BetterBricks Hospital and Healthcare Initiative

Market Progress Evaluation Report #3

PREPARED BY

Research Into Action, Inc.

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Final Report

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Funded By:

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ES EXECUTIVE SUMMARY

This third Market Progress Evaluation Report (MPER #3) documents the progress of the BetterBricks Hospitals & Healthcare Initiative (formerly the High Performance Hospitals Program) between October 2006 and November 2007. The Hospitals & Healthcare Initiative is targeted to hospital and hospital systems that have their headquarters in the region served by the Northwest Energy Efficiency Alliance (NEEA). The goal is to have these organizations adopt Strategic Energy Management Plans (SEMPs), which create lasting changes in business practices and lead to reduced energy consumption in all buildings. The initiative is currently funded through 2008 as part of BetterBricks.

SUMMARY OF INITIATIVE ACCOMPLISHMENTS AND EVALUATION FINDINGS

The BetterBricks Hospitals & Healthcare Initiative (Hospitals Initiative) is showing significant progress toward its goals and is on target to meet them and its objectives by 2010. As of the end of 2007, seven healthcare organizations of all sizes and comprising 36 hospitals have signed strategic energy management plans and are actively taking steps to bring about a comprehensive change in their business practices. These 36 hospitals account for 25% of the hospital beds in the region. The organizations range in size from a community hospital with 143 beds to a large system with nearly 4,000 beds. Another three organizations, comprising an additional 7% of the region's beds, are working with initiative market specialists with the intention of developing a SEMP. Finally, another five organizations, comprising an additional 7% of the region's beds, have interactions with the initiative, are aware of its benefits, and are contemplating development of a SEMP. (These three groups of healthcare organizations collectively comprise 44 hospitals and 39% of the region's beds.)

The Hospitals Initiative, specifically, and BetterBricks, more generally, have succeeded in developing tools and materials appropriate for hospitals implementing and developing SEMPs. The BetterBricks cross-cutting efforts of *Design & Construction* and *Building Operations* are also building skills in hospital consultants and contractors, which, in turn, are serving hospitals that have or are developing SEMPs.

At the same time, initiative experience indicates that the process of full SEMP implementation is more complicated than the basic program logic suggests. NEEA created its BetterBricks Initiative because it realized that business practice change is needed both in vertical markets (e.g., hospitals) and in cross-cutting markets (design & construction and building operations). The findings from hospitals engaged in SEMP implementation strongly support NEEA's position that neither the *demand-side* of the market for commercial energy use nor the *supply- side* of the market have the knowledge, tools, and capacity to achieve highly energy-efficient building

construction and operations. These market conditions continue to persist after the signing of SEMPs.

The Hospitals Initiative team's experience with hospitals reveals significant gaps in the initiative's knowledge and tool set for efficiently and fully implementing a SEMP. Shortfalls in the knowledge and tool set that the Hospital Initiative continues to face include such areas as easily-used tools for life-cycle cost analysis, integrated design, and enhanced O&M methods suitable for highly regulated hospital facilities.

In addition to gaps in the Hospital Initiative's knowledge and tool set, hospitals continue to have the obstacles of money and time, even when the hospital has signed a SEMP and staff are enthusiastic about it. The SEMPs have brought about significant change in the views of most interviewed hospital staff, but they cannot generate resources in a highly resource-constrained environment.

Because neither the initiative nor the market have yet to develop and offer the various tools and types of information needed, and because hospitals remain highly resource-constrained, it is essential that BetterBricks staff continue to work with organizations that have signed SEMPs. It is challenging enough for an organization to bring together the various people who influence a given process or decision (e.g., purchasing) and get them pulling in a consistent direction. The challenge becomes overwhelming if these people then need to themselves develop or find the necessary tools and consulting services, particularly given the lack of experience both they and the market have to draw upon.

All contacts, both within hospitals and within the Initiative, indicated the hospitals could not have developed SEMPS on their own or, had they tried, would have developed plans that would not have been nearly as comprehensive and which would have taken many times longer to complete. Contacts knew of no other organizations providing the services BetterBricks provides. Similarly, when asked to consider their next steps, hospital contacts thought their SEMP activities would be slowed and perhaps compromised without ongoing BetterBricks support.

It appears that BetterBricks will need to continue to devote substantial resources to the hospitals that already have already begun SEMP implementation – for at least one to two more years, if these SEMPs are to be fully implemented and achieve the goal of permanently changing business practices. This need will limit the number of new hospitals that the initiative will be able to support.

Another evaluation finding is that there is a clear opportunity for NEEA management to better inform its utility stakeholders about its market transformation philosophy, with examples provided from its work with hospitals and other targeted markets. Finally, the evaluation found some unclear, overlapping terminology in the building operations arena.

CONCLUSIONS AND RECOMMENDATIONS

Hospital organizations and staff have enthusiastically embraced SEMP as a much-needed set of tools that make a positive contribution to their financial and non-financial objectives and mission. Experience to date indicates it takes about two years for an organization to go from seriously entertaining the notion of SEMP development until the first energy savings begin to be achieved; the experiences and views of interviewed hospital contacts suggest it will take perhaps an additional three years after SEMP adoption to begin to fully realize potential energy savings through the development, dissemination, and adoption of practice changes throughout the organization. It is likely that resources such as BetterBricks has been providing will be needed throughout this period if permanent business practice change is to be achieved.

The Hospitals Initiative is on target to meet its 2010 objectives if it continues to support hospitals that have signed SEMPs with an initiative manager, market specialist, and technical advisor resources. We recommend the Hospitals Initiative continue to be supported by NEEA. BetterBricks needs to determine what actions it can take so that existing design, construction, and building operations firms in the market can meet the needs of hospitals implementing SEMPS, and add these actions to its logic model. BetterBricks should examine possibilities for deliberately transitioning hospitals to paying for market specialist-type services. In addition to these steps, the level of in-house BetterBricks staffing is insufficient for the Hospitals Initiative. The multiple responsibilities of the market manager require perhaps 1.5 to 2 FTE.

We recommend that NEEA complement the field activities of its market specialists and technical advisors by having its senior management meet with the efficiency staff and management of utilities involved in its Hospitals and other initiatives to present the market transformation and BetterBricks vision and methods, to provide examples from its hospital and other market activities, and to respond to questions and concerns.

Given the significant and likely ongoing investment BetterBricks has made in the hospital sector, and the very positive reception hospitals have had to its strategic, structured approach to energy management, we recommend BetterBricks consider parlaying this investment into other institutional energy users (such as colleges and universities).

On a more trivial note, we recommend that BetterBricks should standardize the terminology used in the building operations arena.

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.[1]

This third Market Progress Evaluation Report (MPER #3) documents the progress of the BetterBricks Hospitals & Healthcare Initiative (formerly High Performance Hospitals Program) between October 2006 and November 2007. The Hospitals Initiative, targeted to hospitals and hospital systems that have their headquarters in the region served by NEEA, is currently funded through 2009 as part of BetterBricks, NEEA's overall commercial sector initiative.[2]

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 & construction, and in building and facility operations. Create natural market demand for related trade ally products and services.[3]

The changes in business practices will result in facilities that achieve reductions in energy-related capital and operating costs. In addition, there are potential non-energy benefits, such as improved patient outcomes and medical staff retention for hospitals, and an alignment of design & construction projects with industry best practices.

The BetterBricks approach adds two components to local utilities' identification and funding of cost-effective energy efficiency measures:

1. In-depth relationship building at multiple levels and within multiple departments of the hospital
2. Products, tools, and services to support energy-efficient business decision-making and practices

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1 See the website at: *www.nwalliance.org*.

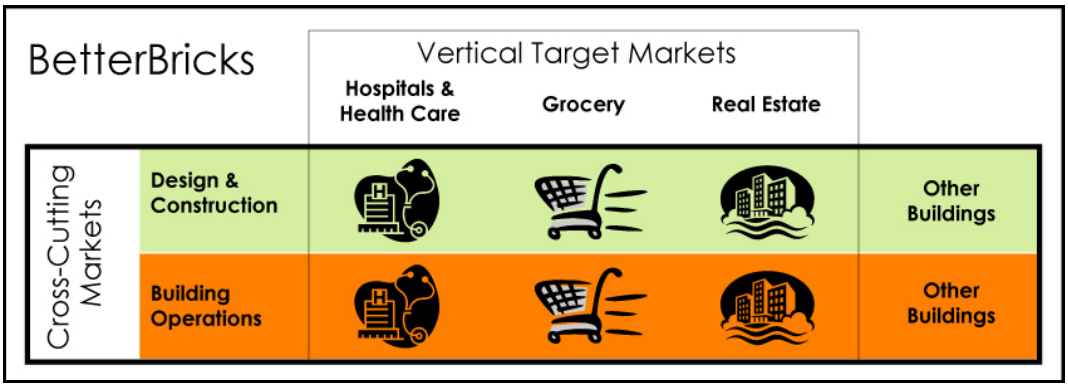
2 Northwest Energy Efficiency Alliance. 2006. *Commercial Sector Initiative 2006-2008 Project Description (July 5, 2005).* Portland, OR.: Northwest Energy Efficiency Alliance. See: *http://www.nwalliance.org/proposals/rfps/CSIProjectDescriptionForRFP.pdf.*

3 Op. Cit., p. 6.

Together with local utility incentives and project identification assistance, these provide a classic three-legged support system for energy efficiency.

BetterBricks currently addresses three "vertical" markets (*Hospitals & Healthcare*, *Grocery Stores*, and *Commercial Real Estate*) and two "cross-cutting" markets (*Design & Construction*, and *Building Operations*), as shown in Figure 1.1. In broad terms, the distinction is between companies and organizations that have a demand for services (vertical) and companies that supply services (cross-cutting) across vertical markets.

Figure 1.1: BetterBricks



HOSPITALS INITIATIVE DESCRIPTION

The BetterBricks Hospitals & Healthcare Initiative (Hospitals Initiative), approved by the NEEA Board of Directors in July 2005, works directly with hospital systems headquartered in the region and larger independent hospitals in the Pacific Northwest to change energy-related business practices.

The goal of the Hospitals Initiative is to transform the regional healthcare market so that hospitals and associated facilities are designed and operated according to best energy efficiency practices. In its first phase, the initiative is working with market leaders to validate the benefits of changing energy-related business practices and thus to create success stories that can then be used to influence the remaining market.

The initiative operates with a single program manager supported by four market specialist teams – consultants under contract to BetterBricks who work directly with hospitals to create organizational change for sustained energy efficiency. Oregon, Idaho, and Montana hospitals are each served by a single, locally-based market specialist; Washington hospitals are served by a team of three market specialists. There is also a team of specialty contractors that assists in developing tools, products, and materials for hospital and market specialist use. The market specialists work with targeted hospitals to develop and to implement a strategic energy management plan (SEMP), which is characterized by the following elements:

1. A business case for energy management that identifies the financial return and other related benefits – such as an improved healing and working environment – from long-term investments in energy savings (as suggested by benchmarking and walk-through or scoping studies)
2. A commitment to ensuring cost-effective energy efficiency through corporate policies that govern purchasing practices, design and construction practices, facility operations practices, equipment upgrades, and energy commodity management
3. Monitoring and tracking of progress toward goals

The market specialists typically initiate contact with a hospital staff member in the facility manager role. It is seldom a cold call; often they have met the facility manager (or even an executive) in prior market work or were invited by the utility representative to make contact. Although the market specialists typically are engaged primarily with the facility manager, they have learned how to get executive interest early in the process. Ideally, a team comes together within a hospital to develop a SEMP, with team members representing facility operations, design and construction, and hospital management or financial operations.

Once a SEMP is developed and signed by the chief executive officer (and sometimes by the board of directors or other executives or management groups), the market specialists assist in plan implementation. Typically, the first step is the creation of an action plan for facility operations and upgrades. Early experience suggests SEMP implementation requires even greater inter-departmental work by the market specialist than SEMP development. Changing business practices for purchasing and new construction involves complex technical issues, as well as complex organizational concerns.

The initiative manager and market specialists can draw on the expertise and services provided by the two BetterBricks cross-cutting market initiatives, Building Operations and Design & Construction. Parallel to the Hospitals Initiative structure, the teams for these cross-cutting initiatives include technical advisors who, when requested by the market specialists, provide support on: facility benchmarking; facility scoping and diagnostic studies; drafting of action plans; integrated design assistance; and so on.

In addition to technical advisors, the initiative is supported by the BetterBricks marketing team and the education and training (E&T) team. The marketing team's Hospitals Initiative activities fall into two main categories: developing materials for use by both market specialists and hospital staff; and disseminating success stories and lessons learned throughout the hospital market to speed market transformation. The BetterBricks E&T team develops curricula and delivers education and training to both technical and business-related audiences from hospitals and the facility design, construction, and operations professions who serve them.

THE VALUE PROPOSITION

The Hospitals Initiative developed a Value Proposition – summed up in the phrases "investments in energy efficiency are low-risk and high-return" and "dollar savings for energy cost reduction go directly to the bottom line." BetterBricks originally named the initiative the High Performance Hospital Program, but quickly learned the phrase *high performance* was already familiar to the market without any connotations for energy. BetterBricks now positions the initiative as helping executives think about energy management as a key part of a high performance facility, directly supporting common hospital goals of offering world-class patient care, a top-notch working environment, community and environmental leadership, and a healthy operating margin.

The market specialists further tailor the Value Proposition to individual hospitals. For example, in hospitals that have a 3% margin, the Value Proposition may say something to the effect that $50,000 in energy savings is equivalent to $1,500,000 in revenues. The Value Proposition points out that the energy savings can be used to support improved patient care or be reinvested to achieve even more energy savings.

Translating the Value Proposition concept to a specific organization, which occurs as part of SEMP development, requires technical expertise and an understanding of the savings potential of the facility. Energy goals and savings potential need to be established with the involvement of the facility management staff, so they agree that what is being claimed is feasible and beneficial. By integrating the Value Proposition, the savings goals, and a clear statement of management commitment, the door for management attention to facility operations and design concerns is opened. This does not guarantee the necessary resources will be provided, but the information for a fully-informed discussion will be available.

INITIATIVE THEORY

The four hypotheses and associated long-term goals, as laid out in the 2005 Commercial Sector Initiative (CSI) project description approved by the Board of Directors, are noted in Table 1.1.

Table 1.1: Hospitals Initiative Market-Transformation Hypotheses and Long-Term Goals

HYPOTHESIS	LONG-TERM GOALS
If hospital executives are aware of the benefits available through high energy efficiency, then they will request and support energy management plans and changes in energy-related business practices.	Hospital executives are aware of the benefits available through high energy efficiency and obtain these benefits by supporting changes in energy-related business practices.
If facility managers and others are aware of the benefits of pursuing energy management strategically and are provided with the tools and resources to develop, sell, and implement such plans, then they will do so.	Facility managers and others develop and implement strategic energy management plans that improve energy-related business practices. The development and implementation is viewed by they and their managers as an important part of their job responsibilities.
If facility managers, construction managers, and others request trade ally support to achieve energy efficiency in design & construction and facility operations, the trade allies will be willing and able to support these efforts.	The changes in energy-related business practices achieve energy efficiency in design & construction and facility operations, and trade allies promote and support high energy efficiency

The basic initiative logic, displayed in Table 1.2 for Phase I (2005-2010), assumes sustainable changes in business practices and policies (e.g., evaluating investments on life-cycle costs instead of first costs) will result in changes in energy usage. When implemented, these business practices and policies will incorporate energy-efficiency standards into hospital purchasing, management, operations, and design & construction policies. The full logic model is provided in Appendix C.

The Hospitals program manager developed the logic model. We offer here a few comments on it. One, the last two bullets under *Activities* ("SHEs and SHAs publicize…" and "BetterBricks gets other partner organizations to…") might more accurately be described as *Outcomes*. Two, the logic model does not address the role of existing building operations and construction design service providers in supporting hospitals and augmenting the activities provided by BetterBricks.

Table 1.2: Logic Model, Phase I, BetterBricks Hospitals & Healthcare Initiative[1]

PHASE I ACTIVITIES (2007-2009)	PHASE I OUTPUTS (BY END 2009)	PHASE I OUTCOMES – SHORT-TERM (BY 2010)
IN ORDER TO ADDRESS THE SITUATION WE WILL CONDUCT THE FOLLOWING ACTIVITIES	*WE EXPECT THAT IF COMPLETED OR UNDERWAY, THESE ACTIVITIES WILL PRODUCE THE FOLLOWING EVIDENCE*	*WE EXPECT THAT IF COMPLETED OR ONGOING THESE ACTIVITIES WILL LEAD TO THE FOLLOWING CHANGES BY 2010*
ACTIVITIES: Develop/test/ refine SEMP approach and resources: • Develop descriptions of SEMP approach & practices • Develop marketing content for SEMP • Develop tools, materials, education, and training to support development and implementation of SEMP • Test/refine the above with market specialists, target hospitals, and state hospital engineering (SHE) associations • Develop new BB website to house information, tools, materials on SEMP Work intensively one-on-one with target hospitals to develop and begin to implement SEMPs: • Market Specialists (MS) and utilities together select target hospitals and develop coordinated customer strategy • MS work intensively one-on-one with targets to develop and begin to implement SEMP • MS, BetterBricks technical advisors, and utilities provide coordinated support to hospitals on selected technical projects (e.g., new construction, upgrades) Develop strong working relationships with SHEs: • BetterBricks Market Manager and MS raise awareness of SEMP value • Hospitals targeted for SEMP communicate value to peers • BetterBricks offers SEMP-related tools, materials, education & training • SHEs provide opportunities to interact, present, and market	**OUTPUTS:** (1) Clear articulation of SEMP approach; (2) Effective marketing; and (3) Effective resources: • Clear *internal* materials on hospital initiative, SEMP approach and practices: (a) Initiative logic model, (b) SEMP Value Proposition, and (c) Description of BB support. • Marketing content and materials, refined based on market feedback: targeted messaging, presentations, brochures, success stories, articles, awards, etc. • SEMP tools/ materials, refined based on feedback (see website for example) • Education and training refined based on feedback. Topics include: - SEMP Overview - Benchmarking - Financial Analysis - Successfully Selling Efficiency - EM for Small Hospitals -TBD – integrated design and building opportunities • E&T outputs in terms of numbers and types of engagement TBD • New BetterBricks website, refined based on feedback Engagements with one to three large hospitals and systems in each state develop and begin to implement SEMP: • Written account plans by MSs documenting coordinated customer strategies • Letters of Engagement • Verbal communication & documentation by MSs (CTS and BetterBricks update) of sustainable practice change by target hospitals • Selected technical projects pursued by hospitals and supported by BetterBricks (e.g., new construction, upgrades)	**OUTCOMES:** BetterBricks can document market awareness of SEMP benefits among hospital decision-makers representing 75% of beds. Hospitals representing 25% or more of regional beds will be committed to and practicing SEMP elements:[2] • Financial decision-making is clear and uses total cost-of-ownership • Integrated design in new facilities and major renovations • Enhanced facility operations and maintenance practices • Consistent purchase of energy-efficient equipment • Cost-effective capital upgrades • Tracking & accountability Hospital decision-makers (DMs) representing 25% of beds request and/or require (e.g., through RFPs and contracts) trade allies to support SEMP practices as follows: • **Financial Decision-Making**: DMs request/ require that engineers and equipment vendors provide well documented energy and O&M cost data for financial analysis of energy investments • **Integrated Design**: DMs request/require that A&E teams are experienced in or willing to learn ID • **Enhanced O&M**: DMs request/ require that service providers are experienced in or willing to learn enhanced O&M • **Purchasing and Upgrades**: *See financial decision-making above* • Hospital decision-makers and their associations consider BetterBricks an excellent source of information and practical tools on energy-related business and technical practices

Continued

PHASE I ACTIVITIES (2007-2009)	PHASE I OUTPUTS (BY END 2009)	PHASE I OUTCOMES – SHORT-TERM (BY 2010)
IN ORDER TO ADDRESS THE SITUATION WE WILL CONDUCT THE FOLLOWING ACTIVITIES	*WE EXPECT THAT IF COMPLETED OR UNDERWAY, THESE ACTIVITIES WILL PRODUCE THE FOLLOWING EVIDENCE*	*WE EXPECT THAT IF COMPLETED OR ONGOING THESE ACTIVITIES WILL LEAD TO THE FOLLOWING CHANGES BY 2010*
Deliberately leverage successes and relationships: • Encourage target hospitals to share SEMP experiences with peers • BetterBricks publicizes through stories, articles, and awards • BetterBricks sponsors and presents at healthcare events • SHEs & SHAs publicize through websites and other communication channels • BetterBricks gets other partner organizations to carry SEMP content	Strong working relationships with SHEs evidenced by: • In each state, BetterBricks attends all SHE conferences and at least one chapter meeting to network; and periodically tables and sponsors depending on event theme(s) • In each state, SHE provides BetterBricks with opportunities to formally present in at least one SHE conference and one chapter meeting each year • SHEs with websites provide BetterBricks link and periodically post stories & articles (*for SHAs see section below*) Evidence of market leverage: • Hospital peer-to-peer conversations on SEMP • Regular appearance of content of success stories, articles, and award news in websites and other communication vehicles of SHEs, SHAs, and BetterBricks partner organizations • Sponsorship and presentations at least two healthcare events each year	

[1] From file: *NEEA FINAL Logic Model Healthcare – November 2007 v2.doc*, dated 11/30/07. Minor edits made by evaluation team for clarity. The abbreviation BB stands for BetterBricks. Percent of market penetration revised by NEEA in January 2008.

[2] *Committed* means the SEMP has top management support and resources have been committed to implement the plan. *Practicing* means the SEMP is being implemented, with corresponding changes in policies, practices, and energy use.

2 EVALUATION METHODOLOGY

This chapter briefly discusses the approach for the third market progress evaluation for the BetterBricks Hospitals Initiative. The first MPER covered the transition period from January 2004 to October 2005; the second MPER covered the period from October 2005 to September 2006; this third MPER covers the period from October 2006 to November 2007.

Table 2.1 shows the tasks included in MPER #3, along with those for the previous two and next MPERs.

Table 2.1: BetterBricks Hospitals Initiative Evaluation Tasks

COMPONENTS	MPER #1 JUN 2006	MPER #2 MAR 2007	MPER #3 Q1-2008	MPER #4 2009
Market Characterization		X	X	X
Assess Logic Model	X	X	X	X
Assess Market Progress	X	X	X	X
Assess Progress Toward Goals	X	X	X	X
Estimate/Validate Savings Impact			X	X
ACE Model Review			X	X

Table 2.2 shows the specific activities that have been or will be conducted and the data sources that have been or will be used for each MPER.

Table 2.2: Activities and Contacts for Hospitals Initiative MPERs

ACTIVITY	DATA SOURCES	MPER #1 JUN 2006	MPER #2 MAR 2007	MPER #3 Q1-2008	MPER #4 2009
Interviews	NEEA Staff	X	X	X	X
	Hospitals Market Specialists	X	X	X	X
	BetterBricks Technical Advisors		X		X
	Market Professionals		X		X
	Executives / Facility Managers of Hospitals Initiative Partners			X	X
	E&T Developers / Presenters		X		X
	Tools and Materials Developers		X	X	
	BetterBricks Marketing Contractor		X		
Surveys	Hospital Facility Managers	X		X	
	E&T Participants			X	
	Utilities			X	X
Document Review	Hospitals Initiative Documents	X	X	X	X
	Tools and Materials	X	X	X	X
	Marketing Materials		X	X	X
	Logic Models, Indicators	X	X	X	X
Literature Review	Hospital News/ Journals		X	X	X
Database Review	CTS (Commercial Tracking System, the BetterBricks Initiative tracking database), Hospitals Initiative Documents	X	X	X	X

INFORMATION SOURCES

Information and conclusions presented in the subsequent chapters are based on in-depth interviews, on surveys, and on a review of program documents and the program tracking database (CTS – Commercial Tracking System). Among BetterBricks staff, we interviewed the BetterBricks senior manager, the initiative market manager, the education & training and marketing leads, and the new construction and building operations market managers.

Table 2.3 shows the interviewed groups and the number of interviews or surveys conducted in each group.

Table 2.3: Summary of In-Depth Interviews and Surveys

INTERVIEWED GROUPS	METHOD	POPULATION	COMPLETED
BetterBricks – Staff	In-depth	6	6
Consultants – Hospitals Market Specialists[1]	In-depth	5	5
Consultants – Tools and Materials Development Specialists	In-depth	3	1
Hospitals with SEMPs – Executives, Managers, Lead Staff[2]	In-depth	33	21
Hospitals Developing SEMPS – Managers, Lead Staff[3]	In-depth	3	1
Non-Partnering Hospitals – Facility Managers[4]	Survey	232	52
Utilities of Partnering Hospitals – Staff[5]	Survey	80	39
E&T Hospital-Related Events – Hospital Staff Attendees[6]	Survey	32	16
E&T Hospital-Related Events – Non-Hospital Attendees (e.g., architects) [7]	Survey	121	19

[1] The population tally includes two market specialists from Washington and one from each of the other three states. The Washington market specialists are also assisted by a third consultant, who works a smaller amount of time on the initiative and was not interviewed for the current research.

[2] Seven hospital organizations, comprising 36 hospitals, have strategic energy management plans in place. The population size recorded here is the number of contacts at these hospitals with whom the market specialists have met, including executives, managers, and facility staff. The evaluation team interviewed executives only if they had worked extensively with market specialists. The evaluation team placed multiple calls to each contact requesting an interview; the final sample comprises all contacts granting interviews.

[3] Three hospitals are engaged with market specialists in the process of developing strategic energy management plans. The population size recorded here is the number of contacts at these hospitals with whom the market specialists are working closely. The evaluation team placed multiple calls to each contact requesting an interview; the final sample comprises all contacts granting interviews.

[4] A population list was purchased from InfoUSA. The population excludes hospitals with which the initiative is engaged in developing or supporting a SEMP. The completed sample provides a 90/10 confidence/precision.

[5] A list of utility staff was provided by NEEA. The completed sample provides a 90/10 confidence/precision. Only contacts reporting they worked with hospital customers were asked questions pertaining to the Hospitals Initiative.

[6] A list of hospital attendees of hospital-related E&T events was provided by NEEA. The evaluation team first fielded the survey via the Internet, notifying attendees of the survey by email. The team then placed multiple calls requesting participation in the survey to each contact not completing the survey via the Internet or for which the team lacked an email address. The final sample comprises all contacts willing to be interviewed.

[7] The source of the list and the methods used to collect the data were the same as for the hospital attendees. The sample size was designed to equal approximately the number of hospital respondents to facilitate a comparison of responses across the two groups. Taken together, the 35 completed interviews for E&T attendees (16 hospital and 19 non-hospital) provide confidence/precision in excess of 80/10.

3 MARKET CHARACTERIZATION

This chapter covers a brief overview of the regional hospital market, as well as a more detailed analysis of current market concerns. The findings were obtained from in-depth interviews, surveys, program documents, and reviews of journals and secondary information.

MARKET DESCRIPTION

The region's largest hospitals are the systems: Providence Health & Services (13% of regional beds), Legacy Health Systems (5%), Swedish (4%), PeaceHealth (3.5%), and Catholic Health Initiatives (3%).[4]

Table 3.1 and Table 3.2 present the total number of hospitals and hospital beds in the region, by state. In addition, the tables show the number of multi-hospital systems and the number of hospitals and beds comprising these systems.[5] For example, in Oregon more than half of the hospitals (32 of 60) are members of multi-hospital systems. These data were provided by the Hospitals Initiative manager and are current as of July 2005, the latest data available.

Table 3.1: Size of Hospital Market: Number of Hospitals

STATE	ALL HOSPITALS	HOSPITAL SYSTEMS			COMMUNITY HOSPITALS: 300 BEDS OR MORE		COMMUNITY HOSPITALS: UNDER 300 BEDS	
		NUMBER OF SYSTEMS	NUMBER OF HOSPITALS	PERCENT OF HOSPITALS	NUMBER OF HOSPITALS	PERCENT OF HOSPITALS	NUMBER OF HOSPITALS	PERCENT OF HOSPITALS
OR	60	10	32	53%	2	3%	26	43%
WA	106	18	38	36%	5	5%	63	59%
ID	40	6	7	18%	2	5%	31	80%
MT	68	6	14	21%	1	1%	53	78%
Region	**274**	**33***	**91**	**33%**	**9**	**3%**	**174**	**64%**

* Six systems cross state lines. Region total less than the sum of the states reflects subtractions made to avoid double-counting.

[4] These percentages differ from those identified in MPER #2. For MPER #3, the percentages were recalculated from the initiative market manager's raw data on hospital beds.

[5] These two tables also appeared in MPER #2. The numbers were rechecked for MPER #3, and a change was made to re-categorize one Idaho hospital to the category of 300 or more beds from the category of less than 300 beds.

Table 3.2: Size of Hospital Market: Number of Beds

STATE	ALL BEDS	HOSPITAL SYSTEMS		COMMUNITY HOSPITALS: 300 BEDS OR MORE		COMMUNITY HOSPITALS: UNDER 300 BEDS	
		NUMBER OF BEDS	PERCENT OF BEDS	NUMBER OF BEDS	PERCENT OF BEDS	NUMBER OF BEDS	PERCENT OF BEDS
OR	8,010	5,345	67%	782	10%	1,883	24%
WA	15,316	7,915	52%	1,948	13%	5,453	36%
ID	3,123	1,210	39%	764	24%	1,149	37%
MT	3,733	1,646	44%	356	10%	1,731	46%
Region	**30,182**	**16,116**	**53%**	**3,495**	**12%**	**10,571**	**35%**

Table 3.3 provides information on hospital revenues and numbers of employees, based on information purchased from *InfoUSA* and reported by hospital contacts.[6] Because the hospitals with which BetterBricks has directly worked are considerably larger on average than those with which it has not directly worked, the table distinguishes between these two groups.

Table 3.3: Size of Hospital Market: Revenues and Employees

DEMOGRAPHIC	HOSPITALS WITH WHOM BETTERBRICKS HAS WORKED (N=36)[1]	REMAINING HOSPITALS (N=238)[2]
Revenue – Median	$84.8M	$26.5M
Revenue – Average	$164M	$66.4M
Number of Employees – Median	800	250
Number of Employees – Average	1,535	623

[1] While BetterBricks has worked with 36 of the hospitals on the population list provided by *InfoUSA,* these data are based on 33 hospitals that provided these data.

[2] Averages based on 236 that provided these data of 238 remaining hospitals.

[6] Appendix A provides additional information on the purchased *InfoUSA* list and the organizations it comprises.

MARKET CONCERNS

Hospitals are facing enormous financial pressures from many interrelated factors. Not only are the financial pressures high, the underlying trends are escalating in their rate of change, compounding the difficulties from year to year.

The industry trends noted in MPER #2 continue. The following list summarizes those trends to provide a broad context for understanding the hospital market and adds commentary (via footnotes) from the current research.[7] Following, we augment the broad context provided by the list with an analysis of additional market concerns identified by the current research.

- Technical advances are occurring with increasing rapidity, increasing the speed at which facilities and equipment become obsolete, increasing the complexity, cost, and risk of large capital investments.[8]
- Insurance reimbursements for non-specialty areas are lower than hospitals' costs and are still falling.
- All hospitals with emergency facilities (as well as many not-for-profit hospitals, as consistent with their charter) are required to serve the uninsured, even if the patients are unable to pay, and increasing numbers of uninsured are turning to hospitals for care.[9]
- Demand for hospital services is increasing due to the aging of the population, as the elderly per capita consumption of healthcare greatly exceeds those of other demographic groups; thus, most hospitals are engaged in new construction or major renovation projects.[10]
- Hospitals' market share of specialty areas, such as orthopedic surgery, are falling as physicians form private practices to reap the more generous insurance reimbursements these areas offer, yet hospitals continue to incur the high costs of these practice areas.

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7 Appendix D provides the complete discussion provided in MPER #2.

8 American Institute of Architects (AIA), Seattle chapter, Medical Design Forum 2007 addressed this issue, as did the comments of several contacts.

9 In a discussion of a bill that would extend health insurance coverage to the working poor that lack health insurance, the *New York Times* reported President George W. Bush as saying, "I mean, people have access to health care in America. After all, you just go to an emergency room." (Quotation restated by Paul Krugman in an Op-Ed column appearing in the *New York Times*, July 16, 2007.)

10 This topic is further elaborated in the body of the text that follows this list.

- To garner market share as a means of increasing revenues, competition among hospitals is intensifying.[11]
- Insurance costs (malpractice and liability) are rising at ever-increasing rates.
- Staff recruitment is increasingly difficult, as there are national shortages of doctors and nurses. There is also a dearth of volunteers.[12]
- Most nonprofit hospitals were established and have been run by religious orders, which themselves are attracting few novitiates; thus, these hospitals are grappling with fundamental issues of organization and vision.[13]

Findings from the current research (in-depth interviews, surveys, and review of periodicals and other secondary information) amplify items of concern to hospital staff.

- **Staff recruitment and retention, especially among facility managers.** While shortages and retention issues for doctors and nurses have long been recognized, one of the most commonly mentioned issues was the difficulty in recruiting facility managers and the impending retirement of much of the facility manager workforce. The job of facility management is increasingly complex, spanning many activities and complex technologies, and facing complex and extensive regulatory requirements. Often, the pay and internal recognition of the value of the job are relatively low, and hospital financial pressures squeeze O&M salaries and reduce workforce sizes. Even among contacts who believe their organization pays a competitive wage, O&M jobs are going unfilled, as reported to the evaluation team by facility managers at several hospitals implementing or developing SEMPs.
- **"Money, money, money."** Revenues barely cover costs, as both are to a large part driven by factors outside of the hospitals' control due to insurance reimbursements and regulatory requirements. Low profit margins result in intense competition within the organization for funds for investment, operations, and staffing, and require vigilant staff prioritization of their responsibilities and tasks. Many contacts mentioned the burden of having too many priorities.
- **Quality of care and patient safety.** No matter the position held by a hospital employee, providing the conditions that support high quality care and ensure patient safety is everyone's responsibility. [14]

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11 Current research regarding market specialists' activities with hospitals suggests a concern about sharing the details of their SEMPS, in part due to competitive concerns.

12 This topic is further elaborated in the body of the text that follows this list.

13 Three of the seven hospital organizations that have signed SEMPs have religious affiliations.

- **Aging facilities and equipment.** Facilities and equipment are often out-of-date, requiring extra staff resources to maintain. Facilities that are decades old, of which there are many, may be so obsolete they are difficult to upgrade to accommodate new technologies.
- **Expanding facility capacity with new construction projects.** Existing facilities are constantly being remodeled and expanded, and new facilities are being built. Research conducted for the current MPER found most of the organizations involved with SEMP to have construction projects underway. Of those organizations not directly working with BetterBricks, our survey of facility managers found 85% of contacts reported new construction was either planned or underway. (See Appendix B for full results.)
- **Regulatory compliance and emergency preparedness.** Regulation and litigation occupy significant resources and limit the expression and adoption of new ideas. Regulatory and accrediting organizations come unannounced; the hospital must always be ready. Some contacts reported a lack of clarity in the codes and lack of agreement as to how they will be enforced. Emergency preparedness is the current pressing regulatory issue.[15]

Finally, the areas of responsibility for facility directors provide indicators of the issues that concern them, as well as illuminate the context in which the above concerns play out on the job. The current research identified the following responsibilities held by facility directors implementing or developing SEMPS:

- Compliance with regulatory and accrediting agencies
- Facility and physical plant operations and maintenance
- New construction and real estate development (planning, design, construction)
- Clinical engineering, maintaining bio-medical equipment
- Safety and security
- Telecommunications
- Energy, water, and waste management

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[14] A hospital's worst nightmare made front-page news for one of the hospitals implementing a SEMP. Headlines read "Patient dies after being restrained" and "Feds: [Hospital named] doesn't meet safety rules; probe continues." *Portland Tribune*, December 4, 2007.

[15] Emergency preparedness was mentioned by numerous hospital contacts. In addition, the topic was addressed in the September 2007 annual conference of the Washington State Society of Healthcare Engineering and the Seattle chapter of the AIA's Medical Design Forum in 2006.

- Transport
- Emergency preparedness
- Housekeeping
- Food and nutrition services (in smaller hospitals)
- Resource purchasing, materials management, supply chain (may be at a higher level than facility director)
- Staff management

4 HOSPITALS INITIATIVE ACTIVITIES

This chapter describes Hospitals Initiative activities. It summarizes the BetterBricks market manager and market specialists' key activities with hospitals, as well as the education and training activities and market activities supporting the Hospitals Initiative for the current period.

The chapter also discusses initiative activities internal to the hospitals. It integrates the findings from the in-depth interviews with staff of hospitals implementing SEMPs and with the BetterBricks team to provide a picture of the initiative's accomplishments to date and its challenges as it seeks to transform hospital business practices.

MARKET MANAGER, MARKET SPECIALIST, AND TECHNICAL ADVISOR ACTIVITIES

During the period covered by this report, the Hospitals Initiative market manager and market specialists worked with seven hospitals/hospital systems that have signed strategic energy management plans and begun plan implementation – Providence Health & Services, PeaceHealth, Legacy Health Systems, Kalispell Regional Medical Center, Willamette Falls Hospital, Saint Alphonsus, and St. Luke's Health System. The team has also worked with three hospitals/hospital systems that are engaged in developing SEMPs – Billings Clinic, University of Washington Medical Center, and Swedish Hospital. Finally, the team has had some discussions with staff at five hospitals/hospital systems that are becoming increasingly aware of the benefits of energy-efficient business practices and are contemplating SEMP development.

During the evaluation period, the hospitals team has engaged in the entire gamut of activities that comprise the Hospitals Initiative. Irrespective of where a hospital may be relative to a SEMP and business practice change, market specialists spend time forming and strengthening relationships with and among hospital staff in varying positions (facility management, new construction, finance, executive functions). Strengthening inter-departmental relationships within a hospital is central to business practice change; a SEMP elevates the concerns of facility management (of existing and to-be-built facilities) so when they are performing the other management activities that impact energy consumption (i.e., new construction, purchasing), they can more fully weigh energy costs in their decision-making.

Market specialists have assisted in SEMP development. At least three tasks are central to the development of a SEMP, and possibly more at any given hospital. These are:

1. **Conducting an organizational assessment to determine current practices and activities that have bearing on energy consumption** (e.g., purchasing). The market

specialist typically leads the assessment process, working with a cross-departmental team within the hospital.

2. **Conducting facility benchmarking and walk-through/scoping studies** to give the facility manager confidence that a specific goal for facility energy use reduction (e.g., 15%) is achievable. A BetterBricks technical advisor typically assists with or conducts this activity (coordinated by the market specialist). Some hospital facility managers have undertaken the benchmarking studies or hospital systems have paid for technical studies of facilities on their own after BetterBricks has conducted studies of one or more other hospitals in their system.

3. **Determining goals for the SEMP**, in terms of practices to be followed, energy savings goals, investments to be made, and a time period for the plan. The market specialist facilitates this process. The exact elements of a SEMP differ across the hospitals and reflect the hospital staffs' assessment of their capacity to change and the rate at which change can occur.

The market specialists assist internal staff on tasks such as identifying who should be at meetings, setting the agenda (includes moving the discussion along), summarizing progress and task assignments, checking that tasks are done, writing draft pieces (e.g., SEMPs, purchasing policies, RFP language), motivating, encouraging, and convening meetings. In most organizations, no one has ever done such strategic planning or orderly implementation of energy management, so it is daunting for someone within the organization to try to do it. When the market specialists have good relationships and full buy-in for their activities, their detailed support is effective. Of course, the market specialists have learned from experience that it is possible to give too much help, with the result that the organization remains passive and doesn't move to behavioral change.

Market specialists have assisted in all activities covered by SEMPs. Sometimes the activities start in advance of the formulation or signing of the SEMP, as facility managers or construction managers seize opportunities that present themselves, such as influencing a new construction project or specifying a major equipment system.

Once a SEMP is signed, a common first step is for a BetterBricks technical advisor to conduct a more detailed assessment of equipment tune-up and retrofit opportunities, and to propose an action plan that prioritizes and stages the activities.

Both during SEMP development and SEMP implementation, market specialists assist the hospital staff as requested to reduce apparent barriers. For example, the market specialists might locate information or resources, bring in a BetterBricks technical advisor or one of the BetterBricks design labs, meet as requested with contractors or consultants to the hospital, meet with executives or managers outside of the facilities/new construction group, review purchasing

specifications, conduct or assist with life-cycle cost analyses, and assist in the development of RFPs/RFQs.[16]

The market specialists also work closely with the hospitals' utilities and public benefits agencies. Some hospital systems may be served by four or more utilities or energy agencies. Market specialists keep the utility representatives apprised of developments with the hospital and invite them to meetings and facility studies conducted by the technical advisors. Market specialists try to keep up-to-date with the utilities' incentive programs, encourage the hospitals to seek incentives for qualifying installations, and encourage the utilities to be active in serving the hospitals' needs. Market specialists reported some instances of significant strengthening of the hospital/utility (or energy agency) relationship in the past year. They also report they are sometimes in the position of defending NEEA's market transformation mission to utility staff, which they find awkward as they are a contractor to NEEA and a staff person. They perceive that NEEA's relationship with its client utilities is weaker than it might be.

Finally, the market specialists participate in meetings of each state's Society of Healthcare Engineering (referred to cryptically as *SHEs*), staff booths at the SHE meetings, propose workshops and presentations, and deliver workshops and presentations, or coordinate delivery by other members of the BetterBricks team. They have attended meetings of each state's hospital associations (referred to as *SHAs*), yet for the most part, the SHAs have not been receptive to their offers to provide structured education and information to the SHA membership.

Every hospital differs in its capabilities and the BetterBricks team provides the services needed by a given organization and facility. The technical advisors also tailor their services to the needs of each hospital. For example, for one hospital with few staff but strong relationships with service providers, the technical advisor is leading a team of consulting engineers and contractors to increase their skills in identifying energy efficiency opportunities. At another hospital, the technical advisor is providing more direct technical assistance to "kick start things" while the team seeks to identify local service providers with whom it might work.

The BetterBricks Building Operating Performance (BOP) team is working with targeted service providers to hospitals in much the same intensive way that the Hospitals Initiative team is working with targeted hospitals. Through their activities, the BOP team touches the hospital sector in three ways: working with targeted service providers that are working with targeted hospitals, working with targeted service providers that are working with non-targeted hospitals, and working as the opportunity arises with the non-targeted service providers of targeted hospitals.

[16] Requests for Proposals and Requests for Qualifications, such as are used to select contractors. BetterBricks design lab staff have assisted in the development of RFPs/RFQs for design teams.

In terms of design & construction, most of the BetterBricks integrated design labs have one or two hospitals or healthcare clients. As with the other initiatives, the hospital's design & construction team works intensively with architects the team has targeted. Thus, new construction efforts through the design labs and the targeted architects serve hospitals working directly with, and hospitals not working directly with, the Hospitals Initiative. In one case a firm-focus architectural firm is working with a hospital that is considering developing a SEMP. New construction efforts have influenced the specifications (RFPs/RFQs) used by two hospitals to solicit design services. Energy design charrettes, led by the BetterBricks integrated design labs, and other design lab technical expertise, have significantly influenced hospital new construction projects undertaken by two hospitals with SEMPs.

EDUCATION & TRAINING ACTIVITIES

The BetterBricks education and training (E&T) team has developed at least 15 workshops and webinars for the Hospitals Initiative. According to the CTS, BetterBricks successfully conducted seven workshops during the evaluation period that were attended by 239 people. Of the 239 attendees, 47 were hospital staff, 142 were staff of design & construction firms or equipment sales and servicing firms, and the remaining 50 attendees were from utilities, non-profits, BetterBricks, and others.[17] One of the successful workshops was held on-site at a hospital engaged in a SEMP, to train the staff in concepts and methods promoted by the initiative.

The workshops have been held in each of the four states, and include such topics as *Financial Decision-Making Tools for Hospitals, Lighting for Healthcare Facilities*, and *Successfully Selling Energy Efficiency: Strategic vs. Tactical Approaches.* In addition, the E&T team developed a complete multi-module training on how to develop a SEMP.

To the disappointment of E&T and Hospitals Initiative staff, many of the workshops and training curricula developed for the State Societies of Healthcare Engineering (including the curriculum on SEMP development) have not attracted audiences. One market specialist reported being told by the state's society that BetterBricks would have "one year" to educate its membership about energy efficiency and, after that time, the group's interest would turn to other topics. The market specialist continued, "That was in 2006, and he was right. Everything we've proposed in 2007 has been turned down."

Ongoing education for hospitals includes Building Operator Certification (BOC), to which several hospital contacts referred. BetterBricks currently makes some scholarships available to

[17] See Appendix B for a fuller discussion. The reader is cautioned that this paragraph refers to E&T activities in the evaluation period, while Appendix B includes E&T hospital activities for the entire 2006-2007 period, which includes an eighth workshop not referenced here. That workshop was *High Performance Building through Integrated Design*, conducted in June 2006.

hospital staff seeking BOC training. Currently, a BOC Level I series specially tailored to hospitals is being offered to staff at one hospital campus; enrollment is open to others as well.

TOOLS AND MATERIALS DEVELOPMENT

The Hospitals Initiative Manager has devoted a great deal of effort to the development of tools and materials to support the market specialists, and the hospitals engaged in developing and implementing SEMPs. The BetterBricks website provides links to tools and materials in the public domain – those developed by BetterBricks and by others. It currently has links to nearly 20 hospital tools and materials, organized into the following topics: *Benchmarking and Assessment*; *Developing & Selling an Energy Management Plan*; *Energy-Efficient Purchasing*; *Life-Cycle Cost*; and *Design & Construction*. Tools and materials are under development for a section entitled *Building Operations*.

The initiative manager has been assisted in the development of tools and materials by a team of contractors, by the market specialists, and by the BetterBricks Design & Construction market manager. As tools and materials are developed by the BetterBricks team for a specific hospital facing a need, these resources are generalized for use by other hospitals and posted on the website. For example, the website includes a sample energy design charrette agenda and a sample RFP for hospital design services.

The initiative manager had hoped other groups within BetterBricks, such as the marketing team, would be able to take the lead in tool and materials development. However, it is now apparent that only the hospitals team has the expertise and market intelligence to produce most of what is needed.

Two of the singularly most important hospital documents produced by BetterBricks are the *Guide to the Design & Construction of High Performance Hospitals* (the development of which was led by the Design & Construction manager), and the *Guide to Optimizing Hospital Facility Investments.* Although these guides were finalized in the period covered by the previous MPER, they continue to be cornerstone documents.

The Hospitals Initiative team has developed its tools and materials with the intention of empowering facility staff, who work with both existing and new construction, to advocate successfully with their management for high efficiency. They help facility staff articulate the benefits to the entire organization – to the hospital's bottom line, to patient welfare, staff retention, and so on – of energy efficiency in general, as well as of specific energy efficiency investments and activities.

Finally, the BetterBricks team seizes educational opportunities as they arise. For example, the American Institute of Architects' Seattle chapter's *2007 Medical Forum* included a presentation on *Leadership in Energy and Environmental Design* (LEED) and the *Green Guide for Health Care*, for which the director of a BetterBricks integrated design lab was a panelist.

Among the BetterBricks tools, the evaluation team identified one area in which the terminology could be improved, namely the terms used for the various types of facility studies. The studies are distinguished by their level of rigor and a variety of terms are in use, including *walk-through study*, *scoping study*, *facility study*, *tune-up study*, and *retro-commissioning study*. One hospital facility manager expressed confusion (although not distress) regarding *tune-ups* and *retro-commissioning*; the BetterBricks building operations market manager used terminology for the various types of facility studies that was not used by the hospitals team; and the evaluation team encountered difficulty in interpreting hospital team documents that used a variety of terms for *studies* and *activities*.

MARKETING ACTIVITIES

Marketing plans have focused on preparing success stories for publication in trade press outlets and as case studies on the BetterBricks website. The website includes four case studies of hospitals that have developed SEMPs, five case studies of hospitals with energy-efficient new facilities, five case studies of hospitals with efficient operations, and links to several articles addressing the benefits of high-efficiency hospital facilities.

Among the marketing activities that support the Hospitals Initiative are the *BetterBricks Awards*, which honor leaders in energy-efficient design and building operation. In 2007, a hospital regional chief executive officer who had spearheaded the development of a SEMP for her hospital system received publicity (including an article in the *Business Journal*) as a finalist in the owner/decision-maker category of the *BetterBricks Awards*.

The marketing team issued a press release of a study of daylighting hospital patient rooms conducted by the Energy Studies in Buildings Laboratory, one of the BetterBricks design labs, in collaboration with a targeted architectural firm that is working closely with BetterBricks' Design & Construction Initiative.

In the coming year, the marketing manager hopes to contribute to the development of a clear public relations plan for the hospital target market, including hospital executives, and generating a "buzz" that leads people to the website.

SEMP ACTIVITIES INTERNAL TO HOSPITALS

This section discusses SEMP activities internal to hospitals, as these actions, too, are part of the Hospitals Initiative's activity during the evaluation period. The findings in this section draw heavily on the comments made by hospital staff implementing or developing SEMPs in the course of 22 in-depth interviews. These findings are augmented by information obtained from the market specialists, the initiative manager, and other contacts.

We organize the discussion according to the SEMP development and implementation processes; the topics roughly parallel the market progress indicators, an assessment of which is given in Chapter 7, and the logic model outcomes (given in Table 1.2). Within each topic area, we

provide a summary of the pertinent hospital activities during the period, identifying successes attained and challenges remaining.

SEMP Value Proposition

As reported in Chapter 1, seven healthcare organizations, comprising 36 hospitals, have signed SEMPs and another three organizations are developing SEMPs, indicating they believe its value proposition. The organizations with signed SEMPs recognize investments in energy efficiency will benefit the bottom-line; most SEMPs state the organization will invest in energy efficiency projects that pass an internal rate-of-return (IRR) hurdle of about 10% to 20%.

Interviewed senior managers, executives, and facility managers perceive that their organizations now understand how energy management can directly support hospital goals of excellent patient care, excellent working environment, community and environmental leadership, and an improved operating margin.

The previous initiative MPERs reported the hospitals team envisioned the SEMP would provide facility managers with a "language" for presenting to management the case for improved facility operations, design, and equipment. Interviews with facility managers and executives at hospitals implementing SEMPs confirm this key benefit of the SEMP. Although non-energy benefits are included in the full Value Proposition (such as recognizing the contribution of energy management to hospitals' missions of stewardship and community health), it is this monetization of savings that bridges the knowledge divide between facility staff and corporate financial management, enabling facility managers to communicate effectively with executives about the benefits of improving energy efficiency.

Hospital staff and market specialists suggest the Value Proposition should not be limited just to energy. It is becoming apparent that because of the organizational resources and commitment necessary, it may be important for hospitals also to consider water, reduction of waste stream from operations and new construction, sustainability generally, and efficient processes for capital projects (avoiding costly change orders). One hospital recognized the benefit of the SEMP approach and extended it to all its natural resource uses, developing what it affectionately calls its *shrimp* – a Strategic Resource Management Plan (SRMP).

SEMP Value

In addition to providing hospital staff with a "language" that bridges the knowledge divide between departments, a key value of the SEMP, according to interviewed hospital staff, is that it provides the organization with a road map, a plan, an orderly process. The SEMP is necessarily broad in scope, and the Hospitals Initiative is necessarily ambitious, because there are so many decision-makers within an organization whose decisions and actions affect hospital energy use. Interviewed staff reported the very complexity of the objective would be daunting in the absence

of the structured, comprehensive, and orderly approach – with tasks and timelines – that the SEMP and SEMP implementation provide.

One executive in a hospital system offered the following assessment of the SEMP value:

- *"It's so much more valuable to have a system approach than the individual hospitals approaching energy efficiency with this or that project. And the SEMP looks much more deeply than the project approach. Each of our hospitals has a different utility, which makes the project approach even more piece-meal. The SEMP includes things we didn't think of, like purchasing and training. We didn't know what we didn't know!"*

While having a SEMP in place thus provides enormous benefits, according to hospital staff, it comes at a not-insignificant price: it takes a lot of time, from a number of people, to develop. Many contacts mentioned this but concluded "it's worth it"; even a facility director who characterized himself as less enthusiastic and focused on SEMP implementation than his peers at the system's other hospitals concurred: "Sometimes you think 'Holy Cow! One more thing!' But this is worth the effort."

Organizational Commitment to SEMP

Organizational commitment to the SEMP entails many components: executive commitment, commitment of staff time, commitment of money, and commitment to an energy savings objective. The seven organizations with SEMPs have committed to energy savings of 10% ("at a minimum," according to staff) to 30% of current baseline over periods of three to five years.

The organizations' senior system managements and boards of directors have committed to system-wide SEMPs. Typically, the senior executives of each region and each hospital have also committed to the system-wide SEMP, although this statement is not true for most of the hospitals and regions of the most complex organization among the seven. In some cases, regions within a hospital system have developed their own SEMP. Virtually all hospitals, again with the exception of those in the most complex system, have developed or have concrete plans and schedules to develop action plans for SEMP implementation.

All of the organizations have committed staff time, both in the formulation and in the implementation of the SEMP. Two large systems have created one or more positions at the executive level to facilitate SEMP implementation and every organization except two of the smallest have at least one Resource Conservation Manager working at a facility; these positions have been added in response to the SEMPs. Contacts at two of these hospitals reported they had previously tried unsuccessfully to have an energy resource manager on staff, yet the funding for the positions had not been approved. For most of the systems, every hospital has an individual who is charged with implementing the SEMP.

All of the organizations have committed money to the energy efficiency activities of the SEMP. In most cases, the SEMP itself calls out a level of investment to be made. One hospital system

that is moving rapidly with SEMP implementation has spent $300,000 on scoping studies for all of its hospitals and medical office buildings, and has committed $400,000 – based on the scoping studies' recommendations – to be used for direct digital controls, lighting upgrades, and air system improvements.

Contacts agree their hospitals' managements are definitely committed to energy efficiency and to investing the resources required. All contacts also agree the SEMP does *not* take precedence over other organizational commitments and goals, but rather takes its place alongside them, competing for time and money with everything else. SEMP "levels the playing field" with other investments and activities, as the BetterBricks team envisions, but contacts reminded the evaluation team that the availability of money and time will continue to challenge SEMP implementation, and may delay attainment of its goals.

One hospital already provides a case in point; staff received only one-half of the funding they had wanted this year. Yet contacts foresee this setback will only result in making their action plan a four-year, rather than a three-year plan. Even with the scaled-back funding, the contact indicated that one million dollars had been approved. All contacts emphatically agree the SEMP has made it much easier to move ahead with energy efficiency investments.

Financial Practices

The SEMPs commit hospitals to evaluating energy management investments from a total cost-of-ownership (or life-cycle cost) perspective. Few organizations had made uniform progress on this measure. To date, life-cycle-cost analysis has been used by some hospitals for some new construction projects and for some large equipment system purchases. Some hospitals are exploring their options for cost-analysis software. Contacts indicated this practice is still a work in progress. No hospital organization has adopted a single, uniform approach that clearly spells out the methods and assumptions to be used, and the types of investments to which life-cycle-cost analysis will be applied.

Contacts were not pressed by the evaluation team for details on the barriers to progress, yet the Hospitals Initiative team indicates the issue of life-cycle-cost analysis is quite complex. To date, the team has found only a few good software tools, yet they can be complex to use, and specifying the hospital-specific and investment-specific inputs to the tools is challenging.

Purchasing

The practice of energy-efficient purchasing of equipment and services has a number of facets, of which the appropriate use of life-cycle-cost analysis is but one. Hospitals with SEMP are in the process of establishing energy efficiency specifications for group purchasing contracts, routine equipment purchases, custom equipment purchases, O&M services, and design & construction services. Some hospitals have already adopted ENERGY STAR® language for their purchase

specifications. Some contacts reported their vendors and consultants are already "on board" and bring efficiency opportunities to the hospital for consideration.

Some contacts believe changing purchasing practices will be fairly easy, while others view such change as complex, with some contacts noting that desires for regional autonomy within some organizations will lengthen the amount of time it takes to bring this about.

Efficient New Construction

The hospital organizations with SEMPs vary widely in their approach to and progress on high efficiency construction practices. Several of the independent hospitals and small systems have fully embraced high efficiency construction achieved through the integrated design approach being promoted by BetterBricks; some of these hospitals jumped on this facet of SEMP when it was first proposed and immediately applied it to their new construction activities in advance of full SEMP development and approval. These hospitals now are experienced with high efficiency design and reported that their organizations are "never going back" to the old ways of construction.

Some hospitals within large hospital systems have embraced high efficiency design and included efficient design requirements in their solicitations for architectural services.

As reported elsewhere in this document, virtually all hospitals (SEMP and non-SEMP alike) are engaged in or planning for new construction. A lot of this new construction is major renovation of existing facilities. Among SEMP hospitals, most are specifying that the equipment and equipment systems for these facility upgrades be energy-efficient.

More broadly, however, contacts most often think new construction practices will be difficult to change. Often, the new construction manager is the executive with the least commitment to the SEMP in the organization. The job of a construction manager is demanding, with the mandate to bring a facility in "on time and on budget." Successful construction managers have been meeting this mandate for years through strict adherence to a management approach forged over 20-year or longer careers. Innovation is perceived as bringing risk and senior management, while committed to SEMP, is concerned that new approaches might upset the apple cart and force change on a heretofore successful performer.

A further complicating factor is that of regional autonomy, mentioned for purchasing; prior to SEMP, it was typically the case that every construction manager in an organization had the autonomy to build as he or she saw fit.

Finally, the BetterBricks team is in a delicate position in the arena of new construction, as it must influence a design process that is led by a consultant to the hospital organization – the architect or design team – who in turn must maintain control of the project and maintain its position as the expert.

While these factors indeed make changing new construction practices difficult for most hospital organizations, as stated, some hospitals have fully embraced high efficiency new construction through integrated design. Several hospitals have sought BetterBricks integrated design lab assistance on technical matters and in selecting design teams. And the BetterBricks cross-cutting Design & Construction Initiative is directly working with five firms that represent over 50% of the healthcare market.[18] So, in some cases, the design team is already committed to energy-efficient design practices.

Efficient Building Operations and Facility Upgrades

SEMP hospitals are engaged in efficient building operations and facility upgrades, more so than for any other SEMP implementation activities. Contacts have developed or are developing action plans for their facilities. Often these action plans have resulted from "tune-up diagnostic studies" conducted by BetterBricks contractors to: identify systems that need enhanced tune-up and O&M activities; identify equipment that should be replaced; estimate costs; and set priorities. Other contacts reported plans for diagnostic studies are to be completed in 2008.

Action plans typically have three components: (1) conducting tune-ups and instituting enhanced O&M practices; (2) upgrading (replacing) inefficient equipment; and (3) staff training. For many hospitals, O&M staff are attending the BOC trainings. Hospitals have been allocating funds for equipment upgrades, setting priorities, seeking utility/ energy agency incentives, and purchasing and installing efficient equipment. Similarly, hospitals have allocated funds and set priorities for tune-ups of major equipment systems (also called *system retro-commissioning*).

In our in-depth interviews with facility directors, we found only two hospitals that were not embarking on building operations improvements. The staff at one of these hospitals have been fully engaged with a major construction project. While they have included efficiency features in that project, they have not yet devoted their attention to existing facility operations. Yet, they support the SEMP and will do so when the construction project is further along. We also found limited engagement in building operations improvement at a small hospital that is part of a large system. The facility director there did not find the SEMP helpful or relevant: "I've already done the easy stuff, and there is no money for major upgrades. Perhaps I'm missing something that [the market specialist] could help me to see."

These two stories illustrate the recurring theme that money and time continue to be obstacles, even when the hospital has signed a SEMP and staff are enthusiastic about it. The SEMPs have

[18] This statistic of 50% was provided to the evaluation team by the Design & Construction Initiative manager.

brought about significant change in the views of most interviewed hospital staff, but they cannot generate resources in a highly resource-constrained environment.[19]

Another lesson is worth noting here. The BOP technical advisors working with hospitals need fully to understand hospitals and the characteristics that make them different from other commercial spaces. One hospital had a negative experience with a technical advisor who gave "bad" advice – advice to take an action prohibited by the stringent regulations governing hospital facilities.

Tracking and Accountability

Every contact at hospitals with signed SEMPs (21 contacts among seven organizations) reported they and others in their organization were being held accountable for performance relative to the SEMP goals. No hospital had yet put language to this effect in their written job descriptions, but it is in the language of the new hires for the resource conservation or strategic resource manager positions, and several hospitals have specifically assigned to some staff (and some teams) explicit roles in SEMP implementation.

All contacts indicated steps being taken to provide management with quarterly or annual information on progress toward goals. They reported various tracking software and services they have purchased or subscribed to. Some contacts reported tracking progress through the ENERGY STAR® benchmarking process.

BetterBricks Resources

We concluded the in-depth interviews by asking contacts for their assessment of the services they had received from BetterBricks and the Hospitals Initiative, and the value they have received from NEEA's engagement in these activities. Contacts were unanimous in praising their market specialists for their commitment, knowledge, hard work, dedication, organizational skills, and skills inspiring others to take action. Contacts were highly satisfied with the technical consulting services they had received through the BOP and Design & Construction Initiatives (with the one exception noted previously).

All contacts indicated their hospitals could not have developed SEMPS on their own or, had they tried, would have developed plans that would not have been nearly as comprehensive and which would have taken many times longer to complete. Contacts knew of no other organizations providing the services BetterBricks provides, although some noted performance contracting

[19] In fact, energy savings can generate capital for additional efficiency projects, but only a few of the hospitals have such plans. For most hospitals, the savings simply accrue to the general fund, in keeping with the Value Proposition that efficiency can contribute to the hospital's bottom-line, as well as its overall mission.

firms promise they will do something somewhat similar (although not as comprehensive) in return for a large share of the savings.

Going forward, hospitals would like BetterBricks' continued partnership and expertise.

Most commonly, hospital contacts (11 contacts) said they would like to have ongoing access to the expertise and resources of the market specialists and technical advisors. "This will influence how fast we can move," said one contact. Elaborating on the need for expertise, comments included:

- *"Having a listening ear and advisor. Someone who will spot potential problems, keep us focused and avoiding wayward turns."*
- *"Continuous dialogue with the market specialist. Having her continue to attend our team meetings."*
- *"Providing us with a reality check on the viability of proposed measures."*
- *"Helping us to get the back-up data we need from consultants and vendors to prove we will get what we ask for. Each of them is on their own page, and we need a point-person because it's complicated and time intensive to do some of these things."*
- *"Someone we can ask questions of. Working up good ideas for us on operational things."*
- *"Alert us to things that are 'old school' technology."*
- *"I only see them about once every six months. It would be useful to see them more often."*

Five contacts mentioned specific assistance needed:

- *"Facility scoping studies."* (3 contacts)
- *"Better benchmarking information than ENERGY STAR® provides."*
- *"Selling the concept of total cost of ownership to [a specific executive]."*

Two contacts suggested support for ongoing education:

- *"Perhaps a website, a quarterly newsletter, a clearinghouse, or a steering committee? Give us a little reminder, a link to best practices and new technologies. A 'look at this.'"*
- *"Perhaps a newsletter. I'd like to hear about what's going on elsewhere. The market specialist always brings us new ideas."*

Only two contacts referred to needing help primarily in the transition period, as their resource managers become more adept at their new positions.

Contacts offered these comments when asked what they would like to see BetterBricks provide them as they move forward implementing their SEMPs. These comments are in addition to ideas

expressed in preceding sections of this chapter on the barriers to life-cycle cost analysis, changing purchasing practices, and changing new construction practices.

5 SURVEY RESULTS

We conducted telephone surveys with two hospital-related groups: (1) facility managers at hospitals with which BetterBricks has not directly worked (as we conducted in-depth interviews with staffs with whom BetterBricks has directly worked); and (2) participants in 2006/2007 hospital education and training (E&T) events. The latter group includes both hospital participants and non-hospital participants who provide consulting and contracting services to hospitals in the areas of design & construction and equipment sales and services. The approach for each group is summarized in Table 5.1 and described in Appendices A and B, which also provide the detailed findings. Appendix E provides the survey instruments.

The sample of facility managers provides 90% confidence and 10% precision levels. The sample of E&T participants provides 90% confidence and 13% precision levels. We initially hoped to survey enough E&T participants from hospitals to summarize their experiences with 90/10 confidence/precision levels. Yet when the number of hospital participants available to be surveyed turned out to be small, we sought to attain as many completes as we could from hospital participants (and attained 16 completes), and a roughly comparable amount from non-hospital participants (we attained 19 completes).

Table 5.1: Sampling Approach

GROUP	POPULATION	APPROACH	COMPLETIONS
Facility Managers at Hospitals with Which BetterBricks Has Not Directly Worked	238	Random sample	52
Participants in 2006/2007 Hospital E&T Events*	32 hospital staff 121 hospital consultants and contractors	Random sample	16 hospital staff 19 hospital consultants and contractors

* This population tally excludes double-counting of E&T participants who participated in more than one event, contacts for which contact information was missing, staff of hospitals with which BetterBricks is directly working (as in-depth interviews were conducted with this group), and non-hospital participants who are not design/construction and equipment/service consultants or contractors to hospitals.

FACILITY MANAGERS

Surveyed facility managers work at hospitals much smaller on average than those hospitals with which the initiative is directly working, a finding that we anticipated, given BetterBricks' strategy of targeting market leaders (Table 5.2).

Table 5.2: BetterBricks Hospitals Are Larger than Hospitals in the Facility Manager Survey

HOSPITAL GROUP	REVENUE (MEDIAN)	EMPLOYEES (AVERAGE)
Hospitals with Which BetterBricks Has Worked	$84.8 M	1,535
Nonparticipant Hospitals	$24.7 M	519

We note that, overall, the responses of facility managers indicate considerable involvement in energy management activities. These facility managers may have been influenced by BetterBricks activities, as one-third of them report familiarity with the term *BetterBricks* and two-thirds of facility managers reported they are familiar with the term *strategic energy management plan* (see Table 5.3). The hospital market specialists and BetterBricks teams have been promoting BetterBricks and its concepts and methods to hospitals throughout the region through the state societies of healthcare engineering, the state associations of hospital executives, utilities, BetterBricks contact lists, professional conferences (such as AIA's), press releases, and so on. The survey research is unable to determine issues of causality and attribution – that is, whether and to what extent BetterBricks has influenced energy management activities (and even awareness of the term *strategic energy management planning*) at hospitals with which the initiative is not working directly.

Table 5.3: Facility Managers' Awareness of Program Elements

AWARENESS OF SEMP AND BETTERBRICKS	PERCENT
Familiar with Term *Strategic Energy Management Plan*	64%
Familiar with Term *BetterBricks*	33%

We also note survey research is unable to delve deeply into reported behaviors and to ascertain exactly what actions are occurring and with what degree of thoroughness. Findings from the in-depth interviews with hospitals that are implementing or developing SEMPs (reported in the previous chapter) strongly suggest the barriers to energy management are high and continuing, and that involvement with BetterBricks has been instrumental in the hospitals' progress in energy management. Thus, the evaluation team urges caution in interpreting the following findings. It is common for survey respondents to over-report behaviors and attitudes that put them in a good light, and it is often common for research teams and their clients to attribute terms describing behaviors and attitudes with more specificity and significance than the respondents themselves attribute to the terms. Again, recall that these facility managers work at nonparticipating hospitals.

Keeping those caveats in mind, about half of interviewed facility managers reported energy management is included in the job descriptions for themselves or their staffs, and three-quarters indicated they or their staffs had attended training in energy management in the past three years (Table 5.4).[20] Roughly two-fifths of the facility managers reported their facilities had set explicit goals for energy management at some level and one-fifth reported their hospitals currently are in the process of developing energy management goals at the strategic level. About one-third of facility managers characterized their management's commitment to energy management as "high" or "very high."

Table 5.4: Role of Energy Management at Hospital

ROLE OF ENERGY MANAGEMENT (EM)	PERCENT
Inclusion of EM in Facility Manager or Staff Job Descriptions	47%
Inclusion of EM in Annual Performance Reviews (FM's or Staff)	37%
Staff Attended EM Training within the Past Three Years	76%
Explicit EM Goals Have Been Set	43%
Developing EM Goals at a Strategic Level	20%[1]
Purchasing Policy Includes Written Energy Efficiency Guidelines	32%[2]

[1] 10 of 49 reporting on business planning.

[2] 16 of 50 responding contacts.

About two-thirds of contacts reported regularly engaging in the O&M practices of: tracking and trending electricity consumption (most commonly done monthly); logging and trending temperatures, pressures, and loads (most commonly done continuously); and maintaining the economizer linkages and controls (most commonly done quarterly). About 90% reported regularly checking filters, strainers, and flow devices (most commonly done monthly).

About one-third of facility managers reported their hospitals have some purchasing policy or guidelines that include explicit written requirements for energy efficiency, and about twice that many reported they have calculated, at least once, costs over the entire life-cycle of equipment they considered buying (Table 5.5).

[20] Although about one-fifth of the questions asked in the current study were also asked of facility managers for the baseline research in 2006, the population for the two studies has changed so substantially as to make meaningless any direct comparison between the two sets of results. Both study populations excluded organizations with which the BetterBricks hospitals team worked. Between MPER #1 and the current study, the hospitals team greatly expanded the number of hospitals with which it is actively engaged. Furthermore, most hospitals with which the team is working are large (see Table 7.1), so the two populations also differ significantly in the size distribution of the organizations.

Table 5.5: Cost Analyses Performed by Hospitals

COSTS INCLUDED IN EQUIPMENT PURCHASING DECISIONS	PERCENT
Life-Cycle Cost Analysis	61%
Replacement Cost Estimation	78%
Energy Cost Analyses	85%
Maintenance Estimates	90%

Between 50% and 90% of contacts (depending on the measure) reported they have: replaced inefficient lamps; ensured cooling system set-points and reset schedules are at optimal levels; tested and re-balanced airside HVAC; upgraded pneumatic controls to direct digital controls; and installed VFDs. Yet, for most of these activities, facility managers are twice as likely to describe having remaining opportunities in these areas as they are to describe having fully implemented the action.

Facility managers were least likely to reported having done any benchmarking (34%) or to have use of *Green Guide for Health Care*, with no one reporting having fully captured the opportunities afforded by *Green Guide*, and only 6% reporting having fully benchmarked their facilities.

Regarding the use of in-house and contractor staff, about twice as many facility managers reported lighting retrofits have been done by in-house staff as reported the work was done by contractors; testing and re-balancing of airside HVAC was reportedly done in almost equal proportions by in-house staff and contractors; and contractors were used much more frequently than in-house staff for maintaining optimal cooling system set-points, to reset schedules, and to install VFDs.

Only 15% of the surveyed facility managers said their hospitals were *not* currently engaged in new construction or new construction planning. Less than 10% reported they have set measurable energy performance goals for new construction, while two-thirds of contacts reported having held design meetings with all team members – including hospital user groups and the design and construction sides – to address building performance objectives creatively. About one-half of managers say they have conducted building commissioning, while about one-quarter have conducted whole-building energy modeling to confirm the design meets the high performance goals; another one-quarter reported they have evaluated designs and specifications from a total cost-of-ownership or life-cycle-cost perspective. Note that the survey instrument did not define these terms, so respondents are answering the questions based on their own interpretations.

As with the building operations practices we explored, about one-half of facility managers reporting they had done a given new construction practice say there is opportunity to do more. Among facility managers who are aware of these new construction practices, but have not engaged in them, more than half reported they have seriously considered each of the practices.

E&T PARTICIPANTS

In 2006-2007, BetterBricks conducted eight different E&T workshops targeting the staffs of hospitals and the firms that serve them. The workshop titles included, among others: "*Financial Decision-Making Tools for Hospitals*," "*High Performance Hospitals and Medical Research Facilities*," "*Lighting for Healthcare Facilities*," and "*Understanding the Value of Commissioning*." Appendix B provides the complete list of titles.

Thirty-two hospital staff and 121 hospital consultants and contractors attended Hospital E&T events in 2006-2007. The research attained 16 completed surveys with hospital staff and 19 with consultants and contractors. We asked hospital staff to consider their activities at their own facilities and non-hospital staff to consider their activities at their hospital clients' facilities.

Of the 16 hospital participants, four were from clinics for outpatients only, two were from facilities with 50 beds or fewer, four were from facilities with 51-200 beds, and six were from facilities with more than 200 beds (Table 5.6). Most of the hospital participants were management level personnel who are engaged in construction and/or facility management. Only two participants reported energy management activities are a part of their job description and four participants reported energy management performance is included in their annual performance review.

Table 5.6: E&T Participants' Facilities

HOSPITAL PARTICIPANTS' FACILITIES	PERCENT (N= 16)
Outpatient Clinics or Facilities with 50 or Fewer Beds	38%
Facilities with 51 to 200 Beds	24%
Facilities with Over 200 Beds	38%

As shown in Table 5.7, of the 19 non-hospital participants, most of them work for architectural firms (36%) or engineering firms (32%). Other non-hospital participants' organizations include lighting and electrical firms (two participants), construction firms (one participant), control and equipment firms (one participant), and project management and planning firms (one participant).

Table 5.7: E&T Participants Organizational Affiliation

NON-HOSPITAL PARTICIPANTS' ORGANIZATIONS	PERCENT (N= 19)
Architectural Firms	36%
Engineering Firms	32%
Other Consultants and Contractors	32%

For most of the questions we asked, responses did not differ significantly by whether the contact was with a hospital or non-hospital organization. Table 5.5 presents how they learned about the E&T workshop.

Table 5.8: Source of E&T Awareness of Workshop

HOW LEARNED OF E&T WORKSHOP	PERCENT
Colleagues	25%
NEEA Mailings	20%
Professional Associations	15%
BetterBricks Consultants	15%

The E&T workshops greatly increased the interest of a portion of attendees in various topics related to energy efficiency. Proportions of respondents indicating greatly increased interest are around 25% for each efficiency practice explored:[21]

- Building operations practices that maximize energy efficiency
- Looking at costs over the entire lifetime of a facility
- Looking at costs over the entire lifetime of a piece of equipment or equipment system
- A comprehensive approach to energy management
- Reducing hospital energy costs

About 25% of contacts reported the E&T workshops strongly led them to think of some issues in a new way and to share some of the ideas presented with their colleagues. About 15% of contacts said the workshops strongly led them to apply one or more of the concepts or methods taught. Over 40% said their workshop experiences strongly led them to want to attend additional BetterBricks training.

About 60% of contacts reported they had taken the following actions either before the seminar, after the seminar, or both before and after the seminar: looking at cost over the entire lifetime of a piece of equipment or equipment system, taking steps to reduce facility energy use costs, and taking steps to promote a comprehensive approach to energy management.

[21] Respondents were instructed to reply *Not Applicable* if the topic was not applicable to the workshop they attended. Respondents also were instructed they could indicate the workshop did not *increase* their interest *because* their interest in the topic was *already very high*. This response was distinguished from a response that the workshop not increasing their interest in the topic for other reasons (implied: the characteristics of the workshop).

About 50% of contacts reported the workshops helped them to reduce hospital energy use, either *moderately* or *very much*, with a slightly smaller proportion agreeing the workshops helped them to save money for the hospitals.

Between one-half and two-thirds of contacts reported overall satisfaction (reporting a "4" or "5" on a five-point scale with "5" indicating very satisfied) with the event and with such aspects of the workshops as material presented, relevance to their work, instructor/presenter, and duration of the event. Satisfaction was lowest in response to the level of the presentation relative to their knowledge, for which about 45% of contacts reported satisfaction (rating a "4" or a "5").

Suggestions and recommendations included a request for:

- Additional information on cost issues and payback
- Greater opportunities to network with the other participants
- A white paper so attendees could better share the information presented with their colleagues
- More case studies ("model cases").

Appendix B identifies the specific workshop to which each comment pertained.

6 UTILITY EXPERIENCES

This chapter presents the hospital-related results of a telephone survey conducted to determine the level of awareness of and perceptions about BetterBricks among utilities and other energy-related organizations in the Pacific Northwest. Thirty-eight surveys were completed that represented the full range of public and private utilities, as well as the Bonneville Power Administration and the Energy Trust of Oregon, Inc., a public benefits administrator. Given an original sample frame of 85 names, this number of completes provided 10% precision of sample estimates, with 90% confidence. Table 6.1 shows the final disposition of contact attempts. Appendix E provides the survey instrument. This chapter addresses the findings from 24 of the 38 contacts that said they had had interactions with BetterBricks hospital market specialists or technical advisors working with hospitals.

Table 6.1: Final Disposition of Contact Attempts

DISPOSITION	SUB-DISPOSITION	SUB-COUNT	COUNT
Completed			38
Did Not Pass Screen			1
Refused	**Hard Refusal**	1	8
	Suggested Other Contact in Company	7	
Not Available During Survey Period			2
Left Company			4
Wrong Number			1
Quota Reached Before Contact Made			31
Total			**85**

Twenty-four of the 38 contacts (63%) said they had had interactions with BetterBricks market specialists or technical advisors working with hospitals. We asked these 24 contacts to rate their satisfaction with the hospital market specialists' coordination and communication with them. Specifically, we asked how well the market specialists gave notice of events and meetings with utility customers and how well they communicated with the contact regarding their activities with the contact's customers. Eleven contacts indicated coordination had been "satisfactory" or "very well done"; four said it "could be better" and one said it was "very poorly done." Eight respondents either said they did not know or their contact had been so minimal they could not offer a meaningful response.

Similarly, nine contacts said communication had been "satisfactory" or "very well done"; six said it "could be better" and one said it was "very poorly done." Again, eight either did not know or did not have sufficient contact to respond. These responses are summarize in Table 6.2.

Table 6.2: Market Specialists' Coordination and Communication with Utility Contacts

COORDINATION/ COMMUNICATION	RATINGS			
	VERY POOR	COULD BE BETTER	SATISFACTORY	VERY WELL DONE
Coordination with Utility	1	4	6	5
Communication with Utility	1	6	3	6

When asked what they would recommend for improving coordination and communication, only 7 of the 24 gave a response. Of those who did make suggestions, three were related to receiving more information from the market specialists about activities they are engaged in or contact with customers. Two said that they would like to know more about the market specialists' general scope of activities and availability. Two said that utilities representatives should be involved more in planning processes, one specifying that this involvement should take place "at the delivery staff level". One commented that the emails from BetterBricks staff were too long.

Accompanying a BetterBricks technical advisor contractor on a trip to assess facility operations at a hospital is one way in which utility contacts can gain a better understanding of BetterBricks' offerings. Only four contacts indicated that they had done so. Of these, three indicated that they had been "very satisfied" with the contractor's technical knowledge and one said that he had been "satisfied". All four reported that they had been "very satisfied" with the energy efficiency suggestions that the contractor had offered.

The utility contacts who had had interaction with the hospital market specialists varied in their familiarity with the SEMP approach that BetterBricks promotes to hospitals. Of the 24 who responded to the question, four said they were "very much" familiar, seven said "moderately familiar", six said "a little familiar", and seven said they were "not at all familiar" with SEMP.

When asked how they would describe a SEMP to a customer, 17 contacts gave some level of description. Note that a single response typically included a variety of themes. Every contact mentioned one or more of four key themes (either explicitly or by implication):

1. SEMP involves linking energy management to the hospital's mission, goals, strategy, and/or bottom line (9 contacts)
2. SEMP involves best practices, benchmarking, or continuous improvement (9 contacts)
3. SEMP involves executives and management staff at all levels and/or throughout the organization (8 contacts)

4. SEMP involves valuing energy savings as an asset to be managed (6 contacts).

The evaluation staff judge 12 of the 17 descriptions as indicating excellent understanding of SEMP; 3 descriptions indicating a strong understanding of SEMP (e.g., a "B+"); and 2 indicating an understanding that was roughly accurate, but quite limited.

Of the two contacts with what we judged as a limited understanding of SEMP, both reported having contact with market specialists, but not technical advisors; one had interacted with market specialists only minimally, described himself as having only a little familiarity with SEMP, and judged BetterBricks as helping customers "a little." The other contact rated his interactions with market specialists highly and said he was moderately familiar with SEMP. While this contact reported not knowing whether BetterBricks helps his customers, he elaborated, "No projects have been done yet. But some hospitals have taken advantage of [his utility's] programs as a result of the Hospitals Initiative."

Generally, respondents indicated that they believe BetterBricks helps their hospital customers become more energy efficient. In all, 18 contacts (75% of the 24 having contact with hospital market specialists) indicated some benefit. The most frequent response was that it helped customers to a "moderate" extent, reported by 11 contacts; 5 indicated "a little" benefit, 2 reported "very much" benefit, and one said that BetterBricks did not help the utility's customers become more energy efficient at all. This latter contact had said he was not at all familiar with SEMP.

Of those who said either that BetterBricks does not help much or that they did not know, most clarified that the reason was that BetterBricks had no ongoing activity with their specific accounts. Several contacts who said BetterBricks was moderately or very helpful mentioned BetterBricks' role in focusing attention on energy efficiency and SEMP, in providing easy access to assistance, or in performing benchmarking. Others who said that BetterBricks helped "moderately" offered explanations for why they did not give a better rating. Most mentioned that other actors (hospitals, utilities) already were performing energy efficiency activities without BetterBricks' involvement. Two said that BetterBricks' helpfulness was limited by whether or not hospitals implemented recommendations. One simply said that it is a market issue and it "takes time for momentum to build."

7 ASSESSMENT OF ACCOMPLISHMENTS

In this section we provide an assessment of accomplishments for the Hospitals Initiative as of November 30, 2007. Table 7.1 presents program accomplishments in the context of the market characterization given in Chapter 3. It identifies numbers of hospitals and beds with SEMPs or engaged in SEMP development and percentage of the market as described in Table 3.1 and Table 3.2.

Table 7.1: Hospitals with SEMP or Engaged in SEMP Development

STATE	ALL HOSPITALS/ BEDS	HOSPITAL SYSTEMS*			COMMUNITY HOSPITALS			
					300 BEDS OR MORE		UNDER 300 BEDS	
		SYSTEMS	HOSPITALS	BEDS	HOSPITALS	BEDS	HOSPITALS	BEDS
OR	**15 / 3,111 (25% / 39%)**	3 (33%)	14 (44%)	2,968 (56%)	0 (0%)	0 (0%)	1 (4%)	143 (8%)
WA	**15 / 4,661 (17% / 30%)**	4 (22%)	14 (37%)	4,211 (53%)	1 (20%)	450 (23%)	0 (0%)	0 (0%)
ID	**2 / 764 (5% / 24%)**	0 (0%)	0 (0%)	0 (0%)	2 (100%)	764 (100%)	0 (0%)	0 (0%)
MT	**6 / 1,153 (9% / 31%)**	1 (17%)	4 (29%)	647 (39%)	1 (100%)	356 (100%)	1 (2%)	150 (9%)
Total Region	**38 / 9,689 (14% / 32%)**	**4 (12%)**	**32 (35%)**	**7,4826 (49%)**	**4 (44%)**	**1,570 (45%)**	**2 (1%)**	**293 (3%)**

* Three systems cross state lines. Region total less than the sum of the states reflects subtractions made to avoid double-counting.

MARKET PROGRESS INDICATORS

The evaluation team developed the market progress indicators (MPIs), shown in Table 7.2, to track progress toward accomplishing the overall goals of the program as articulated in the logic model. The table displays the current status of the Hospitals Initiative relative to the MPIs for hospitals with SEMPs. (Contacts at hospitals without SEMPs are unlikely to have a clear understanding of the activities tracked in this table – e.g., terms such as *strategic energy management planning* and *integrated energy design* – and thus it is not meaningful to include nonparticipant responses in this summary table.) Percentage of Northwest hospital beds is derived from data provided by the Hospitals program manager to the evaluators (used in Table 7.1) and from data collected in MPER #2 and the current MPER on Hospitals Initiative activities and accomplishments.

Table 7.2: Market Progress Indicators

MARKET PROGRESS INDICATOR	PERCENT OF NW HOSPITAL BEDS	
	MPER #2	MPER #3
1. SEMP VALUE PROPOSITION		
Executives Are Aware of the Benefits of BetterBricks-Like SEMPs (e.g., the SEMP Value Proposition)[1]	31%+	39%+
Managers for Facilities and New Construction Are Aware of SEMP Benefits[2]	31%+	39%+
2. SEMP COMMITMENT		
Have Adopted a BetterBricks-Like SEMP for Use in Facility Operations, New Construction, and Equipment Purchasing	13%	25%
Executives Devote Staffing and Financial Resources to SEMP Implementation	13%	25%
Financial Decision Making is Clear and Uses Total Cost of Ownership	0%	3%
3. DESIGN & CONSTRUCTION		
Design to Meet Energy Efficiency Performance Targets, Typically Using BetterBricks-Like Integrated Energy Design	0%	6%
Require Trade Allies to Have the Skills and Capacity to Meet Energy Performance Targets and Support Integrated Design	2%	12%
4. OPERATIONS & MAINTENANCE (O&M)		
Have Adopted BetterBricks-Like Enhanced O&M and Tune-Up Practices	0%	8%
Require Enhanced O&M from Equipment Service Providers	0%	5%
Majority (Dollar Value) of Capital Upgrades Are Based on Life-Cycle Cost Analysis[3]	0%	23%
5. PURCHASING		
Purchasing Specifications Have Explicit Energy Efficiency Requirements	0%	14%
Adopted Comprehensive Purchasing Policies Designating Energy Efficiency as a Key Specification	0%	12%
6. MONITORING		
Established Methods for Tracking and Reporting to Management Energy Savings	13%	23%
Established Tools for Benchmarking Energy Use	13%	23%
7. ENERGY SAVINGS		
Saving Energy Through One or More Concrete Actions in Above Items 3-5	13%	25%

[1] A larger percentage is given for requiring trade allies than for designing for energy efficiency because the tally includes those facilities that are working on RFPs/RFQs in advance of any new construction activity.

2 The percentages are those contacted individually by BetterBricks; the actual percentage is higher, as many contacts have occurred in group settings (such as through the hospital associations and BetterBricks educational events.) The evaluators lack the data necessary to estimate the number of contacts that occurred in group settings.

3 The figure 23% may seem high given the finding of 3% of market having adopted total cost of ownership for its financial decision making. As text following the table indicates, 23% is the proportion having taken at least one concrete action relating to the MPI (in this case, have used life-cycle cost analysis for at least one capital investment).

All but one of the hospitals with signed SEMPs signed the plans in the period covered by this MPER; thus, the signed plans are less than one year old. Because each SEMP practice area is complex and comprises numerous activities, Table 7.2 counts a hospital as meeting the progress indicator if it has taken a concrete action that satisfies the indicator. As discussed more fully in Chapter 4, no hospital has yet to completely conform any of its practice areas to the level of commitment made in its SEMP. Yet because each of these hospitals has a signed SEMP stating its commitment, has staff enthusiastically supporting the SEMPs, and are requiring staff to report on SEMP progress, this evaluation considers a progress indicator as met at the time a hospital takes its first concrete action within a progress indicator, making the implicit assumption that the first step is the first of many.

For example, for the first design & construction (D&C) indicator (under #3 in Table 7.2), a hospital is counted as having satisfied the indicator if they have one project that has used, or is using, or has evidence of a specific plan to use BetterBricks-like integrated design for new projects. (Evidence of a specific plan would be, for example, that the hospital and design team have committed to integrated design and a design charrette has been scheduled.) As another example, a hospital is counted as having satisfied the second D&C indicator if they have developed or are developing an RFP or RFQ for design services that specifies energy performance expectations for the facility to be constructed. As a third example, for the first indicator under purchasing (#5 in the table), a hospital is counted as having purchasing specifications with energy efficiency requirements if they now require ENERGY STAR®-qualifying equipment. As a final example, the third item under building operations (#4) indicates that the majority of capital upgrades are based on life-cycle-cost analysis. A hospital is counted as having satisfied this indicator if *any* major equipment purchase was determined by life-cycle-cost analysis or by calculating an internal rate of return or other analysis more complex than simple payback that captures energy savings over the life of the equipment. Also included are hospitals with policies in place for evaluating major facility equipment purchases based on life-cycle-cost analysis or internal rate-of-return.

At the end of the planning periods of the SEMPs discussed in this MPER, it will be appropriate to assess the market progress indicators with more stringent standards to capture the extent to which hospitals are fully engaged in the business practice changes to which they have committed.

In addition, the logic model includes outcomes related to the hospital associations (SHEs and SHAs) and to service providers. The Hospitals team should develop measurable objectives for these indicators, which relate to the ongoing sustainability of the initiative.

ASSESSMENT OF PROGRAM PROGRESS

The Hospitals Initiative is clearly changing business practices at hospitals with which BetterBricks has worked to institute SEMPs. All hospitals with signed SEMPs have:

- Executive commitment that energy efficiency enters into corporate decision-making on an equal footing with other financial decision criteria;
- Allocated staffing and financial resources to energy efficiency and SEMP activities;
- Assigned responsibility and accountability for progress toward SEMP goals;
- Taken steps to put in place tracking and benchmarking methods;
- Taken steps to ensure major facility equipment purchases are based on life-cycle-cost analysis or other analysis methods more complex than simple payback; and
- Taken one or more of the actions in the market progress indicators for design & construction, building operations, and purchasing.

All hospitals reported they continue to need BetterBricks support, although the degree of assistance needed varies among the hospitals.

8 FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

FINDINGS

The BetterBricks Hospitals & Healthcare Initiative is showing significant progress toward its goals and is on target to meet them and its objectives by 2010. At the same time, initiative experience indicates that the process of full SEMP implementation is more complicated than the basic program logic suggests. NEEA created its BetterBricks Initiative because it realized that business practice change is needed – both in vertical markets (e.g., hospitals and healthcare) and in cross-cutting markets (design & construction, and building operations). The findings from hospitals engaged in SEMP implementation strongly support NEEA's position that neither the *demand-side* of the market for commercial energy use nor the *supply-side* of the market have the knowledge, tools, and capacity to achieve highly energy-efficient building construction and operations. These market conditions continue to persist after the signing of SEMPs.

Experience with hospitals reveals significant gaps in the knowledge and tool set needed to efficiently and fully implement a SEMP. Examples of the shortfall in energy management tools that the Hospital Initiative has encountered over the last three years (and, in some cases, is still struggling with) are:

1. Life-cycle cost analysis tools and application criteria that can be easily used by hospitals or unbiased professionals active in the market that assist hospitals with life-cycle cost analyses
2. Integrated design processes and criteria
3. Evidence-based rules-of-thumb about the comparative costs of highly-efficient new construction (and specifically hospital construction) and construction to code
4. Enhanced O&M methods that meet the needs of complex facilities and comply with rigorous and extensive regulations
5. Methods and language for incorporating energy efficiency into the purchase of large, diverse equipment systems and service contracts, as well as into the purchasing of routine items
6. Lowest-cost methods for the ongoing tracking of energy savings in facilities that lack extensive sub-metering

In addition to gaps in the necessary knowledge and tool set, the obstacles of money and time continue, even when a hospital has signed a SEMP and staff are enthusiastic about it. The

SEMPs have brought about significant change in the views of most interviewed hospital staff, but they cannot generate resources in a highly resource-constrained environment.

Because neither the initiative nor the market have yet to develop and offer the various tools and types of information needed, and because hospitals remain highly resource-constrained, it is essential that the organizations that have signed SEMPs continue to receive support from BetterBricks and/or the firms that provide construction design and building operations services to hospitals. It is challenging enough for an organization to bring together the various people who influence a given process or decision (e.g., purchasing) and get them pulling in a consistent direction. The challenge becomes overwhelming if these people then need to themselves develop or find the necessary tools and consulting services, particularly given the absence of experience they have to draw upon.

As a corollary to a SEMP hospital's need for ongoing support, it is essential that the BetterBricks logic model address how to expand the available support services in the market.

All contacts indicated their hospitals could not have developed SEMPS on their own or, had they tried, would have developed plans that would not have been nearly as comprehensive and which would have taken many times longer to complete. Contacts knew of no other organizations providing the services BetterBricks provides. Similarly, when asked to consider their next steps, hospital contacts thought their SEMP activities would be slowed and perhaps compromised without ongoing BetterBricks support.

It appears that BetterBricks will need to continue to devote substantial resources to the hospitals that already have already begun SEMP implementation – for at least one to two more years if these SEMPs are to be fully implemented and achieve the goal of permanently changing business practices. This need will limit the number of new hospitals that the initiative will be able to support.

Another key evaluation finding concerns utility support for BetterBricks. The market specialists reported many hospitals whose utilities are closely engaged with their BetterBricks activities. Nearly all of the interviewed utility contacts that indicated some familiarity with the SEMP concept had an excellent understanding of its basic premise, as indicated by their explanation of the term. Yet the market specialists also reported they have to, and continue to, educate utility staff about the market transformation objectives and methods of BetterBricks. There is a clear opportunity for NEEA management to better inform its utility stakeholders about its market transformation philosophy, with examples provided from its work with hospitals and other targeted markets.

Finally, the evaluation found some unclear, overlapping terminology in the building operations arena.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion One: **The Hospitals Initiative is on target to meet its 2010 objectives** if it continues to support hospitals that have signed SEMPS with an initiative manager, market specialist, and technical advisor resources.

- ***Recommendation A:*** **The Hospitals Initiative should continue to be supported by NEEA**; any reduction in levels of support should be carefully considered prior to enacting and should be closely monitored to assess negative impacts on the progress of SEMP implementation at participating hospitals.

- ***Recommendation B:*** **Consider the steps BetterBricks needs to take so that NEEA is not the only supplier of these services in the market**. Revise the logic model to reflect these steps.

- ***Recommendation C:*** **Revise the logic model to move to *Outcomes* two items included in *Activities*** that address the actions of SHEs, SHAs, and other partners.

Conclusion Two: **Market specialists are the primary contact by which most utility staff receive information concerning NEEA's mission and activities,** although both market specialists and utility staff generally report good working relationships concerning participating hospitals.

- ***Recommendation:*** **NEEA and BetterBricks senior management should meet in-person with efficiency staff and management of the utilities involved in its Hospitals and other initiatives to present the market transformation and BetterBricks vision and methods**, provide examples from its hospital and other market activities, and respond to questions and concerns. It would also be useful to have market specialists attend some of these meetings to provide detailing information on SEMP development and implementation, and to answer specific questions.

Conclusion Three: **Hospital organizations and staff have enthusiastically embraced SEMP as a much-needed set of tools that make a positive contribution to their financial and non-financial objectives and mission**. Experience to date indicates it takes about two years for an organization to first seriously entertain the notion of SEMP development until the first energy savings begin to be achieved from SEMP; experience suggests it will take an additional three years after SEMP adoption to begin to fully realize the potential energy savings through the development, dissemination, and adoption of practice changes throughout the organization. It is likely that BetterBricks resources will be needed throughout this period if permanent business practice change is to be achieved.

- ***Recommendation A:*** **BetterBricks needs to determine what actions it can take so that existing design, construction, and building operations firms in the market can meet the needs of hospitals implementing SEMPs**, and add these actions to its logic model.

- ***Recommendation B:*** **BetterBricks should examine possibilities for deliberately transitioning hospitals to paying for market-specialist type services**. For example, hospitals could hire a qualified in-house staff person or BetterBricks could work to build and identify consulting resources in the market.

- ***Recommendation C:*** **BetterBricks should consider parlaying its investment into other institutional energy users (such as colleges and universities)**, given the significant and likely ongoing investment BetterBricks has made in the hospital sector and the very positive reception hospitals have had to its strategic, structured approach to energy efficiency. We recommend. BetterBricks might consider extending its model by training and supporting utility staff to work with their institutional customers to develop and implement SEMPs.

Conclusion Four: **The level of in-house BetterBricks staffing is insufficient for the Hospital Initiative**. The multiple responsibilities of the market manager require considerably more effort than 1.0 FTE. These responsibilities include: contractor management (market specialist and product and service development contractors); contracts and invoices; relationship building with hospital association groups; collaborative communication with other BetterBricks areas (building operations, design & construction, marketing, evaluation). Added to these responsibilities is the considerable time spent on refining products and services, and the associated website materials developed by contractors.

- ***Recommendation:*** **Expand BetterBricks staffing for the hospital initiative by 0.5 to 1.0 FTE.**

Conclusion Five: **The building operations arena uses multiple terms for a single type of facility study** (i.e., for scoping studies and for diagnostic studies) and for enhanced O&M activities (e.g., tune-up, retro-commissioning).

- ***Recommendation:*** **BetterBricks should standardize the terminology used in the building operations arena**.

APPENDICES

APPENDICES

A MARKET SURVEY OF FACILITY MANAGERS

This appendix discusses operational practices, characteristics, and issues of hospitals – located in Oregon, Washington, Idaho, and Montana – with whom BetterBricks has not worked directly to develop a Strategic Energy Management Plan (SEMP). Areas investigated include: organizational energy management policies and practices; facility operations and maintenance (O&M) practices; and facility managers' knowledge and adoption of energy-efficient building practices for existing buildings and new construction. Awareness of SEMPs and BetterBricks, and a description of strategic issues facing facility managers are also included.

We explored these issues with hospitals to provide feedback to NEEA on its market transformation objectives. The research provides a gauge of the market adoption of energy efficiency-related practices NEEA promotes through BetterBricks and the Hospitals Initiative. The current research builds on baseline research with hospital facility managers reported in the Hospitals Initiative MPER #1.[22] Each time a study of market behaviors is conducted, it provides a new baseline against which subsequent change in the market can be measured.

METHODOLOGICAL ISSUES PERTINENT TO BASELINE RESEARCH

Over time, research on market behaviors can provide an indication of market change. However, it is beyond the ability of the research design for this study to identify the causes of market change. Many of the facility managers interviewed for this evaluation belong to their states' organizations of healthcare engineers and, as such, have likely heard about the Hospitals Initiative, BetterBricks, and many of the specific practices the study inquires about. The facility managers may also have heard of BetterBricks and its associated activities and resources through venues other than the state organizations (e.g., the website, general BetterBricks advertising, and personal contacts.) Yet the facility managers are also influenced by many factors beyond BetterBricks, such as information on ways to mitigate global warming and to reduce facility operating costs. To distinguish among possible causes of observed change requires very complex data collection and analysis, which are beyond the scope of the current research.

We initially sought to compare results from the MPER #1 baseline and the current research. In keeping with the evolution of BetterBricks, many of the questions in the current research were not previously asked; nonetheless, roughly one-fifth of the questions were posed in both studies. However, the population for the study changed, as it excludes the organizations with which the

[22] *High Performance Hospitals Partnership First Market Progress Evaluation Report,* Research Into Action, Inc. for Northwest Energy Efficiency Alliance, June 2006. See: *http://nwalliance.org/research/reports/06-159.pdf*.

BetterBricks hospitals team is working; between MPER #1 and the current study, the hospitals team greatly expanded the number of hospitals with which it is actively engaged.

For simplicity, this appendix refers to hospitals with whom BetterBricks is actively engaged as *participants* and those with whom it is not actively engaged as *nonparticipants*. These terms are not fully accurate, however, for two reasons. First, the term *participant* has connotations from its use by incentive programs that the utility customer so designated has installed a specific measure or type of measure to save energy. The BetterBricks initiatives are aimed at changing business practices; *participants* voluntarily adopt practices and tailor them to their organization and don't necessarily undertake specific installations. Second, the term *nonparticipant* has connotations that these utility customers have not interacted with the initiative, which is not necessarily true. They may have attended a workshop or stopped by a table providing information relating to the Hospitals Initiative that the market specialists have offered at engineering association meetings; or, they may be on the BetterBricks mailing list or seen a course announcement and signed up for a BetterBricks training event. The group we are calling *nonparticipants* have not received intensive services through the Hospitals Initiative, yet may still have some exposure to or involvement with its outreach, tools, and materials.

With those caveats in mind, these terms are used in this appendix as a reminder to the reader that the interviewed facility managers are a subset of the entire market. Initiative participants were excluded from this study so we could contact them for in-depth interviews to explore their SEMP activities. We recommend revisiting this approach of using two different data collection instruments for participants and nonparticipants the next time NEEA conducts a baseline study. A single instrument might better enable an assessment of the penetration of targeted behaviors throughout the market and a comparison between those with whom BetterBricks has worked intensively and those with whom it has not.

SAMPLE AND DISPOSITION

In order to learn about the energy efficiency awareness and practices of the organizations with which BetterBricks has not directly worked – *nonparticipants* – we interviewed facility managers from 52 such hospitals in August and September 2007.

We categorized these 52 hospitals by number of employees, number of beds, number of buildings, annual revenue, and number of full-time-equivalent (FTE) operations-and-maintenance staff. With one exception, the sampled hospitals were small to medium in size, and in those ways were typical of most of the hospitals with which BetterBricks has not directly worked. Throughout our analysis, we compare (as relevant) survey results across our sample, based on all of these hospital characteristics, except for the number of buildings, which we found to be a less reliable measure for comparison.

Research Into Action surveyed 52 hospital facility managers from a list of hospitals purchased from *InfoUSA*. The initial list contained 577 contacts in NEEA's service territory, and included 304 non-hospitals facilities (such as medical clinics) and 36 hospitals that are currently working

with NEEA's BetterBricks program. A population of 238 remained after these facility contacts were removed from the list (Table A.1). The sample size of 52 was deemed sufficient for statistical testing at a 90% confidence level, with 10% precision.

Table A.1: Disposition of Interviews

DISPOSITION		TOTAL
Completed		52
Refused		24
List Errors	**Duplicate Record**	3
	Wrong Number	3
	Not Qualified	7
No Contact Made	**Attempts Failed**	149
TOTAL		**238**

HOSPITAL CHARACTERISTICS

We compared hospitals across a variety of organizational and facility characteristics, including hospital revenue, number of hospital staff, number of buildings, number of full-time equivalent (FTE) O&M staff, and number of beds.

Differences between Participant and Nonparticipant Hospitals

Median and average numbers for revenues and employees reveal that hospitals with whom BetterBricks has directly worked to develop a SEMP are almost three times larger, on average, than the other hospitals in its service territory (Table A.2). The average – and especially the median – revenues and number of employees for our sample are similar to those of these other facilities with whom BetterBricks has not directly worked. The median revenue of these latter hospitals was $26.5 million, compared to $24.7 million for our sample, while the median number of employees for the remaining hospital population was 250, compared to 242 for our sample. We found hospital revenue levels and total number of employees to be highly correlated (significant Pearson Correlation of .92).

Table A.2: Hospital Population and Sample Compared

SAMPLE	HOSPITALS WITH WHICH BETTERBRICKS HAS WORKED (N=36)[1]	REMAINING HOSPITALS (N=238)[2]	HOSPITALS INCLUDED IN SAMPLE (N=52)[3]
Revenue – Median	$84.8 M	$26.5 M	$24.7 M
Revenue – Average	$164 M	$66.4 M	$57.5 M
Number of Employees – Median	800	250	242
Number of Employees – Average	1,535	623	519

[1] While BetterBricks has worked with 36 of the hospitals on the population list provided by *infoUSA,* these data are based on 33 hospitals that were able to provide this information.

[2] Averages based on 236 of 238 remaining hospitals providing these data.

[3] Out of the 52 hospitals in our sample, 50 were able to provide this information.

Given the revenue base and the size of participating hospitals (average 1,535 employees), our sample is not intended as a control group for comparisons to participants. Rather, the value of our survey is in gaining an understanding of the changes in O&M practices taking place in smaller and medium-sized nonparticipant hospitals in the absence of intensive involvement with the initiative.

Hospital Characteristics within the Nonparticipant Sample

Across our sample, facility managers reported being responsible for anywhere from 1 to 122 buildings, revealing a high level of variability in this measure of hospital size. We collapsed the number of buildings into four categories, as shown in Table A.3. However, the manner of reporting the number of buildings makes comparison difficult. For example, responses included "one building," "one campus," and "one hospital plus 22 other buildings," among others. Because contacts' responses to the question provide an unreliable indicator of the exact number of buildings, this count will not be used further to compare across the sample.

Table A.3: Number of Buildings for which Contacts Are Responsible (n=52)

NUMBER OF BUILDINGS	PERCENT
One	15%
Two to Three	17%
Four to Ten	50%
Eleven or More	17%

Total FTE of O&M staff (including facility managers, engineers, and O&M line staff) is highly variable across the sample, ranging from 1 to 64 FTE, with one-third under 4 FTE, another third

between 4 and 8.5 FTE, and three-quarters with 12 or fewer FTE personnel devoted to O&M. As with the total number of hospital staff, we found the total FTE devoted to O&M to be highly correlated with hospital revenue levels (.80 Pearson Correlation, significance at .01 level).

The number of beds offers another useful measure for comparing hospitals, and is correlated with revenue and total FTE of O&M staff (significant at the .01 level with a two-tailed Pearson Correlation of .71 and .85, respectively). This suggests that the number of beds provides an indirect indicator of the complexity of hospital O&M systems. As seen in Table A.4, the majority of hospitals responding had fewer than 50 beds, while 27% had from 50 through 299, and 10% fell into the largest category (>300). The distribution of responding hospitals across number of beds is roughly consistent with the distribution of the entire regional population of hospitals.[23]

Table A.4: Number of Hospital Beds (n=52)

NUMBER OF BEDS	PERCENT
Fewer than 50	63%
50 to 149	15%
150 to 299	12%
300 or More	10%

ORGANIZATIONAL ENERGY MANAGEMENT POLICIES AND PRACTICES

Three indicators of the importance of energy efficiency (and market transformation toward efficient buildings) may be found in the role that energy management (EM) objectives play in job descriptions, annual performance reviews, and the number of energy management trainings attended (Table A.5). These indicators suggest that energy-efficient operation of buildings is not simply being talked about. Among the sample (all nonparticipating hospitals), almost half of our contacts reported that energy-efficient operations play a role in facility manager and O&M staff hires. And perhaps, even more importantly, in nearly four out of ten cases, efficient operations are included in annual performance reviews.

[23] The Hospitals Initiative manager conducted an analysis in 2005 that indicated 52% of hospitals in the region have fewer than 50 beds, 22% have between 50 and 149 beds, 14% have between 150 and 299 beds, and 12% have 300 beds or more.

Table A.5: Role of Energy Management Objectives in Staff Evaluation and Training (n=52)

ROLE OF ENERGY MANAGEMENT	PERCENT RESPONDING YES
Included in Facility Manager or Staff Job Descriptions	47%
Included In Anyone's Annual Performance Review	37%
Staff Attended Energy Management Training In Past Three Years	76%

Note: Some items have samples of 49 or 51 as a result of "don't know" responses.

Among the 39 hospitals reporting that staff had attended energy management training in the past three years, 32 reported between one and three staff members had attended. Among the other 7, attendee levels were higher – ranging from four to ten staff attending in the period. While energy management training rates are high overall, only 6 hospitals (15%) reported staff attending training sponsored by BetterBricks within the past three years.

Besides recent training related specifically to energy management, a similar percentage (73%) of all facility managers reported staff attended training or certification related to other areas of building operations and management in the past three years. While the survey did not probe barriers to training in general (perhaps a lack of money or time), it appears that energy management training is not given higher priority than training in other O&M areas.

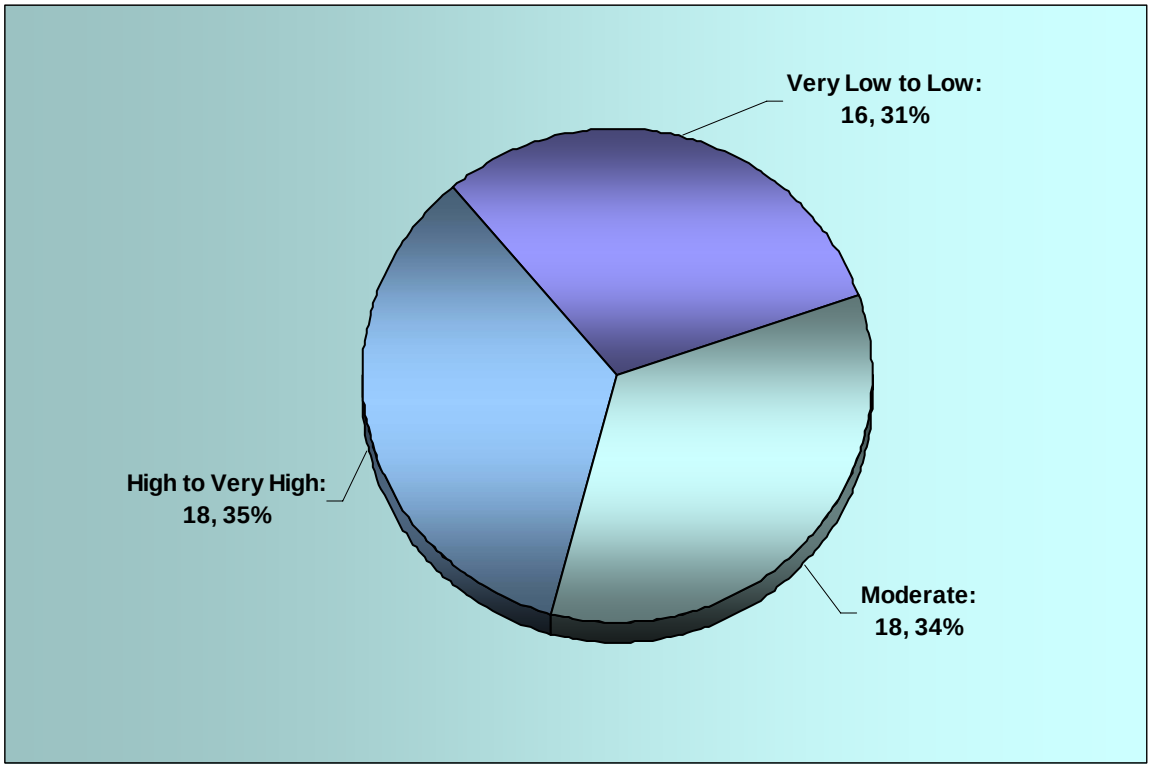
Certification levels are an indicator of the specialized O&M knowledge resident in the hospital's staff, although facility managers reported they and other staff also attend trainings that do not offer certification. The most commonly reported type of certification was for boiler operations, with seven hospital facility managers reporting their hospital had staff with that type of certification. This was followed by: HVAC (six hospitals); electrical (four hospitals); Building Operator Certification (BOC) and refrigeration (three each); and healthcare facility management, motors, and codes and regulations (two each). While only three managers reported they (or other staff) had BOC, lack of knowledge of the program does not seem to be at issue, since 71% told us that they had heard of BOC training.

Other training mentioned included: building and operations management, including HVAC, boiler, or electrical training without certification (ten); hazardous materials, including waste water treatment (six); energy audits and management training (five); building automation (three); safety or security (four); LEED (one); and miscellaneous other training without certification (five).

Facility manager perceptions of the commitment of their hospital's administrators and executives to energy management are also indicators of an organization's commitment to energy-efficient operations. Roughly two-fifths (43%) of the nonparticipant facility managers reported their facilities had set explicit goals for energy management at some level. One-fifth currently are in the process of developing energy management goals at the strategic level (10 of 49 reporting on business planning).

In the absence of written directives supporting energy management, facility managers may be influenced by their perception of executive management's commitment to energy efficiency and energy savings. Facility managers were asked to rate executive management's commitment on a scale from one to five (one = "very low", three = "moderate", and five = "very high"). As Figure A.1 shows, when we collapsed the bottom two categories ("1" and "2") and top two categories ("4" and "5"), roughly one-third of the managers fell into each resulting group.

Figure A.1: Perceptions of Management's Commitment to Energy Management (n=52)



While service contracts may include explicit requirements for energy efficiency, only 24% of facility managers (12 of 52) reported having service contracts with such requirements. When asked to identify the types of equipment for which their hospitals have such contracts, these 12 managers mentioned automated systems such as boilers, air handlers, electrical (e.g., lighting), and HVAC units. We caution that these findings do not tell us what percentage of service contracts, on average or in any given hospital, stipulate energy requirements, just the percentage of hospitals that have at least some such contracts.

The requirements of purchasing policies are another way to measure an organization's commitment to energy-efficiency. Just under one-third (16 of 50 responding contacts) reported currently using this avenue to set purchasing guidelines that include energy-efficiency (Table A.6). Hospitals employing purchasing policies with energy-efficiency standards tended to have

higher revenue levels (five hospitals with between $18.1 M and $44.7 M, and eight hospitals with revenues of over $44.6 M,). This finding was not significant at the .05 level, however – three hospitals with revenues below $18.1 M also had purchasing guidelines that included energy-efficiency.

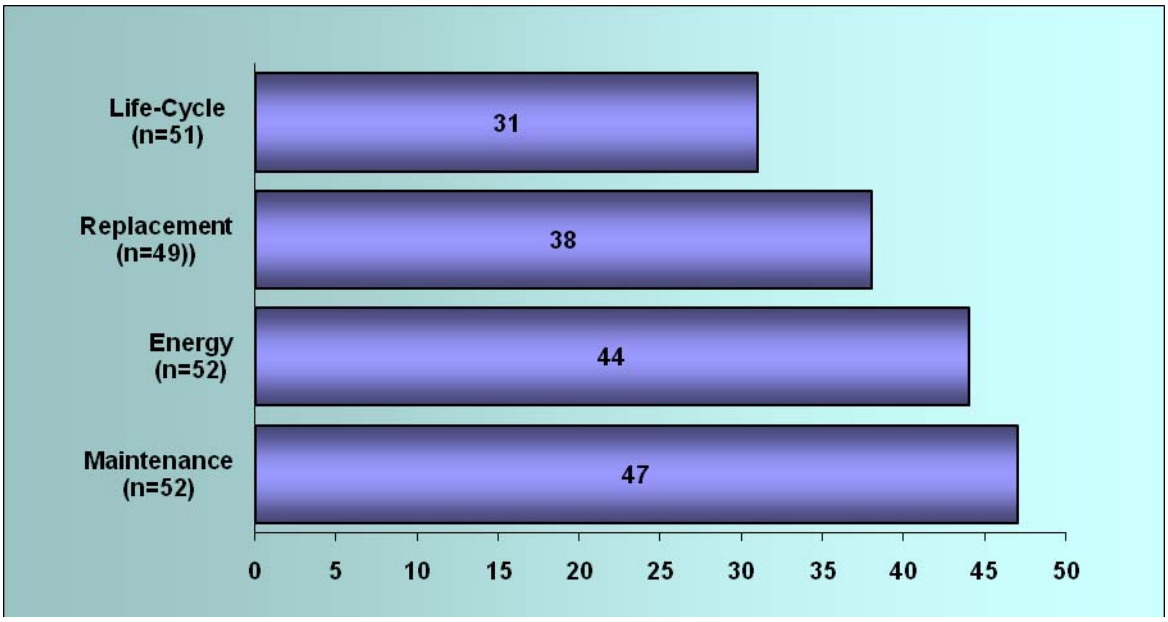
Table A.6: Equipment in Hospitals with Energy-Efficiency Purchasing Guidelines (n=50)

EQUIPMENT	NUMBER OF HOSPITALS[1]	PERCENT OF SAMPLE
Lighting	14	28%
Motors	13	26%
HVAC Systems or Components	14	28%

[1] Thirty-five contacts reported they did not have explicit energy-efficiency purchasing policies or guidelines, while one reported not knowing about purchasing guidelines.

Calculating the total cost of equipment (or buildings) over their entire life cycle is one method used for ensuring that future purchases meet set standards – energy costs are an input in this calculation. Almost 61% of managers (31 of 51 reporting) have done this type of calculation for their facility (Figure A.2). When evaluating a specific purchase, managers routinely factor in the costs of energy or maintenance (44 and 47 – 85% and 90% – respectively, of 52 reporting). Equipment replacement cost may also be considered (38, or 78%, of managers estimating this cost).

Figure A.2: Costs Considered in Evaluating New Equipment Purchases (n=52)



Note: Some practices have samples of 49 or 51 as a result of "don't know" responses.

Estimating the entire life-cycle cost of equipment is likely to become more prevalent in the near future. While 4 of 49 responding hospitals (only 8%) reported doing this now, in almost half of these hospitals (24) the management team is considering requiring life-cycle calculations to be estimated prior to purchase. Hospitals across our entire sample seem to be making this decision – but no significant correlation was found between the decision to estimate life-cycle costs and total FTE of O&M staff, revenue, or number of beds (proxy for hospital size).

OPERATIONS AND MAINTENANCE PRACTICES

To ascertain O&M practices and whether staff or contractors are responsible for this work, we asked facility managers a series of questions about: tracking and trending electricity consumption; logging temperatures, pressures, and loads; checking filters, strainers, and flow devices; and maintaining economizer links and controls. Initially, we asked whether these practices were performed "on a fairly regular schedule," "sporadically," "when there is a problem," or "never." For those who answered "regular schedule" or "sporadically," we followed up to get additional details on frequency and coded responses as "continuously," "weekly," "monthly," "quarterly," and "other." Responses to the first question are summarized in Table A.7; the more fine-grained analyses of those who regularly or sporadically performed the activities are detailed in a series of figures (below).[24]

Table A.7: Regularity of Conducting O&M Practices (n=52)

PRACTICE	NEVER	WHEN A PROBLEM	SPORADICALLY	FAIRLY REGULAR SCHEDULE	TOTAL
Track/Trend Electricity Consumption	8%	12%	14%	66%	**100%**
Log/Trend Temperatures, Pressures, and Loads	12%	10%	12%	66%	**100%**
Check Filters, Strainers, and Flow Devices	0%	4%	6%	90%	**100%**
Economizer Linkage Maintenance	4%	20%	7%	69%	**100%**

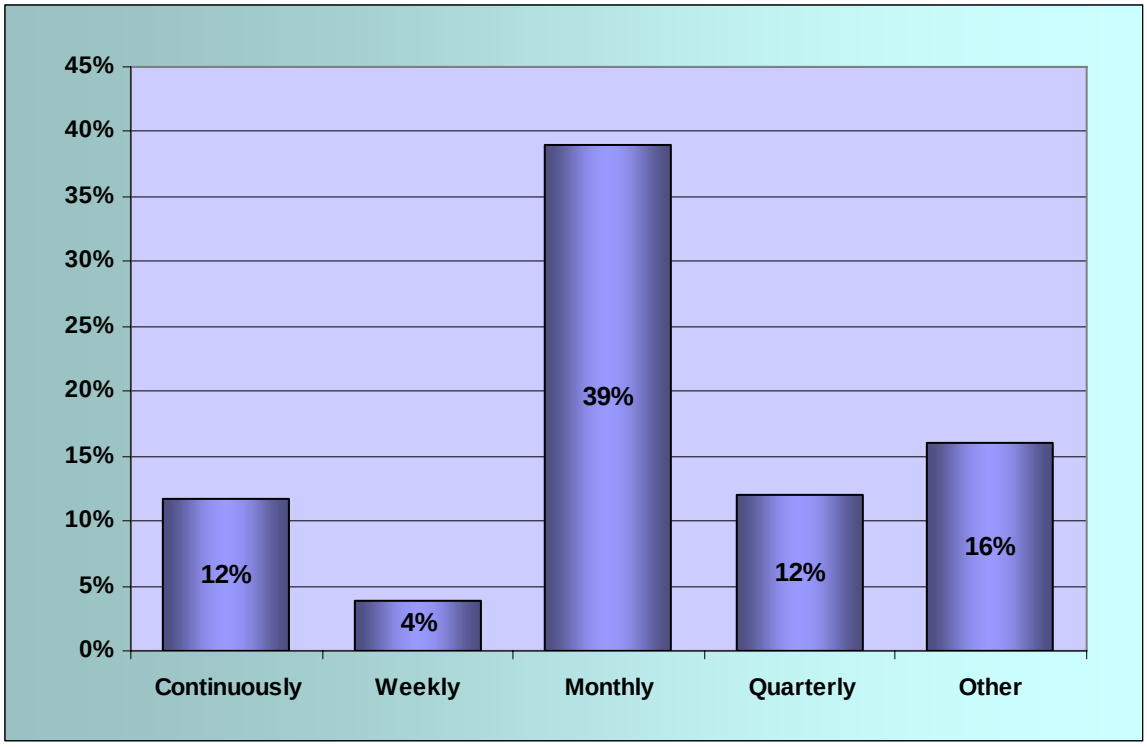
[24] Hospitals that reported tracking and trending "when there is a problem" are excluded from the following analyses of the regularity of O&M practices.

Note: Some practices have samples of 50 or 51 as a result of "don't know" responses, with the sample for *Economizer Linkage Maintenance Equal* to 44 due to "Don't Know" responses.

Electricity Consumption

Two-thirds of facility managers (67%) reported tracking and trending electricity consumption on a "fairly regular schedule," while 27% do so either "when there is a problem" or on a "sporadic" basis (12% and 15%, respectively). Only 6% (three contacts) reported they do not track or trend electricity consumption. We asked those who reported acting at times other then when there was a problem how often they tracked and trended consumption; Figure A.3 depicts the responses. Only two of the managers who earlier reported doing so sporadically reported acting monthly or quarterly, while the remaining six reported doing so rarely (e.g., on a yearly or longer basis). Overall, the plurality of contacts track or trend electricity consumption on a monthly basis (39%) and about equal proportions do so either more frequently (16% "continuously/daily" or "weekly") or less often (12% "quarterly" and 16% "other" – e.g., few times a year, yearly, or bi-annually).

Figure A.3: Regularity of Electricity Consumption Track/Trend (n=39)



In most cases, hospitals reported using their own staff to track and trend electricity consumption (87%, 40 of 46 who reported repeated electricity tracking). The remaining 13% of cases use

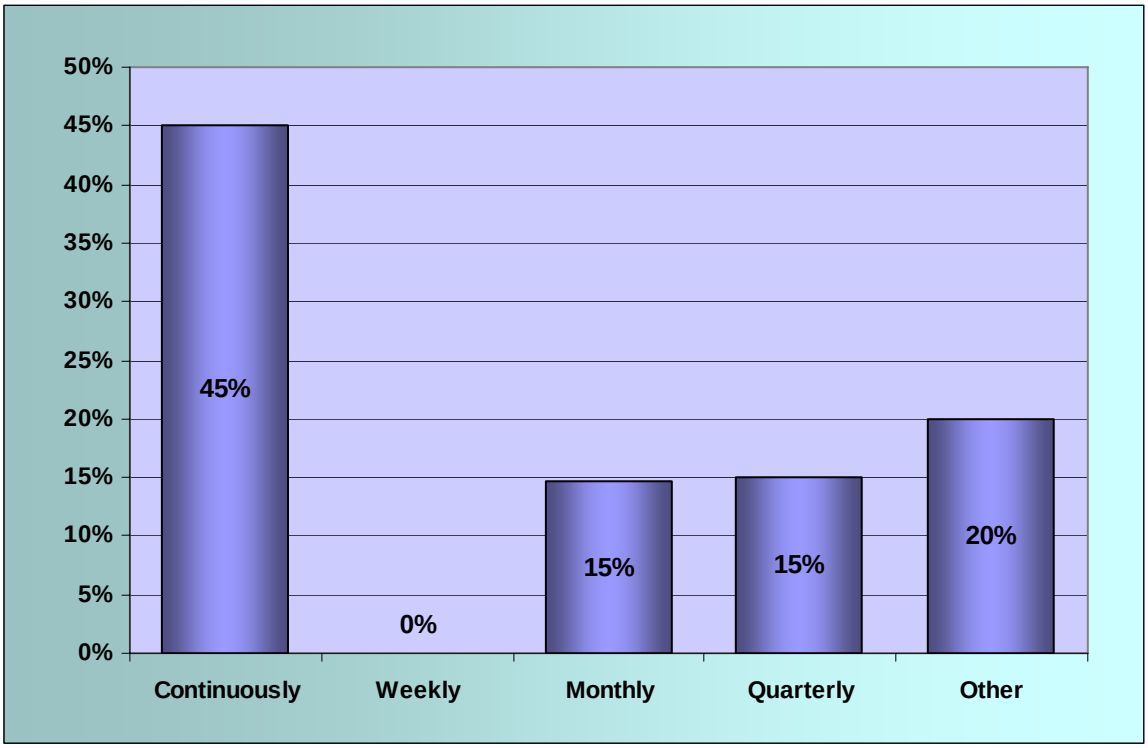
contractors to perform this function. No difference in the regularity that tracking/trending was performed was found between in-house staff and contractors.

Temperature, Pressures, and Loads

Ninety percent (46 of 51 reporting; one contact didn't know) of the hospitals surveyed log and trend data on equipment operating characteristics – such as temperature, pressures, and motor loads – to assess degradation in equipment performance. When asked how often this is done, two-thirds (34 of 51) reported tracking equipment-operating characteristics on a "fairly regular schedule." Roughly one-quarter (23%) did so either "when there is a problem" or "sporadically" (6 cases, somewhat under 12%, each). And about 10% (5 of 51) did not assess degradation by tracking performance measures.

Among the 40 contacts that logged either "sporadically" or "regularly" (and reported when they did so) the regularity of logging varied considerably. We see in Figure A.4 that none of the contacts in this subgroup reported logging equipment on a weekly basis.

Figure A.4: Regularity of Logging/Trending Equipment Characteristics (n=40)



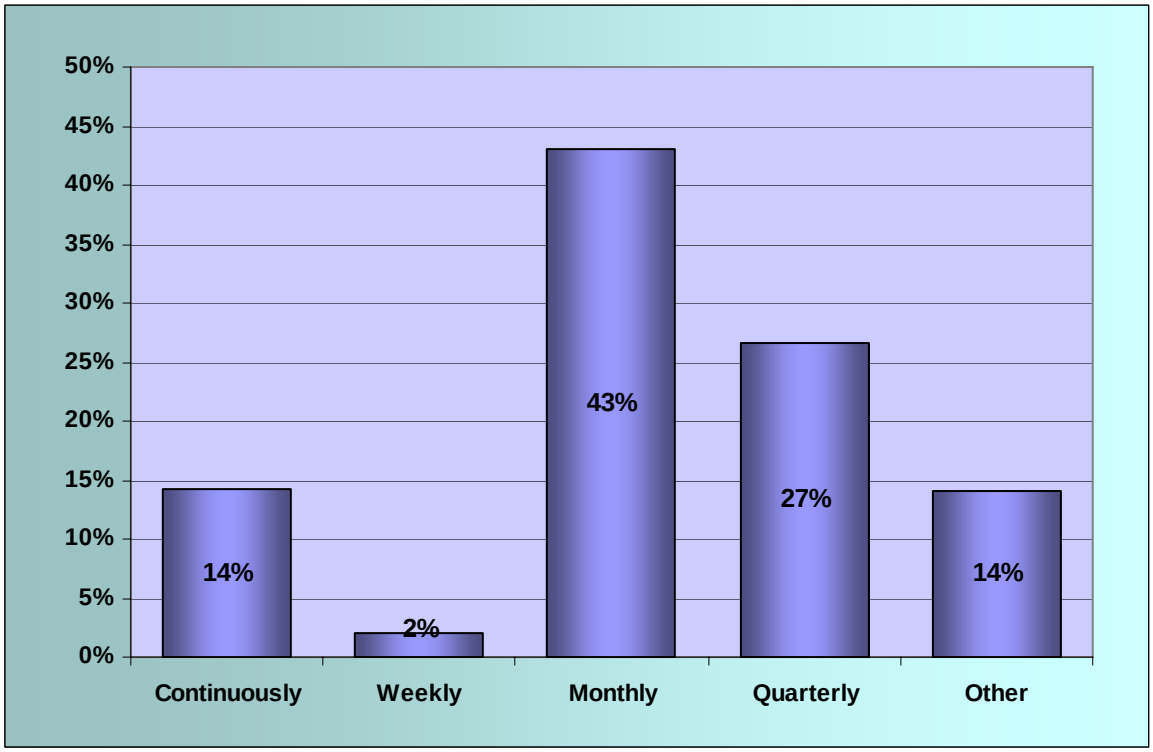
Among "regular" trackers of temperature, pressures, and motor loads, facility managers most often reported logging and trending on a continuous basis (44% doing so daily). The remaining facility managers in this subgroup reported doing so less frequently – monthly, quarterly,

annually, or even less frequently. Among those who earlier reported logging on a "sporadic" bases, two contacts each reported monthly, quarterly, and yearly/other as the frequency of doing so. Thirty-eight (of 40, or 95%) of the hospitals that repeatedly log equipment characteristics reported hospital staff does these tasks. No difference in the regularity of this work was found between that done by in-house staff and that done by contractors (at .05 significance level).

Filters, Strainers and Flow Control Devices

Of 51 facility managers reporting (one didn't know), all check filters, strainers, and flow-control devices. Forty-six (90%) reported making sure that cleaning is done on a "fairly regular basis," while 10% do so either "when there is a problem" or "sporadically (4% and 6% respectively). Excluding two cases that check these items only when there is a problem**,** Figure A.5 reveals that checking is variable – either done very frequently (8 contacts, or 16%, reporting continuously or weekly), monthly (21 contacts, or 43%), or quarterly (13 contacts, or 27%). In 14% of the cases, checking is done on some other timeframe (7 cases reporting less frequently or unspecific time frames, for example, "per manufacturer's recommendation"). In all but one case, these strainers and devices were reported to be maintained by the hospital's own staff (50 out of 51 responding).

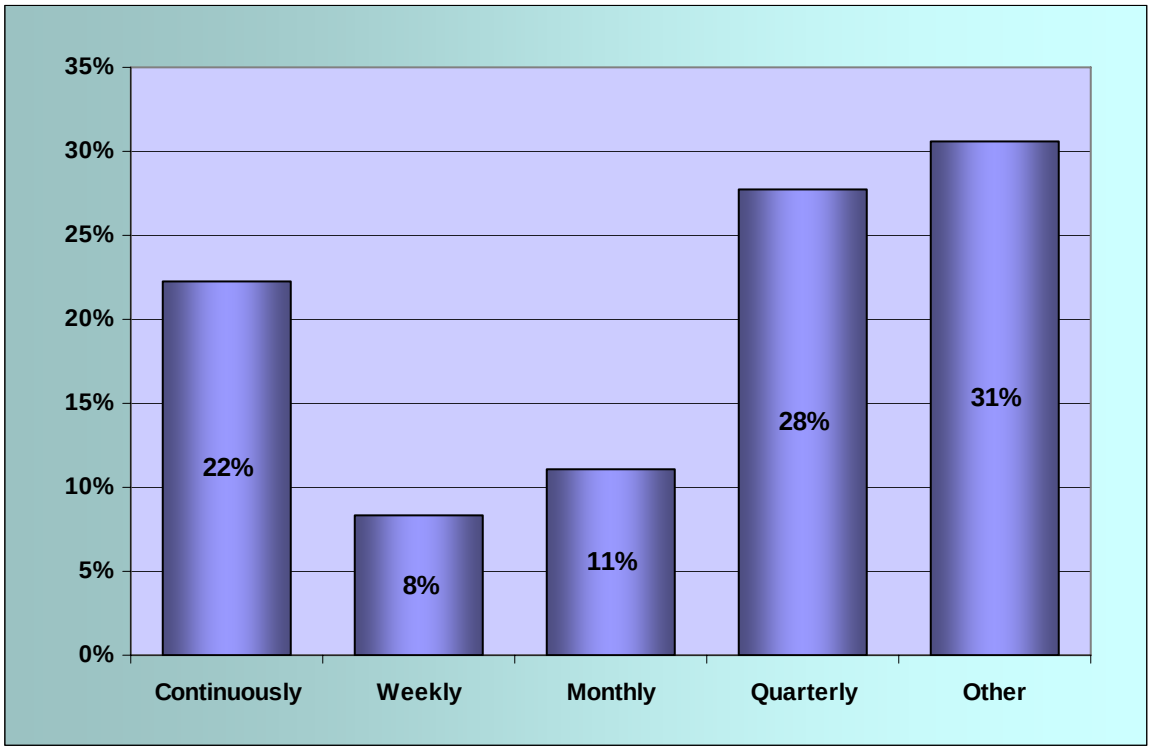
Figure A.5: Regularity of Checking Filters Strainers and Flow (n=49)



Economizer Linkages and Controls

Forty-five (87% of 52) managers reported they ensure that economizer linkages and controls are working properly (two said they never check economizer linkages and five reported not knowing). Of the 45 who reported checking, nine (or 20%) do so "when there is a problem," while 80% do so on a repeating basis – either "sporadically" (two of 52, 4%) or "on a fairly regular schedule" (34 of 52, 76%). For those 36 managers who reported repeat maintenance (excluding those who check only "when there is a problem"), no clear schedule preference was indicated: roughly equal percentages said "continuously/weekly" as "monthly/quarterly" (Figure A.6). Among 11 who gave an "other" response, frequency of checking included less than quarterly (10 contacts) and "per manufacturer's recommendations" (one contact).

Figure A.6: Regularity of Economizer Linkage Maintenance (n=36)



Recall that for ongoing O&M related to tracking/trending electricity consumption, logging/ trending equipment characteristics, and checking filters, strainers, and flow controls, we have seen that in-house staff are used more frequently than service contractors (87%, 95%, and 98%, respectively). Economizer maintenance is the only O&M area where we see a somewhat lower incidence of in-house staff reported as responsible for the work. Thirty-three hospitals (75% of 44 reporting on type of staff) rely on in-house staff, while 11 hospitals (25%) reported the use of service contractors for economizer linkage maintenance.

KNOWLEDGE AND ADOPTION OF ENERGY-EFFICIENT BUILDING PRACTICES

To gain an understanding of the diffusion of new technologies and business practices related to system tune-ups, retrofits, and benchmarking, we designed a continuum of decision and action stages to explore. The continuum ranges from "unfamiliar," to "familiar," through "planning to do it," to "have done it" – further partitioned into "partially done" and "fully done" – and was used to gauge awareness and adoption of seven areas of building practices. With this continuum, we can look at both the diffusion of selected building practice concepts ("unfamiliar" versus all other stages) and real-world applications of each (planning to do it and done it).

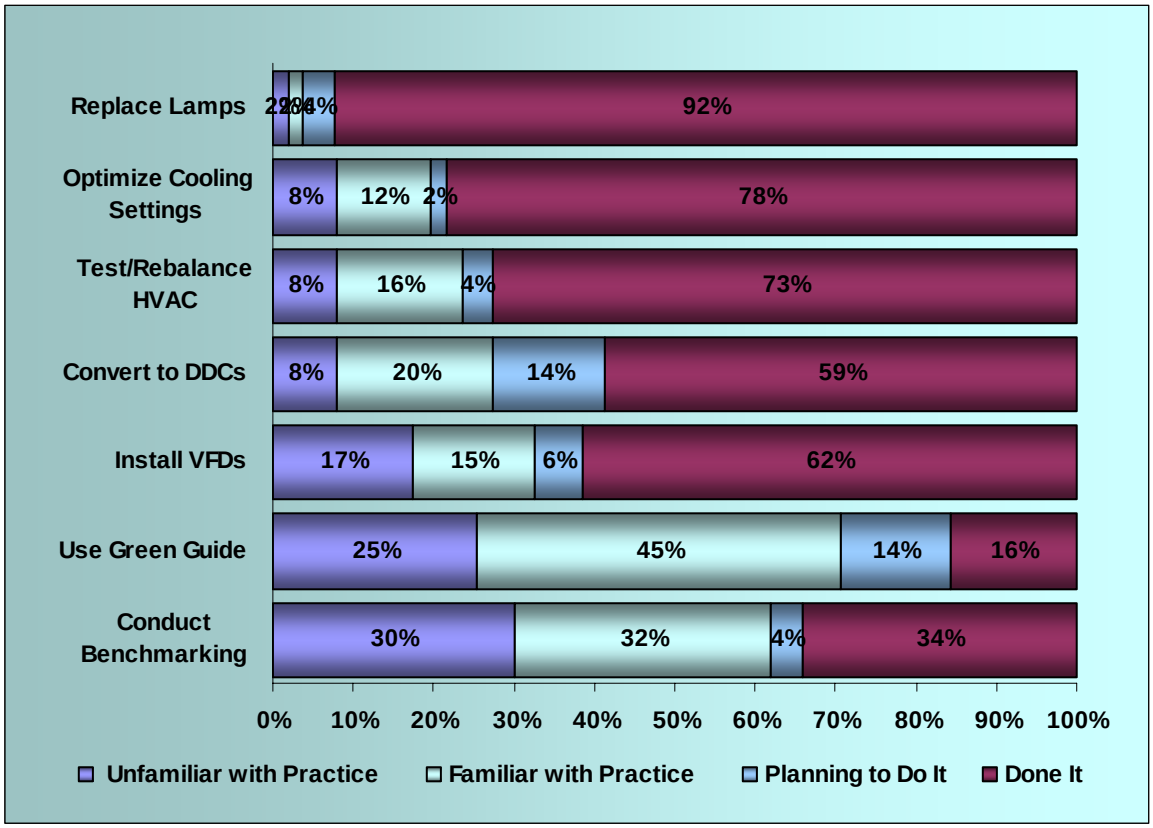
The discussion covers the following technologies and building practices:

- Replacement of remaining T12, non-LED, and mercury-vapor lamps with energy-efficient lights
- Ensuring cooling system set-points and reset schedules are at optimal levels for parameters such as discharge air, duct pressure, chilled water, and condenser water
- Rebalancing and testing of airside HVAC, including minimum ventilation flow rates and minimum terminal unit flow
- Upgrading pneumatic controls to direct digital controls (DDCs)
- Installing variable frequency drives (VFDs) for motors and constant volume fan systems
- *Green Guide for Health Care*[25]
- Benchmarking for energy use

Figure A.7 summarizes where facility managers locate their hospitals along our decision-action continuum for each of these building practices.

[25] The Hospitals Initiative promotes the *Green Guide for Health Care* as a resource for hospitals. According to its website, www.gghc.org, the document is a best practices guide for healthy and sustainable building design, construction, and operations for the healthcare industry.

Figure A.7: Stages of Awareness and Adoption of Technologies/Building Practices (n=52)



Note: Some practices have samples of 50 or 51 as a result of "don't know" responses.

Knowledge of Technologies and Building Practices

It is clear from Figure A.7 that some "unfamiliarity" or "familiarity (without plans for action)" was reported for each practice listed. Managers who are either unfamiliar or familiar, but do not plan upgrades, may be hampered by lack of knowledge or lack of staff. No significant relationship was found between total O&M FTE and each specific practice across managers either reporting "unfamiliarity" or "familiarity," compared to those reporting "planning to do it" or had "done it." It is also clear from Figure A.7 that, in all cases, varying degrees of implementation have occurred at these hospitals. Total O&M FTE and the total number of measures reported "done" are positively correlated (Pearson Correlation = .289 – significant at a .05 level). This finding tends to indicate that as the FTE of O&M staff increases, the number of building practices done in-house also tends to increase.[26]

[26] However, the relationship is weak – the two variables each account for less than 9% of the variance in the other.

We were interested to know whether hospitals reporting higher numbers of O&M staff with recent energy management training would correspond with higher incidences of O&M practices being implemented (that is, either "planning to do" or "done"). However, no pattern between incidence of training within the past three years and reported stage of implementation was found for any of the O&M practices.

Moving from Consideration to Adoption of Building Practices

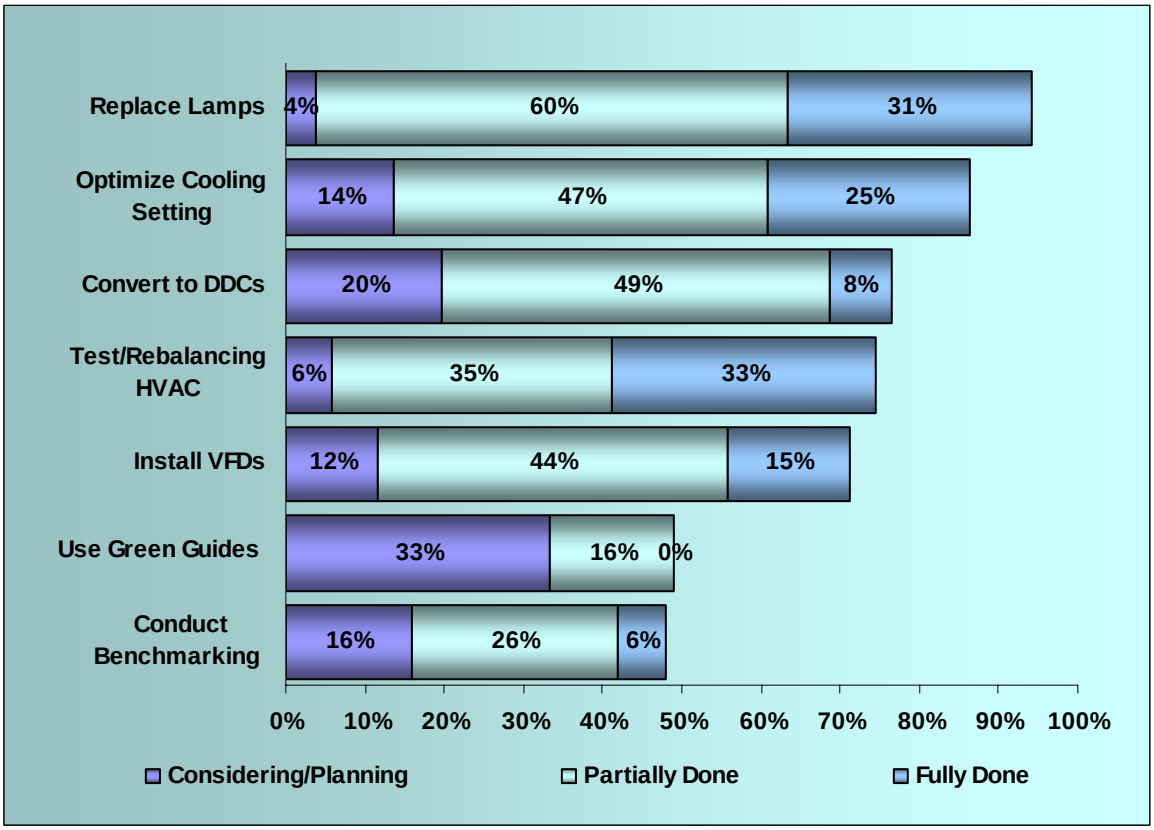
To delve specifically into the more action-oriented side of our decision/action continuum, contacts who reported they were either "unfamiliar with" or "familiar with but not considering" a given business practice are excluded from the following findings. By limiting our discussion to managers who reported they were "seriously considering," "planning to do it," or "have already done it," we can explore:

- Where the managers locate their hospital's actions for each practice, and
- Which personnel would be (or was) responsible for implementing the building practice.

As an initial look, Figure A.8 shows the percentage of managers who indicated they were considering or planning to do an efficiency practice, had partially completed it, or had fully completed it (in their estimation). This figure shows results combined across staff and contractor responsibility.

One finding made immediately obvious by the figure is that use of the *Green Guide for Health Care* and the practice of benchmarking facilities for energy use have the lowest incidence of reported implementation across the seven practices reviewed. For these practices, fewer hospitals (25 and 24 respectively) reported being in some stage of action, compared to from 37 to 49 hospitals taking actions toward implementing the other practices reviewed. In terms of Green Guide implementation, more of these managers reported being at a "considering" or "planning" stage than a "doing" stage. Recall that 25% (or 13) of reporting managers are unfamiliar with this practice (Figure A.7). Twice as many managers reported they have taken some action to implement benchmarking as have taken some action to implement the Green Guide.

Figure A.8: Considering/Planning to Completing Building Practices (n=52)



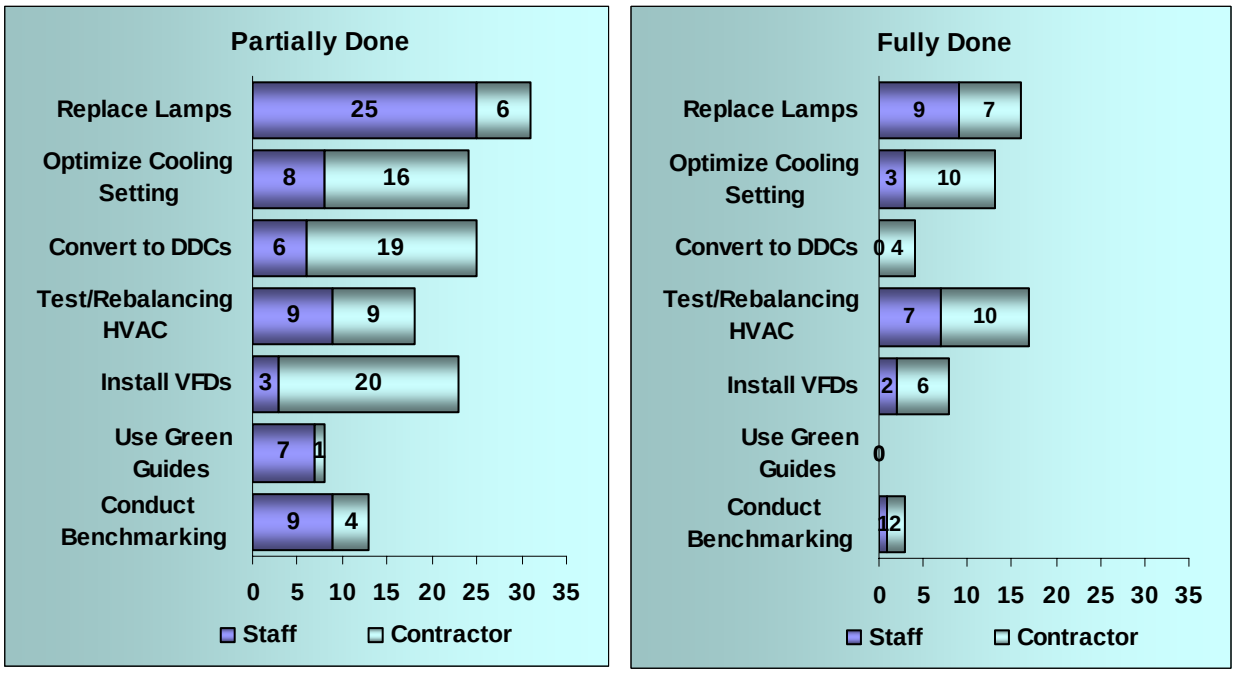
Note: Some practices have samples of 50 or 51 as a result of "don't know" responses. Graph does not show facility managers that reported unfamiliarity or familiarity without seriously considering taking action.

Figure A.9 excludes those facility managers in the considering or planning stage, focusing on those who have partially or fully completed the various practices. In this figure, we break out those who implemented the practices with in-house staff versus those who have used contractors.

Several things stand out in Figure A.9. Among reporting hospitals:

- About twice as many lighting retrofits have been done by in-house staff than by contractors (partially done and fully done combined).
- Testing and re-balancing of airside HVAC was reportedly done in almost equal proportions by in-house staff and contractors.
- Contractors were used more than twice as often as in-house staff for maintaining optimal cooling system set-points and reset schedules, and contractors were used five times as often as in-house staff for the installation of VFDs on motor and constant volume fan systems.

Figure A.9: The Role of Staff and Contractors in Completing Building Practices (n=52)



Note: Sample is 52 facility managers (except for a few "don't know" responses). Data graphed are numbers reporting specific answers.

Automated Maintenance Management and Energy Management Systems

In addition to the energy management strategies listed above, two-thirds of our contacts (36, or 69%) reported using computerized maintenance management systems (CMMS). Among those, the vast majority (30 managers) used the system's module for scheduling O&M routines. However, only one-third of these managers (12 mentions) said their CMMS integrated key system performance indicators, such as schedules, set-points, or electric demand. Nineteen (37%) of the hospitals we contacted reported using energy management control systems (EMS). It is worth noting that 17 of those hospitals also use a CMMS, while two use EMS alone. Thirteen (25%) contacts reported using neither a CMMS nor an EMS; all of these hospitals had fewer than 50 beds (a significance test was inconclusive due to small cell size).

Table A.8: CMMS and EMS Use (n=52)

USE A COMPUTERIZED MAINTENANCE MANAGEMENT SYSTEM (CMMS)	USE AN ENERGY MANAGEMENT SYSTEM (EMS)		
	YES	NO	TOTAL
Yes	17	19	**36***
No	2	13	**15**
Total	**19**	**32**	**51**

Note: One contact reported not knowing.

Temperature resets (e.g., for supply air, hot water, chilled water, and/or condenser water) and scheduled starts and stops for fans and pumps were managed through the EMS in virtually all hospitals using an EMS (18 of 19 hospitals); 16 hospitals (84%) also used the EMS to optimize or stage equipment (e.g., chiller compressor staging). In fewer cases, hospitals reported using the EMS to manage the outside air lockout – in 9 cases or 47%. Among the 10 contacts not reporting using the EMS to manage the outside air lock, 2 said this was not possible at their facility.

NEW CONSTRUCTION

In most cases (44 of 52, 85%), the hospitals surveyed had new construction projects "underway" (11, 21%), or "planned" (18, 35%), or both "planned and underway" projects (15, 29%). In only 8 cases (15%) was new construction neither planned nor underway. In all but 2 of the 44 hospitals with projects planned or underway, facility managers reported being involved with the process.

Regardless of their involvement with current or upcoming projects, all managers were asked a series of questions on new construction practices. As with the series of questions on O&M practices, we also applied a decision/action continuum in the review of new construction practices. By using this continuum we can get a good sense of the diffusion of each concept across our sample ("unfamiliar" compared to all other stages), as well as an indication of the adoption and implementation of each practice ("planning to do it" and "done it"). The six new construction practices explored include:

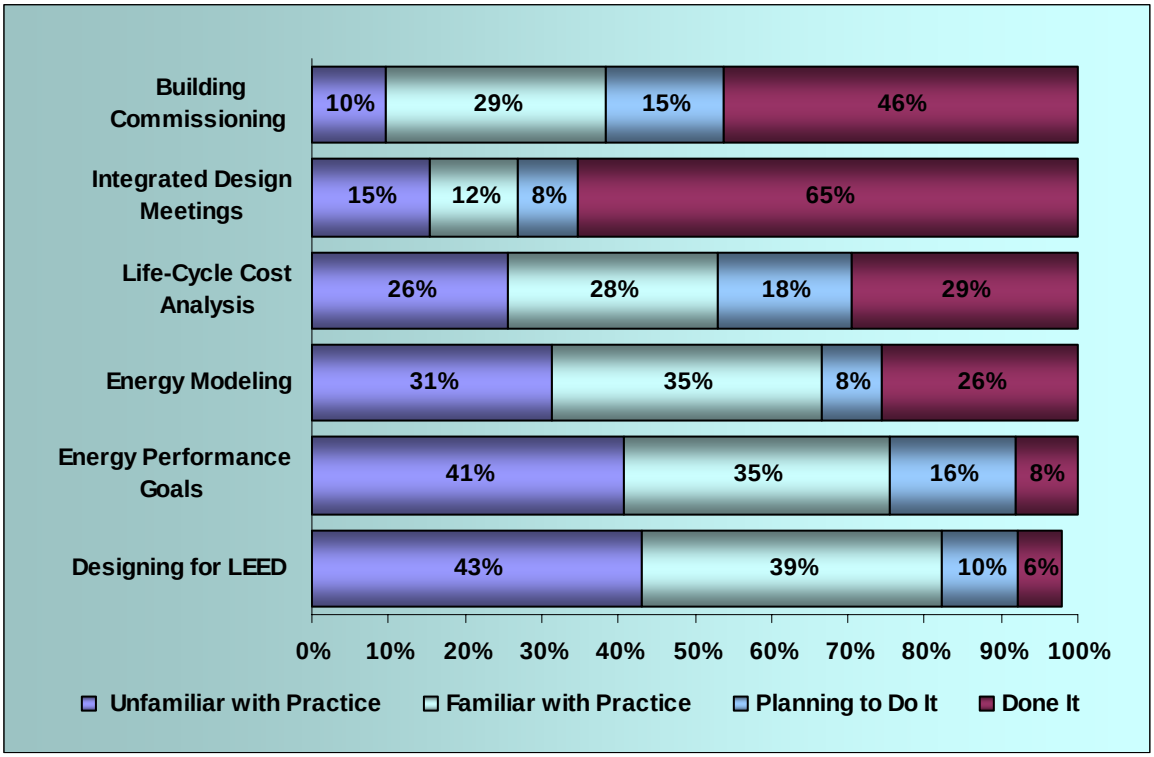
- Commissioning the facility prior to occupancy
- Holding design meetings with all team members, including hospital user groups – design side and construction side – to creatively address building performance objectives (integrated design)
- Evaluating designs and specifications from a total-cost-of-ownership or life-cycle-cost perspective, which considers the cost over the life of the facility, not simply first costs
- Conducting whole-building energy modeling to confirm the design meets the high performance goals
- Setting measurable energy performance goals, such as 25% better than operating guidelines
- Designing to meet Leadership in Energy and Environmental Design (LEED) certification requirements

From Figure A.10 we can see that:

- The overall building performance concepts of integrated design meetings and commissioning are well known and applied.

- The energy-specific performance concepts of energy performance goals, energy modeling, and designing for LEED are comparatively less known, with about 30% to 40% of managers unfamiliar with these concepts.
- Life-cycle-cost analysis may be at a tipping point with three-quarters of managers either familiar with the concept or in some stage of implementation.

Figure A.10: New Construction Practices Awareness/Adoption Continuum (n=52)

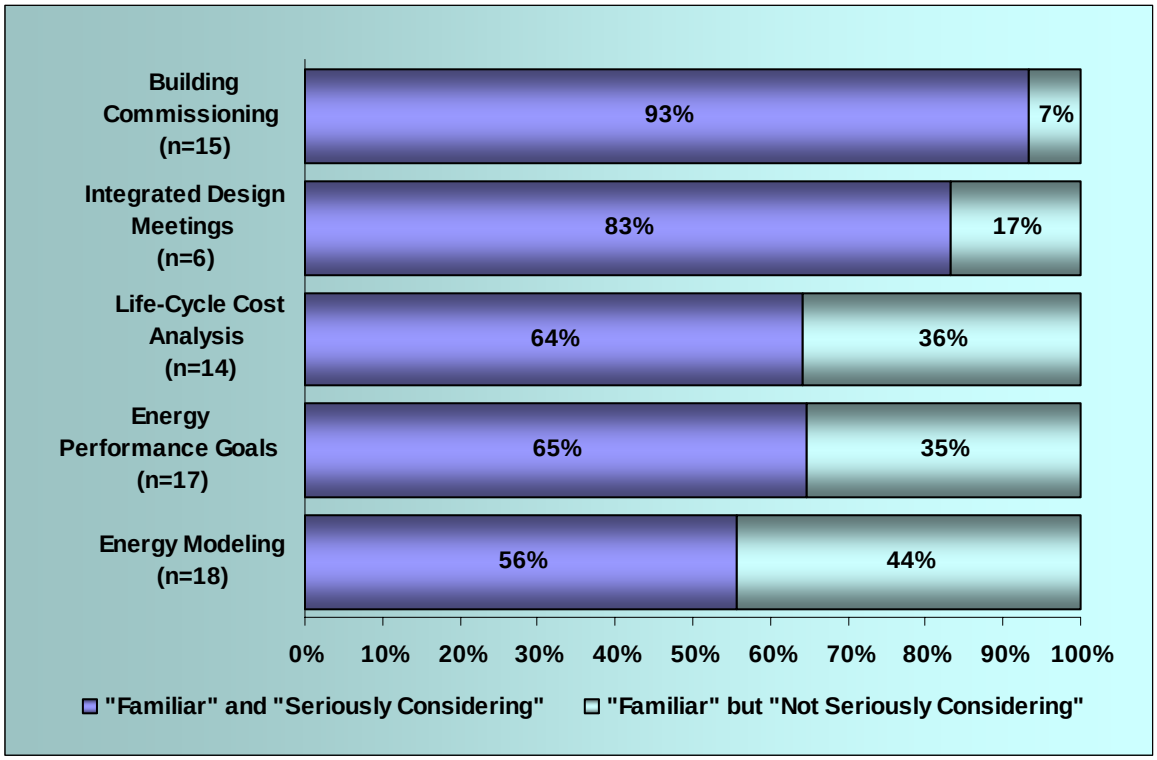


Note: Some practices have samples of 49, 50 or 51 as a result of "don't know" responses.

Level of Consideration Being Given New Construction Practices

To appropriately place our contacts along the decision/action continuum, we asked those "familiar" with each practice, who were neither planning to implement nor had implemented the practice, whether they were "seriously considering" implementation. Having seriously considered implementation moves a manager further along the decision process that may result in future action, compared to those who have not moved beyond the stage of being simply "familiar" with a practice. Among those contacts reporting they were "familiar" with each of the concepts (see number listed for each in Figure A.11), the percentage who are "seriously considering" future implementation varies considerably.

Figure A.11: Level of Consideration among Managers "Familiar" with the Practice (n=52)



Note: Sample is 52 facility managers (except for a few "don't know" responses). Data graphed are percentages reporting "seriously considering" out of those who reported they are familiar with, but not implementing the practice.

The high percentages of "familiar" managers that reported "seriously considering" building commissioning or using an integrated design team meetings approach for new construction planning suggest that those who are familiar with these practices may be moving in the direction of implementation.

As previously seen in Figure A.10, the practices of setting measurable energy performance goals and energy modeling were far more often reported as "unfamiliar" and far less often reported as "done" when compared to the practice of integrated design meetings or building commissioning. (Designing to meet LEED standards will be discussed below). However, of those managers that are "familiar" with these two practices, we see from Figure A.11 that over one-half reported they are "seriously considering" these practices for the design phase of new construction (11 of 17, or 65% for energy goals; and 10 of 18, or 56% for energy modeling). We anticipate increasing saturation rates for these two practices if those who are "seriously considering" them go on to implement them.

As discussed, designing to meet LEED standards is the least implemented practice among the six we reviewed with managers. This practice had the highest reported number of "unfamiliar" managers (43%, 22 of 51 reporting) and the lowest percentage implemented (6% or 3 managers having "done it"). While five (10%) are currently planning a LEED design and one (2%)

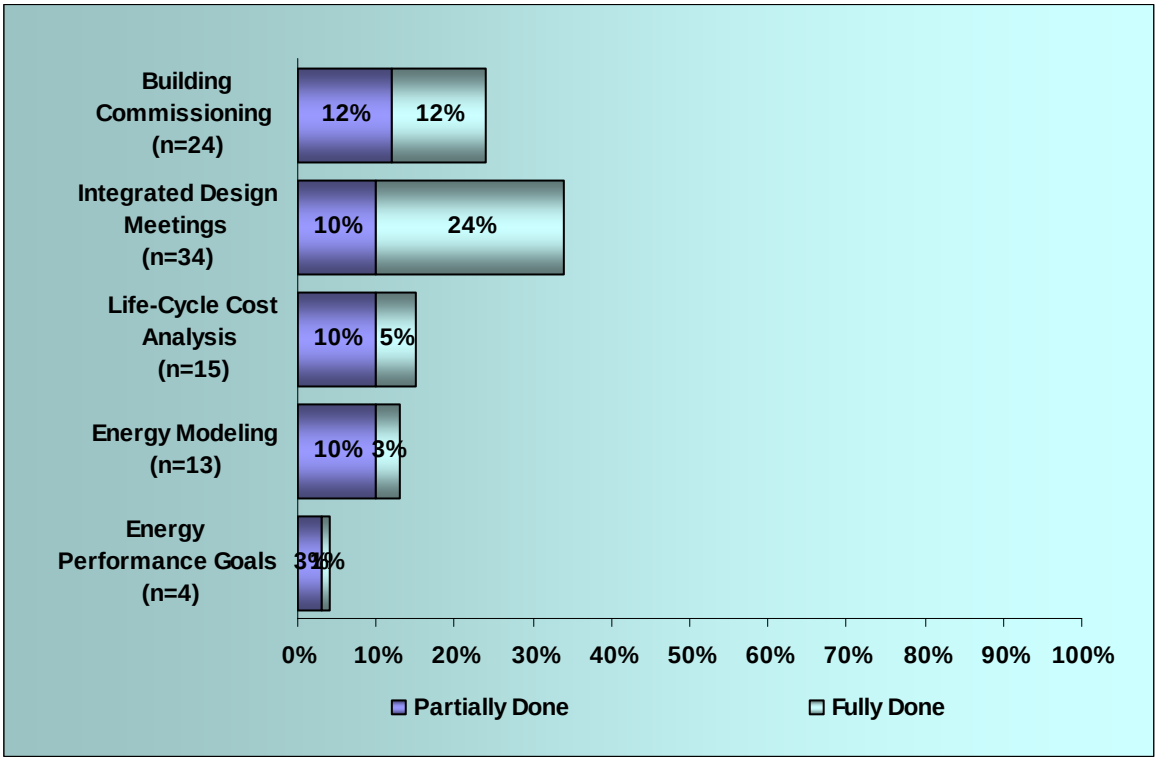
reported a LEED project underway, it appears that, in the future, we may expect to see a somewhat higher incidence of hospitals designing facilities to meet LEED certification requirements. This is supported by 13 of 20 (65%) of those familiar with the concept reporting to be "seriously considering" this building practice.

Among six managers with planned or underway projects reporting LEED involvement (12% of 51), four did not know which LEED level their hospital hoped to achieve, one hoped to achieve "certified," and one said that the hospital's goal was "silver." Among the three managers who had participated on a new construction project that designed for LEED certification, two reported achieving "silver" status, and the remaining manager could not recall the status achieved.

The Meaning of "Done It"

Now that we have unpacked the term *familiar* by exploring *serious consideration*, we turn our attention to a fuller understanding of what managers meant when they reported having *done* the new construction practices. To accomplish this, we asked managers reporting they had done a practice to tell us if that practice was "partially" or "fully implemented," (Figure A.12).

Figure A.12: Level of Completion Across Reported "Done" Practices (n=52)



Note: Sample is 52 facility managers (except for a few "don't know" responses). Data graphed are percentages reporting "partially/fully" done out of those who reported they have done the practice to some extent.

In Figure A.12, reports of *done* for the new construction practices other than LEED[27] are disaggregated into *partially* or *fully* done. It shows managers reporting *done* are generally referring to partial implementation. (We alert the reader to the very small number of contacts – four – who reported having set energy performance goals.)

STRATEGIC ENERGY MANAGEMENT PLANS AND BETTERBRICKS

Among interviewed hospital facility managers, about twice as many reported awareness of the term *Strategic Energy Management Plan* than of *BetterBricks* (64% versus 33%). Twenty-nine of 33 managers reporting SEMP awareness described SEMP either as a plan or as a process related to building "efficiency" (11 mentions), or "efficiency and costs" (8 mentions), "efficiency, and costs over time" (8 mentions), or "energy conservation" (2 mentions). Two others simply said that it related to long-term planning, another said it "deals with green buildings," and one didn't know.

CURRENT STRATEGIC ISSUES

One-half of these facility managers identified a strategic issue or problem they were currently facing (the other 26 said they did not have an issue or problem). We've categorized the issues mentioned into four general topics – budget, space, equipment, and personnel – in order of the frequency with which they were mentioned. Except for personnel issues, with few mentions, these categories were reported in fairly equal proportions.

- **Budget** (nine mentions)
  - Budget constraints – general (three mentions)
  - Budget constraints – facilities (three mentions)
  - Cost of energy/weather (three mentions)
- **Space-Related** (eight mentions)
  - Building upgrades needed (two mentions)
  - New construction – in progress or in the offing (two mentions)
  - New construction – balancing with current system capacity (one mention)
  - Space constraints (two mentions)
  - Changing nature of use of space and staff resources (one mention)

[27] Follow-up regarding LEED certification concerned level of certification rather than level of completion, as discussed above.

➡ **Equipment-Related** (eight mentions)

- Aging equipment / equipment repairs (four mentions)
- Getting management on board with new technologies (two mentions)
- Constraint of existing equipment (one mention)
- Equipment reliability (one mention)

➡ **Personnel-Related** (one mention)

- Hiring qualified staff (one mention)

B HOSPITAL EDUCATION AND TRAINING EVENT PARTICIPANTS

INTRODUCTION

The education and training (E&T) program has been developed as a key element of a strategy to spread Strategic Energy Management Planning (SEMP) and its associated concepts (e.g., efficient building operations, life-cycle-cost analysis, integrated design) to hospitals beyond those with whom the market specialists are working closely. The Hospitals Initiative theory presumes that hospitals will adopt SEMPs or a SEMP-like strategy as they become aware of it, aware of its benefits, and aware of how to do it. The education and training program is the key vehicle by which hospitals that are not working with market specialists can learn how to develop a SEMP and its associated activities.

During the periods covered by MPERs #1 and #2, the education and training team developed several curricula based on a variety of tools and materials developed by the marketing team. These were then presented to both technical and business/financial-related audiences within the hospitals, as well as to professionals, such as architects, providing services to hospital clients. During the period covered by the current MPER (#3), the team continued its efforts in furthering curriculum development and delivery to reach increased audiences.

Our evaluation activity for this MPER included reaching participants in these workshops – provided by the team in 2006 and 2007 – in order to understand the extent to which the E&T effort is delivering content that is appropriate to the participants, the extent to which the E&T program is influencing participants as it intends, and any program elements that may require modification to better align the E&T effort with the Hospitals Initiative's overall goals.

METHODOLOGY

Many of the participants attended more than two workshops during the target period of this evaluation; therefore, we asked them to reflect on their experiences in the most recent workshop they attended. The data collection instrument consisted of three major parts: an awareness section that included questions relating to how the participants learned about the workshop; an influence section that asked questions to assess participants' behavioral and attitudinal responses to specific areas addressed by the workshops; and a final section that assessed participant satisfaction and sought their opinions about how the workshops might be modified to better serve their needs. The concluding question asked contacts to identify key trends and critical issues facing hospitals.

In 2006 and 2007, E&T offered eight different workshops whose target audiences were hospital staff, as well as consultants and contractors that serve hospital clients. The participant contacts in

these workshops (265 in all) were extracted by NEEA from its online program tracking database. We first eliminated from this list duplicate contacts (i.e., we kept a single record for participants in more than one workshop) and contacts lacking both a phone number and an email address. Next, we eliminated from the list of hospital staff participants those individuals the evaluation team was contacting for in-depth interviews. We eliminated from the list of non-hospital participants those individuals not appearing to be consultants or contractors to hospitals.[28] After these cleaning steps, the final population list included 32 hospital and 118 non-hospital contacts, as shown in Table B.1.

Table B.1: Population Distribution

POPULATION DISPOSITION	HOSPITAL	NON-HOSPITAL	TOTAL
Participant list from CTS	51	214	265
Less Duplicates	-6	-12	-18
Less Missing Contact Information	-3	-6	-9
Less Hospital Contacts Included In Sample For In-Depth Surveys	-10	NA	-10
Less Non-Hospital Contacts That Are Not Consultants Or Contractors To Hospitals	NA	-78	-78
Total	**32**	**118**	**150**

We employed two data collection methods. First, a web-based survey was made available to those participants for which we had email addresses (a large majority of the participants). One solicitation email was sent with the link to the web survey; a week after the first solicitation, we sent one follow-up email to those who had not completed the survey. Then, trained interviewers at Research Into Action made follow-up calls to the contacts who did not complete the survey via the web and asked for participation in the survey on the phone, using the same instrument, while offering contacts an option to complete the survey online. The interviewers attempted to schedule callbacks whenever possible, such as when softly rejected or when the contacts were not available when calls were made.

[28] Excluded individuals included NEEA staff and contractors, utility staff, individuals that provided no organizational affiliation and whose email address referenced a public ISP (e.g., Gmail), and individuals in organizations that did not appear to directly serve regional hospitals (e.g., government, educational, nonprofits, and out-of-region). Although the determination was subjective, as the NEEA database did not contain a field for participants' business type, the evaluation team consulted organizational websites to assist the judgment process. Participants kept in the sample and designated as "consultant/contractor" include staff of the following types of firms: architects, engineers, construction, developers, lighting, electrical, controls, and other equipment.

The data collection period was from October 31 through November 16, 2007. We completed 19 surveys via the web and 16 surveys via the phone, for a total of 35 completes. We compared the data collected by phone and web using *t*-tests and the results confirm responses from the two different methods are equivalent. Table B.2 summarizes the final survey population by workshop attended.

Table B.2: Summary of Cleaned Participant List by Workshop

WORKSHOP TITLE (N=TOTAL ATTENDEES)	SURVEY LIST	PARTICIPANT TYPE		TOTAL
		HOSPITAL	NON-HOSPITAL	
Financial Decision-Making Tools for Hospitals **(n=11)**	Count	2	3	5
	Distribution	40%	60%	100%
High Performance Hospitals & Medical Research Facilities **(n=59)**	Count	15	34	49
	Distribution	31%	69%	100%
Hospital Strategic Energy Management Overview **(n=13)**	Count	2	4	6
	Distribution	33%	67%	100%
High Performance Building through Integrated **Design (n=26)**	Count	2	10	12
	Distribution	17%	83%	100%
Kalispell Regional Medical Center Staff Training **(n=6)**	Count	1	0	1
	Distribution	100%	0%	100%
Lighting for Healthcare Facilities **(n=97)**	Count	10	48	58
	Distribution	17%	83%	100%
Successfully Selling Energy Efficiency: Strategic vs. Tactical Approaches **(n=17)**	Count	0	4	4
	Distribution	0%	100%	100%
Understanding the Value of Commissioning **(n=36)**	Count	0	18	18
	Distribution	0%	100%	100%
Total (n=265)	Count	32	121	153
	Distribution	21%	79%	100%

Note: This tally of survey population by course does not reflect attendance in multiple courses by some participants. Although surveyed participants were asked to reflect on the workshop they most recently attended, elimination of duplicate records was made without regard to retaining that of the most recently attended workshop. The Kalispell workshop was offered on-site to KRMC staff: six staff attended. Only one staff remained in the survey population after the initial population list was cleaned according to the steps outlined in Table B.1.

Though we initially hoped to survey enough hospital participants to summarize their experiences with 90/10 confidence/precision levels, when the number of hospital participants available to be surveyed turned out to be small (32 participants), we expanded the sample to include consultants and contractors to hospitals. Yet, because we wanted to be able to compare the two groups, we

did not want the number of completed hospital participants to be dwarfed by the number of completed non-hospital participants. Thus, we sought to attain as many completes as we could from hospital participants (and attained 16 completes), and a comparable amount from non-hospital participants (we attained 19 completes).[29]

With a 90% confidence level, the final sample size provides approximately 13% precision overall. T-tests and chi-squared (χ^2) significance tests were conducted for all the close-ended scale questions to compare responses between hospital and non-hospital participants. The results suggest the responses provided by these two groups do not significantly differ. Therefore, most of the analysis that follows presents findings for the sample overall, without making a distinction between hospital and non-hospital participants.

SUMMARY OF RESPONDENTS

The final sample size for this survey was 35 – 16 from hospitals and 19 from non-hospitals (Table B.3). Although the sample size of these two groups is disproportionate in terms of the affiliations of total participants (see Table B.2), we tried to maximize the samples from hospitals because we wanted to understand their experience in particular. As expected, most of the respondents were participants of either *Lighting for Healthcare Facilities* or *High Performance Hospitals & Medical Research Facilities*. A very few respondents reflected upon their experiences in other workshops.

Table B.3: Respondents by Workshop

WORKSHOP TITLE	HOSPITAL	NON-HOSPITAL	TOTAL
Lighting for Healthcare Facilities	8	9	17
High Performance Hospitals & Medical Research Facilities	7	5	12
Financial Decision-Making Tools for Hospitals	1	1	2
Understanding the Value of Commissioning	0	2	2
High Performance Building through Integrated Design	0	1	1
Hospital Strategic Energy Management Overview	0	1	1
Total	**16**	**19**	**35**

Of the 16 hospital participants, one-third were from multi-hospital systems. The number of campuses of the 16 hospitals ranges from one to more than 60 sites (31% with one campus, 31%

[29] Because the two groups of participants were surveyed coincidentally, we attained a few more completes from non-hospitals than from hospitals.

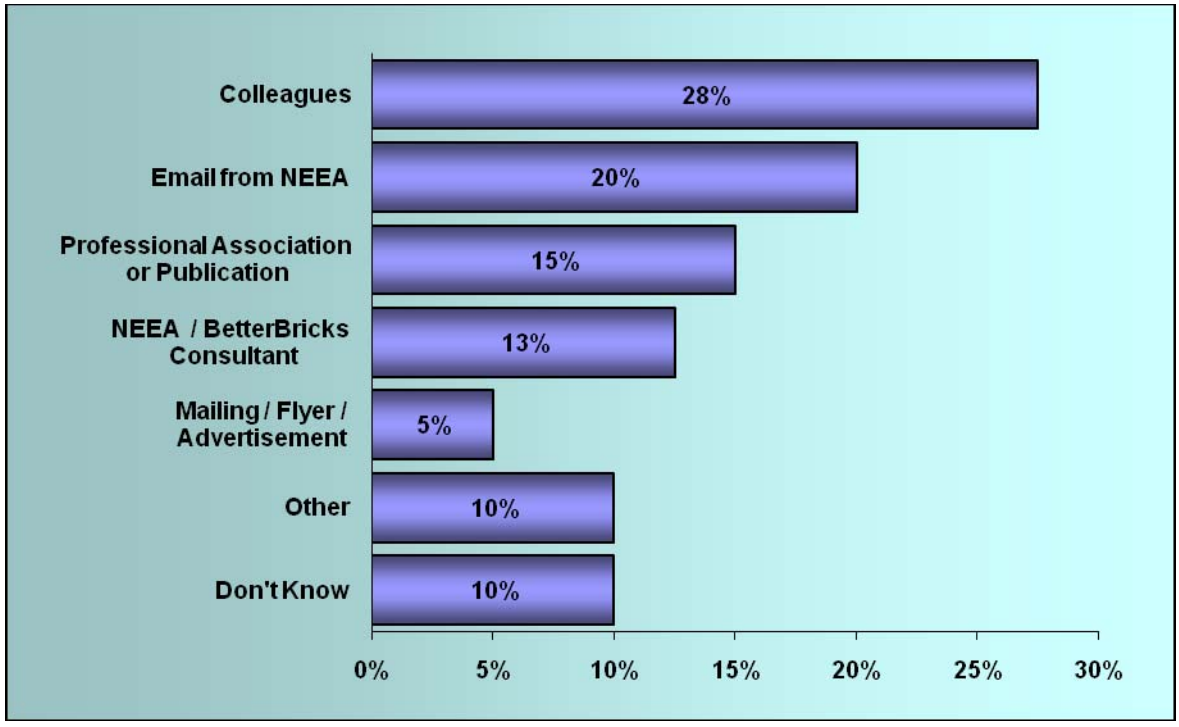
with 2 to 5 campuses, 19% with 6 to 20 campuses, and 13% with more than 21 campuses). Four hospital participants' facilities are for outpatients only (25%). Of those with inpatient hospitals, two are small with 1 to 50 beds (13%), four are medium with 51 to 200 beds (25%), and six are large with more than 201 beds (38%). Most of the hospital participants were management level personnel who are engaged in construction and/or facility management. Only two participants reported that energy management activities are a part of their job description (13%); four participants reported energy management performance is included in their annual performance review (25%).

Of the 19 non-hospital participants, most work for architectural firms (36%) or engineering firms (32%). Other non-hospital participants' organizations include lighting and electrical firms (2 participants), construction firms (1 participant), control and equipment firms (1 participant), and project management and planning firms (1 participant).

AWARENESS OF THE WORKSHOPS

We asked contacts how they learned about the BetterBricks workshop they attended, allowing for multiple responses (Figure B.1).

Figure B.1: Source of Information About the Workshop



Most commonly, one-third received information through direct contacts with NEEA – 20% received an email notification from NEEA, and 13% received the information from a NEEA or

BetterBricks consultant. Just over one-quarter (28%) said the workshop was recommended by their colleagues or supervisors. Fifteen percent of the responses indicated that the workshop information was provided through professional/trade association contacts or publications; 5% said they received the information by some form of advertisement, such as a mailing or flyer, but did not recall the specific source. Ten percent heard about it from various other methods and another 10% just did not recall the information source.

INFLUENCE OF THE WORKSHOPS

To assess the impact of the workshops, we asked contacts various questions regarding specific topics that may have been addressed in the workshops.[30] The Hospitals Initiative theory poses that hospitals will adopt a SEMP as they become aware of it, aware of its benefits, and aware of how to do it. Our investigation sought to uncover the extent to which the workshops impacted participants at each stage of this theory of change.

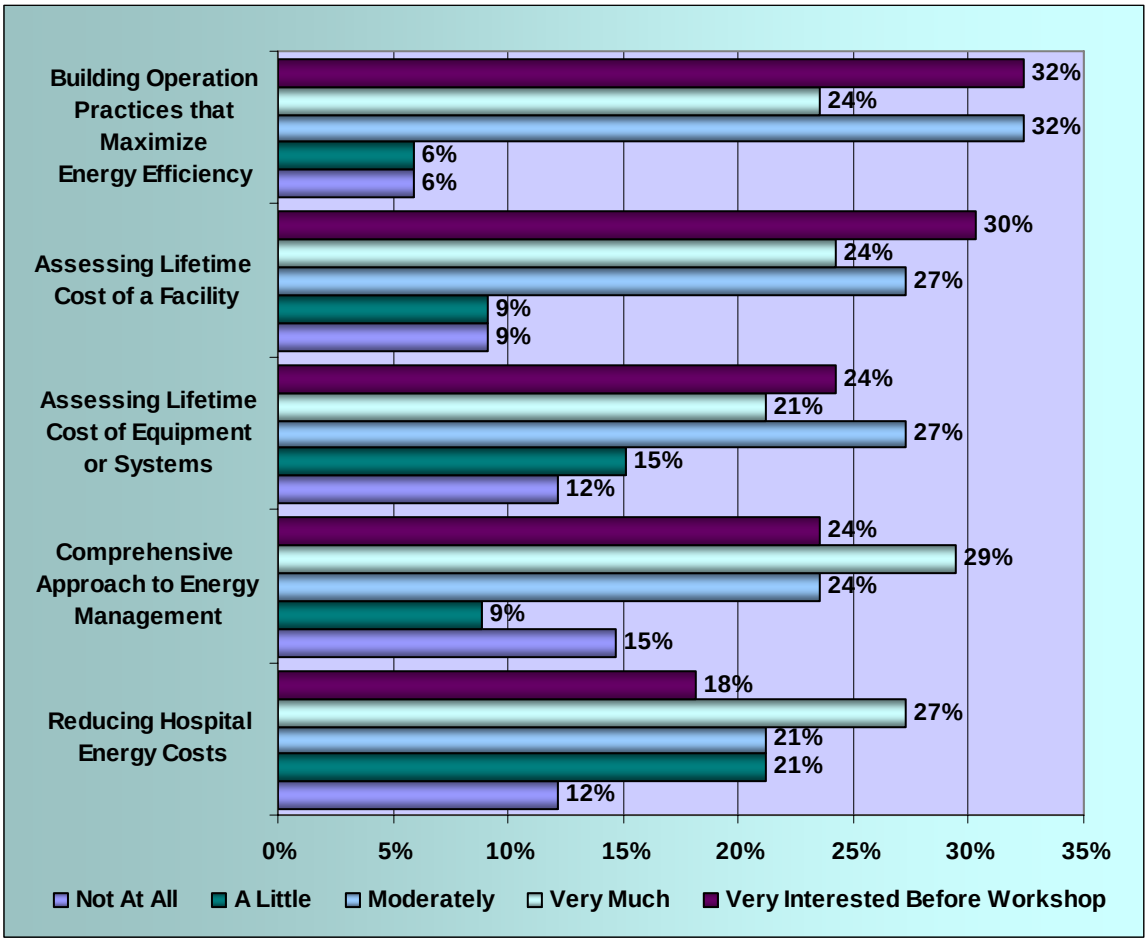
Interest In and Awareness of Efficiency Actions

One of the key roles of the E&T activities is the development of awareness and interest in energy-efficient building operations. We asked all the participants to rate the extent to which the workshops they attended have increased their interests in several general areas relating to energy-efficient building operations. If contacts were already very interested in the areas before attending the workshops, and thus the concept of "increased" interest does not apply, they were told to choose "very interested before workshop" (Figure B.2).

About one-third of contacts said they were already "very interested before workshop" in building operation practices that maximize energy efficiency (32%) and in assessing lifetime cost of a facility (30%). Assessing lifetime cost of equipment (24%) and comprehensive energy management (24%) were also areas in which respondents already had high interest before the workshops. Reducing hospital energy costs had the lowest percentage of respondents who had high interest before the workshop (18%).

[30] We offered contacts a response of "not applicable" if they felt the workshop did not address a given topic. We used this approach as an expediency, as the research budget could not handle the cost of exploring with the E&T manager the extent to which each item was addressed in each workshop, tracking for participants in multiple workshops the most recent workshop they attended, and confirming with these respondents that, indeed, the workshop to which they referred was the workshop we understood to be their most recent.

Figure B.2: Development of Interest and Awareness in Energy-Efficient Buildings (n=35)



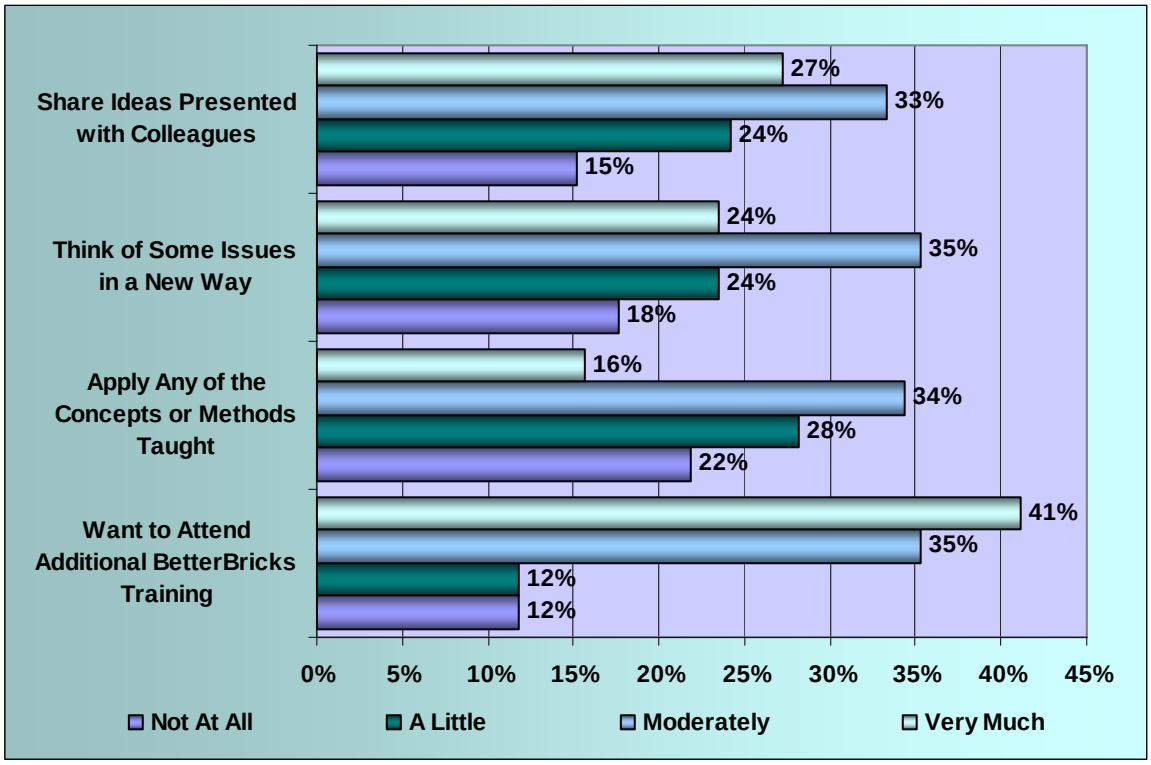
Note: Some items have samples of 34 or 33, having excluded "don't know" and "not applicable" responses.

The workshops seem to have increased participants' interests in all areas. When "very much" and "moderately" responses are combined, about half (48% to 56%) of the contacts reported for each area that their interest had increased more than moderately due to the workshop. Contacts who said the workshops had "a little" or "no impact" on increasing their interest ranged from 12% to 33%, depending on the area of response. Lifetime cost assessment of equipment (27%), comprehensive energy management (24%), and reducing hospital energy costs (33%) were the areas in which the largest numbers of contacts said the workshops least influenced their interests.

Post-Workshop Experiences

The program postulates that the heightened awareness and interest in efficient building operations will be translated into some immediate actions or attitudinal changes. We asked the participants to rate the extent to which the workshops have impacted on their post-workshop experience in several areas (Figure B.3).

Figure B.3: Post-Workshop Experiences (n=35)

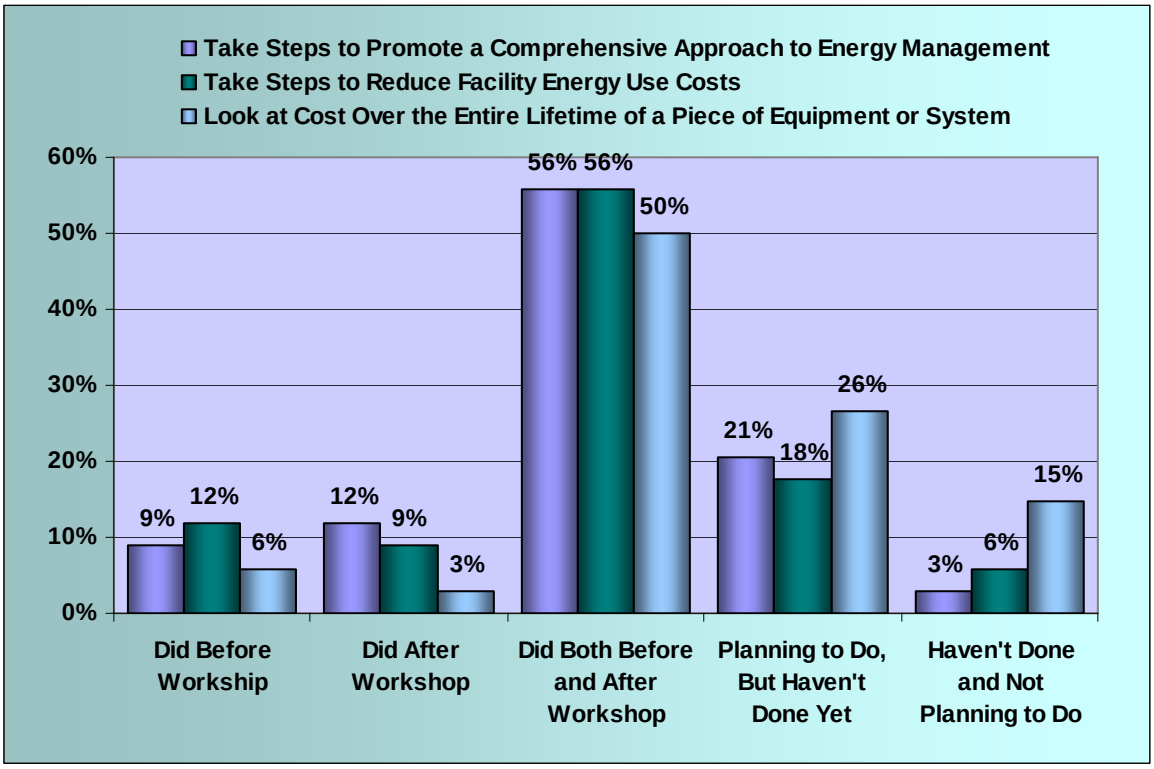


Note: Some items have samples of 34 or 33, having excluded "don't know" and "not applicable" responses.

Nearly two-thirds of contacts reported they frequently or to a moderate extent shared ideas learned in the workshops with their colleagues and think of issues around energy-efficient building operations in new ways; and, similarly, one-half of contacts indicated they had applied any of the concepts or methods taught in the workshops. Three-fourths of contacts said the workshops they attended led them to desire to participate in future BetterBricks workshops to a moderate extent or "very much," with one-fourth of contacts indicating little or no desire to participate further.

We asked the participants additional questions that relate to their post-workshop experiences – whether they have taken steps encouraged by the workshops before and/or after the workshop and, if not, whether they are planning on doing so (Figure B.4). Many participants appear to be engaged in all three areas fairly actively, with about one-half of contacts reporting they implemented each activity both before and after the workshops. Even among the respondents who have not implemented the activities, across all activities, contacts are about three times as likely to have reported they are planning to take the action as to have reported they have no plans to do so (18, or 26%, compared with 3, or 15%). "*Looking at lifetime cost of equipment*" had the highest proportion of contacts indicating they had no plans to do this (15%).

Figure B.4: Pre- and Post-Workshop Implementation Status (n=35)



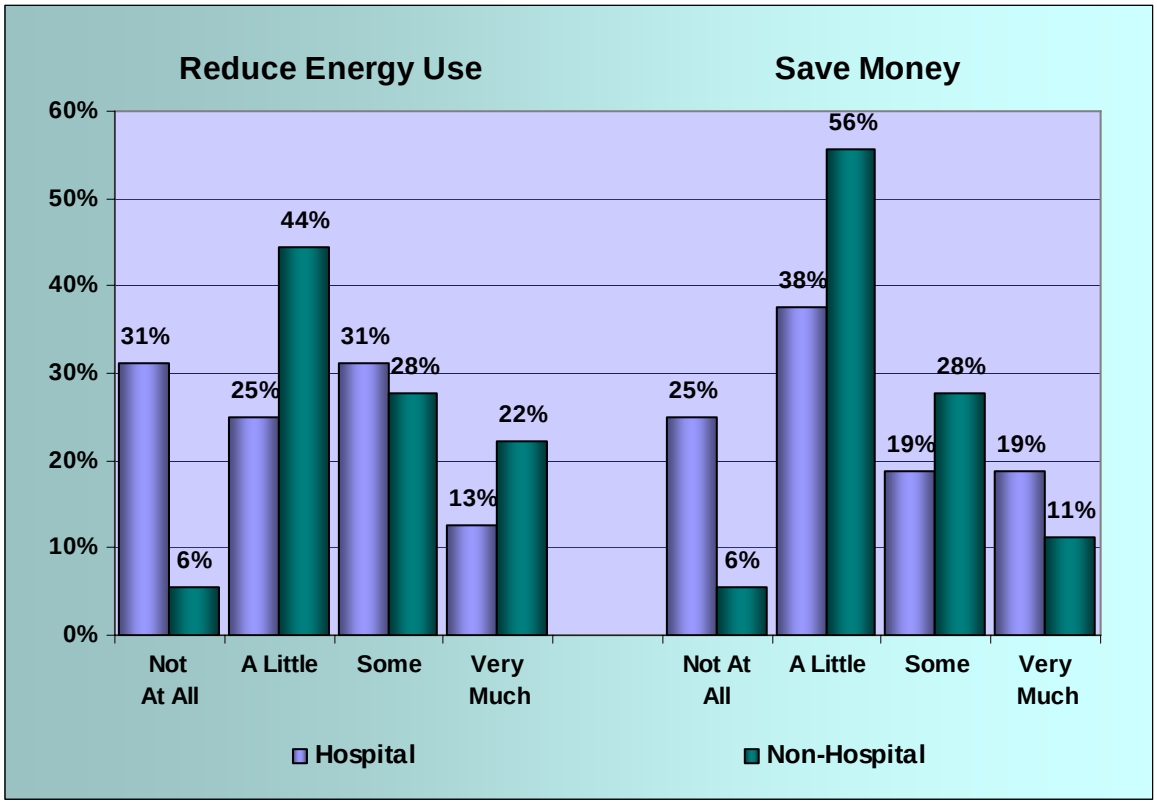
Note: Some items have samples of 34, having excluded "don't know" and "not applicable" responses.

Post-Workshop Perception of Ability

Finally, we asked the participants whether they deem that the workshops enhanced their ability to reduce energy use and save money at hospitals (Figure B.5). Hospital participants were asked to rate the extent to which the workshop supports their hospital's ability to reduce energy and save money. Non-hospital participants were asked to rate the extent to which the workshops support their ability as consultants or contractors to help their hospital clients reduce energy use and save money.

Most commonly, the respondents rated "a little" for both outcomes – 35% in reducing energy use and 47% in saving money. Hospital contacts were more likely than non-hospital contacts to give "not at all" responses, yet t-tests and chi-square analysis suggest these results are not significantly different at the samples sizes reporting.

Figure B.5: Perceived Ability to Reduce Energy and Save Money



SATISFACTION AND SUGGESTIONS

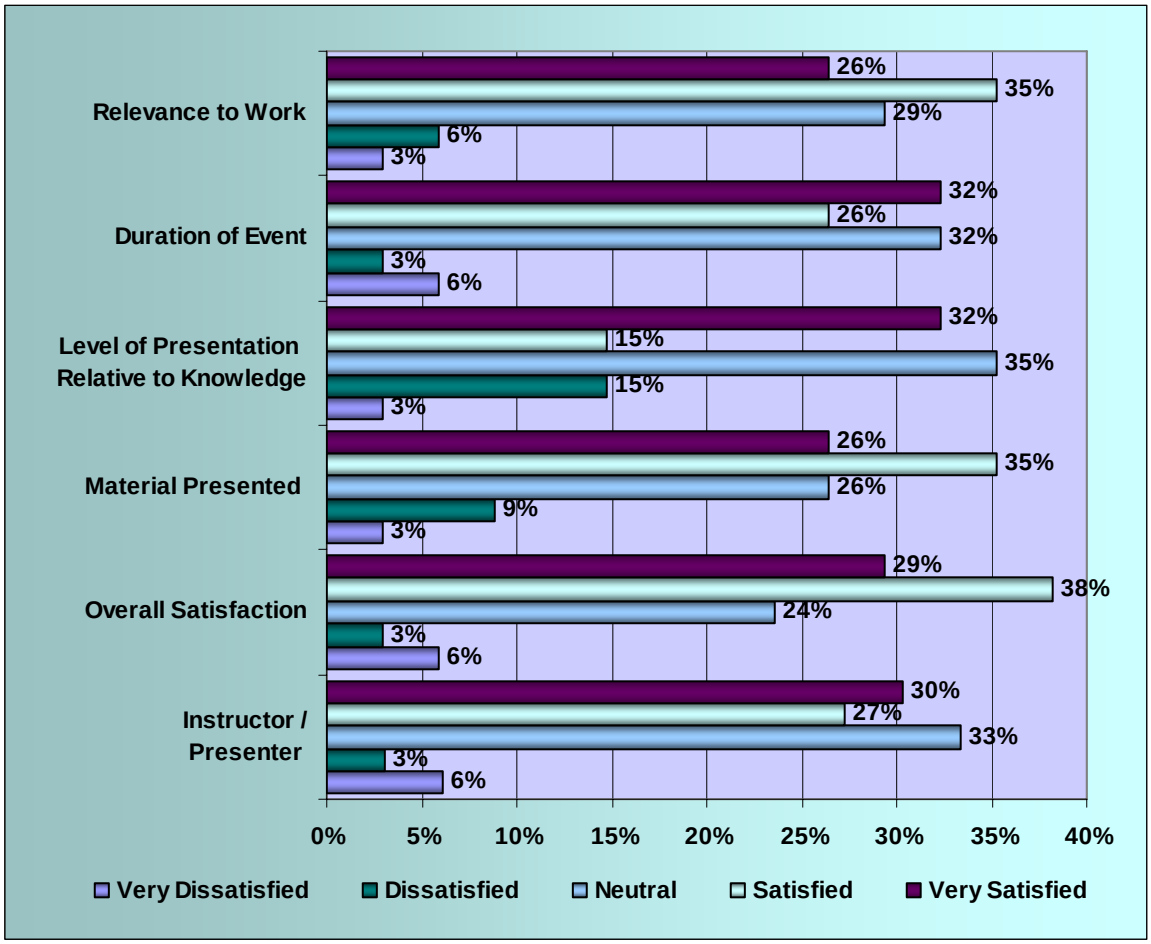
We asked a set of questions to assess the extent to which the participants were satisfied with various aspects of the workshops. Then we gathered participants' suggestions for improvements.

Satisfaction

Figure B.6 illustrates the result of the responses regarding the participants' satisfaction with several aspects of the workshops. Between one-half and two-thirds of contacts were satisfied (ratings of "4" or "5") with their workshops overall, with each of the specific aspects we explored.[31] Contacts were least satisfied with the level of the presentation relative to their knowledge.

[31] Each aspect of the workshops was measured using the 5-point scale with 1 being "very dissatisfied," 3 being "neutral" and 5 being "very satisfied" (don't know and NA responses were treated as missing values).

Figure B.6: Satisfaction with Specific Aspects of the Workshops (n=35)



Note: Some items have samples of 34 or 33, having excluded "don't know" responses.

Differences in these ratings between hospital and non-hospital participants were assessed by conducting t-tests of the mean ratings; the results suggest both groups equally rated these areas highly. Moreover, we used t-tests to compare these ratings among two types of workshops, *Lighting for Healthcare Facilities* and *High Performance Hospitals & Medical Research Facilities*, both of which had large enough samples to support this analysis.[32] Again, these two workshops received equally quite high ratings for all aspects of these workshops.

[32] Sample sizes for other workshops were not sufficient to support a t-test.

Suggestions

We asked all participants to provide comments potentially helpful for course developers and to identify any topics they wished had been addressed. Most contacts either provided positive statements about their workshop experiences or offered no opinions. Several contacts provided suggestions, yet the suggestions ranged widely. We extracted appropriate comments and show them below by workshop type.

High Performance Hospitals & Medical Research Facilities

- *"The sessions should provide opportunities to network with other participants who work for hospitals and have similar facility concerns, as well as with non-hospital participants who may be beneficial to know when contracting needs arise."*
- *"The workshops focused on health, safety, and energy, but did not sufficiently address cost issues."*
- *"Provide a white paper so that what we learned in the workshops can be easily presented to our colleagues."*
- *"Wish that topics related to solar power or co-generation plants were covered."*
- *"Wanted to hear slightly more in-depth discussion of payback."*

Lighting for Healthcare Facilities

- *"More detail and cutting-edge information should be provided."*
- *"More convenient workshop locations."*
- *"Wish to see model cases that demonstrate the need for a comprehensive maintenance program and the importance of a strong operating budget that allows for scheduled facility and operation maintenance."*

Understand the Value of Commissioning

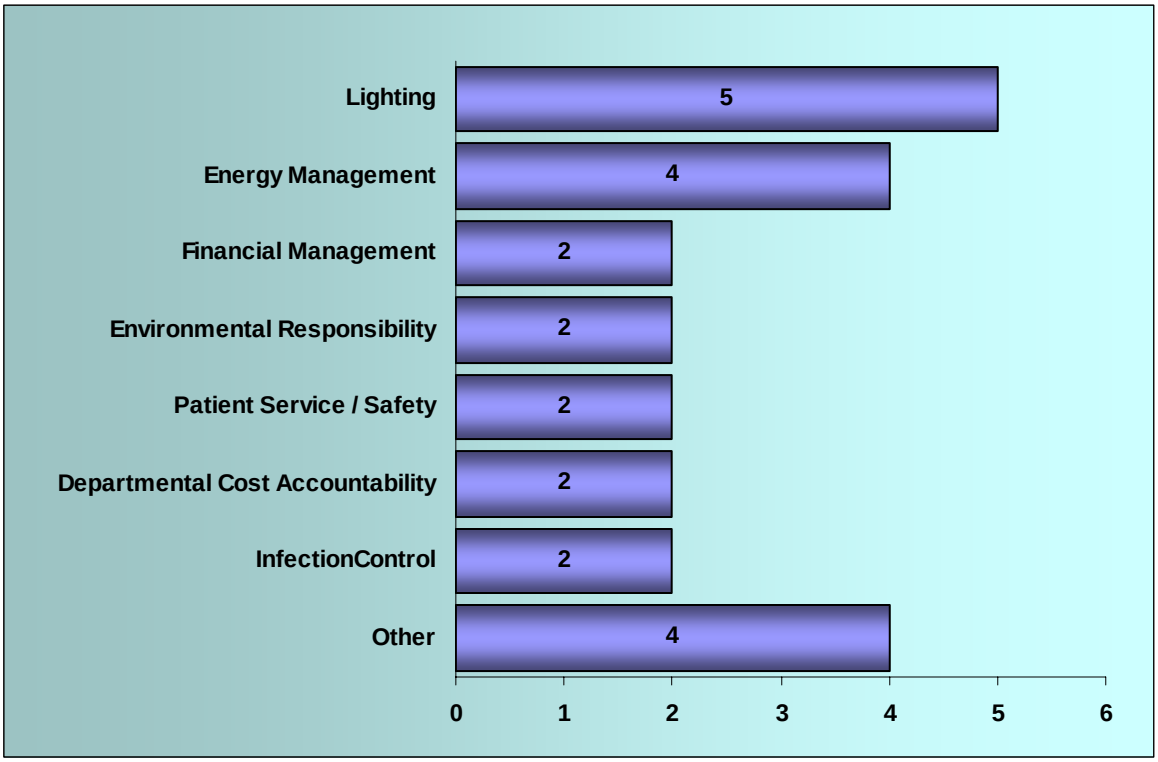
- *"A new guideline."*
- *"Guidelines for Design & construction of Health Care Facilities (2006) published by AIA should be presented as a resource."*
- *"Wish to hear topics on alternative power sources, such as solar and wind, and other future technology."*

Critical Issues Facing Hospitals

The concluding question asked contacts to identify key trends and critical issues facing hospitals. Half of the respondents (17 of 35) provided appropriate comments we were able to categorize.

Consistent with the fact that most contacts attended workshops addressing lighting and efficient operation of healthcare facilities, the most commonly identified issues concern lighting (mentioned by five contacts) and energy management (identified by four contacts; see Figure B.7). Other issues raised by two contacts each were financial management or the rising cost of building operations, environmental responsibility, patient care, departmental cost accountability, and infection control.

Figure B.7: Critical Issues Facing Hospitals



C BETTERBRICKS HOSPITALS AND HEALTHCARE LOGIC MODEL

SITUATION	PHASE I			PHASE II		IMPACT
	ACTIVITIES (2007-2009)	OUTPUTS (BY END 2009)	OUTCOMES – SHORT-TERM (BY 2010)	ACTIVITIES (2010-?)	OUTCOMES – LONGER-TERM	
THE CONTEXT AND NEED THAT GIVES RISE TO AN INITIATIVE, INCLUDING OPPORTUNITIES AND BARRIERS	*IN ORDER TO ADDRESS THE SITUATION WE WILL CONDUCT THE FOLLOWING ACTIVITIES*	*WE EXPECT THAT IF COMPLETED OR UNDERWAY, THESE ACTIVITIES WILL PRODUCE THE FOLLOWING EVIDENCE*	*WE EXPECT THAT IF COMPLETED OR ONGOING THESE ACTIVITIES WILL LEAD TO THE FOLLOWING CHANGES BY 2010*	*IN ORDER TO ADDRESS THE SITUATION, WE WILL CONDUCT THE FOLLOWING ACTIVITIES*	*WE EXPECT THAT IF COMPLETED OR ONGOING, THESE ACTIVITIES WILL LEAD TO THE FOLLOWING CHANGES POST 2010*	*CHANGES IN THE MARKET RESULTING FROM THE PRECEDING OUTCOMES*
OPPORTUNITIES: • Hospitals are under increasing financial pressure and have slim operating margins so are looking to reduce costs • Hospitals own their facilities and so directly benefit from energy management (EM) • EM tangibly and directly supports mission-critical goals: patient care, staff retention, community leadership, and environmental stewardship	**ACTIVITIES:** Develop/test/ refine SEMP approach & resources: • Develop descriptions of SEMP approach and practices • Develop marketing content for SEMP • Develop tools, materials, education, and training to support development and implementation of SEMP • Test/refine the above with market specialists, target hospitals, and state hospital engineering assoc. (“SHEs”)	**OUTPUTS:** (1) Clear articulation of SEMP approach; (2) Effective marketing; (3) Effective resources: • Clear *internal* materials on hospital initiative, SEMP approach and practices: (a) initiative logic model, (b) SEMP Value Proposition, (c) description of BB support. • Marketing content and materials, refined based on market feedback: targeted messaging, presentations, brochures, success stories, articles, awards, etc.	**OUTCOMES:** BetterBricks can document market awareness of SEMP benefits among hospital decision-makers representing 75% of beds Hospitals representing 25% or more of regional beds will be committed[2] to and practicing[3] SEMP elements: • Financial decision-making clear and uses total cost of ownership • Integrated design in new facilities and major renovations • Enhanced facility O&M practices	**ACTIVITIES:** Based on feedback from hospitals doing SEMP, further refine approach & resources: • BetterBricks will focus on online tools & resources and E&T that will enable hospitals to do SEMP with less and less direct BB advisory support Continue, but deliberately reduce, one-on-one support: • Continue to help Phase I hospitals with practice change, but reduce support as change takes root	**OUTCOMES:** BetterBricks can document market awareness of SEMP benefits among hospital decision-makers representing 90% of beds Hospitals representing 60% or more of regional beds will be committed to and practicing SEMP elements (see Phase I for elements) Hospital decision-makers (DMs) representing 60% of beds request &/or require (e.g., through RFPs & contracts) trade allies to support SEMP practices (see Phase I for elements)	**CHANGES IN THE MARKET:** Hospitals, associations, and trade allies are widely aware of and embrace the value of the SEMP approach and its associated practices Hospitals actively implement SEMP with the support of a well-developed trade ally network Hospitals achieve significant measurable reductions in energy usage and costs: • 10% to 30% in existing facilities • 25% to 40% better than current code in new facilities

SITUATION	PHASE I			PHASE II		IMPACT
	ACTIVITIES (2007-2009)	OUTPUTS (BY END 2009)	OUTCOMES – SHORT-TERM (BY 2010)	ACTIVITIES (2010-?)	OUTCOMES – LONGER-TERM	
• Hospitals are energy intensive and have significant EM opportunities • Hospital associations are market channel • Multi-hospital systems and networks represent aggregation points • Related healthcare market momentum (e.g., "green," "sustainable" trends) **BARRIERS:** • Executives unaware of EM opportunities and how they support mission-critical goals • Facility managers not well-equipped to develop or push business case to hospital executives for EM; often project-focused • Facility managers and staff have many competing priorities; facility departments often under-staffed	• Develop new BB website to house information, tools, materials on SEMP Work intensively one-on-one with target hospitals to develop & begin to implement SEMPs: • Market Specialists (MSs) and utilities together select target hospitals and develop coordinated customer strategy • MSs work intensively one-on-one with targets to develop and begin to implement SEMP • MSs, BetterBricks technical advisors, and utilities provide coordinated support to hospitals on selected technical projects (e.g., new construction, upgrades) Develop strong working relationships with SHEs (for SHAs see section below):	• SEMP tools/ materials, refined based on feedback (see website for example) • Education & training, refined based on feedback. Topics: - SEMP Overview - Benchmarking - Financial Analysis - Successfully Selling Efficiency - EM for Small Hospitals -TBD – integrated design and building opportunities • E&T outputs in terms of # & type of engagement TBD • New BetterBricks website, refined based on feedback Engagements with one to three large hospitals and systems in each state develop and begin to implement SEMP: • Written account plans by MSs documenting coordinated customer strategies	• Consistent purchase of energy-efficient equipment • Cost-effective capital upgrades • Tracking & accountability Hospital decision makers (DMs) representing 25% of beds request &/or require (e.g., through RFPs and contracts) trade allies to support SEMP practices as follows: • **Financial Decision-Making**: DMs request/ require that engineers and equipment vendors provide well-documented energy & O&M cost data for financial analysis of energy investments • **Integrated Design**: DMs request/require that A&E teams are experienced in or willing to learn ID	• For hospitals *outside* the Phase I target group, provide "limited" one-on-one assistance; *Limited* means that on SEMP development, a hospital might do 75% of work, MS might do 25% (Phase I, the opposite) • In Phase II on SEMP implementation, BetterBricks also anticipates providing one-on-one advisory support as market embraces value of SEMP, BB online resources, and E&T are refined, and trade ally capabilities improve BetterBricks and SHE leaders work more closely together: • SHEs encourage BetterBricks to be more involved in SHE decisions on events, initiatives, and materials	Utilities, hospital associations (SHEs and SHAs), and select hospitals promote SEMP on their own; examples: • Utilities and associations refer hospitals to BetterBricks website • Both SHEs and SHAs provide web-based information on the why/how of SEMP to their target audiences (may be a link to the Better-Bricks website) • SHEs regularly deliver SEMP content through events • Facility-level and executive-level peers share value of SEMP among themselves Sustained and deepened commitment to & implementation of SEMP practices: • Initial adopters continue to implement and improve SEMP, achieving efficiency goals and setting new targets	

SITUATION	PHASE I			PHASE II		IMPACT
	ACTIVITIES (2007-2009)	OUTPUTS (BY END 2009)	OUTCOMES – SHORT-TERM (BY 2010)	ACTIVITIES (2010-?)	OUTCOMES – LONGER-TERM	
• Some lack internal expertise to identify and implement EM opportunities • Capital is constrained due to fixed capital budgets and tradeoffs with competing priorities **MARKET TRANSFORMATION HYPOTHESIS:** If executives, facility managers, and other key decision makers… (4) Are convinced EE directly supports organizational and personal goals/needs; (5) Understand the meaning and benefits of a "strategic approach to energy management" (see sector Value Proposition for specific benefits); (6) Have the knowledge, ability, and tools to undertake a strategic approach…	• BetterBricks Market Manager and MSs raise awareness of SEMP value • Hospitals targeted for SEMP communicate value to peers • BetterBricks offers SEMP-related tools, materials, education & training • SHEs provide opportunities to interact, present, and market Deliberately leverage successes & relationships: • Encourage target hospitals to share SEMP experiences with peers • BetterBricks publicizes through stories, articles, and awards • SHEs & SHAs publicize through websites and other communication channels • BetterBricks gets other partner organizations to carry SEMP content	• LOEs[1] • Verbal communication & documentation by MS (CTS and BetterBricks update) of sustainable practice change by target hospitals • Selected technical projects pursued by hospitals and supported by BetterBricks (e.g., new construction, upgrades) Strong working relationships with SHEs evidenced by: • In each state, BetterBricks attends all SHE conferences and at least one chapter meeting to network; and periodically tables and sponsors depending on event theme(s) • In each state, SHE provides BetterBricks with opportunities to formally present in at least one SHE conference and one chapter meeting each year	• **Enhanced O&M**: DMs request/ require that service providers are experienced in or willing to learn enhanced O&M • **Purchasing And Upgrades**: See financial decision-making above • Hospital decision-makers and their associations consider BetterBricks an excellent source of information & practical tools on energy-related business & technical practices	• BetterBricks works with SHEs to more consistently include SEMP content • SHEs provide increasingly visible opportunities to interact, present, and market Continue to leverage successes and relationships but SHEs and SHAs become more likely to initiate and lead the following: • Peer-to-peer sharing of experience • Publicizing successes through stories, articles, and awards • Publicizing through websites and other communication channels • Build/facilitate peer-to-peer support mechanisms/channels; examples: (1) regional hospital summit focused on SEMP; (2) interactive website supported by business and technical advisory experts	Market Spillover: • One or more other large hospitals and systems besides the ones directly receiving BetterBricks business advisory support have developed and are actively implementing a SEMP Positive Market Feedback: • Evaluation can document that key market players find the SEMP tools, materials, and information available through the BetterBricks website and education valuable and are using them	

SITUATION	PHASE I			PHASE II		IMPACT
	ACTIVITIES (2007-2009)	OUTPUTS (BY END 2009)	OUTCOMES – SHORT-TERM (BY 2010)	ACTIVITIES (2010-?)	OUTCOMES – LONGER-TERM	
…then they will commit resources and support to developing and implementing a "Strategic Energy Management Plan" (SEMP) resulting in… (7) Energy efficiency becoming part of organizational planning, decision-making and day-to-day practices; (8) Staff having clear goals and responsibilities, and being rewarded for energy management successes; (9) Obtaining the benefits of optimal energy management	• BetterBricks sponsors and presents at healthcare events	• SHEs with websites provide BetterBricks link and periodically post stories & articles (for SHAs see section below) Evidence of market leverage: • Hospital peer-to-peer conversations on SEMP • Regular appearance of content of success stories, articles, and award news in websitesand other communication vehicles of SHEs, SHAs, and BetterBricks partner organizations • Sponsorship and presentations at least two healthcare events each year		• BetterBricks continues to work with other partner organizations to carry SEMP content • BetterBricks continues to sponsor and present at healthcare events, with increasing focus on stories and concrete financial results		

[1] Early in the initiative LOEs (Letters of Engagement) were not used consistently, but now are required and BB has a standard template.

[2] *Committed* means the SEMP has top management support and resources have been committed to implement the plan.

[3] *Practicing* means the SEMP is being implemented, with corresponding changes in policies, practices and energy use.

D INDUSTRY TRENDS IDENTIFIED IN MPER #2

Hospitals are facing enormous financial pressures from many interrelated factors. Not only are the financial pressures high, the underlying trends are escalating in their rate of change, compounding the difficulties from year to year.

The following summary is based on the comments of contacts interviewed for MPER #2 and a review of periodicals.

➡ **Technical advances are occurring with increasing rapidity, increasing the speed at which facilities become obsolete.**

- Technical advances increase the complexity of equipment, increasing the speed at which equipment costs are escalating.
- Technical advances increase the complexity of building design requirements and make it necessary to gut, rather than modify, existing buildings. The majority of facilities are many decades old and often the old designs cannot accommodate the new requirements (as example, ceiling heights are often too low to accommodate the electrical and ducting requirements associated with new patient care technologies, and wider corridors are needed).

➡ **Insurance reimbursements for non-specialty areas are lower than hospitals' costs and are still falling.**

- As reimbursements fall short of operating expenses, hospitals have spent down reserves once maintained for capital expenses. Nonprofit hospitals, in particular, are challenged to fund the construction of new facilities. Hospitals are currently experiencing the seemingly contradictory conditions of financial crisis – due to changes in Medicare and Medicaid funding for patient care – and building boom, as the demand for healthcare services continues to increase. And while demand increases, Medicare/Medicaid reimbursement levels continue to decrease.
- Due to costs in excess of reimbursements, hospitals are increasingly dependent on philanthropy to cover costs, rather than using donated funds solely for facility construction, as in the past.

➡ **All hospitals with emergency facilities are required to serve the uninsured** (as well as many not-for-profit hospitals, as consistent with their charter), even if the patients are unable to pay, **and increasing numbers of uninsured are turning to hospitals for care.**

- Increasing proportions of doctors in private practice (although not all) are refusing to serve the uninsured, so increasing proportions of the uninsured have no healthcare provider other than hospitals.

- The uninsured, as a proportion of the population served by hospitals, is rising. Throughout Oregon, the overall rate of uncompensated care as a percentage of gross charges has been steadily increasing from a rate of approximately 3% in 2002 to 6% in 2005. In 2006, the total cost of uncompensated care in Oregon was $675,965,755, and appears to be rising at a rate of about 1% of gross charges per year. In the Portland metropolitan area, uncompensated care rose from 3% of gross charges in 2001 to approximately 6% in 2005, for a total of $327,984,685.
- Nonprofits hospitals are threatened with losing their nonprofit status through lawsuits that challenge the extent to which they serve the uninsured or provide other community services.
- Although hospitals have a requirement to serve, as a nation, American's have not developed a definition of a citizen's basic entitlement to healthcare.

➡ **Demand for hospital services is increasing due to the aging of the population**, as the elderly per capita consumption of healthcare greatly exceeds those of other demographic groups.

➡ **Hospitals' market share of specialty areas**, such as orthopedic surgery, **is falling as physicians form private practices to reap the more generous insurance reimbursements these areas offer.**

- These specialty areas often require highly specialized diagnostic and treatment facilities and equipment for the most difficult cases that are not purchased by the doctor practices. The result is that hospitals must spend large amounts of money on equipment that is used relatively rarely, at the same time that they are losing revenue from more common procedures.

➡ **To garner market share in high-reimbursement specialty areas, hospitals try to quickly establish specialties in emerging areas they hope will be profitable** (example: bariatric surgery). On the negative side, **these new areas can themselves contribute to increasing hospital facility and equipment costs, and may not be closely aligned with hospital missions and core competencies.**

➡ **To garner market share as a means of increasing revenues, competition among hospitals is intensifying.**

➡ **Insurance costs (malpractice and liability) are rising at ever-increasing rates.**

- *Example:* Washington has the seventh highest insurance costs in the 50 states.

➡ **Regulation and litigation occupy significant resources and limit the expression and adoption of new ideas.** It is common for a hospital's legal counsel to say, in effect, "Don't do anything until you call us."

➡ **Staff recruitment is increasingly difficult, as there are national shortages of doctors and nurses. There is also a dearth of volunteers.**

- The physician profession is attracting fewer people as the cost of medical training is increasing and the compensation, due to insurance reimbursements and cost of coverage, is decreasing.
- The nursing profession is attracting fewer people as hospital working conditions for nursing staff deteriorate due to cost-cutting moves hospitals institute to respond to reimbursement rates below the cost to provide services.
- From a national or regional perspective, one hospital's success in attracting staff results in another hospital's difficulty recruiting personnel, as the total professional populations are lower than the need.
- Volunteering in hospitals is at an all-time low and volunteers are limited in the activities they can conduct with patients due to liability concerns (i.e., volunteers are no longer used to transport patients).

➡ **Most nonprofit hospitals were established and have been run by religious orders, which themselves are attracting few novitiates**.

- Hospitals are grappling with the issues of who owns the organization after a religious order has ended or becomes too small to support a hospital, and who will preserve its founding spirit and spiritual principles.
- As the founding governance structure fades away, hospitals become more secular, leading to a crisis of culture.
- Some hospitals established in a religious tradition have been investing time and resources to ensure the mission and values of the organization will be sustained by all leadership and employees, rather than dependent on the religious orders.

F DATA COLLECTION INSTRUMENTS

QUESTIONS FOR HOSPITAL MARKET SPECIALISTS
BETTERBRICKS HOSPITAL INITIATIVE – MPER 3

Date: _____

Name: _____

Position: _____

Roles and Responsibilities

1. Has your role in the program changed or evolved over the past year? If so, how?

2. Do you feel completely clear on your current role and responsibilities, both with regard to interacting with BetterBricks staff and interacting with hospitals?

Program Evolution

3. Are there any aspects of the Hospital Initiative that you consider to be still in flux or under development?
   [IF YES] What? Any notable changes to the initiative in the past year?
   [**IF SO**] For better or worse? What problem were they trying to address?

4. Do you have a single Value Proposition, or does that vary by hospital? Is it an evolving tool, or is it "fixed" and final?

Technical Advisors

5. Can you describe the services that BetterBricks Technical Advisors have provided to your customers? (Distinguish between building ops and design lab advisors)

6. Have you had any difficulties coordinating or communicating with the Technical Advisors? (Distinguish between building ops and design lab advisors)

7. How well are the reports and services provided by the Technical Advisors meshing with the Initiative goals for your hospital(s)? (Distinguish between building ops and design lab advisors) [**PROBE:**] Is that true for all the hospitals?

Current SEMP Hospitals

8. How is your work changing with the hospitals that have adopted SEMPs—focus and intensity/quantity of work?

9. Can you give me a status for each hospital of the business practice changes underway.

10. What activities have been occurring with utilities and BPA?

11. What's happening with the SHEs and SHAs?

    Is the Initiative offering anything for smaller hospitals?

12. Do you have the market-ready tools and materials you need?

Next Wave of Hospitals

13. Are you encountering any difficulties as you work with the next wave of hospitals—those that are developing SEMPs or just becoming aware of SEMP benefits? Do you think NEEA has the resources to expand in this way?

14. What is the strategy governing who you go after next?

15. What's your current opinion about the market transformation hypothesis, that NEEA can provide intensive services to the market leaders, publicize and education, and provide less intensive services thereafter and SEMP-like activity will begin to penetrate the market.

16. Have you seen the revised website and the resources it makes available? What do you think of it/them?

17. Do you feel the Initiative goals are achievable in the 2010 time frame?

18. What barriers have you been experiencing in 2007 to accomplishing these goals/objectives? (Probe for most difficult)

How has the initiative been addressing these barriers?

Communication

19. Do you feel that the NEEA staff you interact with are completely aligned on the vision for the program (i.e., what's the internal consistency of the vision)?

Market Conditions

20. What would you say are the most important issues facing hospitals today?

Closing

21. What has been the most difficult challenge of the Hospitals Initiative?

22. What do you expect to be the most successful aspect of the initiative?

23. What do you think most needs to be changed in the Hospitals Initiative?

INTERVIEW GUIDE FOR HOSPITALS IMPLEMENTING SEMPS BETTERBRICKS HOSPITAL INITIATIVE – MPER 3

Date: _____

Name: _____

Position: _____

Hospital: _____

Introduction/Background

1. The market specialist has told me your hospital has formulated a strategic energy management plan, also called a SEMP. I work for an independent contractor NEEA has hired to evaluate its BetterBricks Hospital Initiative and how well it is fitting the needs of hospitals. I would like about 15 minutes of your time to explore your experiences with the Initiative.

2. First, can you give me a nutshell description of your responsibilities?

SEMP Specifics

3. What elements or activities of your organization does the SEMP address?

    a. Do you have any new construction underway? [If not clear] Does the SEMP address new construction?

4. And what is your role in the SEMP?

    a. [Probe: Look for who is "carrying the torch", is a spokesperson, a cheerleader]

5. Can you give me a very brief update as to where you are in the process of implementing your hospital's SEMP?

6. Are you requiring a life-cycle cost analysis for major capital investments as a result of SEMP?

    a. [If yes] What return on investment or payback do you need?

7. Thinking about your equipment procurement practices: Where are you in the process of incorporating energy efficiency requirements into your practices, how easy or difficult will this be, and how long do you think it will take your organization to do this as fully as it is capable of?

8. Thinking only about facility operations, how do you see the SEMP working as you try to add energy efficiency into the mix of competing objectives?

    a. Probes: technical barriers (facility needs/time/budget), organizational barriers (people/culture), market barriers (contractors, suppliers)

9. What is your sense of how long it will take to move toward energy-efficient facility operations to the point you believe your organization is capable of?

10. Now for new construction, how do you see it working to add energy efficiency to program requirements?

    a. Probes: technical barriers (facility needs/time/budget), organizational barriers (people/culture), market barriers (contractors, suppliers)

11. What is your sense of how long it will take to move toward energy-efficient new construction practices?

12. Has any funding been allocated to the SEMP?

    a. [If yes] Any back-tracking on funding commitments?

13. Do you think your organization has the policies and procedures needed to support SEMP?

14. Are any SEMP-related activities or goals being written into job descriptions?

    a. Will you be reporting back to your superiors on SEMP progress?

15. Are you in a position to oversee implementation activities? Are you tracking progress toward goals?

Attitudes

16. Can you give me a general sense of how you think the people you talk with are responding to the SEMP? For example, do you think those people feel it's essentially a burden or are they excited about it? [Probe: Get perspectives of peers, supervisors, and supervisees.]

17. In what ways, if any, has the SEMP influenced your activities or thinking?

    a. Probe for existing facilities and for new construction

18. What do you see as the benefits and drawbacks of the SEMP?

19. Any parts of the SEMP that you feel unclear about, or unclear about how it will work in your organization?

Program Feedback

20. Can you give me feedback on the specific services provided by the market specialist and BetterBricks? (Probe: quality)

21. Had your hospital taken any substantial steps to achieve comprehensive energy management planning prior to working on the SEMP with the market specialist and BetterBricks?

    a. [If Yes:] What had you done? [Probe to see how similar it is to SEMP]

    b. Was any of the work done using outside consultants or contractors? [If Y: What services did those companies offer?]

22. If BetterBricks assistance had not been available, would your organization have adopted comprehensive strategic energy management?

23. Have any other organizations or individuals been influential in your organization's decision to adopt comprehensive strategic energy management?

24. Has the SEMP made it any easier to push ahead with energy efficiency?

25. Do you know of other organizations or companies that are offering services similar to those being provided by BetterBricks?

    a. [If yes:] What organizations/ firms?

    b. What services do you think they provide?

26. In hindsight, is there anything BetterBricks could have done differently that would have made it easier for your organization to make the commitment to energy efficiency it has made?

    a. Probes: data/software/estimates of cost & savings, etc.

27. As you move forward in implementing your SEMP, what are the most valuable services BetterBricks can provide?

28. I have one question that's not related to energy efficiency. Can you tell me a few of the most pressing work issues on your mind these days?

Other Contacts

29. We are planning on speaking with XXX. In addition to XXX, who else in your organization is involved in facility operations whose actions will have an effect on energy use?

    a. What are their roles?

    b. Are they familiar with the SEMP?

    c. Do you think it would be useful for us to ask them about their experiences?

Closing

Thank you very much for your time. NEEA conducts ongoing evaluations of its programs, so I or another evaluator might be checking in with you again in a year or two. Thanks.

HOSPITAL FACILITY MANAGERS SURVEY
BETTERBRICKS HOSPITAL INITIATIVE – MPER 3

1. Sample ID: _____

2. Hospital: _____

3. Phone Number: _____

4. Date: _____

Introduction and Screening Questions

I am _____, calling on behalf of the Northwest Energy Efficiency Alliance. I would like to talk with the person responsible for decisions about facility management, operations, and maintenance for this hospital.

5. Contact name_____

6. Are you currently the person responsible for decisions about facility management, operations and maintenance for this hospital?
   Y N DK
   [If Y, skip to Q8]

7. Can you tell me who that person is? _____

[**THANK AND TERMINATE**]

[WHEN CONTACT REACHED, SAY] Hi. I am conducting research for the Northwest Energy Efficiency Alliance. I would like to ask you some questions about the use of energy in your hospital. My questions will take about 15-20 minutes. Can we schedule a good time to talk?

Before asking you specific energy-related question, I'd like to ask you about your staff and your responsibilities.

8. How many buildings are you responsible for? [BQ18] _____

9. Now, I'd like to know the amount of time facility managers spend supporting these buildings? Please indicate this in terms of the full time equivalent, or FTE. For example, if 2 facility managers are assigned to support these building, and one spends 40 hours and the other spends 20 hours per week, the FTE would be 1.5. _____

10. How much time engineers spend supporting these buildings? (in terms of FTE) _____

11. And how much time O&M line staff spends supporting these buildings (in terms of FTE)? _____

12. Are energy management objectives or activities written into the job descriptions for yourself or any staff? [BQ46]
Y N DK

13. Are energy performance or energy management goals included in anyone's annual performance review? [BQ101]
Y N DK

14. Including you, about how many of your staff, if any, have attended training related to energy management within the past three years? [BQ68]
0 More Than 1 DK
[If zero, skip to Q19; If DK, Skip to Q16]

15. [ENTER THE NUMBER OF PEOPLE ATTENDED TRAINING] _____

16. Have you received any training from BetterBricks? [IF ASKED ABOUT BETTER BRICKS, SAY: BETTER BRICKS IS A PROGRAM THAT SUPPORTS ENERGY-EFFICIENCY FACILITY DESIGN]
Y N DK

17. Including you, about how many of your staff, if any, have attended training/certification programs relating to any other area of building operations and maintenance in the last three years? [BQ69m]
0 More Than 1 DK
[If zero or DK, skip to Q19]

18. [ENTER THE NUMBER OF PEOPLE ATTENDED TRAINING] _____

19. What types of certification have you/they received [DO NOT READ PROMPTS: PROBE, ANYTHING ELSE?] [BQ70] **[This question uses Check-box response]**

    a. Building Operator Certification (BOC) _____
    [I**f this checked, skip to Q21 but still probe for 19a-j**]

    b. Boiler operations, Refrigeration _____

    c. HVAC _____

    d. Healthcare facility manager _____

    e. Electrical _____

    f. Motors _____

    g. Codes and regulations _____

    h. OTHER _____

    i. Specify "other" _____

    j. DON'T KNOW _____

20. Have you heard of Building Operators Certification? [BQ74]
    Y N DK

The next few questions are regarding Policies & Service Contracts

21. Does your organization's overall strategic or business plans include explicit goals for energy management? [Q90]
    Y Under Development N DK

22. Does your specific facility have explicit goals for energy management? [Q91m]
    Y Under Development N DK

23. Using a scale of 1-5, where 1 is very low, 3 is moderate, and 5 is very high, how would you rate the level of commitment from executive management to energy management at this facility? [BQ96]
    1 2 3 4 5 DK

24. Does your hospital have any equipment service contracts, such as for the HVAC system, that contain explicit requirements for energy efficiency? [BQ62m]
    Y N DK
    [If not Y, skip to Q26]

25. For which types of equipment do the service contracts contain explicit requirements for energy efficiency? [BQ62m] _____

OK, the next sets of questions are regarding your hospital's Ongoing O&M

Electricity Consumption

26. How often does your group track and trend electricity consumption? [BQ21/27] Would you say…
When There Is A Problem Sporadically On A Fairly Regular Schedule Never Don't Know
[If when there is a problem, skip to Q29, If never or DON'T KNOW, skip to Q30]

27. About how often do you do that? [ASK OPEN-ENDED, BUT PROBE THIS WAY] [BQ26]
Continuously or Daily Weekly Monthly Quarterly A Few Times A Year Yearly Every Few Years Don't Know Other
[If not Other, Skip to Q29]

28. Other, describe: _____

29. Is this activity done by staff or contractors?
Staff Contractors Don't Know

Temperatures, Pressures, and Loads

30. How often does your group log and trend data on equipment operating characteristics, such as temperature, pressures, and motor loads, to assess degradation in equipment performance? Would you say…
When There Is A Problem Sporadically On A Fairly Regular Schedule Never Don't Know
[If when there is a problem, skip to Q33. If never or DON'T KNOW, skip to Q34]

31. About how often do you do that? [ASK OPEN-ENDED, BUT PROBE THIS WAY]
Continuously or Daily Weekly Monthly Quarterly A Few Times A Year Yearly Every Few Years Don't Know Other
[If not Other, Skip to Q33]

32. Other, describe: _____

33. Is this activity done by staff or contractors?
Staff Contractors Don't know

Filters, Strainers, and Flow

34. How often does your group check if filters, strainers, and flow control devices are clean? Would you say…
When There Is A Problem Sporadically On A Fairly Regular Schedule Never Don't Know
[If when there is a problem, skip to Q37. If never or DON'T KNOW, skip to Q38]

35. About how often do you do that? [ASK OPEN-ENDED, BUT PROBE THIS WAY]
Continuously or Daily Weekly Monthly Quarterly A Few Times A Year Yearly Every Few Years Don't Know Other
[If not Other, Skip to Q37]

36. Other, describe: _____

37. Is this activity done by staff or contractors?
Staff Contractors Don't Know

Economizer

38. How often does your group ensure economizer linkages and controls are working properly? Would you say…
When There Is A Problem Sporadically On A Fairly Regular Schedule Never Don't Know
[If when there is a problem, skip to Q41. If never or DON'T KNOW, skip to Q42]

39. About how often do you do that? [ASK OPEN-ENDED, BUT PROBE THIS WAY]
Continuously or Daily Weekly Monthly Quarterly A Few Times A Year Yearly Every Few Years Don't Know Other
[If not Other, Skip to Q41]

40. Other, describe: _____

41. Is this activity done by staff or contractors?
Staff Contractors Don't know

We'll move on to the next set of questions regarding System Tune-Ups, Retrofits, and Benchmarking. I am going to read some possible building practices you may have heard of or implemented. Please let me know whether you are familiar with the practice, or you are planning to do it, or you have already done it.

Lighting

42. Replacing any remaining T12 lamps, non-LED exit signs, and mercury vapor lamps with energy efficient lighting. Would you say you are…
Familiar With This Practice You're Planning To Do It Or You've Done It
None of the Above Don't Know
[If None of the above or DK, skip to Q48. If Planning, skip to Q45. If Done it, skip to Q46]

43. Would you say you've seriously considered doing this?
Y N DK
[If not Y, skip to Q48]

44. And as you consider this, are you thinking you might have your staff do it, or ask a contractor to do it?
Staff Contractor DK
[Any Skip to Q48]

45. Are you planning to have your staff do this, or would you hire a contractor to do it?
Staff Contractor DK
[Any Skip to Q48]

46. Would you say you've done it to some extent but there is opportunity to do more, or would you say you've fully implemented this?
Partially Fully DK

47. And did you have your staff do this, or a contractor?
Staff Contractor DK

Cooling/Heating/Boiler

48. What about ensuring cooling system set points and reset schedules are at optimal levels—for parameters such as for discharge air, duct pressure, chilled water, and condenser water. [BQ43m] Would you say you are…
Familiar With This Practice You're Planning To Do It Or You've Already Done It
None of the Above Don't Know
[If None of the above or DK, skip to Q54. If Planning, skip to Q51. If Done it, skip to Q52]

49. Would you say you've seriously considered doing this?
Y N DK
[If not Y, skip to Q54]

50. And as you consider this, are you thinking you might have your staff do it, or ask a contractor to do it?
Staff Contractor DK
[Any Skip to Q54]

51. Are you planning to have your staff do this, or would you hire a contractor to do it?
Staff Contractor DK
[Any Skip to Q54]

52. Would you say you've done it to some extent but there is opportunity to do more, or would you say you've fully implemented this?
Partially Fully DK

53. And did you have your staff do this, or a contractor?
Staff Contractor DK

54. Selective re-balancing and testing of airside HVAC, including minimum ventilation flow rates and minimum terminal unit flow. [BQ43m] Would you say you are…
Familiar With This Practice You're Planning To Do It Or You've Done It
None of the Above Don't Know
[If None of the above or DK, skip to Q60. If Planning, skip to Q57. If Done it, skip to Q58]

55. Would you say you've seriously considered doing this?
Y N DK
[If not Y, skip to Q60]

56. And as you consider this, are you thinking you might have your staff do it, or ask a contractor to do it?
Staff Contractor DK
[Any Skip to Q60]

57. Are you planning to have your staff do this, or would you hire a contractor to do it?
Staff Contractor DK
[Any Skip to Q60]

58. Would you say you've done it to some extent but there is opportunity to do more, or would you say you've fully implemented this?
Partially Fully DK

59. And did you have your staff do this, or a contractor?
Staff Contractor DK

60. Upgrading pneumatic controls to direct digital controls (DDC). Would you say you are…
Familiar With This Practice You're Planning To Do It Or You've Done It
None of the Above Don't Know
[If None of the above or DK, skip to Q66. If Planning, skip to Q63. If Done it, skip to Q64]

61. Would you say you've seriously considered doing this?
Y N DK
[If not Y, skip to Q66]

62. And as you consider this, are you thinking you might have your staff do it, or ask a contractor to do it?
Staff Contractor DK
[Any Skip to Q66]

63. Are you planning to have your staff do this, or would you hire a contractor to do it?
Staff Contractor DK
[Any Skip to Q66]

64. Would you say you've done it to some extent but there is opportunity to do more, or would you say you've fully implemented this?
Partially Fully DK

65. And did you have your staff do this, or a contractor?
Staff Contractor DK

Motors

66. Installing variable frequency drives (VFDs) on motors and constant volume fan systems. Would you say you are…
Familiar With This Practice You're Planning To Do It Or You've Done It
None of the Above Don't Know
[If None of the above or DK, skip to Q72. If Planning, skip to Q69. If Done it, skip to Q70.]

67. Would you say you've seriously considered doing this?
Y N DK
[If not Y, skip to Q72]

68. And as you consider this, are you thinking you might have your staff do it, or ask a contractor to do it?
Staff Contractor DK
[Any Skip to Q72]

69. Are you planning to have your staff do this, or would you hire a contractor to do it?
Staff Contractor DK
[Any Skip to Q72]

70. Would you say you've done it to some extent but there is opportunity to do more, or would you say you've fully implemented this?
Partially Fully DK

71. And did you have your staff do this, or a contractor?
Staff Contractor DK

Green Guidelines to Healthcare

72. And the set of practices published as the *Green Guidelines to Healthcare*. Would you say you are…
Familiar With This Practice You're Planning To Do It Or You've Done It
None of the Above Don't Know
[If None of the above or DK, skip to Q78. If Planning, skip to Q75. If Done it, skip to Q76.]

73. Would you say you've seriously considered doing this?
Y N DK
[If not Y, skip to Q78]

74. And as you consider this, are you thinking you might have your staff do it, or ask a contractor to do it?
Staff Contractor DK
[Any Skip to Q78]

75. Are you planning to have your staff do this, or would you hire a contractor to do it?
Staff Contractor DK
[Any Skip to Q78]

76. Would you say you've done it to some extent but there is opportunity to do more, or would you say you've fully implemented this?
Partially Fully DK

77. And did you have your staff do this, or a contractor?
Staff Contractor DK

Benchmarking

78. Benchmarking facilities for energy use. Would you say you are…
Familiar With This Practice You're Planning To Do It Or You've Done It
None of the Above Don't Know
[If None of the above or DK, skip to Q84. If Planning, skip to Q81. If Done it, skip to Q82.]

79. Would you say you've seriously considered doing this?
Y N DK
[If not Y, skip to Q84]

80. And as you consider this, are you thinking you might have your staff do it, or ask a contractor to do it?
Staff Contractor DK
[Any Skip to Q84]

81. Are you planning to have your staff do this, or would you hire a contractor to do it?
Staff Contractor DK
[Any Skip to Q84]

82. Would you say you've done it to some extent but there is opportunity to do more, or would you say you've fully implemented this?
Partially Fully DK

83. And did you have your staff do this, or a contractor?
Staff Contractor DK

CMMS/EMS

84. Do you use a Computerized Maintenance Management System (CMMS)? [BQ47]
Y N DK
[If N, skip to Q87]

85. Do you use the system's module for O&M routines scheduling? [BQ50]
Y N DK

86. Do you integrate key system performance indicators, such as schedules, set points, electric demand thresholds?
Y N DK

87. 87. Do you use an Energy Management Control System, or EMS?
Y N DK
[If N, skip to Q92]

88. 88. Do you use any of the following capabilities of your EMS?…Temperature reset, for example supply air, hot water, chilled water, condenser water) [BQ53].
Y N Not Possible Here DK

89. 89. Scheduled start/stop for fans and pumps [BQ54]
Y N Not Possible Here DK

90. 90. Equipment outside air lockout [BQ55]
Y N Not Possible Here DK

91. 91. Optimizing or staging of equipment, for example staging of chiller compressors) [BQ56]
Y N Not Possible Here DK

Purchasing

92. Do any of your purchasing policies or guidelines for building equipment include any explicit written requirements for energy efficiency?
Y N DK
[If not Y, Skip to Q94]

93. Which of the following equipment has such requirements? …

a. Lighting? [BQ77]
Y N DK

b. Motors? [BQ78]
Y N DK

c. HVAC systems or components? [BQ79]
Y N DK

94. Have you ever calculated, for equipment you considered buying, its cost over its entire life cycle?
Y N DK

95. Have you ever estimated any of the following specific factors when evaluating an equipment purchase? …

a. Energy Costs?
Y N DK

b. Maintenance costs?
Y N DK

c. Replacement costs?
Y N DK

d. Non-monetary benefits and drawbacks, such as effects on productivity?
Y N DK

96. Is the hospital management team considering requiring the calculation of costs over the life of equipment when purchases are being considered?
Y Already Done This N DK

New Construction

97. Does your organization currently have any new construction, remodeling, or renovation projects planned or underway? [BQ103m]
No Underway Planned Both DK
[If N or DK, skip to Q99]

98. Are you involved in any of these activities? [BQ11m]
Y N DK

Similar to previous questions, I am going to read some possible new construction practices you may have heard of or implemented. Please let me know whether you are familiar with the practice, or you are planning to do it, or you have already done it.

99. Setting measurable energy performance goals, such as 25% better than operation guideline. Would you say…
Familiar With This Practice You're Planning To Do It Or You've Done It
None of the Above Don't Know
[If None of the above, Planning, or DK skip to Q102 If Done it, skip to Q101]

100. Would you say you've seriously considered doing this?
Y N DK
[Any Skip to Q102]

101. Would you say you've done it to some extent but there is opportunity to do more, or would you say you've fully implemented this?
Partially Fully DK

102. Holding design meetings with all team members, including hospital user groups, design side, and construction side, to creatively address building performance objectives. Would you say you are…
Familiar With This Practice You're Planning To Do It Or You've Done It
None of the Above Don't Know
[If None of the above, Planning, or DK skip to Q105. If Done it, skip to Q104]

103. Would you say you've seriously considered doing this?
Y N DK
[Any Skip to Q105]

104. Would you say you've done it to some extent but there is opportunity to do more, or would you say you've fully implemented this?
Partially Fully DK

105. Conducting whole-building energy modeling to confirm the design meets the high performance goals. Would you say you are…
Familiar With This Practice You're Planning To Do It Or You've Done It
None of the Above Don't Know
[If None of the above, Planning, or DK skip to Q108. If Done it, skip to Q107]

106. Would you say you've seriously considered doing this?
Y N DK
[Any Skip to Q108]

107. Would you say you've done it to some extent but there is opportunity to do more, or would you say you've fully implemented this?
Partially Fully DK

108. Evaluating designs and specifications from a "total cost of ownership" perspective, also called a "life-cycle cost" perspective, which considers the cost over the life of the facility, not simply first costs. Would you say you are…
Familiar With This Practice You're Planning To Do It Or You've Done It
None of the Above Don't Know
[If None of the above, Planning, or DK skip to Q111. If Done it, skip to Q110]

109. Would you say you've seriously considered doing this?
Y N DK
[Any Skip to Q111]

110. Would you say you've done it to some extent but there is opportunity to do more, or would you say you've fully implemented this?
Partially Fully DK

111. Commissioning the facility prior to occupancy [BQ37]. Would you say you are…
Familiar With This Practice You're Planning To Do It Or You've Done It
None of the Above Don't Know
[If None of the above, Planning, or DK skip to Q114. If Done it, skip to Q113]

112. Would you say you've seriously considered doing this?
Y N DK
[Any Skip to Q114]

113. Would you say you've done it to some extent but there is opportunity to do more, or would you say you've fully implemented this?
Partially Fully DK

114. Designing to meet LEED certification requirements [IF ASKED ABOUT LEED, SAY: IT STANDS FOR Leadership in Energy & Environmental Design]. [BQ39] Would you say you are…
Familiar With This Practice You're Planning To Do It Or You've Done It
None of the Above Don't Know
[If None of the above, DK skip to Q118. If Planning or Underway, skip to Q116. If Done it, skip to Q117]

115. Would you say you've seriously considered doing this?
Y N DK
[Any Skip to Q118]

116. What LEED certification do you hope to achieve? [ASK OPEN-ENDED, BUT CODE THIS WAY]
Certified Silver Gold Platinum DK
[Any Skip to Q118]

117. What LEED certification did you achieve? [ASK OPEN-ENDED, BUT CODE THIS WAY]
Certified Silver Gold Platinum DK

Awareness

I have just a few more questions. Which of the following terms have you heard of?

118. BetterBricks
Y N DK

119. Strategic Energy Management Plan
Y N DK
[If not Y, Skip to Q121]

120. What does that term mean to you? _____

121. A few years ago, issues such as "increasing efficiency in management" or "whether or not to contract out work" often concerned many people who are involved in hospital facility operation. Could you tell us any strategic issues or problems your hospital is facing this year? _____

122. In the future, we may be conducting follow-up interviews to better understand energy management needs in hospitals. Would you be willing to be contacted again?
Y N DK

This is all the questions I have. Thank you very much for your time.

INTERVIEW GUIDE FOR EVALUATION OF EDUCATION AND TRAINING BETTERBRICKS HOSPITAL INITIATIVE – MPER 3

ID: _____

Date: _____

Interviewer: _____

Contact Name: _____

Organization Name: _____

Phone Number: _____

Organization is a Hospital: Yes No

Introduction

My name is _____ from Research Into Action, and I am calling on behalf of the Northwest Energy Efficiency Alliance. We are evaluating their BetterBricks education and training events, as part of an ongoing quality assurance effort. This is an important study that will guide NEEA's activities over the next 5 years. I understand you have participated in at least one training event and I'd like to ask you some questions about your experience. Our interviews are taking approximately 15 minutes, and your responses are completely confidential. Is this a good time to talk or can we schedule another time?

In the last few years, BetterBricks has provided numerous educational and training events in the area of energy efficient hospital building design and operation. You may have attended more than one event; however, when responding to the following questions, please reflect on your experiences in the most recent event you participated in.

Marketing

1. First of all, how did you learn about the BetterBricks' workshop? [DON'T READ, BUT PROBE TO CODE] [CHECK ALL THAT APPLY]
   a. Email notification from NEEA
   b. NEEA website
   c. BetterBricks or NEEA consultant
   d. Professional or trade association event or publication
   e. Utility
   f. Supervisor, co-worker, or colleague
   g. Mailing/Flyer/Advertisement
   h. Don't know
   i. Other (describe) _____

2. How much would you say the course met your expectation? Would you say…?
   a. Exceeded your expectation
   b. It was about what you expected
   c. Neutral
   d. Slightly below what you expected
   e. Did not meet your expectation at all
   f. Don't know

3. How would the materials you read about the workshop need to be changed to better convey its purpose and value? _____

Impact

Now, I'd like to ask you some specific questions regarding your experiences since the workshop and your satisfaction with it.

4. Please rate the extent to which the following statements describe your experience since attending the workshop. Please indicate whether the statement does not at all describe your experience, describes it a little, describes it to a moderate degree, or describes your experience very well. Feel free to answer "don't know" or that the question is not applicable to the workshop you took. Now, to what extent would you say the workshop increased your interest in…

Extent the workshop has increased your interest in…	1 Not At All	2 A Little	3 Moderately	4 Very Much	Don't Know / NA
a. Reducing hospital energy costs	○	○	○	○	○
b. A comprehensive approach to energy management	○	○	○	○	○
c. Looking at costs over the entire lifetime of a facility	○	○	○	○	○
d. Looking at costs over the entire lifetime of a piece of equipment or equipment system	○	○	○	○	○
e. Building operations practices that maximize energy efficiency	○	○	○	○	○

5. And using the same scale, to what extent would you say the workshop has led you to …

Extent the workshop has led you to…	1 Not At All	2 A Little	3 Moderately	4 Very Much	Don't Know / NA
a. Share some of the ideas presented with your colleagues	○	○	○	○	○
b. Apply any of the concepts or methods taught	○	○	○	○	○
c. Take steps to promote a comprehensive approach to energy management	○	○	○	○	○
d. Want to attend additional BetterBricks trainings	○	○	○	○	○

6. [If Hospital, ask:] And using the same scale, to what extent would you say the workshop training supports you and your hospital's ability to…

Extent the training supports your hospital's ability to…	1 Not At All	2 A Little	3 Moderately	4 Very Much	Don't Know / NA
a. Reduce energy use	○	○	○	○	○
b. Save money	○	○	○	○	○

7. [If Not a Hospital, ask:] And using the same scale, to what extent would you say the workshop training supports your ability to help your customers…

Extent the training supports your ability to help your customers …	1 Not At All	2 A Little	3 Moderately	4 Very Much	Don't Know / NA
a. Reduce energy use	○	○	○	○	○
b. Save money	○	○	○	○	○

8. Please rate your satisfaction with the following aspects of the workshop. This time I'd like you to use a 1-5 scale, where 1 indicates 'very dissatisfied', 3 indicates 'neutral', and 5 indicates 'very satisfied'.

	1 Very Dissatis-fied	2	3 Neutral	4	5 Very Satis-fied	Don't Know / NA
a. Instructor/ presenter	○	○	○	○	○	○
b. Material presented	○	○	○	○	○	○
c. Level of presentation relative to your knowledge	○	○	○	○	○	○
d. Duration of the event	○	○	○	○	○	○
e. Overall satisfaction with the event	○	○	○	○	○	○

Suggestions

Now, I'd like to explore ideas relating to future training events.

9. Is there anything you would like to say, positive or negative, about the training that the course developers need to know to make sure it meets the needs of other hospital participants? _____

10. Are there any topics you wished had been addressed in the training _____

11. [If Hospital, ask:] What do you see as the key trends and critical issues in the hospital market? (These issues don't need to include energy concerns.) _____

12. [If Not a Hospital, ask:] What do you see as the key trends and critical issues facing your customers in the hospital market? (These issued don't need to include energy concerns.)
_____

Responsibilities

[IF NOT A HOSPITAL, THANK AND TERMINATE. IF A HOSPITAL, CONTINUE.]
I have just a few final questions to describe your hospital.

13. How many beds does your hospital have? _____

14. How many separate campuses are there? _____

15. [If more than one campus] Is your hospital part of a multi-hospital system?
    a. Yes
    b. No
    c. Don't know

16. Which of the following job titles best describes your job responsibility? Would you say…?
    a. Executive
    b. Financial manager
    c. Construction manager
    d. Facility manager
       facility staff
    e. [or something else:] _____

17. Are energy management objectives or activities written into the job descriptions for yourself or any staff in your hospital?
    a. Yes
    b. No
    c. Don't know

18. Are energy performance or energy management goals included in anyone's annual performance review?
    a. Yes
    b. No
    c. Don't know

Those are all the questions I have. Thank you so much for your time!!

INTERVIEW GUIDE FOR UTILITY SURVEY
BETTERBRICKS HOSPITAL INITIATIVE – MPER 3

ID: _____

Date: _____

Contact Information: _____

Contact Name: _____

Name of Utility: _____

Phone Number: _____

Interviewer Name: _____

Introduction

Hello, my name is _____ from Research Into Action in Portland, and I am calling on behalf of the Northwest Energy Efficiency Alliance. We are talking with experts in a select sample of utilities about energy efficiency and your commercial customers. This is an important study that will guide many activities targeted to commercial buildings in the Northwest over the next five years. Is this a good time to talk or can we schedule another time? Our interviews are taking 15-20 minutes. Your responses are completely confidential.

1. What are your utility's energy efficiency goals and priorities for its commercial customers?

   _____

   _____

2. Which commercial customer groups or segments are most important to your utility's efficiency goals and priorities? [OPEN-ENDED. RECORD ALL THAT APPLY.]

   Hospitals
   Grocery stores
   Commercial real estate
   New commercial building and design and construction services
   Existing commercial buildings and building operations
   Other (please specify)

   If you selected other please specify:_____

   Additional comments: _____

3. Have you ever heard of BetterBricks?
   Yes
   No [TERMINATE]

4. How familiar are you with NEEA's BetterBricks initiatives? Are you not familiar with it at all, familiar with it a little, familiar with it moderately, or familiar with it very much?
   Not at all familiar
   A little familiar
   Moderately familiar
   Very much familiar
   DON'T KNOW

5. How would you briefly describe BetterBricks to one of your customers that hasn't heard about it?

   _____

   _____

6. How aligned do you consider BetterBricks to be with your utility's energy efficiency goals and objectives? Would you say 'not aligned at all', 'aligned a little', 'aligned moderately', or 'aligned very well'?
   Not aligned at all
   Aligned a little
   Aligned moderately
   Aligned very well
   DON'T KNOW
   Additional comments: _____

7. How has your familiarity with BetterBricks changed since last year, if at all? Would you say…
   Not at all increased/the same
   Increased a little
   Increased moderately
   Increased significantly
   DON'T KNOW
   Additional comments: _____

8. And as your familiarity with BetterBricks has increased, which of the following statements describes your assessment of BetterBricks?

More favorable than previously
Less favorable than previously
No change and have a favorable assessment
No change and have a neutral or unfavorable assessment
DON'T KNOW
Additional comments: _____

9. What sorts of comments have you heard from your customers about BetterBricks, if any?

_____

_____

Hospitals interactions with Market Specialists and Technical Advisors

10. Have you had any interactions with the BetterBricks market specialist or technical advisors working with *hospitals* in your area?

Yes
No
Don't know

11. Specifically with regard to you being invited to appropriate meetings and giving you adequate notice of events and meetings with your customers, how would you describe the coordination with the *hospital market specialists*? Would you say…

Very poorly done
Could be better
Satisfactory
Very well done
DON'T KNOW
NA
Additional comments:_____

12. Overall, how would you describe communications between the hospital market specialists and you regarding their activities with your customers? Would you say…

Very poorly done
Could be better
Satisfactory
Very well done
DON'T KNOW
NA
Additional comments: _____

13. Do you have any recommendations for improving communications and coordination between the hospital market specialists and utility staff such as yourself?

_____

_____

14. Have you ever accompanied BetterBricks technical advisor contractors as they have assessed facility operations *at hospitals*?

Yes
No

15. Using the scale of 'very dissatisfied', 'dissatisfied', 'satisfied', or 'very satisfied', how satisfied were you with their…

	Very Dissatisfied	Dissatisfied	Satisfied	Very Satisfied	Don't Know
a. Technical knowledge					
b. Suggestions for efficiency					

16. How familiar are you with Strategic Energy Management Planning or SEMP, the business approach that BetterBricks is promoting for hospitals? Are you not familiar with it at all, familiar with it a little, familiar with it moderately, or familiar with it very much?

Not at all familiar [PRESS "NEXT PAGE"]
A little familiar
Moderately familiar
Very much familiar
DON'T KNOW [PRESS "NEXT PAGE"]
NA [PRESS "NEXT PAGE"]
Additional comments: _____

17. How would you briefly describe Strategic Energy Management Planning to one of your customers that hasn't heard about it?

_____

_____

18. To what extent, if at all, do you believe that the BetterBricks initiative helps your hospital customers become more energy efficient? Would you say…

Not at all
A little
Moderately
Very much
DON'T KNOW
Additional comments: _____

19. And why did you say that?

_____

_____

Grocery store interactions with Market Specialists and Technical Advisors

20. Have you had any interactions with the BetterBricks market specialists working with *grocery stores* in your area?

Yes
No
DON'T KNOW

21. Specifically with regard to you being invited to appropriate meetings and giving you adequate notice of events and meetings with your customers, how would you describe the coordination with the *grocery market specialists*? Would you say…

Very poorly done
Could be better
Satisfactory
Very well done
DON'T KNOW
NA
Additional comments: _____

22. Overall, how would you describe communications between the *grocery market specialists* and you regarding their activities with your customers? Would you say…

Very poorly done
Could be better
Satisfactory
Very well done
DON'T KNOW
NA
Additional comments: _____

23. Do you have any recommendations for improving communications and coordination between the grocery market specialists and utility staff such as yourself?

_____

_____

24. Have you ever accompanied BetterBricks technical advisor contractors as they have assessed facility operations *at grocery stores*?

Yes
No

25. Using the scale of 'very dissatisfied', 'dissatisfied', 'satisfied', or 'very satisfied', how satisfied were you with their…

	Very Dissatisfied	Dissatisfied	Satisfied	Very Satisfied	Don't Know
a. Technical knowledge					
b. Suggestions for efficiency					

26. How familiar are you with the refrigeration tune-up process that BetterBricks is promoting for groceries? Are you not familiar with it at all, familiar with it a little, familiar with it moderately, or familiar with it very much?

Not at all familiar
A little familiar
Moderately familiar
Very much familiar
DON'T KNOW
NA

Additional comments:_____

27. How would you briefly describe the refrigeration tune-up process to one of your customers that hasn't heard about it?

_____

_____

28. How familiar are you with the Energy Action Planning, the business approach that BetterBricks is promoting for groceries? Are you not familiar with it at all, familiar with it a little, familiar with it moderately, or familiar with it very much?

Not at all familiar [PRESS "NEXT PAGE"]
A little familiar
Moderately familiar
Very much familiar
DON'T KNOW [PRESS "NEXT PAGE"]
NA [PRESS "NEXT PAGE"]
Additional comments:_____

29. How would you briefly describe the Energy Action Planning process to one of your customers that hasn't heard about it?

_____

_____

30. To what extent, if at all, do you believe that the BetterBricks initiative helps your grocery customers become more energy efficient? Would you say…

Not at all
A little
Moderately
Very much
DON'T KNOW
Additional comments:_____

31. And why did you say that?

_____

_____

Real Estate

32. Do you currently work with commercial real estate firms to improve the efficiency of their buildings?

Yes
No

33. Are you familiar with the BOMA BEEP education series that was offered recently?

Yes
No
DON'T KNOW

34. Were you aware that BetterBricks played a major role in bringing that series to your area?

Yes
No

35. Please rate your assessment of the value of BOMA BEEP to your customers. Would you say…

Not at all valuable
Valuable a little
Valuable moderately
Very valuable
DON'T KNOW
Additional comments:_____

36. Using the same scale, please rate your assessment of the value of BOMA BEEP to your utility efficiency program.

Not at all valuable
Valuable a little
Valuable moderately
Very valuable
DON'T KNOW
Additional comments:_____

37. Do you have any comments to offer to elaborate on your rating of the value of BOMA BEEP to your customers or your efficiency programs?

_____

_____

New Construction

38. Does your utility currently target new construction in its energy efficiency activities?

Yes
No
DON'T KNOW

39. What do you offer new construction projects?

_____

_____

40. How familiar are you with the integrated design approach being promoted by BetterBricks? Are you not familiar with it at all, familiar with it a little, familiar with it moderately, or familiar with it very much?

Not at all familiar
A little familiar
Moderately familiar
Very much familiar
DON'T KNOW
NA
Additional comments:_____

41. How would you briefly describe BetterBricks' integrated design approach to one of your customers that hasn't heard about it?

_____

_____

42. Does your utility take steps to encourage customers to use an integrated design approach when designing new buildings?

Yes
No
DON'T KNOW

43. Could you describe what your utility does to encourage integrated design?

_____

_____

44. Does your utility have any activities specifically designed to align with the AIA 2030 Challenge to make new buildings carbon neutral by 2030 or to reduce fossil fuel consumption to 50% by 2010?

Yes
No [PRESS "NEXT PAGE"]
DON'T KNOW [PRESS "NEXT PAGE"]

45. Could you describe the activities?

_____

_____

46. Have you had any interactions with the staff from the BetterBricks integrated design labs?

Yes
No
DON'T KNOW

47. Specifically with regard to you being invited to appropriate meetings and giving you adequate notice of events and meetings with your customers, how would you describe the coordination with the Integrated Design Lab staff? Would you say…

Very poorly done
Could be better
Satisfactory
Very well done
DON'T KNOW
Additional comments:_____

48. Overall, how would you describe communications between the BetterBricks Integrated Design Lab staff and you regarding their activities with your customers? Would you say…

Very poorly done
Could be better
Satisfactory
Very well done
DON'T KNOW
Additional comments:_____

49. Do you have any recommendations for improving communications and coordination between the Integrated Design Lab staff and utility staff such as yourself?

_____

_____

50. Have you ever attended a design charette or other work session led by the Integrated Design Lab staff?

Yes
No [PRESS "NEXT PAGE"]
DON'T KNOW [PRESS "NEXT PAGE"]

51. Using the scale of 'very dissatisfied', 'dissatisfied', 'satisfied', or 'very satisfied', how satisfied were you with their…

	Very Dissatisfied	Dissatisfied	Satisfied	Very Satisfied	Don't Know
a. Technical knowledge					
b. Suggestions for efficiency					

52. To what extent, if at all, do you believe that the BetterBricks initiative helps your customers who are designing and constructing new buildings make them more energy efficient? Would you say…

Not at all
A little
Moderately
Very much
DON'T KNOW
Additional comments:_____

53. And why did you say that?

_____

_____

Building Operations

54. Does your utility currently encourage operations and maintenance practices that improve the energy efficiency of *existing buildings*?

Yes
No

55. What activities does your utility do to encourage efficient operations and maintenance practices?

_____

_____

56. Have you had any interactions with the BetterBricks technical advisors for building operations?

Yes
No
DON'T KNOW

57. Specifically with regard to you being invited to appropriate meetings and giving you adequate notice of events and meetings with your customers, how would you describe the coordination with BetterBricks technical advisors? Would you say…

Very poorly done
Could be better
Satisfactory
Very well done
DON'T KNOW
Additional comments:_____

58. Overall, how would you describe communications between the BetterBricks technical advisors and you regarding their activities with your customers? Would you say…

Very poorly done
Could be better
Satisfactory
Very well done
DON'T KNOW
Additional comments:_____

59. Do you have any recommendations for improving communications and coordination between the BetterBricks technical advisors and utility staff such as yourself?

_____

_____

60. Have you ever accompanied BetterBricks technical advisors as they have assessed a facility's operation?

Yes
No [PRESS "NEXT PAGE"]
DON'T KNOW [PRESS "NEXT PAGE"]

61. Using the scale of 'very dissatisfied', 'dissatisfied', 'satisfied', or 'very satisfied', how satisfied were you with their…

	Very Dissatisfied	Dissatisfied	Satisfied	Very Satisfied	Don't Know
a. Technical knowledge					
b. Suggestions for efficiency					

62. How familiar are you with the BetterBricks' approach to building operations which emphasizes tune-up and enhanced O&M practices for existing buildings? Are you not familiar with it at all, familiar with it a little, familiar with it moderately, or familiar with it very much?

Not at all familiar
A little familiar
Moderately familiar
Very much familiar
DON'T KNOW
NA
Additional comments:_____

63. How would you briefly describe BetterBricks' approach to building operations to one of your customers that hasn't heard about it?

_____

_____

64. To what extent, if at all, do you believe that the BetterBricks initiative help your customers who work with existing commercial buildings operate their buildings more efficiently?

Not at all
A little
Moderately
Very much
DON'T KNOW
Additional comments:_____

65. Why did you say that?

_____

_____

Closing

66. Finally, is there anything additional that you would like to tell NEEA about its BetterBricks initiatives and how it works with your customers?

_____

_____

THANK YOU VERY MUCH FOR YOUR TIME!!!