefits they have identified to the service provider and their customers in providing comprehensive maintenance services.

The interview instrument was developed in collaboration with BetterBricks staff to reflect the initiative's objectives and intent. A copy of the interview instrument is provided in Appendix B. Results of the interviews are presented in the following pages.

### Existing Services

Service providers were asked to describe their existing services starting with their most basic services to determine how existing services match with the initiative ideal. Specific services that are included in their basic service packages are presented in Table 7. All companies offer various tiers of service to their customers, which are predominantly driven by customer demand and the specific building application. Firms typically present services with the use of "line cards", which explain the specific services they provide. Then they work with their customers to reach an agreement on the mix of services that are needed. Firms characterized their most basic services as belt and filter changes on a quarterly or semi-annual basis, along with a visual inspection and documentation, but none of the interviewees recommend this minimal level of service to their customers, emphasizing that this level of service does not result in adequately performing equipment.

**Table 7. Specific elements included in the basic service package (N=17\*)**

Do "basic" services include:	'Yes'	Comments
Service-on-failure agreements?	1	Usually in comprehensive or full coverage agreements. They are charged on a "time and materials" basis.
Visual inspections of equipment to confirm operation?	17	All providers are doing this in the initial stages of the review.
Providing initial equipment tune-ups to get it operating at maximum efficiency?	4	Part of the initial assessment and likely part of a more comprehensive agreement, not basic service.
Written equipment operations assessments?	10	This would be part of the initial review of the equipment, but is based on customer demand.
Equipment replacement?	7	Equipment replacement is part of the discussion with customers, but actual replacement is handled outside of the basic maintenance agreement. Recommendations are based on ASHRAE standards

\*Four service providers identified their services as completely customized and did not answer this question.

The mechanical and controls service and maintenance industry is more strongly driven by customer demand than by sales or presentation approaches. The needs of the customer are determined by their available budget for maintenance, their commitment to the building, their understanding of the value of preventative maintenance and their tolerance for equipment failure risk. Customers that purchase higher tiers of service are looking for fixed maintenance costs for budget planning and reducing their risk of costly replacements and downtime. They are also willing to invest in the maintenance services that add value to the building. These customers are aware of the value of preventative, proactive maintenance services for these reasons and others, and are looking to optimize their buildings' operations for the benefit of their bottom line. Customers who are purchasing the lower tiers of services typically have a small budget for maintenance services and see little value in proactive maintenance of their systems for a variety of

reasons (sometimes they are not responsible for equipment replacement costs). These customers are trying to make their budgets and systems survive into the next fiscal cycle.

Customers at all service levels are typically focused on their equipment, not systems, because service provider-client discussions, contracts and work orders are structured around addressing equipment issues. Knowledge of the field staff is typically equipment-focused (i.e. task lists and work proposals are generated based on manufacturer specifications and industry standards (ASHRAE) for equipment). All of the companies interviewed for this baseline were aware of the benefits of taking a systems approach and several report that they are effectively marketing and selling those services to their customers. Other providers are taking systems into consideration in providing their on-site services once equipment issues are addressed, and may or may not be discussing these efforts with their customers. Many service providers will take a system approach in their higher tiers of service or in complex applications with integrated controls systems, but few customers are taking advantage of this level of service. Table 8 shows responses to questions about equipment and system focus.

**Table 8. Service providers using an equipment or systems focus (N=21\*)**

<b>Are services equipment or systems focused?</b>	<b>'Yes'</b>	<b>Comments</b>
Basic Services are Equipment Focused	<b>15</b>	Customer focus on equipment is the driving factor for offering an equipment focus for basic services as well as the simplicity of the applications involved in basic service agreements.
Basic Services are System Focused	<b>8</b>	System focus is necessary to ensure proper function of the equipment, even in basic applications. Control systems also necessitate a system focus.
Comprehensive services are Equipment Focused	<b>6</b>	More comprehensive service packages are also focused on the equipment, because it is the primary focus of the customer.
Comprehensive services are Systems Focused	<b>17</b>	Higher tiers of service typically have a broader focus to address customer demands for system optimization. These are typically more complex applications.

\*Note: Two providers contend that their basic service and comprehensive service can be either equipment or system focused depending on the building application.

All service providers recognize a need to take controls into consideration when dealing with the mechanical systems linked to them. Basic review of the controls systems includes an overview of the controls equipment and any parameters that can be changed by the facility manager, such as equipment set points. They may also review the diagnostics that are being used in the system and note the alarms or other settings to see if there are opportunities for savings or equipment operations benefits. These providers said that reviews of these systems are a normal part of the process and are conducted quarterly or in some cases semi-annually. Service providers were asked about specific elements that may be included in a review of the controls systems; responses are presented in Table 9.

**Table 9. Elements included in a basic review of controls systems**

<b>Does a review of controls include:</b>	<b>'Yes'</b>	<b>Comments</b>
A written sequence of operation, as the system was designed? (N=20*)	<b>14</b>	Provided by the customer; used as a baseline for the provider. Provider is not typically making changes.
A "point by point" checking of controls to ensure they are functioning as designed? (N=20)	<b>5</b>	Too detailed in most cases and not warranted. Overall review of the system to identify problems is more likely.
Checking control sequences to ensure they match building schedules and occupancy needs? (mechanical contractors; N=14**)	<b>12</b>	Some found this to be an essential service; others saw it as a more comprehensive review of controls.
Resetting control sequences?  (mechanical contractors; N=14)	<b>6</b>	Usually part of a more significant effort that, in most cases, has to be handled by the control contractor.
Calibrate all controls as part of the checkout (controls contractors; N=9**)?	<b>4</b>	Part of more comprehensive services.
A review of any changes to controls with the building owner/operator? (N=20)	<b>19</b>	Critical part of communication with the customer.

\*One mechanical contractor sub-contracts all controls work and was unable to answer.

\*\*Some service providers answered both mechanical and controls contractor questions.

### **Proposal Development**

Service providers were asked about their typical processes for developing a proposal for mechanical or controls maintenance services and presenting it to the customer. The processes were similar across the providers interviewed but vary in the depth of analysis provided to the customer. Typically, customer needs are assessed during an interview that is associated with a walk-through of the building to conduct a visual and audio inspection of the equipment. A handful of providers noted that there are times when a site visit is not necessary, but that would not be the case in larger buildings with built-up systems.

All providers noted that they produce a formal proposal for services to their customers, but the sophistication of these proposals appeared to vary significantly from one firm to the next. Providers recognized a need to structure the proposal format and content according to the issues and concerns raised by the customer during the interview process. Some of the service providers are willing to go beyond addressing specific customer concerns and provide a proposal for a higher tier of service if they think that proposal will be well received. The larger providers were clearly more willing and able to invest in the proposal and take the risk of presenting more comprehensive services to their customers. However, even these said that they present the more aggressive services as choice options that the customer can elect to ignore or accept, again highlighting the sensitivity to customer needs. Several providers considered it risky to put too much detail in a proposal that may end up in the hands of their competitors or in offering services that are not seen as necessary in the eyes of the client.

The typical information presented in a proposal is an equipment inventory, recommendations for service based on ASHRAE and manufacturer's standards, and options for labor and parts depending on the customer's existing staff. Proposals do not typically include energy benchmarking or projecting energy savings and costs (see Table

10). The level of equipment assessment detail presented in the proposal is structured to be preliminary because of the risk of appearing too aggressive in the sale and the risk of the assessment work being transferred to a competitor if the client does not accept the proposal. Several of the interviewees that are currently working with the Building Operations Initiative noted that they have provided significantly more detail in the proposals for the NEEA projects than for their typical customers.

Only a handful of service providers are making the case for preventative maintenance services to their customers on the basis of energy savings. They are concerned that energy savings are not the primary benefit to the customer and presenting them may detract from the other important reasons to have quality preventative maintenance. Also, the difficulty in providing reliable energy savings estimates or being able to guarantee them presents a risk to their credibility. Some interviewees also noted that even when they have total control of a building it is hard to demonstrate to the customer that the value of the savings is greater than the added costs for the enhanced services. The general assessment among the providers is that there is not a lot of demand for detailed energy tracking, but several noted a recent increase in customer concerns over energy costs being driven by the higher energy costs. Table 9 summarizes responses to this topic.

**Table 10. Elements<sup>7</sup> typically included in a service proposal (N=21)**

<b>Do service proposals include:</b>	<b>'Yes'</b>	<b>Comments</b>
Benchmarking of energy consumption and costs?	<b>7</b>	This is a fairly involved process requiring significant data from the customer and unless a firm is guaranteeing energy savings it may not be worth the effort.
Listing of known equipment operational issues or concerns?	<b>18</b>	In the site visit and interview issues with equipment are identified.
Inventory of mechanical systems?	<b>18</b>	In the site visit most providers will take an inventory of the equipment: age, make, model, and visual condition. Information is used to build equipment specific service proposals based on manufacturer and ASHRAE standards for service and maintenance.
Assessment of the condition of the mechanical systems?	<b>10</b>	Only to the extent a visual inspection can provide the information. This is typically too detailed to risk in the proposal. May be sold as "due diligence" or part of the initial phase of the service contract
Priority listing of operational and maintenance issues to be addressed or solved?	<b>16</b>	Based on the interview and site visit this may be generated and included in the proposal.
Projection of energy and cost savings if specific equipment changes are made?	<b>9</b>	Some firms include this information in the service agreement proposal; but it is more likely included in a proposal for equipment replacement (typically based on manufacturer efficiency ratings).
Projection of energy and cost savings if specific operational or maintenance practices are changed?	<b>8</b>	Only some firms include this information in the proposal. Others do not because of a perceived lack of value to the customer, reliability of the estimates, and ability or interest in guaranteeing the savings.

<sup>7</sup> These service elements are part of the "screening report" encouraged through the initiative.

While not measured directly with a survey question, conversations with the service providers about how they interact with their customers revealed a very strong commitment to their existing market approaches. Few of the interviewed service providers seem to be interested in modifying their already successful approaches until they see more demand coming from the markets they serve. Service providers were quick to share their stories about their corporate histories that define who they are, what they do and how they do it. On the whole, these providers have limited interest in modeling their market approach after another company. These providers do not seem to be interested in or involved with a follow-the-leader approach. There is also limited interest in modeling business practices in related fields (like monitoring and benchmarking) based on what they see others doing in the market. Interviewed service providers expressed skepticism regarding the value of such services in some of the following comments.

*“It [performance contracting] is all a lot of smoke and mirrors as far as I can tell.”*

*“We’re not suits trying to go in and sell our customers something they don’t need.”*

*“There’s just too much risk in putting a number [energy savings estimate] on paper; our reputation is at stake.”*

*“We have to be careful about selling something that is not needed or recognized by our customers as a valued service. There are substantial risks in offering services that are viewed as profit building.”*

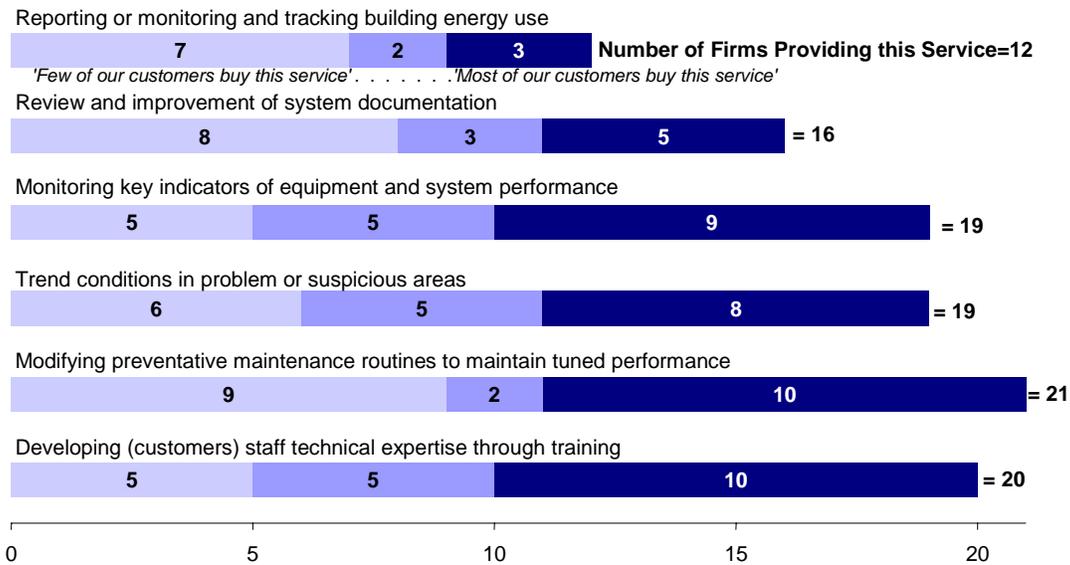
Service providers that are not already selling these types of services are not likely to start pushing them on their customers without significant demonstrated benefits to their bottom line and a clear risk-free approach for them to provide a tangible, added value that their customers demand.

Equipment sales are not the primary driving force for these service providers. Firms reported on average that 55 percent of business revenue comes from the sale of services within that division. Only two companies reported that business revenue from equipment sales exceeded revenue of the maintenance services. The service agreement is usually their “in” with the customer and equipment sales are understood to be part of the service solution rather than a separate business transaction. Many of these firms sell maintenance services separate from their design and installation service divisions. While they receive spillover customers from those divisions they were quick to point out that they have contracts with many customers outside of those relationships.

### Additional Services and Building Tune-ups

Firms were asked a series of questions about specific services that the Building Operations Initiative expects to promote. Many of these are already being incorporated into service agreements for many of these firms, however the share of customers buying several of these services is low as shown in Figure 3<sup>8</sup>.

**Figure 3. Customers taking advantage of additional maintenance services**



The term “building tune-up services” was not consistently interpreted across the sample of service providers. Five of the largest companies have recognized it as a unique service and include the elements promoted by the program. They are actively promoting it in the market, though demand for the service is weak. The remainder of the providers defined building tune-up services either as part of the services they already provide (equivalent to quarterly check-ups) to their customers or something that is not necessary unless the building has not been maintained. Interviewees reporting that they often come across new customers with buildings and equipment that is not performing well, mostly because of neglect by the owner and/or the current service provider. While providers will often recognize these conditions, most indicated that they are not in business to promote and sell building tune-ups or retro-commissioning types of services as a main line of service.

<sup>8</sup> With limited time in the interview, many of the respondents could only provide a qualitative estimate of the portion of their customer base that is taking advantage of these specific services. Percentages would have been preferred.

**Table 11. Additional building tune-up services (N=16\*)**

<b>Do your building tune-up services include the following elements</b>	<b>'Yes'</b>
Systematic equipment and equipment performance problem diagnosis and repair	<b>15</b>
Providing specific operational modifications to equipment to increase or maintain savings	<b>13</b>
Use control optimization approaches to maintaining building controls and systems	<b>13</b>
Set equipment schedules to maintain efficiency and reduce costs	<b>15</b>
Identify, monitor and track of key performance indicators to know when equipment needs service	<b>14</b>

\*The remaining 5 service providers did not offer building tune-up services.

### **Staff Capacity and Qualifications**

The companies interviewed have a high level of confidence in the capabilities of their staff, and do not see their abilities as a limiting factor in providing high quality operations and maintenance services. Most of these firms rely on unionized mechanics as their field technicians and have technicians or partners that are specifically trained in control systems. Many of the larger firms offering specific energy services, including performance based contracting, “whole building” or “solutions-focused” services rely on project managers with engineering degrees to develop more comprehensive projects with customers. All of these firms have technically knowledgeable sales staff responsible for promoting and negotiating the service contract with the customer.

Ongoing training and education is important to these firms to stay competitive in a dynamic market. They all have some form of in-house training and education for their employees. Some are more focused on training than others, but at a minimum, seasonal training courses (sometimes weekly) are offered to the field technicians on issues like heating systems in the fall or cooling systems in the spring. They may also offer equipment specific training which is typically driven by training materials developed and presented by the manufacturers. Many firms also give employees time for continuing education credits through external sources. AEE (Association of Energy Engineers) was noted as one resource for external training. Union resources were also noted as an important source of keeping field staff at a desired level of competency.

Only a handful of firms could identify energy specific training courses they have offered their customers.

### **Business and Customer Benefits**

Firms in this study identified several benefits to offering comprehensive mechanical and controls services to their customers. The most commonly cited business benefits included: larger profit margins, stable customer base, providing something valuable and useful, and getting more customers.

The primary benefits to the customer, as identified by the providers, are the performance and comfort of the buildings and the increased reliability of the equipment. Customers will have to deal with fewer customer complaints, and they are adding value to their buildings.

Both customer and business benefits will be compared in later MPEs for consistency with benefits promoted by the initiative.

### **Service Provider Recommendations for the Building Operations Initiative**

Service providers voiced several specific recommendations for the direction of NEEA's Building Operations Initiative. The most common recommendation was to focus on educating the building owners on the value of quality operations and maintenance services and building market demand. Materials that can easily be incorporated into their existing proposals would provide a reliable third party source to reinforce the value message. Service providers offered the following recommendations:

- *Education of building owners and their organizations through demonstration of payback, quality of building, cost savings, building value. This value message needs to be clear and concise for building owners and operators to understand.*
- *Coordinate with other energy efficiency initiatives in the region and LEED-EB to build synergy instead of market confusion.*
- *Roll out this initiative with a little "fanfare" to talk about where it is going and what it can do.*
- *Serve as another voice for the value of comprehensive, predictive, proactive services.*
- *Communicate with providers to build service offerings and provide feedback to the providers over time to know what is being done and what is working.*
- *In vertical markets build on existing service offerings through existing providers.*
- *Develop easy, standard approaches for estimating energy savings. This approach from a third party will be trusted by customers.*
- *Any training should come from within the industry not utility or energy efficiency initiative professionals*

Recommendations from the evaluation team based on this study can be found in the final section of this report.

## 7. Process Evaluation

The process evaluation for this first MPER was based on input from five interviews conducted with: the Initiative Manager, one Initiative Advisor/Technical Advisor, one additional Technical Advisor working in the vertical markets, the Education & Training manager and the marketing manager. Results of the baseline interviews with firm focus service providers were also used.

### Start-up challenges

The NEEA manager in charge of the Building Performance Services pilot, who would have been the manager of the Building Operations initiative, left NEEA in November 2005. The current manager was hired as his replacement in February 2006 but started with little experience in the BetterBricks market transformation approach.

One of the major challenges noted by initiative staff is recruiting advisors and getting time with some of the service providers. There is a general “busy-ness” in the market these days with lots of efficiency work in the region (especially California), a heightened awareness of energy prices, and high demand for the types of skills the initiative needs to move more quickly on implementation. Staff noted that the energy efficiency industry is coming out of a bit of a slump and it takes a little time to “get the market back up to speed.”

### Firm focus relationships

Building Operations staff and advisors noted that the existing firm focus relationships are moving in a positive direction, but there are major limitations to expanding them given the lack of a business case, and limited advisory resources to support additional firms. Business advisors have only recently been involved in developing the business case and have not yet assumed responsibility for firm focus relationships. These have been handled by the Initiative Manager and another key Advisor, who noted that they are “maxed out” providing the necessary support in the existing three relationships, and only see opportunities to expand the firm focus base if more advisory resources can be found.

All of the active and pending firm focus firms were interviewed as part of the baseline study. While these interviews were not geared toward assessing the strengths and weaknesses of the firm focus relationship, some comments and concerns did emerge that were pertinent to the existing process of working with these firms.

First, while these firms had a fairly concise understanding of the overall objective of the Northwest Energy Efficiency Alliance as a force for market transformation, there was still confusion about the existing status and purpose of the current Building Operations Initiative. One of the BPS partners noted that they were aware that BPS had been terminated, but were not clear on the opportunities and objectives of the new Building Operations Initiative and recommended more “fanfare” in rolling out the new initiative. Several of the Portland firms were also aware of the Energy Trust of Oregon’s Building Tune-up and Operations program, but not clear about how the Building Operations Initiative is related.

Two firm focus firms identified specific issues with how Building Operations is approaching projects in the vertical hospitals market. They stated that if incentives are offered for the building assessments and the proposal development, specifically in hospital projects, there needs to be a strategy to wean the market off them in the long term without souring customers who quickly assume incentives will always exist. One firm focus firm identified a case where their opportunity to sell value-added comprehensive maintenance services was circumvented by the presence of Building Operations Technical Advisors. The initiative provided its own consultants to the site and offered services that this company was capable of selling to the customer, causing a diminishing effect in their market. This firm was identifying the Building Operations Technical Advisor as a competitor rather than an ally.

### **Technical Advisors and the vertical markets**

The primary way Building Operations is collaborating with the vertical markets is through specific projects with the Market Specialists. Initiative staff and advisors noted that coordination between these groups needs improvement. They identified the most important aspect as making sure that the technical advisors understand their roles and responsibilities so that they send the right messages to building owners, understand how to get service providers involved, and correctly communicate to owners how building operations fits into strategic energy management plans. The technical advisors also need a clear understanding of the tools and materials available through the initiative. Initiative staff and advisors felt strongly that despite the challenges presented by working through collaboration it is still the best approach to achieve the long-term benefits of behavioral changes of market players. Their interpretation of the existing challenges and recommended improvements are provided in the following sections.

### **Challenges engaging service providers**

Technical advisors and the initiative manager noted that, while existing service providers at the targeted hospitals have been invited to and have often attended the preliminary assessment of the facilities (the “walk through” and associated report of the findings) they have not been actively engaged in the process. The initiative ideal is to have technical advisors and service providers working together to develop proposals initially so that eventually the service providers will be able to develop similar proposals on their own. When the service providers are not involved or show no enthusiasm, the technical advisor can fill that role but the initiative influence is substantially diminished. Meaningful engagement with the existing service providers – when they are not firm focus -- is one of the primary venues by which the initiative intends to build capacity in the broader O&M service market. Technical advisors offered two key reasons why the service providers did not participate:

*1. Sometimes there has not been a service provider to engage in the process.*

The advisors noted that every hospital has a pre-existing relationship with a service provider. In some cases these relationships are not good, and the hospital is not interested in investing time and effort into helping that service provider get better. It is not entirely clear why hospitals would continue relationships with service providers they feel are incompetent, but it may be a result of upper managerial decisions, or limited reliance on those service providers (since many hospitals have their own facility staff). Furthermore, the initiative's firm focus firms are not always the people that the hospital is or wants to be working with. There was an instance in the field where a hospital refused to move forward on the project if a certain service provider was involved in the process.

Technical advisors noted that the key to addressing this issue is to have a clear understanding of the existing relationship between the service provider and the facility manager/owner/operator before the walk-through takes place. They recommended that the market specialist be responsible for assessing this relationship as well as facilitating discussions with the service provider prior to the walk-through to clearly define roles and responsibilities. This will avoid the technical advisors being seen as a competitor to the existing service provider. They also recommended that initiative management clarify to the technical advisors the conditions under which participation could occur without a service provider involved. Technical advisors have to be comfortable in presenting and advocating that position to the facility owners and managers so they need clear agreement with the Market Specialists.

*2. It has not been clear to the technical advisors how to engage service providers in the process, and Building Operations has not offered clear directives about how to do this.*

Typically the technical advisors first encounter with the service provider is at the preliminary walk-through meeting for the project. Existing service providers, the utility, and hospital staff and management are typically invited to this meeting where they discuss the facility and equipment. Technical advisors found it difficult to engage a service provider at this point in the process because they had no understanding of the existing relationship between the service provider and the hospital staff, no knowledge of the technical capacity of the service provider, and no arrangements had been made for compensation for the service provider to be involved in the process. Without any of this information, technical advisors found it nearly impossible to ask a service provider, at that point in the process, to participate. One technical advisor suggested that if the initiative is going to rely on them to establish a positive relationship with the existing service providers then better, more flexible approaches will need to be created.

The initiative manager recognizes a need to better explain the expected roles and responsibilities of the technical advisors and to clarify the initiative objectives of capacity development. Some additional recommendations from the technical advisors included creating written guidelines for working on vertical market projects and a meeting with all

vertical market team members to compare notes to see how they can best promote initiative objectives.

### **Relationship with the Hospital Vertical Market Specialists**

Overall the technical advisors were positive about their working relationships with the Hospital Market Specialists, but noted several opportunities for improvement.

One technical advisor recommended assigning each Market Specialist to a technical advisor so they can build a working relationship. As it stands, the relationship between the technical advisor and the market specialist is facilitated (or instigated) through the Building Operations Initiative Manager who assigns technical advisors to projects as needed. Since each Market Specialist has his/her own mode of operation it takes some effort to understand how they approach their clients and how they want the technical advisor involved in the process. If relationships were pre-established, the market specialist could take the project to the initiative manager for approval, and then the market specialist could go directly to the assigned technical advisor to begin work.

The two main technical advisors differed in their interpretation of their role in the vertical market projects and expressed a need for clarity from initiative management. Both considered their primary role to be providing technical resources to individual projects. One saw this as being directed at enhancing the capacity of the service providers or the facility management. This interpretation is consistent with the initiative theory, but has not matched the reality in the field in many cases. The other saw his role as a technical resource to the market specialist and the owners and operators of the hospitals they are working with. In his view, the Market Specialists are the ones that are responsible for the success of individual projects, and they rely on the technical advisors to contribute to moving those projects forward. This technical advisor saw the Market Specialist as the “team leader”, managing the relationship with the client, and guiding the rest of the team through the necessary process. Both advisors were in agreement that the intended role of the Technical Advisor needs to be clarified, outlined formally, and presented to everyone working on projects in the vertical markets.

The technical advisors also noted that the resources that each party can bring to the project also needs to be clarified, as there has been uncertainty as to the level of financial assistance available to implement proposals or to have the continued support of the technical advisors on specific projects. Market Specialists need to be able to have this discussion with the hospitals in clear and concise terms so the facility management and the owner know what to expect as they plan their next budget. They suspect that this may be one reason why none of the proposals have moved on to implementation.

Technical advisors recommended a BetterBricks sponsored in-person meeting of vertical market and building operations staffs and contractors to establish the necessary personal connections to enable them to work as a team.

## Education & Training / Marketing support

Staff from Education & Training and Marketing noted that there are significant challenges in coordinating development of materials given the very different stages of development for each BetterBricks initiative. They each noted that Building Operations has lagged the other commercial initiatives, which has led staff to have to take a different development approach, or simply hold off on projects until the Building Operations component is ready to move ahead.

As an example, managers report that the hospitals initiative was developing more quickly than Building Operations and the original plan of developing dedicated materials for the Building Operations efforts and applying them to the vertical markets had to be transposed, so that the materials that were developed for hospitals were applied to Building Operations.

Education & Training staff noted that there is still uncertainty with respect to the language used within the Building Operations initiative. For example, the building market may not understand the term “*building operating performance*” in the way the initiative understands it. If this is true, it could impact service provider interest in attending initiative events. Managers noted that a better understanding of the market and market terminology will be gained through further interaction with key market players, seminars such as those with the hospital facility managers and the planned small hospitals survey.

## Utility collaboration

Currently initiative staff attends bi-monthly updates via conference call with the NEEA funding utilities. They also have fairly regular meetings with the Energy Trust of Oregon, but no concrete steps have been taken to coordinate similar programs. There is interest from both parties (utilities and NEEA) to further develop relationships. Ideally, they would like to be able to develop a deeper interaction with one or two people at each utility. Eventually coordination is expected to be an asset; however, in the current development stage it was noted that it can slow things down given the protocols involved in working with utilities.

The initiative has been able to use their relationship with the utility as an “in” with some facilities. Utility staff is always invited to attend the diagnostic walk-throughs that they have done at the hospitals, and they have always been eager to participate.

## 8. Conclusions and Recommendations

### Overview

The Northwest Energy Efficiency Alliance's BetterBricks Building Operations Initiative was launched in January 2006. The initiative has benefited from a foundation established through its predecessor the pilot Building Performance Services (BPS) initiative, particularly with respect to the relationships with key service providers in the region. However, beyond these relationships and efforts initiated under BPS the new initiative has made less progress than hoped for. Key materials to make the case for improved building operations and maintenance are still in development. Relationships with key service providers have continued to be developed and these firms are showing enthusiasm and support for expanding their building operations service offerings, but substantive engagement has been limited due to the lack of a business case. The added initiative component of collaborating, under the BetterBricks umbrella, with the hospitals vertical market has been an asset to the initiative's development efforts by expanding the reach of the initiative, but has presented challenges in coordination and involvement of existing service providers.

There are challenges associated with moving this initiative into the market and ensuring implementation consistent with the initiative theory. These challenges and recommendations for addressing them are presented in this final section of the report.

### Initiative Theory

Initiative activities, since January 2006, are aligned with the Board-approved project description with two exceptions. First, while existing service providers are invited to participate in the initial stages of building assessment in the vertical market projects, in many cases they are not actively engaging in the process. As this is an important component for building capacity for enhanced operations and maintenance services in the broader market it is important to understand why they are not actively participating. Second, business advisors, who are to be responsible for recruiting and developing relationships with the firm focus firms, have not yet been significantly involved in these relationships. The initiative management and Advisors are aware of both of these issues and they appear to be a function of the immaturity of the program in clarifying and distributing roles and responsibilities and recruiting the necessary advisory resources.

***Recommendation 1:*** *Technical Advisors and Business Advisors should be given the proper training and responsibility to perform duties outlined in the program theory. They should also talk to service providers to understand what could be done to engage them more in the building assessment process.*

The initiative has a reasonably well-developed initiative theory and logic model. The logic model does not address specific barriers and methods of addressing each barrier, which could help the initiative in directing its actions.

***Recommendation 2:*** *The initiative staff should incorporate the barriers identified in this report as well as methods to address each barrier into the logic model.*

## Market Support Materials

The majority of Education & Training, marketing and other initiative materials, including the Toolkit, are still in development. The business case for service providers was not yet available, even in draft form, for evaluation review. Initiative materials that clearly lay out the business case, and the product and service offerings available through the initiative are essential for the initiative to enter new projects in the Vertical markets, approach new candidates for firm focus, and continue training and education efforts in the broader market.

***Recommendation 3:** The business case for service providers and other elements of the Toolkit should be completed to allow for the initiative to progress. Also tools and materials should be reviewed by market actors, especially service providers, to ensure that they resonate with and provide value for the intended audience.*

## Firm Focus Relationships

Firm focus efforts are concentrated on three major service providers that participated in the BPS initiative, falling short of the progress indicator goal of 4-5 firms. These relationships have not yet resulted in case studies or materials that can be used to promote initiative objectives to the broader market. The initiative manager and one key advisor have been responsible for working with the firm focus firms and noted that without additional advisory resources (and the above-mentioned business case materials) it would be difficult to expand the pool of firm focus firms. Contracted business advisors have not yet been significantly involved in these relationships, but are expected to assist firm focus firms in developing activity plans and implementation of those plans. Transferring these responsibilities, and soliciting additional advisory resources should allow the initiative to spend more time building strong, productive relationships with these three firms so they can help the initiative sell the idea in the market through their demonstrated success. It should also open opportunities for recruiting more Firm focus firms to increase the chances of viable success stories to convince the broader market.

***Recommendation 4:** Solicit additional advisory resources to rapidly move existing firm focus firms toward the completion of projects that can be used to make the case to the broader market. Expansion to other firms should be done cautiously, ensuring that sufficient resources are available and that implementers use the experience gained with the existing firms to better understand their needs and refine the initiative's tools, materials and business advice. Additionally care should be taken in how successful projects packaged and marketed. The current initiative logic assumes that success stories from firm focus firms will be persuasive for other service providers. Given the results of the service provider interviews, implementers should revisit this logic and decide if it is still applicable.*

There is market confusion with respect to how the Building Operations Initiative will or does relate to other energy efficiency initiatives and even how it differs from the BPS initiative. One firm focus firm was unclear as to what the new initiative had to offer compared to BPS, and many service providers interviewed in the baseline study were

unclear as to how the Building Operations Initiative would relate to other energy efficiency programs in the region. As the initiative reaches out to the broader market, either in recruiting firm focus firms or other activities, it will have to clearly distinguish what it has to offer. Coordination with complementary or similar utility programs can help diminish market confusion and build on enthusiasm generated by these programs.

**Recommendation 5:** *The initiative should openly communicate with firm focus firms with respect to the new role and objectives of the Building Operations Initiative and collaborate with complementary or similar utility programs to diminish the effects of market confusion.*

## Technical Advisors and the Vertical Markets

Collaboration with the vertical markets, specifically hospitals, has been important for the initiative's progress to date. The relationships with Market Specialists have been positive, but there is room for improvement through greater coordination, team building, and clarifying roles and responsibilities.

One role that specifically needs to be clarified is that of the Technical Advisors working on vertical market projects. Their role as a provider of technical assistance to the completion of the project is clear, but their responsibilities for capacity building among the service providers and facility staff is not clear, and they have had little direction from the initiative. Technical advisors have not been effective in securing active participation by existing service providers in the preliminary facility assessment activities. There has been at least one instance where a firm focus service provider saw the technical advisor as a competitor rather than a partner. Early and open communication with service providers to clarify the role of all parties involved in the project must be a priority for all vertical market projects.

**Recommendation 6:** *The initiative needs to provide clear direction to technical advisors outlining their responsibilities for capacity building among the service providers and facility staff in the form of written, formal guidelines.*

Technical advisors and the rest of the vertical market project team members have never been brought together for formal training to clearly address roles, responsibilities, coordination accountability, and resources.

**Recommendation 7:** *Before additional vertical market projects are acquired, technical advisors, market specialists, and initiative management need to come together to better define roles, relationships and strategies for efficiently meeting initiative objectives.*

## Baseline

One of the major efforts for the MPER was to conduct a baseline assessment of the market as a means to measure initiative progress in the future. Several observations emerged from this study that may affect to how the initiative ultimately approaches the market.

The building operations and maintenance service market is customer demand driven. Many service providers address customer demands directly and view offering enhanced services as risky unless the customer requests such a service.

***Recommendation 8:*** Offer service providers concise, trustworthy, third party materials to effectively present the value proposition to the customer without appearing to be self-serving. Design materials so that they can be easily integrated into their existing proposal formats.

Customers and field staff are typically focused on their equipment, not systems, because service provider-client discussions, contracts and work orders are structured around addressing equipment issues. All of the companies interviewed in the baseline were aware of the benefits of taking a systems approach but typically are only offering it in their higher levels of service and to a relatively small portion of their customer base. Likewise, while many of the service providers interviewed for the baseline can and do provide at least some of the enhanced building operations and maintenance services promoted by the initiative, only small portions of their customers are taking advantage of these services. Greater provision of these services relies on the ability to encourage demand for them. Service providers serve an important education role in the market but they cannot be expected to move this market on their own. This may be beyond the ability of the service providers in the short term, until substantial education and market development efforts on the demand side have been successful. Service providers will not push this market without successful demand stimulation efforts.

***Recommendation 9:*** The initiative can continue assisting service providers in clearly making the value proposition to their customers to sell enhanced services, but simultaneously building demand through outreach to facility managers and building owners and operators is critical for market adoption.

Service providers typically believe that their approach to the customer, which is based on successful corporate history and philosophy, is the best for their market and are apprehensive about following other firm's leads as assumed in the initiative theory. Changes in business practices to sell more of the enhanced services encouraged by this initiative will have to respect existing business approaches and practices. Service providers in the broader market will be more accepting of success stories applicable to their customer base than to their competitor's successful business model. Caution must be taken in how these materials are developed. If a case study has information on the success of a competitor's performance, it will not be used by other service providers and will not be shared with their customers. In fact, just the opposite will occur, it will be discarded so that there is no potential for it to be seen by one of their customers.

***Recommendation 10:*** Materials for marketing the initiative and to present the business case should focus on the benefits to the bottom line, benefits to the customers, and be structured to build customer demand for a service that may not be seen as necessary by the majority of the customers. Avoid materials that identify service providers so they can be used by all service providers.

Ongoing training and education is important to service provider firms to stay competitive in a dynamic market. They all have some form of in-house training and education for their employees. Some are more focused on training than others, but at a minimum, seasonal training courses (sometimes weekly) are offered to the field technicians on issues like heating systems in the fall or cooling systems in the spring.

***Recommendation 11:*** *As much as possible, work to offer training within the service providers existing frameworks rather than expending resources to create a new framework.*

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## Appendix B. Service Provider Baseline Interview Instrument

### Concept Introduction

This interview focuses on how building and equipment operation and maintenance services are provided in the commercial buildings market. We understand that building and equipment operation and maintenance services may not be universally understood as service offering terms. By looking at your website we identified some service offerings that may be related to the type of things we were interested in talking about. Going through a brief summary of these may help us focus our discussion a little better. These include: *<List related services - Key words may include, preventative maintenance, commissioning, planned maintenance, etc. The interviewer will have as many materials as possible on the firm and the services they provide in preparation for the interview.>*

We would like to start the interview by asking some general questions about the range of building operations or maintenance services you provide to your commercial customers.

### Existing Service Offerings

1. Does your firm offer a basic service package (package = a combination of services that would all be performed together and sold as a bundle to the customer) to customers? *These may include reactive, preventative, predictive or reliability centered maintenance service initiatives.*  
**Yes** (skip to question 2) or **No** (skip to question 5)
2. **If yes**, what is included in this basic package? *<record description then probe with: Does it include . . .>*
  - a. Service-on-failure agreements to get failed or poorly performing equipment operating?
  - b. Visual inspections of equipment to confirm operation?
  - c. Providing initial equipment tune-ups to get it operating at maximum efficiency? If yes, How do you determine what equipment needs to be tuned-up?
  - d. Written equipment operations assessments?
  - e. Equipment replacement? *Ask criteria for recommending an equipment replacement.*
3. Which of these are included with the basic fee and which ones are additional charges to the customer?
4. Do you have existing materials that outline the basic maintenance service package offered by your firm? Can I get a copy?

5. *If, No to question 1, How do you determine what services to offer any given customer? Do you customize services for all customers? <allow for open-ended response>*
6. *Would you characterize the basic service package as equipment-focused or systems-focused? (Note: Equipment-focused means looking at each piece of equipment separately and does not assess interaction effects across equipment. Systems-focus looks at both the individual pieces of equipment and their interactions, with the goal of optimizing the whole system. A worst- case example is ‘battling thermostats’ where two roof-top units are functioning perfectly but they have different thermostat settings so one is providing cooling and the other heating at the same time.*
  - a. *Equipment focused: Why? <allow description>*
  - b. *Systems focused: Why? <allow description>*
7. *[Question for mechanical contractors – if control contractor skip to question 8] Does your firm’s basic maintenance service package include review of controls and control sequences?*

*YES (skip to question 7a.) or NO (skip to question 7d.)*

- a. *If YES, What is your in-house controls expertise?*
- b. *On what types of control systems are you experienced? (Pneumatic, analog, DDC).*
- c. *How are controls taken into consideration? [Allow for open response, then probe with: Does the basic maintenance service package include:*
  - i. *A written sequence of operation, as the system was designed.*
  - ii. *A “point by point” checking of controls to ensure they are functioning as designed*
  - iii. *Checking control sequences to ensure they match building schedules and occupancy needs*
  - iv. *Programming or resetting control sequences*
  - v. *A review of any changes to controls with the building owner/operator*
- d. *If NO, How do you determine whether controls are operating correctly and control sequences are programmed correctly? [Allow for open response, then probe with:*
  - i. *Do you have specific controls contractors that you prefer to work with and with whom you have established on-going relationships?*

8. *[Question for controls contractors]* How does your firm's basic maintenance service package address review of controls and control sequences?

- a. *What brands of controls systems do you represent?*
- b. *What types of control systems do you support? (Pneumatic, analog, DDC).*
- c. *Do you secure a written sequence of operations for the system as designed? If so, do you review it with the owner/operator before commencing work on the system?*
- d. *Is a complete point to point checkout of the system performed?*
- e. *Are all controls calibrated as part of the checkout?*
- f. *Do you review suggested sequence changes with the building operator before and after changes are made?*

9. Do you have **other** standardized maintenance service packages that you offer to customers that are more comprehensive?

Yes or No

*If yes, What do they include?*

10. Do you have existing materials that outline the **other** standardized maintenance service packages offered by your firm?

Yes or No

*If yes, Can I get copies?*

11. What are the most common additional services that are requested by your commercial building customers beyond your basic maintenance service package? *<allow for open answer>*

12. Would you characterize the **other** service packages your firm offers as equipment focused or building systems focused?

- a. Equipment focused: Why?
- b. Systems focused: Why?

13. In either your standard or other service packages, do you have performance-based agreements where you are paid for achieving a certain level of bill reduction, comfort level, number of customer complaints or other metrics?

- a. *If Yes, How are those types of agreements structured?*
- b. Have they generally worked well?
- c. What problems have you encountered?

## Proposal Development

14. Now I want to better understand the process by which a new customer would be sold services by your company. Walk me through the process that would get me from the first contact with your firm to the point of signing a contract .

*<Allow open answer, then, as necessary, probe with>*

- a. Who is typically your first point of contact when calling on a new prospect? Who in your organization makes that first contact?
- b. Do you always do a site visit before you make a proposal? Do you conduct a site survey? If so, who in your organization typically will be involved?
- c. Do you attempt to determine how well the equipment in a building is functioning before you make a proposal? How do you do that?
- d. Do you do any analysis at the system or building level or is it always based on individual pieces of equipment?
- e. What are typical customer questions and needs that come up? (want lower energy bills, increase equipment life, O&M staff costs, etc.)

*<Follow-up questions>*

15. Does your firm offer the customer a formal proposal for the recommended maintenance services?

16. What information is included in this proposal to allow the customer to make a decision about buying your maintenance services? How do you justify the proposed services? (energy savings, comfort, indoor air quality improvement, extended equipment life, peace of mind...)

17. In either the proposal or complementary material that is provided to the customer to help them in their decision to buy your maintenance services do you present information about the following: *<Read and check all that apply:>*

*<These are the elements that are to be included in the “screening” report that the initiative is promoting >*

- a. Benchmarking of energy consumption and costs
- b. Listing of known equipment operational issues or concerns
- c. Inventory of mechanical systems
- d. Assessment of the condition of the mechanical systems
- e. Priority listing of operational and maintenance issues to be addressed or solved
- f. Projection of energy and cost savings if specific equipment changes are made
- g. Projection of energy and cost savings if specific operational or maintenance practices are changed

18. Do you typically offer the customer the most comprehensive services available, or do you typically present the minimum services necessary, or something in-between?

19. Once you have an agreement in place, how do you mobilize? What do you do when you first visit a building? What types of things take priority? *[We're trying to get at whether they do some tune-up work normally, or just accept things as they are.]*

**Additional Maintenance Services**

Now that we have talked about the different services you provide to your customers, and how they are organized and offered, I want to go through a list of services that may or may not be provided by your company (and we may or may not have talked about), and I want you to tell me first if you offer a similar type of service and describe it, including if it would typically be part of a basic maintenance agreement, or part of a more comprehensive maintenance agreement.

*<These are the enhanced service offerings that the initiative is working toward, in the interview we will not refer to them as enhanced, or improved >*

<b>&lt;Enhanced&gt; Service Offering</b>	<b>Offer Similar Service (describe)</b>	<b>Basic or Other</b>
20. Reporting or monitoring and tracking building energy use		
21. Review and improvement of system documentation so it can be used as a management tool		
22. Monitoring of key indicators of equipment and system performance to identify when performance is slipping		
23. Trend conditions in problem or suspicious areas		
24. Modifying preventative maintenance routines to maintain tuned performance		
25. Developing (customers) staff technical expertise through training		

For each of these services I want to know about the demand for these types of services and how your company has or could address a request for this type of service.

<b>&lt;Enhanced&gt; Service Offering</b>	<b>What percent have you supplied it to?</b>
26. Reporting or monitoring and tracking building energy use	
27. Review and improvement of system documentation so it can be used as a management tool	
28. Monitoring of key indicators of equipment and system performance to identify when performance is slipping	
29. Trend conditions in problem or suspicious areas	
30. Modifying preventative maintenance routines to	

maintain tuned performance	
31. Developing (customers) staff technical expertise through training	

### Building Tune-up Services

I'd like to talk now about a related service that your company may provide.

32. Are you familiar with the term “building tune-up service”? What does that term mean to you? I would confirm what they understand it to mean...it can mean different things to different people. I think this is what we are trying to get at. What do they believe a tune-up is and then compare it to what we believe it to be.

YES or NO

*If NO, offer initiative's general definition and ask if that sounds familiar, and if they have another term for it. If not, skip to question XX.*

33. What services do you consider part of a building tune up? (i.e. what specific elements are included in a building tune-up that would be offered by your company?) *<allow for open response>*

34. Does your firm offer building tune-up services to your customers?

YES or NO *(skip to question 49)*

35. *If YES, how are building tune up services offered to your customers? <allow open response, then probe with:>*

- a. Is it a standard part of the overall maintenance packages we were talking about before?
- b. Would it be part of a basic package or a more comprehensive package?
- c. Would it be sold separately, as an independent service, with a unique contract?

36. What is the time frame or regularity for the building tune-up, or similar services being offered to existing customers?

37. Do you have materials that describe this type of service to your customers?

YES or NO

*If yes, Can I get a copy?*

38. Do your current customers ever contact you to request a building tune up from your firm?

If Yes, What percent of your current-customer-initiated service requests ask for a building tune-up or similar scope of service? \_\_\_%

I want to go through a list of building tune-up related services that may or may not be provided by your company (and we may or may not have talked about), and I want you to tell me first if you offer a similar type of service and describe it, including if it would typically be part of a maintenance agreement (specifying basic or more comprehensive), or would only be offered on demand.

<These are the service elements the initiative expects to be included in a good building-tune-up. In the interview we will not refer to them as enhanced, or improved >

<Enhanced> Service Offering	Offer Similar Service (describe)	Type of Maint. Contract or “On Demand”
39. Systematic equipment and equipment performance problem diagnosis and repair		
40. Providing specific operational modifications to equipment to increase or maintain savings		
41. Use control optimization approaches to maintaining building controls and systems		
42. Set equipment schedules to maintain efficiency and reduce costs		
43. Identify, monitor and track of key performance indicators to know when equipment needs service (these would be predictive/reliability centered maintenance services)		

For each of these services I want to know more about the demand for these types of services and how your company has or could address a request for this type of service.

<Enhanced> Service Offering	What percent have you supplied it to?
44. Systematic equipment and equipment performance problem diagnosis and repair	
45. Providing specific operational changes to equipment to increase or maintain savings	
46. Use control optimization approaches to maintaining building controls and systems	
47. Set equipment schedules to maintain efficiency and reduce costs	
48. Identify, monitor and track of key performance indicators to know when equipment needs service (these would be predictive/reliability centered maintenance services)	

**Role of equipment**

49. Do you sell equipment? YES or NO. *If No, go to question Error!*  
*Reference source not found..*

We would like to understand the relationship between your capital projects, in which you install new equipment, and the maintenance services you provide. To do this I will ask a

series of questions about the relationship between these two different areas of your business.

- 50. Are your capital projects and your maintenance services integrated into the same business unit or are they separate business units in your firm?
  - a.  Same business unit
  - b.  Different business unit
  - c.  Don't know Not Sure
- 51. What percent of your maintenance service work comes out of your capital projects? That is, you obtain the maintenance service work as a result of the capital projects or your relationship with the capital project?  Percent
- 52. What percent of you business revenues come from equipment sales (capital projects)? % What percent from maintenance services? %

**Staff training expertise and capacity**

The next portion of the interview asks about staff and staff training needs.

- 53. What are the typical qualifications for your maintenance field staff to be initially hired?
- 54. What kind of training do you typically need to obtain or provide for your staff once they are hired and have a few years experience before you put them in charge of providing commercial maintenance services?
- 55. What if any energy related training do you provide or require field staff to participate in?
- 56. Has the level of expertise (training and experience) that you require of new people who are going to perform operations and maintenance services changed over the last couple of years?
- 57. *If yes to 56, How has it changed? <allow open response>*
- 58. Given how you've just described the differences, how many total staff do you have at this location that can provide commercial customer operations and maintenance services and building tune-up services? I would like know this for the number of part time and full time staff and specific skill sets or expertise. *<Number of people as well as number of skills sets might be beneficial to know . . . (controls, hvac, boilers, steam traps) there will be multiple capabilities within different organizations with some individuals having very specific expertise.>*

Maintenance Services	Special skill sets or expertise
<input type="text"/> part time staff	
<input type="text"/> full time staff	

59. What training and experience is needed for staff to provide the more comprehensive types of maintenance services we talked about?

<Enhanced> Service	Necessary Skills
Reporting or monitoring and tracking building energy use	
Review and improvement of system documentation so it can be used as a management tool	
Monitoring of key indicators of equipment and system performance to identify when performance is slipping	
Modifying preventative maintenance routines to maintain tuned performance	
Developing (customers) staff technical expertise through training	

60. How many of your staff currently have the ability to deliver these types of services?

61. What training and experience is needed for staff to provide the building tune-up services that include the elements that we talked about?

<Enhanced> Service	Necessary Skills
Systematic equipment and equipment performance problem diagnosis and repair	
Providing specific operational changes to equipment to increase or maintain savings	
Use control optimization approaches to maintaining building controls and systems	
Set equipment schedules to maintain efficiency and reduce costs	
Identify, monitor and track of key performance indicators to know when equipment needs service	

62. How many of your staff currently have the ability to deliver these services? (What percentage?)

### Identification of Business Benefits Battery

Now I would like to talk to you a little bit about any benefits you may see to your business in offering maintenance services or building tune-up services that are more comprehensive than your company's basic package.

63. Do you see a business opportunity for expanding (creating?) the services we've discussed? What are some of the specific benefits that your firm could obtain from providing more comprehensive maintenance services and/or building tune-up services? *Don't read list; check all mentions:*

a. More profit	b. Less susceptible to economic or market swings
c. Business growth	d. Increase opportunity for construction part of my business (Construction and Service companies)
e. Increased customer loyalty	f. Sales of engineering or design services
g. Skilled staff	h. HVAC equipment upgrades and retrofits
i. Market position or dominance	j. Other1: _____
k. Expanded markets – both vertical and geographical	l. Other2: _____
m. Longer term business viability	n.

64. Are there deterrents to offering more comprehensive maintenance services or building tune-up services to customers? That is, can this in any way harm your business or cause problems for your business? *<allow open response followed by inquiry into specific problems>*

**Identification of Customer Benefits Battery**

65. What would you say are the top benefits to your customers who take advantage of maintenance services that are more comprehensive than the basic package? What is it that your customers obtain from these services that they would not get from other, less comprehensive services?

*Do not read; check all mentions:*

a. More energy efficient buildings	b. Fewer employees to take care of
c. More comfortable buildings	d. Less need for training for their staff
e. More valuable buildings	f. They can focus on their core business
g. More rentable / leaseable buildings	h. Less equipment problems (equipment reliability)
i. Fewer tenant complaints	j. Less down time for their business
k. Lower costs over the short term	l. Other1: _____
m. Lower costs over the long term	n. Other2: _____

**Major Market Trends**

66. What are the major market trends that are currently affecting the operations and maintenance service industry? *<Allow open answer. If necessary say, what are the major topics that have service providers are talking about or concerned about? If I opened up \_\_ magazine [get name of most widely known O&M magazine] What are the headline articles about?>*

67. How are they affecting your business?

**Move the Market Recommendations**

68. What specific things would you recommend that NEEA do in your market to encourage customers to take advantage of enhanced building operations and maintenance services from companies like yours?

