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NEEA Hospitals and Healthcare Initiative: Market Progress Evaluation Report 6

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1 Executive Summary

This report is the sixth Market Progress Evaluation Report (MPER) of the Northwest Energy Efficiency Alliance's (NEEA's) Hospitals and Healthcare (H&H) Initiative. This report presents evaluation findings based on in-depth telephone interviews with participating hospitals, the utilities that serve these hospitals and other market actors. The report also includes an analysis of 2012 energy savings and recommended steps to continue tracking these savings.

The H&H Initiative has targeted hospitals and hospital systems that have their headquarters in the region served by NEEA. The primary goal of the Initiative is to have these organizations adopt Strategic Energy Management Plans (SEMPs), which can guide long-term changes in business practices and lead to reduced energy consumption. Strategic Energy Management (SEM), which includes the development of SEMP plan documents, is a broad organizational commitment to energy management that uses a comprehensive set of business tools and practices that enable hospitals to reduce energy consumption, maximize resource efficiency and lower costs. NEEA's Initiative also assists regional hospitals by providing technical resources (e.g., dedicated Market Specialists, co-funded Resource Conservation Managers (RCMs)), comprehensive website materials and a regional energy benchmarking challenge.

NEEA is currently focusing its efforts on transitioning out of the hospitals market (i.e., not enhancing Initiative services or hospital recruitment). Therefore, a key objective for this evaluation was to assist NEEA in learning how best to complete a handoff of Initiative strategies, knowledge and materials to the participating hospitals and their supporting utilities, instead of improving an ongoing Initiative, which is a primary objective of NEEA MPERs.

One important key finding from this evaluation is that all of NEEA's participating hospitals are still practicing SEM according to NEEA's definition. These hospitals account for 27% of regional hospital capacity, as measured by hospital beds, which exceeds NEEA's goal of 25%. Importantly, all systems will have a guiding SEM plan, even if all the preferred elements (e.g., a timeline) are not included. These participant hospitals saved over 4.8 million kWh in 2012, and have planned additional projects for 2013. Three systems have already completed major capital projects in 2013 and four systems have smaller capital projects planned for the remainder of the year. In addition, four of the six systems will be or have implemented operational and behavioral changes to save energy. All of the participating systems plan to continue implementing SEM in the foreseeable future. All three systems with RCMs that have received NEEA funding plan to continue to fund this position. The remaining three hospital systems will all continue to fund positions that include SEM as a key staff function.

Following are some additional key findings from this evaluation:

1. **Nationally, hospitals are increasing their focus on energy efficiency.** In national surveys, more than 50% of hospitals reported that they have goals for energy reductions.

2. **NEEA's participating hospital systems have positive and productive relationships with their local utilities.** Five of the six hospitals reported that they have very good relationships with their local utilities and are satisfied with the support they receive for SEM in the form of rebates, project development assistance, energy consumption data and energy savings estimations.

3. **The utilities are prepared to continue promoting SEM, particularly capital projects, using their current program designs.** They are also eager to learn more about NEEA's detailed planning to transition SEM leadership to them.

4. **Key hospitals associations and alliances in Washington and Montana are planning to promote SEM to their member hospitals in the short-term future.** Although hospitals management currently focused on restructuring patient care delivery, the association executives also perceive interest in energy efficiency and want to promote this along with other resource conservation.

5. **Hospitals face continuing challenges implementing SEM.** These include funding constraints for capital projects, requirements for fast payback periods, challenges measuring energy savings and overextended facilities staff.

6. **Participant hospitals staff perceive that SEM is not yet firmly embedded in their organizational culture, and could regress with new senior management in the future.**

7. **Hospital participants' primary concern with NEEA's planned exit from the market is the loss of an outside advocate for SEM.** Specifically, utilities and hospitals facilities staff may not have time available to build a strong case to keep hospitals management supporting SEM.

To strengthen NEEA's SEM "handoff" to the utilities, we recommend the following:

1. **Deliver periodic presentations to groups of regional hospitals executives to describe and promote SEM.** This would help to ensure that changing management has the opportunity to consider SEM or is not inclined to eliminate existing, successful efforts. These presentations could replicate a recent presentation to a Montana hospitals alliance, which was effective in convincing hospital executives to pursue SEM. These presentations could be delivered after more details are finalized regarding how NEEA's SEM tools and knowledge will be transferred to the utilities, so the utilities are prepared to respond to increasing inquiries about SEM.

2. **Conduct advocacy training with hospitals SEM staff and utility account managers before leaving the market.** Providing RCMs, facilities managers and utility account representatives with advocacy tools and skills could help to maintain an executive focus

on SEM. Utility account representatives usually do not have SEM expertise, but they do have goals to recommend or achieve savings.

3. **Work with BPA to expand or replicate its Track and Tune program to serve the hospitals segment.** According to interviewees, BPA's program to induce operational improvements in the industrial sector has been very successful, and NEEA (and the utilities) could collaborate with BPA to explore if and how they could expand the program to serve regional hospitals. This could be a valuable complement to existing utility rebate programs, which primarily focus on capital projects.

2 Introduction

2.1 Initiative Overview

This report is the sixth Market Progress Evaluation Report (MPER) of the Northwest Energy Efficiency Alliance's (NEEA's) Hospitals and Healthcare Initiative. NEEA is supported by and works in collaboration with the Bonneville Power Administration (BPA), the Energy Trust of Oregon and more than 140 Northwest utilities on behalf of more than 13 million energy consumers. NEEA uses the market power of the region to accelerate the innovation and adoption of energy-efficient products, services and practices.

This Initiative began in 2002 with a focus on working with a select number of hospital systems in the region. Market Specialists in each state, supported by a team of technical specialists, identified target hospital accounts and worked with them to develop, adopt, and implement strategic plans for improved energy management. This aspect of the Initiative was later supplemented by a broad based collaboration with the American Society of Healthcare Engineering (ASHE) Region 10 to recruit and support hospitals across the region in adopting energy accounting and benchmarking practices. A robust set of tools, materials, and educational programs supports the Initiative.

Strategic Energy Management (SEM) is an organizational commitment to energy management that uses a comprehensive set of business tools and practices that enable hospitals to reduce energy consumption, maximize resource efficiency and lower costs. NEEA considers hospitals to have adopted SEM if the hospitals meet four of the following six requirements:

1. There is a written Strategic Energy Management Plan (SEMP) to reduce building energy use[1]
2. The plan includes numeric goals for energy savings or use
3. The plan includes a timeline
4. The plan includes a budget
5. The plan is authorized by senior management
6. Senior management receives updates on plan achievements.

[1] The terms "SEMP" and "SEM" appear throughout this document. SEMP refers to planning documents created by healthcare institutions that provide goals and guidance to achieve improved energy management practices. SEM is an organizational commitment and set of actions undertaken by those institutions to improve and sustain energy management best practices. Having a SEMP is just one component of broader SEM practices.

In addition to helping hospitals to develop SEMPs, the Initiative has provided other valuable tools to help hospitals implement SEM:

- Technical Assistance – NEEA has co-funded Resource Conservation Managers (RCM's) at participant hospitals to implement SEMPs and champion energy efficiency projects. NEEA has also co-funded consultant studies at some hospitals for projects development, prioritization and savings estimating, which has also helped to secure executive commitment for broader SEM activities and staffing. Lastly, the Initiative has utilized contractor Market Specialists to give both technical and business advice to Initiative participants. Market Specialists work with targeted hospitals to develop and implement SEMPs. Once a hospital has developed a SEMP and an executive has signed it, the Market Specialists assist in plan implementation.

- ASHE Region 10 E2C Energy Efficiency Challenge – NEEA has sponsored an energy benchmarking challenge that uses ENERGY STAR Portfolio manager track and rate energy performance, to encourage hospitals to adopt the foundational SEM best practice of energy benchmarking and accounting. The hypothesis of the challenge is that tracking energy performance and receiving feedback on performance (relative to a peer group of hospitals) will lead to reductions in energy use. NEEA has 44 hospitals across the region participating in the energy benchmarking challenge. The E2C Challenge recognizes healthcare facilities that reduce energy consumption by 10% relative to a user-specified baseline year.

  Analyses conducted by Energy350 determined that E2C participants reduced electric energy consumption by 1.6% in 2011 compared to 2010, and natural gas consumption by 0.1%. In 2012, electric energy savings were 0.45% while gas consumption increased by 0.35%.[2] The analyses did not include data from peer groups of non-participants or ask participants about specific SEM activities undertaken, and thus NEEA could not conclusively attribute these savings to SEM.

- BetterBricks Website SEM Tools (available at http://betterbricks.com/healthcare) - NEEA's website includes technical tools for SEM planning and implementation, case studies, published articles by SEM experts and recordings of regional Peer Technical Forums. Section 5.1 of this report includes findings on how participating hospitals use and value the website materials, and Section 5.4 describes how the national chapter of ASHE has integrated NEEA's benchmarking and technical materials into its Sustainability Roadmap to help propagate SEM to other hospitals throughout the nation (see: www.sustainabilityroadmap.org for more details). Initiative staff are currently working with the Northwest utilities to determine which website content should be transferred to the utilities and how.

[2] Energy350. Hospitals Savings Analysis memos to NEEA dated July 16, 2012 and April 23, 2013.

Notably, NEEA is currently focusing its efforts on transitioning out of the hospitals market (i.e., not enhancing Initiative services or hospitals recruitment). Therefore, a key objective for this evaluation was to assist NEEA in learning how best to complete a handoff of Initiative strategies, knowledge and materials to the participating hospitals and their supporting utilities, instead of tracking progress and improving an ongoing Initiative, which are key objectives of NEEA MPERs.

NEEA's Initiative Manager, with assistance from the Market Specialists, is continuing to work closely with NEEA's Directors to plan and execute NEEA's exit from the H&H SEM market. NEEA is also including the utilities in its transition planning, and conducted its first regular quarterly call with them in June 2013.

2.2 Initiative Goals and Logic Model

Following are the goals for NEEA's H&H Initiative:

1. The Initiative can document market awareness of SEM benefits among hospital decision makers representing 75% of beds. *Evergreen will assess this goal in MPER 7 via a telephone survey of Northwest hospitals.*

2. Hospitals representing 25% or more of regional beds will be committed to, and practicing SEM elements. *Information on this indicator is in Section 5.1. Evergreen will continue to assess this goal in MPER 7 via a telephone survey of Northwest hospitals.*

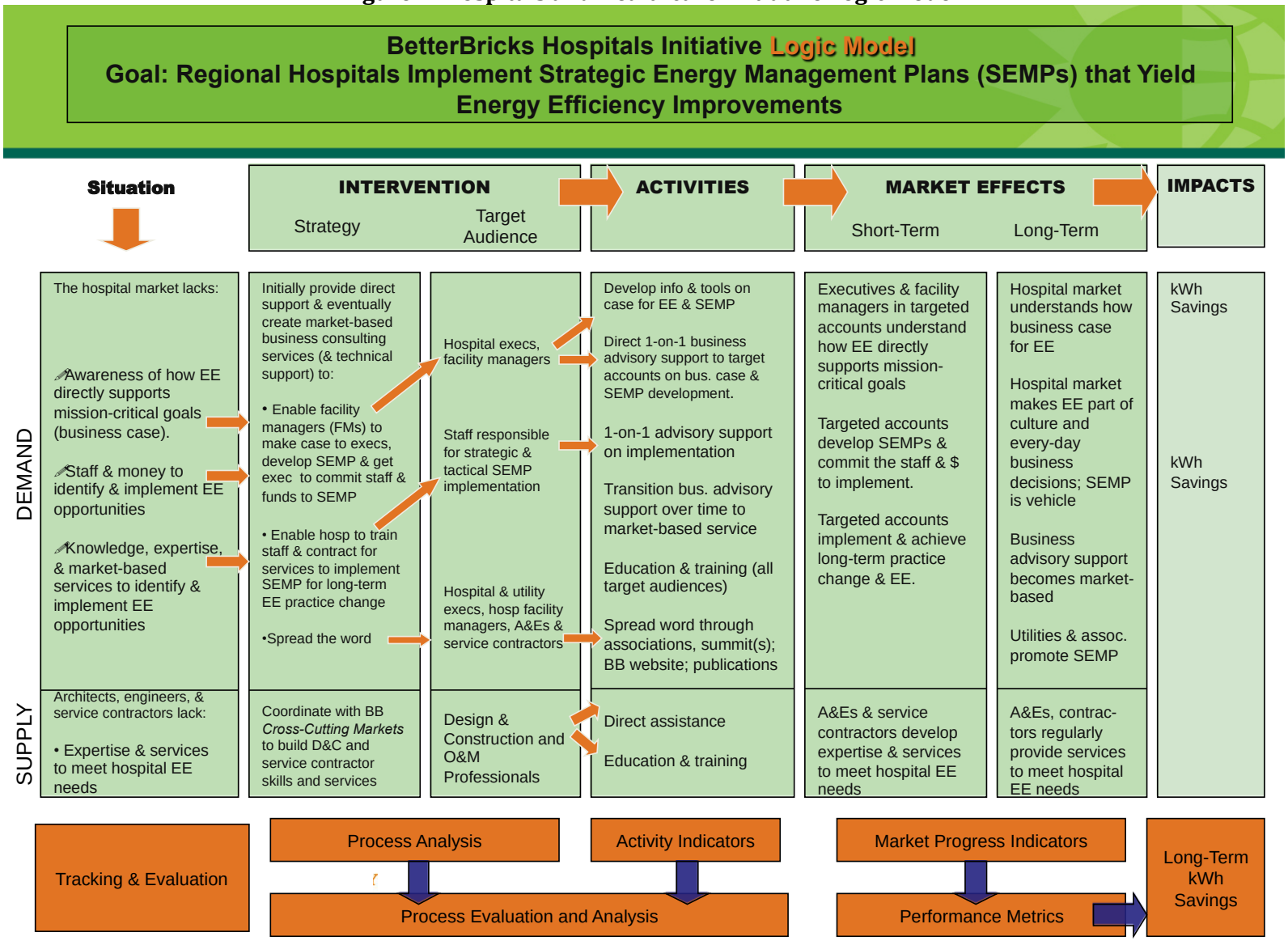
3. Hospital decision makers representing 25% of beds request and/or require (e.g., through RFPs and contracts) trade allies to support SEM practices. *Evergreen will assess this goal in MPER 7 via a telephone survey of Northwest hospitals.*

4. Hospitals decision makers and their associations consider NEEA an excellent source of information and practical tools on energy-related business and technical practices. *Information on this indicator is in Section 5.1. Evergreen will continue to assess this goal in MPER 7 via a telephone survey of Northwest hospitals.*

NEEA's Initiative logic model, which is presented in Figure 1, reflects these goals in various activity-outcome linkages. Measurement and tracking of these goals in past, current and future evaluations can shed light on the success of Initiative activities and the likelihood of sustained market transformation.[3]

[3] For past results on these goals, refer to the 2010 BetterBricks Market Progress Evaluation Report (December 22, 2010) completed by the Research Into Action evaluation team.

Figure 1: Hospitals and Healthcare Initiative Logic Model



3 Evaluation Tasks

3.1 Market Characterization

For this task, we used secondary data sources to characterize the Northwest H&H market (e.g., number of hospitals, hospital systems, beds) by state. These data show the region's potential for SEM implementation, and are used to measure the Initiative's progress within the market (e.g., the percent of regional hospital beds in hospitals practicing SEM). We also conducted a secondary literature review to identify national trends in the demand for SEM among Hospitals and Healthcare facilities.

3.2 In-depth Interviews

Our team conducted phone interviews with SEM implementers at NEEA's participating hospital systems, representatives of six utilities that serve these hospitals, two regional hospital associations directors and the engineering firm that migrated NEEA's benchmarking tools and website content to the national chapter of ASHE. The interviews focused on current SEM practices, implementation challenges, expected future actions and suggestions for future NEEA assistance. Appendix A includes the interview guides used in this evaluation.

3.3 2012 Savings Validation

Our team reviewed project documentation provided by NEEA, the utilities and staff at participating hospitals to verify that methods used to derive savings claims were reasonable and that savings and rebate amounts were consistent between NEEA and project data providers.

3.4 Define Data Needs for Future Savings Tracking

For this task, our team developed a recommended approach that NEEA can implement to track savings from SEM in the future, considering projects data for past and current savings validation efforts and the types of measures that hospitals are most likely to implement.

3.5 ACE Model Review

For this task, our team reviewed the effective useful life assumptions for the measures most commonly implemented through the Initiative (e.g., HVAC equipment and controls, lighting retrofits, operations and maintenance projects). Based on this review we proposed a more detailed categorization scheme and updated measure life assumptions.

4 Market Characterization

This section provides an overview of the Hospitals and Healthcare market for Idaho, Montana, Oregon, and Washington. These data give a high-level overview of the market and provide context for evaluation results presented in subsequent chapters.

4.1 Northwest Hospitals by Size

Evergreen Economics collected hospital data from a variety of sources. The primary source of data was the American Hospital Directory.[4] From the American Hospital Directory we compiled a basic list of hospitals and bed numbers by state. We then verified and refined the information from this list with secondary sources where available. These secondary sources also provided us with information on changes in the healthcare market. For Oregon data, we used the 2012 Oregon Community Hospital Report and individual hospital websites.[5] For Washington data, we used the Washington State Hospital Association website and individual hospital websites.[6] For Montana and Idaho, we accessed individual hospital websites only.

Table 1 presents a summary of hospital and bed groupings by state, and compares the data compiled by Evergreen Economics with 2005 data compiled by Research Into Action for MPER 3 (published in 2008).

In 2012, Washington State had the largest share of hospitals (38%) and hospital beds (46%), followed by Oregon (23% and 27%, respectively), Montana (23% and 14%, respectively), and Idaho (17.6% and 13%, respectively). As we would expect due to the relatively large urban areas in Oregon and Washington, the share of medium and large hospitals in these states is higher than in Idaho and Montana. The average hospital size in Washington is 134 beds, Oregon 130 beds, Idaho 80 beds and Montana 69 beds. Oregon and Washington also have a greater share of hospitals run by healthcare systems. Overall, healthcare systems manage slightly more than half of the hospital beds in the region (53%).

There has been no significant change in the overall number of hospitals or hospital beds in the region since Research Into Action compiled similar data for MPER 3.[7] In Oregon, Washington and Montana, there has been no significant change in the number or market share of health system hospitals. In Idaho, the market share of health system hospitals increased due to acquisition of several hospitals by the St Luke's Health System and the Ernest Health System.

In Washington, the most significant change was the new partnership between Providence Health and Swedish Health Services finalized in February 2012. Under this partnership,

[4] *American Hospital Directory*. http://www.ahd.com/. Accessed 02/10/2013.
[5] Apprise Health Insights. *2012 Oregon Community Hospital Report.* http://apprisehealthinsights.com/wp-content/uploads/2012/07/2012-Oregon-Community-Hospital-Report.pdf. Accessed 02/10/2013.
[6] "Fast Facts about Washington Hospitals", *Washington State Hospital Association,* http://www.wsha.org/fastfacts.cfm. Accessed 02/11/2013.
[7] For MPER 3, data current as of July 2005 were provided to RIA by the Initiative Manager and no other source is documented. These data were also included in the 2010 BetterBricks MPER.

Swedish Health Services became a division of Providence Health but will maintain its name on all existing Swedish Health Services facilities and will remain a non-religious organization. Other significant changes in Washington include the acquisition of two major hospitals (500 beds) in Spokane by the Rockwood Health System, and the acquisition of the 162-bed Auburn Medical Center by the MultiCare Health System. There have been no significant changes in Oregon or Montana since 2005.

NEEA's participating health systems - St Alphonsus, Peace Health, Providence, Swedish, Legacy Health and Kalispell Regional Healthcare - account for 27.6% of beds in the Northwest region.

Table 1: Summary of Hospital and Bed Groupings by State, 2005 v. 2012

	2005 (RIA)					2012 (Evergreen)				
OR	*Number of Systems = 10*					*Number of Systems = 10*				
	Hospital Category	**# of hospitals**	**% of region**	**# of beds**	**% of region**	**Hospital Category**	**# of hospitals**	**% of region**	**# of beds**	**% of region**
	System Hospitals	32	11.7%	5,345	17.7%	System Hospitals	32	11.3%	5,626	18.6%
	> 300 beds	2	0.7%	782	2.6%	> 300 beds	2	0.7%	863	2.8%
	151 to 300 beds	3	1.1%	587	1.9%	150 to 300 beds	5	1.8%	846	2.8%
	50 to 150 beds	7	2.6%	693	2.3%	50 to 150 beds	5	1.8%	412	1.4%
	< 50 beds	16	5.8%	603	2.0%	< 50 beds	20	7.1%	692	2.3%
	Total	***60***	***21.9%***	***8,010***	***26.5%***	***Total***	***64***	***22.6%***	***8,439***	***27.9%***
WA	*Number of Systems = 18*					*Number of Systems = 11*				
	Hospital Category	**# of hospitals**	**% of region**	**# of beds**	**% of region**	**Hospital Category**	**# of hospitals**	**% of region**	**# of beds**	**% of region**
	System Hospitals	38	13.9%	7,915	26.2%	System Hospitals	39	13.8%	8,257	27.3%
	> 300 beds	5	1.8%	1,948	6.5%	> 300 beds	2	0.7%	781	5.0%
	151 to 300 beds	12	4.4%	2,842	9.4%	150 to 300 beds	8	2.8%	2,027	6.7%
	50 to 150 beds	21	7.7%	1,775	5.9%	50 to 150 beds	15	5.3%	1,361	4.5%
	< 50 beds	30	10.9%	836	2.8%	< 50 beds	42	14.8%	1,089	3.6%
	Total	***106***	***38.7%***	***15,316***	***50.7%***	***Total***	***106***	***37.5%***	***13,515***	***44.6%***
ID	*Number of Systems = 6*					*Number of Systems = 6*				
	Hospital Category	**# of hospitals**	**% of region**	**# of beds**	**% of region**	**Hospital Category**	**# of hospitals**	**% of region**	**# of beds**	**% of region**
	System Hospitals	7	2.6%	1,210	4.0%	System Hospitals	14	4.9%	1,825	6.0%
	> 300 beds	1	0.4%	409	1.4%	> 300 beds	0	0.0%	0	0.0%
	151 to 300 beds	2	0.7%	480	1.6%	150 to 300 beds	3	1.1%	697	2.3%
	50 to 150 beds	4	1.5%	486	1.6%	50 to 150 beds	13	4.6%	992	3.3%
	< 50 beds	26	9.5%	538	1.8%	< 50 beds	19	6.7%	456	1.5%
	Total	***40***	***14.6%***	***3,123***	***10.3%***	***Total***	***49***	***17.3%***	***3,970***	***13.1%***
MT	*Number of Systems = 6*					*Number of Systems = 6*				
	Hospital Category	**# of hospitals**	**% of region**	**# of beds**	**% of region**	**Hospital Category**	**# of hospitals**	**% of region**	**# of beds**	**% of region**
	System Hospitals	14	5.1%	1,646	5.5%	System Hospitals	10	3.5%	1,283	4.2%
	> 300 beds	1	0.4%	356	1.2%	> 300 beds	0	0.0%	0	0.0%
	151 to 300 beds	2	0.7%	374	1.2%	150 to 300 beds	3	1.1%	724	2.4%
	50 to 150 beds	6	2.2%	671	2.2%	50 to 150 beds	17	6.0%	1,488	4.9%
	< 50 beds	45	16.4%	686	2.3%	< 50 beds	34	12.0%	868	2.9%
	Total	***68***	***24.8%***	***3,733***	***12.4%***	***Total***	***64***	***22.6%***	***4,363***	***14.4%***
	Grand Total	**274**	**100%**	**30,182**	**100%**	**Grand Total**	**283**	**100%**	**30,287**	**100%**

Sources: Data from BetterBricks Hospitals and Healthcare Initiative MPER 3 (Research Into Action, 2008)

American Hospital Directory. *American Hospital Directory*. http://www.ahd.com/. Accessed 02/10/2013).
Apprise Health Insights. *2012 Oregon Community Hospital Report.* http://apprisehealthinsights.com/wp-content/uploads/2012/07/2012-Oregon-Community-Hospital-Report.pdf. (Accessed 02/10/2013).
"Fast Facts about Washington Hospitals", *Washington State Hospital Association,* http://www.wsha.org/fastfacts.cfm. (Accessed 02/11/2013).

4.2 General Hospitals SEM Trends

National health care construction spending declined by 1.5% in 2012, preceded by a 1.4% decline in 2011 and 5.9% decline in 2010.[8] Factors contributing to this modest decline/market stabilization include: uncertainties related to medical reimbursements under the Patient Protection and Affordable Care Act, tight credit markets for construction, increasing labor costs (decreasing revenues) and robust hospitals construction prior to the economic recession.

Some of the key findings from the 2011 Energy Efficiency Indicator (EEI) Healthcare Survey, administered by the Johnson Controls Institute for Building Efficiency (with others), include:[9]

- Healthcare has led other industry sectors in implementing measures to reduce energy use in their buildings, compared to 2010.
- Seventy-eight percent of healthcare respondents said they are paying more attention to energy than they were one year ago (up from 66% in 2010).
- The most popular energy efficiency projects in 2011 were improvements to the HVAC and control systems (71%), followed by lighting improvements (69%) and behavioral improvements (41%).
- In the next decade, healthcare leaders expect the greatest future growth in advanced lighting, advanced building materials and smart building technologies.
- More than 50% of healthcare professionals reported that their organization has an energy reduction goal in place.
- Thirty-three percent of respondents cited inadequate funding as the most significant roadblock to progress, followed by insufficient paybacks (14%).
- The average allowable payback for the healthcare sector is 3.8 years.

Following are some key findings from the 2011 Hospitals Energy Management Survey by Health Facilities Management, the American Society for Healthcare Engineering and the American Hospital Association:[10]

[8] U.S. Census Construction Spending, http://www.census.gov/construction/c30/prpdf.html.

[9] http://www.institutebe.com/Energy-Efficiency-Indicator/Energy-Efficiency-Indicator-2011-EEI-Healthcare.aspx

- **Aging facilities**. Most main hospital buildings (claimed by 69% of the survey respondents) are more than 20 years old. The performance of energy-consuming systems can degrade by 30% in the first few years of operation, according to the American Society of Heating, Refrigerating and Air-Conditioning Engineers.

- **Infrequent or lacking audits.** Twenty-eight percent of poll respondents perform an energy audit in their acute care hospital at least annually, while another 25% said they perform an energy audit every two to three years.

- **Stable energy costs.** Overall, energy costs have not changed dramatically in five years. Forty-three percent of surveyed organizations saw annual energy costs rise from the previous year, with the most common response (30%) being an increase of between 1 and 5 percent. But 40% reported lower costs. Those declines likely derived from increased energy efficiency and/or rate reductions in some areas.

- **Popular measures.** Conducting energy audits is the most common energy-monitoring measure, cited by 40%. Other strategies used by at least a 25% of all respondents include setting energy budget and performance targets and monitoring them annually (38%), and participating in ENERGY STAR (29%, up from 14% in 2006). Other strategies used by 75% of the respondents include: preventive maintenance, LED exit signs, electronic ballasts and/or energy-efficient lamps.

  Roughly half the organizations are buying ENERGY STAR-certified products (55%), upgrading building control systems (53%) or implementing energy conservation programs (49%). More than half (51%) are using higher-efficiency HVAC equipment, while slightly more than 30% are using retro commissioning and/or reduced-lighting power density and occupancy controls.

  Two-thirds of survey respondents said they participate in demand-response programs (and use emergency generators), to alleviate load on the grid during peak periods. (These programs are only available in areas where utilities have problems meeting maximum demand during critical periods.)

- **New Construction.** Three energy-saving design strategies are proving particularly popular in new construction projects: commissioning of building energy systems; integration of low-energy strategies such as building massing and orientation; and daylighting. Nineteen percent of hospitals are pursuing LEED certifications in new construction.

[10]http://www.hfmmagazine.com/hfmmagazine/jsp/articledisplay.jsp?dcrpath=HFMMAGAZINE/Article/data/07JUL2011/0711HFM_FEA_CoverStory&domain=HFMMAGAZINE

4.3 Other Northwest Market Actors

Many utilities in the Northwest provide rebates for capital measures that hospitals can implement as part of their SEM efforts. In section 5.2 of this report, we describe the rebates and services that utilities currently provide to NEEA's participating hospital systems. Two regional energy organizations have formal programs dedicated specifically to SEM and/or hospitals – Energy Trust of Oregon and Bonneville Power Administration (BPA). In addition, Puget Sound Energy provides funding for Resource Conservation Managers (RCMs) that can and do implement SEM at hospital facilities. According to NEEA staff, PacifiCorp is also in the process of launching a new SEM offering in conjunction with their updated energy efficiency portfolio.

NEEA staff also identified several consulting firms that provide SEM services in the Northwest (in addition to the Market Specialists that directly serve the Initiative), listed below. Currently we do not know if these firms are actively helping hospitals clients to implement SEM, and we could explore this in the next MPER evaluation.

- Cascade Energy
- Ecova
- EnerNOC
- Global Strategy Energy
- JDM Associates
- Milepost Consulting
- Strategic Energy Group
- Sustainable Environmental Services
- Triple Point

5 Interview Findings

5.1 Participating Hospitals

Evergreen interviewed staff from six hospital systems served by the NEEA Hospitals and Healthcare Initiative. We conducted these interviews in May and June 2013. The interviewees possessed wide-ranging knowledge of their hospital systems and provided us with comprehensive information across their system facilities.

The key objectives of the interviews were to:

- Understand how participant hospitals currently implement their SEMP plans, and possible future implementation challenges
- Identify expected 2013 capital and behavioral/Operations and Maintenance (O&M) projects
- Collect feedback on the usefulness of NEEA's web content pertaining to SEM for hospitals
- Identify potential concerns related to NEEA's exit from the Initiative
- Solicit future assistance needed from NEEA and/or utilities to maintain or enhance SEM

Current SEMP Implementation

Early in the interviews, respondents reported which elements of SEM they are currently implementing and which facilities were covered by their SEMP plans. Table 2 presents the number of hospital systems implementing each of six key SEM elements.

Table 2: SEM Implementation Reported by Initiative Participants

SEM Element	Number Implementing (n=6)
Written plan (SEMP) developed	5
Quantitative goals for energy savings or use	4
Timeline included in plan	2
Budget included in plan	2
Plan authorized by senior management	6
Senior management updated on plan achievements	4

NEEA defines "doing SEM" as employing any of four of six elements above. According to this definition, five of the six hospital systems are practicing SEM. The sixth system will be practicing SEM upon the completion of a written SEMP scheduled for July 2013.[11] *Including the sixth hospital system, these systems represent 27.6% of regional hospitals beds, which exceeds the Goal 2 threshold of 25% for hospitals practicing SEM (see Section 2.2). This*

[11] According to NEEA staff, this hospital already has a formal, adopted SEMP plan in place; the SEM staff person that was recently hired to replace departing staff was apparently not aware of the plan's status, however.

percentage is also likely to increase pending the results of the planned MPER 7 phone survey; previous market wide research conducted by Research Into Action in 2010 found that hospitals representing 40% of beds capacity were implementing SEM.

Five of the six hospital systems have a written SEMP plan in place. The remaining system is in the process of converting the previously "generally understood" plan into a formal, written SEMP plan, due for completion in July 2013. In four systems, the SEMP covers all facilities. In one case, the SEMP plan presently covers only the primary hospital in the system but the hospital plans to expand the SEMP to cover all system facilities in 2013. The final system reported that their plan covers the main hospitals in the system but does not always cover smaller facilities such as community medical centers.

Four systems' SEMPs include numeric goals for savings and energy use. One system is developing numeric goals for the 2013 release of its SEMP. The final system does not have numeric goals at the system level, as the system decided that given the large number and variety of facilities, it was not realistically feasible to establish numeric goals. This system has specific goals at the individual facility level.

Only two of the six systems reported having a timeline in the SEMP. Similarly only two systems reported having a formal budget included in the SEMP. In both cases interviewees explained that they face significant challenges, inherent to hospitals, in developing fixed timelines and budgets. Challenges include constantly shifting priorities in the hospital environment and an uncertain regulatory climate that is driving a conservative budgeting approach.

All interviewees reported that their SEMP was approved at the Director level or above, with five of six having approval at the senior executive level (Vice President or C-Suite level management). Regular updates to senior management on plan achievements are the norm for four of the systems, one system is formalizing an update process, and the last has no requirement for providing updates to senior management.

Two systems have formal policies requiring SEMP plan updates every five years. Two systems are currently in the process of updating their SEMP plans, with the remaining two systems still operating under SEMPs developed in 2007 and 2008.

Each of the interviewees stated that their SEMP contained no specific prioritized project list. In two cases, the SEMP contained guidelines on how to identify and prioritize projects. Instead, facilities identify and prioritize projects on an ad hoc basis in accordance with facility needs, available funding and the potential for energy savings and return on investment.

Current SEM Monitoring and Best Practices

All systems regularly monitor monthly energy consumption data and benchmarking data to track project and overall portfolio energy savings as well as identify targets for future energy efficiency projects. All systems use Energy Star Portfolio Manager to track and benchmark

energy consumption across their facilities. In order to measure energy savings, three systems use Energy Expert software, one system uses tools provided through Energy Trust of Oregon (ETO), and two use systems developed in-house.

Four interviewees offered their opinions on potential best practices. Each of these interviewees identified benchmarking with Energy Star Portfolio Manager as an essential practice. One interviewee also identified Energy Expert as being an essential tool for SEM. One interviewee noted that in the current financial climate with limited capital available for capital improvements that do not directly relate to patient care, they have had success "selling" energy efficiency projects by first identifying a business or operational need and then looking for energy savings projects within the scope of these needs.

Healthcare consolidation had affected only one of the six hospital systems. The interviewee from this system was cautiously optimistic that consolidation would have a positive effect on SEM practices, as senior management under the post-consolidation structure is showing greater support for SEM and energy efficiency generally.

SEM Benefits and Challenges

Interviewees highlighted several significant benefits of SEM. The most cited benefit, noted by all interviewees, was lowering energy consumption and thereby reducing the cost of energy to the hospital system and freeing resources to devote to core business activities and improving patient care. Additionally, interviewees reported that SEM improves hospital operations and building systems that support the delivery of healthcare. SEM raises awareness of the importance of energy efficiency and the potential for energy savings at upper levels of hospital management. SEM adds value to their corporate brand by proving they "walk the walk" when it comes to core values of environmental stewardship, sustainability and being a positive force in the communities they serve. The majority of the systems communicate these benefits both internally and externally in multiple ways, including via internal intranet sites, staff newsletters and public press releases.

Each of the interviewees noted that there remain significant challenges to implementing and maintaining SEM practices. Foremost is the lack of available funding for energy efficiency projects, particularly capital improvement projects. The interviewees noted that that there is a lot of uncertainty in the healthcare industry about availability of funding and potential changes in key revenue streams. Hospitals are responding by imposing capital freezes and requiring swift returns on investment for any projects deemed non-essential. Another barrier to maintaining SEM is difficulty identifying and demonstrating savings. The complex nature of hospital energy infrastructure provides significant challenges to measuring energy savings from SEM practices.

Interviewees from three systems noted that ongoing commitment from senior management and willingness to invest capital in SEM practices could decline in the future due to shifting priorities, personnel changes at the senior level, ownership changes and other unforeseen

factors. In addition, one interviewee noted that reduced facilities personnel numbers and increased responsibilities on facility staff make it difficult for staff to maintain focus on energy management. Generally, interviewees were concerned that staff turnover from the facilities level to the senior executive level poses a potential barrier to SEM, as each can change can potentially require rebuilding knowledge and commitment to SEM practices.

Hospital Interactions with Utilities and NEEA Staff

We asked interviewees about their relationships with local utilities and the support they receive for their SEM efforts. Interviewees from five systems were very satisfied with their relationships with their local utilities and stated that they received support for their SEM practices in a number of areas. The remaining system reported very little support from their local utility. Support provided by the local utilities includes:

- ***Financial assistance through grants and rebates.*** Interviewees from five of the six systems noted that utility grant funding and rebates have been essential in completing SEM projects.
- ***Technical assistance*.** Three systems reported that they receive technical project design assistance from their local utilities.
- ***Data collection and energy savings estimation.*** Two systems report receiving assistance from utilities or ETO in data collection and energy savings estimation.
- ***Identification of potential energy savings and project prioritization.***
- ***Contractor referrals.***

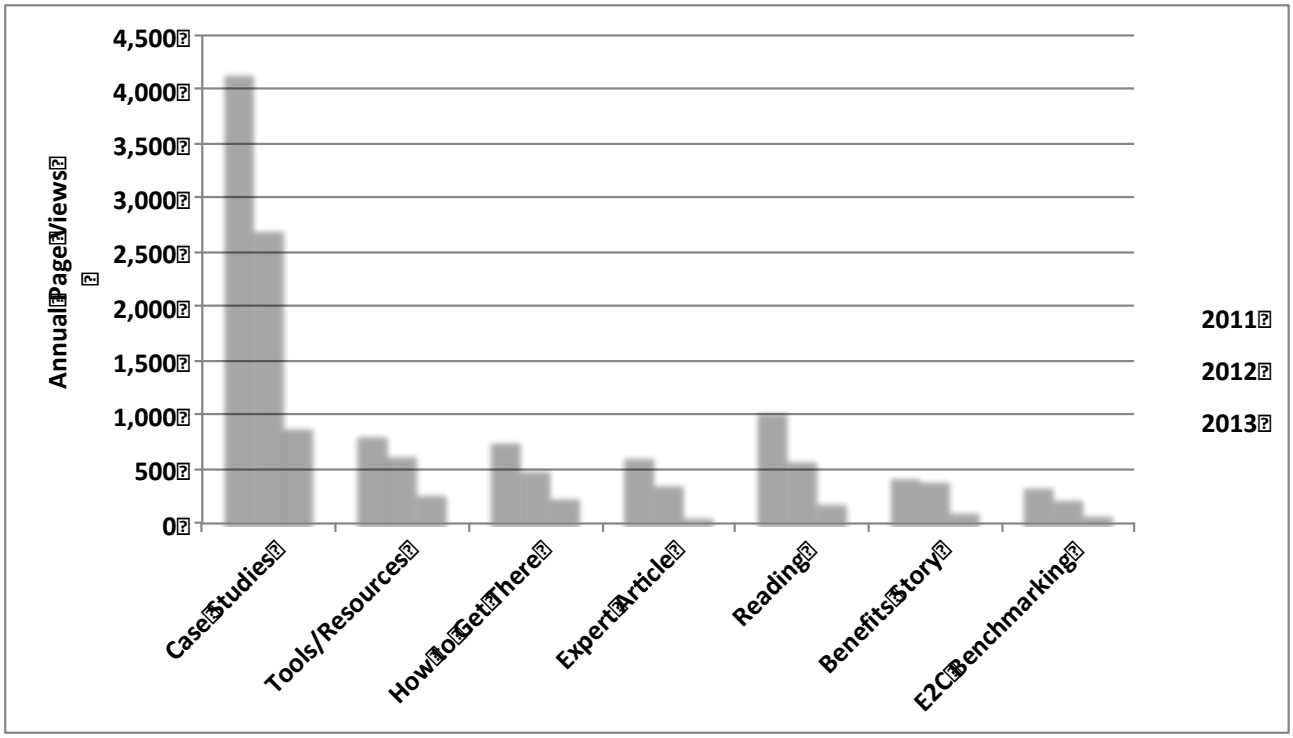
One system in Oregon has transitioned to working with Energy Trust of Oregon in its SEM efforts. The respondent from this system reported that the transition process was successful and they have a strong working relationship with ETO staff. The interviewee noted that the keys to this success have been maintaining continuity in the fundamental concepts that NEEA introduced with SEM (e.g., SEMP plans with goals, timelines), very knowledgeable ETO staff, having useful tools for monitoring and managing energy use and access to technical assistance for identifying and prioritizing energy savings projects.

Evergreen asked the interviewees about their interactions with NEEA staff and SEM contractors and their actions to prepare hospitals for the planned end of the Hospitals and Healthcare Initiative and transition of SEM leadership to the local utilities. Interviewees from three of the six health systems were not aware of NEEA's planned exit from the hospital SEM market. One system had transitioned to work primarily with ETO. The remaining two systems felt that NEEA and their local utilities kept them well informed of NEEA's exit plans but expressed some uncertainty about the process of transitioning SEM leadership to the local utilities.

Website Content Usage and Value

Figure 2 shows how NEEA's website contents have been utilized starting in 2011, when the Hospitals and Healthcare Initiative was separated from the broader BetterBricks Initiative. As shown in the figure, the number of page views has declined in recent years as Initiative staff (including Market Specialists) have had more direct communications with hospitals participants, and NEEA has placed less emphasis on updating the BetterBricks website.

Figure 2: Annual Page Views by Content Type (2013 January – June Only)



Evergreen asked interviewees a series of questions regarding NEEA's website content to promote hospitals SEM. Of the seven interviewees, four said that they regularly review the website and had utilized some of the content during the past two years. One interviewee reviewed the content occasionally but had not had any occasion to utilize the information other than for general interest. Two of the interviewees had not reviewed the website content at all.

Respondents who regularly reviewed and utilized the website were generally satisfied with the quality and usefulness of the content, and advised that all content appeared accurate and relevant. One interviewee stated that he regularly passed on information from the website to his hospital facilities staff. In particular, this interviewee noted the usefulness of the various

case studies available on the website. Another respondent explained that he has often used the case study resources as a tool to engage senior hospital leadership and promote the value of energy savings projects. Other content highlighted as useful included the energy calculation tools, the SEMP template and the RSS feed to obtain industry news. Suggested additions to the website content were:

- A case study on the Swedish Medical Center in Issaquah, Washington.
- A case study on the Peace Health Hospital in Friday Harbor.
- More technical resources and information about new technologies.
- Better resources for networking with peers in the industry.

Overall, these findings suggest that NEEA is meeting its Goal 4 objective of being an excellent source of SEM information and practical tools for hospital decision makers (see Section 2.2). Market wide progress towards this goal will also be assessed in the MPER 7 phone survey.

Plans for SEM

All seven interviewees stated that SEM would continue in their hospital systems for the foreseeable future with varying degrees of support from senior management. In two systems, interviewees characterized SEM as integrated in the culture of the business and having a high level of commitment at the senior management level. Two systems reportedly have strong senior management commitment to SEM but interviewees from these systems were concerned that significant turnover at the senior management level could lead to neglect of SEM practices; SEM is not yet embedded in the business culture of these systems. One system has tentative senior management commitment to SEM as long as the practice and associated RCM position can continue to deliver demonstrable savings and ancillary benefits to the system. This system currently implements SEM practices at only one of two hospitals. In July of 2013, SEM practices will expand to include the second system hospital. The interviewee from the final system was cautiously optimistic that SEM practices would continue however, he expressed concern about a lack of commitment from senior management.

One indicator of whether SEM will continue within a system is if the system plans to continue to fund a Resource Conservation Manager (RCM) position. Three of the systems we spoke with have an RCM position that NEEA fully or partially funds. All three of these systems plan to continue to fund this position for the foreseeable future after funding from NEEA is withdrawn. The remaining three hospital systems will all continue to fund positions that include SEM as a key function of the position.

Evergreen asked interviewees about what plans systems have to install capital energy savings projects in the remainder of 2013. Each of the interviewees conditioned their response to this question by noting that the availability of funding for capital improvement projects was limited. Two of the six systems have no major capital improvement projects planned or recently completed in 2013. Three systems have completed major capital projects in 2013. These include the construction of a new surgical wing at a primary hospital, improvements to

a primary chiller plant, a wholesale kitchen upgrade with demand control ventilation and the conversion of a building from constant volume HVAC systems to a variable air volume system. Utility incentives partly funded each of these projects. Four systems have smaller capital projects planned for the remainder of 2013. These projects include lighting upgrades, controls upgrades, installation of variable frequency drives and installation of operating room ventilation setbacks and controls.

Four of the six systems will be or have implemented operational and behavioral changes to save energy. One system has begun an appeal to staff to help reduce lighting in unoccupied areas. Another system is introducing a compressed air initiative aimed at identifying and correcting system leaks to reduce HVAC system run times. Several systems are looking at opportunities to introduce setback schedules across HVAC systems. A nurse-initiated project has been launched at one hospital that introduces a "quiet hour" in which lights are turned down or off for one hour during daylight hours to promote healing and reduce energy usage.

SEM Status After NEEA Exit

Evergreen asked interviewees a series of questions about their ability to continue SEM after NEEA exits the hospitals market and if they have any concerns about NEEA's exit plans. In all of the systems, interviewees were confident that they would have the technical expertise at the facilities staff level required to maintain their SEM progress. Four of the six systems will also have the higher level technical expertise needed to identify and prioritize projects and maintain and develop the SEMP plan. Interviewees from two systems noted that they would be likely to require assistance to help identify projects with energy savings potential and in maintaining their SEMP plan. In one case, the interviewee was confident that this would be something that the local utility could provide. In the other case, the interviewee was skeptical that their local utility would be able to provide this assistance at the same level as NEEA. The interviewee's main concern was that the utility did not have the expertise or knowledge to understand and support the SEM process.

The biggest concern that interviewees had with NEEA leaving the market was the loss of an advocate for energy conservation. Four interviewees from three systems stated that this would be a significant loss to them. Several interviewees noted that it was important to have an entity external to the system advocating for SEM. In particular, interviewees expressed concerns that their ability to advocate for and market SEM effectively to their senior management would diminish without NEEA's ongoing assistance. Without this advocacy, system facilities staff will not have time to promote SEM to upper management and SEM may fall off the radar of senior management.

Two other interviewees stated that they were not concerned about the exit plans for their specific hospital system but felt that NEEA's exit would be a loss of an important champion for energy conservation. Both interviewees believed that NEEA had not achieved a sufficient level of SEM market penetration to warrant withdrawal from the hospitals market.

5.2 Utilities Interviews

Evergreen interviewed staff from six Northwest utilities that serve hospital systems participating in the NEEA's Initiative. Evergreen conducted the interviews in May and June 2013. The key objectives of the interviews were to:

- Understand current and expected future utility assistance to hospitals (e.g., SEM planning, SEM education and training, projects development, funding/rebates)
- Understand how hospitals' historical efforts/projects are tracked by utilities
- Identify potential concerns related to NEEA's exit from the Initiative
- Determine how NEEA can further assist the utilities in the short-term as utilities become the primary drivers of SEM

Current SEM Efforts

Collectively, the utilities provide a wide range of SEM assistance to NEEA's participant hospitals. Following are descriptions of their different programs:[12]

1. One utility has an RCM program that supports a champion to implement low/no cost improvements to reduce energy and water consumption and solid waste. RCMs are not directly funded, however the utility offers a salary guarantee if they follow certain guidelines (in a 3-year contract), as energy savings are likely to pay for one FTE. The RCM program requires a SEMP and staff to oversee daily operations. The utility does no "handholding" to ensure hospitals follow the SEMP plan. The utility also has prescriptive rebates (lighting, VFDs) and custom rebates, and its engineering staff can help to specify custom projects, which can be funded up to 70%. Other hospitals that are not in the RCM program have received incentives for new construction and commissioning help, upgrades beyond code and fuel switching.

2. One utility has a formal SEM Program with the following elements: 1) Participants (from all sectors) must guarantee executive support and project champions, and provide at least 500 hours of dedicated staff time in year 1; and 2) Conduct detailed organization, facilities and policies assessments (similar to the ISO 50001 requirements). The program gives cohort trainings and has monthly meetings where participants give presentations on their SEM experiences. The program also provides facilities audits to identify operational projects and savings. Incentives are equal to 2 cents/kWh and 20 cents/therm (capital projects go through other programs with higher rebates). Qualifying projects include behavioral change, educating tenants on equipment use, HVAC maintenance and scheduling, and reducing overlapping heating/cooling.

[12] No programs have specific energy savings goals for hospitals; instead utilities typically develop savings goals at the sector level (e.g., commercial, industrial).

3. The following core programs are reported by one utility each, for assisting hospitals:
   3.1 Staff reviews contractor analyses to confirm savings for incentives (e.g., T8 lighting, LED exit signs). Large loads like hospitals go through the Custom Efficiency Program and get 12 cents/kWh up to 70% of cost. They also have a prescriptive program for small lighting, and New Construction and Major Remodel programs with 14 measures. The utility also does scoping audits every two years on major medical buildings, and will pay up to $12,500 for the audits.

   3.2 Staff attends hospitals facilities planning meetings to review current and planned efficiency projects in the SEMPs, and discuss how hospitals can implement them. This utility provides both deemed and custom incentives and helped to develop one hospital's SEMP seven years ago (this hospital is presently updating the SEMP). Staff helps hospitals to develop custom projects (e.g., wet to dry chiller conversions, small ECMs, new construction) and answer questions on energy planning (e.g., what to do during power outages).

   3.3 This utility (a small PUD) prefers to be "reactive and supportive of customers, and otherwise stay out of their way." Incentives are available for prescriptive and custom projects, and staff sometimes provides temporary meters and data logging services. Custom projects get 20 cents/kWh up to 70% of cost.

4. A large, regional utility provides engineering assistance and staff resources to smaller local utilities (and their subcontractors) for projects in the Industrial, Commercial and Agriculture sectors. This utility has completed audits, data logging, and project evaluations for multiple hospitals in NEEA's territory. Commercial projects can receive up to 20 cents/kWh, although local utilities can choose to pay less. This utility has an RCM program for the industrial sector, and reimburses savings at 2.5 cents/kWh (to pay for the RCMs). An RCM program for Commercial customers is in development.

The utility with an RCM program regularly reviews monthly energy data with participants to track trends and progress towards goals; the weather-normalized, whole building data are managed using Ecova's Utility Manager software. For the utility with the formal SEM program, participants' contractors receive and analyze monthly billing data to develop baselines upon which to claim savings later.[13] The other utilities only provide energy consumption data to customers upon request (due to staff limitations) and noted that hospital participants can utilize the information in their monthly bills. (One of these utilities had already established an "access point" so that a participating hospital can load monthly and interval data directly into its Energy Expert software.) All of the utilities can provide 15-minute interval data to customers demand meters, usually for a fee.

[13] The program requires a 3-year measure life for operational/behavioral projects in order to claim savings; contractors collect and analyze data (via regression analysis) to ensure savings are actually occurring for three years.

One utility was tracking their Initiative participant's energy savings over time. The other utilities were not doing this systematically, but noted that they can access customers' historic billing and measures data as needed, to get a sense of past accomplishments.[14] Notably, NEEA is currently developing comprehensive participant "profiles" that highlight cumulative achievements to distribute to utilities, so they have convenient information about past projects and a foundation upon which to scope future projects.

Two utilities do not have sufficient staff resources to promote NEEA's E2C Challenge, although one believed that four or five of their customers were participating. Another respondent was unsure about promotion activity, since much of their SEM program is outsourced to a contractor. The other three utilities do promote the Challenge; one has focused on smaller hospitals in particular. Another reported that major account managers promote the Challenge to customers and other staff describe it at state hospital association events. This respondent also stated that Washington has a new state requirement to facilitate automated uploads to EPA's Portfolio Manager (for all customer segments), and they were developing software to give customers this option.

One utility was starting to work with a new large hospital to implement SEM through its formal program but could not disclose any details due to confidentiality agreements. (This utility was also confident of enrolling additional hospitals in the future.) Another respondent had recently completed engineering studies and presented information on utility incentives to a hospital planning an expansion, and was hoping to do a "full SEM presentation" to upper management at a future meeting. Two other respondents reported that some non-participating hospitals had received incentives for projects, but did not perceive that they are implementing SEM comprehensively.

Transition Issues

One utility had already assumed leadership for SEM for some Initiative participants and was not tracking NEEA's emerging plans for other utilities. In this case, the utility collaborated with NEEA to review specific projects NEEA was promoting, and successfully negotiated who should follow the projects through completion to prevent duplicative efforts. Since then, the utility has been able to maintain SEM through its own program, including the development of SEMP plans and specific projects.

Four utilities were aware of NEEA's intention to exit the H&H market because they or staff attend NEEA sector webinars or are members of official advisory committees. All of these utilities wanted to know more about *how* the transition will actually occur, and what tools the

[14] Only one respondent was familiar enough with specific completed projects to suggest some potential best practices, which were: educating HVAC staff to tune controls to respond to occupancy in addition to temperature (e.g., fresh air reductions), and training electrical maintenance staff to become lighting experts (through the Lighting Design Lab) so they can do lighting audits, specify projects and calculate paybacks.

utilities will get to further promote SEM. Another respondent was beginning to participate on the Exit Activities working group to detail the transition strategy.

In response to NEEA's planned market exit, one utility was conferring more closely with a Market Specialist to address lots of planned new construction in their territory, and would likely retain their consulting services in the future. Another utility had met with its Market Specialist to clarify NEEA and BPA's likely future roles, and subsequently met with its hospital customer, the Market Specialist and BPA to scope out potential SEM strategies for the future.

The two utilities with formal RCM and SEM programs had no concerns about NEEA's market exit; the latter was expecting to double their program budget and to recruit many additional hospitals to complete capital or operations projects. Three utilities were concerned that hospitals would struggle to get or maintain executive management buy-in without NEEA's engagement (and would "de-fund" their RCMs), and that operations and maintenance projects would dissipate. Two utilities were concerned that SEM would never penetrate the smaller hospitals and medical office segment without NEEA's leadership.

Future Plans and Needs

Except for the utility that is expanding its SEM budget, all the utilities are planning to continue their current range of services. In addition, one had recently completed a successful Pilot for industrial refrigeration operators (in collaboration with NEEA), and wondered if this could be expanded for local hospitals. In particular, the Pilot was successful in getting management buy-in, and the participants shared many best practices with their peers.

The interviewees desired the following assistance from NEEA (or others) to help them maintain SEM progress:

- Activities focused on obtaining executive support for SEM – Regulators in Washington, for instance, are less supportive of RCM and SEM programs than "widget-based" programs, and utilities need a champion to fill this gap while they focus on installing measures.
- SEM training for utility account representatives – These staff usually do not have SEM expertise, but they do have goals to recommend or achieve savings.
- Continued assistance to hospitals through a New Construction or Integrated Design program, since many hospitals are planning expansions
- Expansion or replication of BPA's Track and Tune program to also serve regional hospitals – BPA's program provides funding for RCMs to industrial customers and targets low/no cost O&M projects such as reprogramming VFDs, turning off extra air compressors, and improved air filter maintenance. (The program pays participants about 2 cents/kWh for each year an energy auditor verifies savings.)

5.3 Healthcare Associations and Alliances

Evergreen interviewed two executives of hospitals associations and alliances in Washington and Montana in June and July 2013. The key objectives of the interviews were to:

- Understand energy efficiency trends in the hospitals market
- Identify hospitals' barriers to energy efficiency
- Identify concerns related to NEEA's exit from the hospitals SEM market
- Solicit views on the role Northwest utilities can take in promoting/leading hospitals energy efficiency activities going forward

This section also includes findings from a brief interview with the CEO of the Engineering firm that helped to replicate NEEA's website content on the national ASHE website (the next section describes this effort). This CEO has deep experience leading the firm's healthcare engineering practice, and had firsthand knowledge of recent SEM trends and barriers in the national market.

Energy Efficiency Trends Among Hospitals

Both executives described a positive trend in energy efficiency efforts in the hospitals sector. In Washington, energy efficiency is becoming a primary focus in new construction and large remodeling projects, where the energy savings potential is high. Similarly, in Montana several new construction and lighting projects in the past three years have had a strong focus on energy efficiency. (There has also been greater focus on broader resource management such as water and waste management.) Our interviewees noted several drivers of these trends. Hospitals have realized the cost saving potential of energy efficiency, especially in new construction. The Washington interviewee noted that NEEA's programs and assistance with new construction projects has been a significant influence. Hospitals associations have also been pushing members to find energy savings, which has driven more sustainable practices.

The interviewee from Washington also reported that hospitals are increasingly integrating energy efficiency into their mission statements, to link to broader sustainability efforts and position hospitals as good stewards of resources. However, the interviewee noted that hospitals do not always act on their mission statements consistently. He also noted that larger systems seem to have more explicit goals for energy, water and waste than smaller systems.

Energy Efficiency Planning and Implementation

The Washington executive estimated that more than 60% of hospitals statewide are implementing energy efficiency planning or projects in collaboration with their local utilities, although he did not know how comprehensive these plans and projects are.

The alliance in Montana has five member hospitals. The interviewee stated that all member hospitals are trying to save energy in some way. Coordination between the hospitals is limited

and the interviewee believed that the hospitals would benefit significantly by collaborating and adopting universal SEM practices. The alliance management is eager to assist with this and is starting to provide assistance for SEM now. They are also looking into other areas of collaboration, including group-purchasing agreements and pooling resources to develop SEM plans.

Barriers to Energy Efficiency

The interviewees described the following barriers to energy efficiency practices:

- **Many hospitals do not benchmark or understand their actual energy consumption.**
- **Competing priorities at the executive management level**. Many hospital executives do not perceive energy efficiency to be a core issue. Hospitals in the region are going through significant restructuring to implement new health care legislation. This has led to greater focus on patient care practices and reducing direct healthcare costs. The result is reduced focus on "peripheral" issues, which often includes energy efficiency.
- **Changing composition of C-suite staff from administrators to clinicians**. The trend in hospital management has been toward hiring clinicians to upper executive positions. The natural inclination of these executives is to focus primarily on healthcare delivery processes and efficiencies and focus less on the physical structure of hospitals. Our interviewees noted that hospitals executives rarely make tours of buildings, and lack the knowledge needed to manage physical infrastructure effectively.
- **Facilities staff are undervalued by management, and their workloads are increasing.** These staff are often the first staff cut to reduce costs, and one respondent reported (from an undisclosed source) that square feet per hospitals facility staff has "recently" doubled from 20,000 to 40,000 square feet per staff.
- **Facilities staff have less time to devote to SEM and may not have the requisite skillsets**. Shrinking staff numbers and increased responsibility mean that facilities directors and their staff have less time to devote to energy efficiency and SEM. One respondent perceived that new facilities staff are less educated/skilled than the "older, skilled navy guys", and increasingly have not studied facilities engineering just as operating systems are becoming more complex. As a result, staff are increasingly operating systems incorrectly.
- **Fiscal uncertainty and reduced capital availability**. Factors including changes in the regulatory climate have created financial uncertainty in hospitals. This uncertainty has led hospitals management to restrict capital budgets. Competition from other areas, especially Information Technology, has reduced budgets for facilities upgrades.
- **Difficulty quantifying energy savings and translating to the executive level.** In general, hospital executives understand that energy efficiency is important and can be a source of cost reduction. However, facilities staff has difficulty quantifying the impacts of energy efficiency projects, measuring ROI and communicating the positive results of energy efficiency practices to the executive level.

Current and Future Importance of Energy Efficiency

Both interviewees characterized energy efficiency as being a mid-level priority for hospitals currently. Hospitals understand that they can gain significant cost savings and operational benefits from energy efficiency. In some activities, energy efficient practices are becoming the norm, particularly in large new construction or expansion projects. However, due to barriers listed previously, hospitals sometimes relegate energy efficiency to lower priority levels.

The executives expect a variety of factors to elevate the importance of energy efficiency for hospitals. Going forward, hospitals will need to find cost reductions and efficiencies across *all* aspects of their business and energy efficiency will be a key source of cost reduction. There is significant pressure on hospitals to reduce energy consumption from local business communities, particularly in Washington. Utilities in the Northwest are unable to build new plants so local business lobbies are concerned that increasing energy costs are going to put the Northwest at a competitive disadvantage in the future. These entities are calling for hospitals, as a high use industry, to do more to reduce energy consumption. Also, as the healthcare industry adjusts to the current reforms and regulation changes, capital will become more available and energy efficient practices will rise in importance.

Both interviewees stated that energy efficiency and SEM will be high priorities for the hospital associations going forward. In Washington, the association is eager ramp up SEM practices in the near future. The association has two priority projects at present. After the first project is making significant progress, the association will focus on developing/updating SEMP plans across 97 hospitals with the goal of creating hospital specific energy, waste and water profiles, and then encouraging collaboration and experience sharing across the hospitals. The association has received positive initial feedback from its member hospitals regarding this general plan and the interviewee was optimistic that SEM practices would continue and grow.

In Montana, the alliance's goal is to increase its members' future focus on energy efficiency. In the past SEM has not gained traction with hospital leadership. Recently, however, there has been significant interest among hospital executives, due in part to a recent NEEA presentation documenting the benefits obtained at Kalispell Regional Medical Center (KRMC). The interviewee was optimistic that SEM will gain momentum among its member hospitals, particularly if they are able to secure the assistance of talented consultants to develop SEMP plans and guide their implementation.

Working with Utilities

Neither organization works directly with the utilities in their regions, and both executives are hoping to engage with utilities in their future SEM efforts. Hospitals, on the other hand, are working closely with their local utilities with generally positive results. Both interviewees noted that engaging utilities in SEM is key to the success of their energy efficiency plans going forward.

Working with NEEA

The interviewee in Montana had very limited knowledge of NEEA until recently. However, she has become very aware of the successes of SEM at the KRMC and is excited to implement SEM going forward. In this regard, the interviewee is disappointed that NEEA is leaving the market as SEM is at a very early phase in Montana and NEEA's assistance would be helpful. In particular, assistance is required conducting audits, project identification and project management. As NEEA is exiting the market, they will look to other sources such as utilities and/or independent consultants to obtain planning and engineering resources.

The interviewee from Washington was also disappointed that NEEA is leaving the hospitals market. Approximately one-third of Washington hospitals still need help with energy efficiency planning and a lot could be achieved through a broad appeal to hospitals in Washington. He was also concerned that the collaboration among hospitals facility staff fostered by NEEA's program could diminish when NEEA leaves the market. Going forward Washington hospitals will continue to need assistance from professional project engineers and resource consultants. The interviewee was optimistic that hospitals and the hospital association would continue to fund these services.

5.4 Engineering Firm

Evergreen interviewed the engineering firm responsible for transitioning the Northwest Region 10 E2C benchmarking content (on the BetterBricks website) to the national ASHE Sustainability Roadmap for Hospitals website, to better understand the motivations for doing this and expected outcomes.

The ASHE national chapter recently announced a planned update to the national E2C benchmarking website. The engineering firm we spoke with was familiar with the NEEA's BetterBricks website content for hospitals and proactively suggested that the national ASHE chapter adopt NEEA's website content as the basis for the updated site. In particular, the engineering firm was impressed with the additional resources included beyond the "core" benchmarking tools, including detailed case studies, SEM assistance and the variety of other educational tools and information available on the website. The national ASHE chapter agreed with the recommendation and integrated NEEA's website materials.

The website content transfer is complete and is free to hospitals on the Sustainability Roadmap site. While the site is relatively new, the interviewee reported that initial feedback from ASHE and site users has been very positive, particularly regarding the additional SEM resources and tools it provides, replicated from NEEA's website. ASHE's current goal is to drive more healthcare providers to the site and have them add more SEM content.

The interviewee noted that ASHE is still working to secure long-term funding for the website project. To do this they are reaching out to utilities and healthcare alliances to provide financial assistance, and the initial responses have been positive. The interviewee reported

that the utilities and alliances perceive that the website provides a beneficial service and they are interested in providing funding. However, as these are investor or member driven organizations they will need to obtain formal funding approvals. Although this process could take some time, the interviewee was optimistic that they would be able to secure funding for the long-term maintenance of the Sustainability Roadmap website.

In replicating NEEA's website content, ASHE has also implemented some changes for the national Sustainability Roadmap. ASHE has changed the structure of the EPA Battle of the Buildings and transformed it into a more competitive program that is now called the Team Challenge Program. They have also expanded the awards and recognition portion of the benchmarking program. In addition to giving awards to facilities meeting the 10% savings threshold, the national program now includes awards for achievements such as the annual "biggest loser", and most improved awards within each state.

Going forward, ASHE plans to add new case studies to the website, and a "how-to" guide for resource management. ASHE will also add several Performance Improvement Measures (PIMs). PIMs are instructional guides for implementing projects and programs related to energy and water conservation and waste management. Eighty PIMs are already on the website, and wiki features will allow users to add more PIMs following screening by a committee.

6 2012 Energy Savings Validation Summary

SBW validated the electrical energy savings from the Initiative for the year 2012, and Table 3 shows the summarized results for the seven facilities for which savings information was provided by NEEA. Detailed findings regarding the implemented projects and validation methodologies are included in the report Appendix.

SBW's validation consisted of inspection and review of the documentation provided by NEEA, the utilities, and the facilities. In general, SBW did not have detailed records describing the measures installed. Where a utility has incentivized a measure, SBW verified that the amount claimed by NEEA matched the amount reported by the utility. Where more detailed information was available, SBW verified that the means used to arrive at the savings claim were reasonable, and that the results were within the range of expected savings for the measures. Overall, NEEA's participant hospitals saved over 4.8 million kWh in 2012.

Table 3: Validated Electrical Energy Savings for 2012

Hospital Group / Facility	2012 Validated kWh (aMW)	Electric Utility
Regional Health System #1 / Regional Medical Center #1 (MT)	170,776 (0.019)	Flathead Electric Cooperative
Regional Health System #2 / Regional Medical Center #2 (ID)	1,492,193 (0.170)	Idaho Power
Medical Center #3 (OR)	446,373 (0.051)	Energy Trust of Oregon
Regional Health System #3 / Medical Center #4 (WA)	463,802 (0.053)	Cowlitz PUD
Regional Health System #4 (4 in OR)	1,026,485 (0.117)	Energy Trust of Oregon
Regional Health System #4 – Medical Center #5 (WA)	999,870 (0.114)	Clark County PUD
Regional Health System #3 / Medical Center #6 (WA)	235,033 (0.027)	Puget Sound Energy
Total	**4,834,532 (0.552)**	

7 Data Needs for Future Savings Tracking

A key objective of this evaluation is to determine the data NEEA requires to track long-term energy savings from current participants in the H&H Initiative, after NEEA has exited this market. To assess these data needs, SBW catalogued the actions taken by Initiative participants, and the types of data available from them during the savings validation effort. NEEA staff also provided input on these topics. SBW also reviewed previous NEEA long-term monitoring and tracking (LTMT) studies for similar initiatives. From all of these sources, SBW developed a list of relevant data sources for hospitals and health care facilities. Based on these information sources, SBW recommends in this section the most appropriate and practical data streams for tracking savings in the future.

Hospital and Healthcare Initiative Activities to Date

As described previously in Section 6, SBW reviewed electrical energy savings claims for program year 2012. To provide a more robust snapshot of initiative activities, SBW also examined the savings validation effort that MetaResource Group performed for 2011 savings. Measures claimed for 2011-2012 included the following:

- 8 HVAC upgrades
- 8 HVAC re-commissioning projects (primarily setpoint and schedule changes)
- 4 lighting projects
- 2 new building commissioning projects
- 2 O&M projects
- 2 whole building efficiency improvements over code (new buildings)
- 1 data center cooling upgrade
- 1 Energy Star appliances measure
- 1 process equipment upgrade (hospital medical equipment)

In a majority of these instances, utilities incentivized these activities. Also, much of the initiative's activities clearly centers on HVAC systems. Because of the long-term nature of initiative participation, it is likely that measures yielding larger savings—such as capital measures and major controls-related O&M projects—occur early in the participation cycle, after which the magnitude of savings from initiative activities might be expected to diminish in future years.

Data Available to Date

As the past three savings validation efforts have established, the quality and quantity of data sources available from initiative participants varies. These sources range from measure-specific information, such as utility validation memos and energy conservation measure spreadsheets, to whole-building approaches, such as Energy Expert and EPA Portfolio

Manager. Table 4 summarizes the current data sources that can help evaluators validate initiative energy savings.

Table 4: Hospitals and Healthcare Initiative Current Savings Data

Energy Use Tracking System	Point of contact	Type of report	Current agreement in place
Utility validation memo	Utility representative	Utility incentive forms	None—need to call utility rep and request data/information. ECM spreadsheet notes utility-incentivized measures.
Energy conservation measure (ECM) spreadsheet	NEEA technical advisor, hospital RCM	Excel Spreadsheet with measures, utility incentives, and engineering calculations.	Memorandum of understanding (MOU) with hospital
Resource conservation manager (RCM) monthly report	Hospital RCM	Document detailing RCM activities and associated savings	MOU with hospital
Energy Expert	Hospital RCM, SRM, or facility director	Energy Expert screen shots (RCM or NEEA technical advisor ensures baseline established and clean data with any outliers).	MOU with hospital
EPA Portfolio Manager tool	NEEA business advisor, hospital RCM	EPA Portfolio Manager report, as specified by user	

Each of the seven sites evaluated for 2012 featured utility-incentivized measures and associated documentation. Documentation for five of the sites described each implemented measure in some detail, though in one case, these descriptions only covered some of the measures. One site relied on Energy Expert for developing its savings estimate. SBW was able to obtain full measure-level savings calculations for one site, and partial calculations for a second.

Of the ten sites evaluated for 2011, savings documentation ranged from that associated with utility incentives for five sites, Energy Expert analysis for three sites, and customer-calculated savings (outside of utility and Energy Expert efforts) for two sites. The documentation enumerated the implemented measures at eight of these, although as with 2012, in one case, only some of the measures were known. SBW was able to obtain measure-level savings calculations for three of the sites.

Overall, among currently available data sources, utility-provided documentation is generally most reliable, since the measures they incent tend to be well established, the savings estimates rely on proven calculation methods, and utility staff usually perform the verification. In situations where the utility was unable to provide additional information, facility staff often was able to fill in the information gaps.

Savings calculated by facility staff (or contracted personnel, such as a commissioning agent) can also be fairly reliable. In the two cases SBW reviewed where such calculations were available, the measures were well described, and facility staff were able to fill in information gaps. Staff will likely be a critical secondary source of information, especially when these information gaps exist.

Between the 2010 and 2011, only four sites used Energy Expert to verify savings. In two of these cases, little documentation existed for individual measures. The primary concern with Energy Expert is that it captures all activities at a site during a given analysis period, not just the actions taken as part of the Initiative. Without supplemental information that either confirms that no non-initiative actions took place, or calculates the savings adjustments for such actions, uncertainty remains in the Energy Expert results.

In the same vein, SBW considered another potential source of savings information, reports from the EPA Portfolio Manager tool. NEEA has already commissioned two regression-based studies of savings from their E2C strategic energy management (SEM) benchmarking effort, of which Portfolio Manager is a key component. To date, NEEA has not claimed savings from this effort, since establishing the causation between SEM activities and changes in energy consumption would likely require additional interviews or surveys in the future to know more. After reviewing the memos for these studies, SBW notes that Portfolio Manager has historically aggregated fuels, and thus could not provide separate results for electric and natural gas savings. Consequently, the E2C analyst had to obtain raw billing data.[15] SBW also observed that the differences in usage by fuel tended to be very small (generally much less than 2%).

Future Data Needs

The preceding review of available data makes clear that the types and quality of data will vary significantly between facilities and organizations. Whoever is tasked with tracking Initiative savings in the future will have to rely on a wide variety of data streams whose quality and availability are unknown at this point. Ideally, these data streams will (1) prove that reductions in energy use occurred, and (2) tie those reductions to Initiative actions.

We expect that future long-term monitoring and tracking efforts will have to use a hybrid approach that melds a top-down validation of whole building savings with a bottom-up, more

[15] In July 2013 EPA released an updated version of Portfolio Manager that will calculate savings metrics for separate fuels.

detailed accounting of actions. Hard data are needed in the form of utility meter data and lists of measure and actions, coupled with interviews of key personnel to clarify the context for these. The party responsible for the LTMT effort will likely have to sample some sites and develop a quantification scheme based on available information.

NEEA has formed a team to assess the feasibility of developing a unitized savings methodology for SEM initiatives, including the Hospital and Healthcare initiative. NEEA will make a decision by December 2013 as to how energy savings from SEM activities will be calculated for 2013, 2014 and beyond after the initiative transition is completed. This decision will impact this section's recommendation.

Table 5 details specific savings categories and potential data sources for each. These cover capital and O&M measures, whether utility-incented or not. The table also specifies key data elements and likely points of contact.

Table 5: Hospitals and Healthcare Initiative Future Data Needs

Savings Category	Potential Data Sources	Key Data Elements	Point of Contact	Notes
Utility-incented capital measures	• Project lists • Project files	• Measure description • Installation date • Estimated savings • Savings verification approach and results	Utility represent-ative	Per interviews, utilities are willing to keep providing project data to NEEA at the level of detail they do now. Are open to a standardized submittal format in the future, provided it is not too onerous, and would only request funding if the format was very detailed.
Non-incented capital measures	• ECM spreadsheets	• Measure description • Installation date • Estimated savings • Savings verification approach and results	Facility staff and/or contractors	Interviews hospitals said they could send some data to NEEA. Level of effort varied, from sending what they normally collect to being willing to do additional work to meet NEEA's needs.
Non-incented O&M measures	• Spreadsheets	• Measure description, including affected areas or systems • Date(s) measure began, and duration • Estimated savings and verification efforts, if applicable	Facility staff and/or contractors	

Savings Category	Potential Data Sources	Key Data Elements	Point of Contact	Notes
General	<u>For energy use:</u> • Metered data	• Billing and/or interval data for at least several past years, up through the time of future evaluation. This can be supplemented with Energy Expert (full data, not just screen shots) and Portfolio Manager reports. • Descriptions and square footage, as applicable, for affected areas.	Facility staff and/or contractors	
	<u>For project history</u> • Key SEM personnel	• Names, contact info, and dates of tenure for past and present respondents. • Areas of project knowledge (e.g., HVAC operation, staff training, overall effort)	Facility staff and/or contractors	Establish whether personnel no longer in a key role can still be contacted in the future.

8 Review of NEEA Cost Effectiveness (ACE) Model

As part of the evaluation, SBW reviewed certain assumptions contained in the Alliance Cost Effectiveness (ACE) model. NEEA provided SBW with the model as an Excel workbook and SBW's review focused on model assumptions, rather than the calculation methodology. In this section, we give an overview of the review methodology and key findings. The report appendix includes additional details regarding this ACE model review.

SBW's model review focused on the effective useful life (EUL) assumptions for the main measures implemented under the initiative. A December 2012 NEEA memo (Justice, 2012) noted the key measure categories with high EUL uncertainty, which were: (1) HVAC equipment, and (2) Operations and Maintenance. These two measure categories accounted for the great majority of installed measures; lighting retrofits and HVAC controls are also included in the model. Table 6 shows the distribution of 2008-2011 installed measures among these four categories, along with current EUL assumptions. There are two EULs for HVAC equipment – the 15-year value used previously, as well as 25 years, which is consistent with the Northwest Power & Conservation Council's (NWPCC) Sixth Power Plan.

Table 6: Initiative Measure Distribution and EULs

Measure Category	Percentage of Measures	EUL (years)
HVAC Controls	2.5%	7
Lighting, Retrofit	8.0%	12
Operations and Maintenance	41.0%	5
HVAC Equipment	48.5%	15/25
Integrated Building Design – New	0%	30

Uncertainty in the HVAC equipment EUL is understandable, since the lifetime varies with the specific type of equipment installed. Uncertainty regarding O&M measures is also understandable, as some measures can have very short measure lives, while others are very long-lived. Adding to the uncertainty is the difficulty in distinguishing between a "controls" measure and an "operations" measure, and the fact that capital measures often involve controls work, and vice-versa.

Methodology

The first step in SBW's EUL review was to gain a better understanding of the actual measures installed. For instance, the category HVAC Equipment could include a new chiller, VFD, fan, motor, or rooftop-unit (RTU). Controls measures could include calibrating temperature sensors, changing thermostat setpoints, or installing demand-control-ventilation (DCV). To assess the actual measures installed, SBW tabulated and categorized the itemized measures from two sources: (1) a memorandum from the MetaResource Group validating 2011 initiative savings (Scott, 2012), and (2) 2012 reports and summaries of activity under the

initiative at three sites, which facilities staff enrolled in the initiative provided. The complete detailed list of measures from these sources is provided in the appendix.

SBW's literature review focused on the kinds of installed measures inventoried above. The review focused on "meta" studies, which are reviews of other EUL studies, as well as other well-known sources.

Key Findings and Recommendations

The EULs assumed in the current ACE model are within the range of EULs assumed in other programs and found in relevant industry studies. That said, we recommend minor changes to the ACE model EUL assumptions.

HVAC Equipment

Ideally, measures would be categorized more completely before assigning EUL values. Table 7 shows a recommended categorization scheme, with suggested EULs. If NEEA wishes to leave the model as is, with a single EUL for all HVAC equipment, SBW recommends a value of 17 years. Most of the measures installed are assigned an EUL of 15 years, but efficient chillers and rooftop units will occasionally be installed. Based on available data, SBW was unable to calculate a savings-weighted average EUL for HVAC equipment.

Table 7: Recommended HVAC Equipment EULs

Measure	EUL (years)
High-efficiency chiller	25
VFD on fan, pump, chiller, other	15
VAV terminals or other variable-air components	15
New high-efficiency rooftop unit	20
Add economizer	10
Heat Exchanger/Heat Recovery	14
New Packaged AC or Heat Pump	15
Demand Control Ventilation (DCV)	15
Energy-Management System (EMS)	15
Super-premium motor	15
Other	15
Overall Average	**17**

HVAC Controls and O&M Measures

The current ACE model EUL for controls measures is 12 years, and for O&M measures, five years. SBW recommends adding controls measures into the Operations measure category. A

controls measure that is a large capital expense, such as a VFD, EMS or DCV, should be considered an equipment measure. Smaller items can be considered a normal part of the retro-commissioning process.

SBW bases its recommendation for this category on the persistence studies of commissioning measures, combined with the DEER (Database for Energy Efficient Resources) and NWPCC values. The studies show a wide range of values, and it is not possible to know the average value that correctly captures the measure life for those measures installed under the initiative. One point mentioned frequently in the studies, however, is that persistence is higher at sites where there is a high degree of training and commitment to the ongoing commissioning process. Since the initiative encourages that kind of commitment, SBW recommends a value at the high end of the EUL estimates for commissioning of eight years.

Lighting Measures

The current ACE model EUL for lighting is 12 years. This is a reasonable value for linear fluorescent or HID upgrades. DEER 2008 estimates the EUL for linear fluorescent lighting based on a 70,000-hour lifespan of the ballast. CFLs have a lifespan of only 10,000 hours, however, and the lifetime for LEDs is under 50,000 hours. NEEA should consider further refinement of lighting measures. Since SBW does not have data on the savings attributed to different types of lighting measures, SBW does not recommend changing the current overall value of 12 years.

9 Key Findings and Recommendations

Overall, NEEA's Initiative is still achieving positive SEM results in the H&H sector. Interest in SEM is growing among hospitals, since it can contribute to overall cost reductions in an increasingly competitive and regulated market, and key regional hospitals associations plan to focus on SEM in the short-term future. At the same time, hospital executives are very focused on restructuring patient care services and funding for retrofit projects is constrained.

In this section, we present some of the key findings from the evaluation activities, and recommendations regarding NEEA's exit transition strategy.

Key Findings:

1. **All of NEEA's participating hospitals are or will soon be practicing SEM according to NEEA's definition.** These hospitals account for 27% of regional hospital capacity, as measured by hospital beds. Importantly, all systems will have a guiding SEMP plan, even if the plans do not include all the preferred elements (e.g., a timeline).

2. **Participant hospitals saved over 4.8 million kWh in 2012, and they plan to complete additional projects in 2013.** Three systems have completed major capital projects in 2013 and four systems are planning smaller capital for the remainder of the year. In addition, four of the six systems will implement or have implemented operational and behavioral changes to save energy.

3. **Hospital participants are deriving multiple benefits from SEM:**
    a. SEM is reducing the cost of energy to hospital systems and freeing resources that they can devote to core business activities and improving patient care.
    b. SEM has helped to directly improve participant hospital operations and building systems that support healthcare delivery.
    c. SEM has raised awareness of the importance of energy efficiency and the potential for energy savings at upper levels of hospital management.
    d. SEM has enhanced corporate brands by proving they "walk the walk" regarding environmental stewardship and sustainability.

4. **The participating systems plan to continue implementing SEM in the foreseeable future.** All three systems with RCMs that are or have been partly funded by NEEA plan to continue funding this position. The remaining three hospital systems will all continue to fund positions that include SEM as a key staff function.

5. **Hospitals face continuing challenges implementing SEM.** These include funding constraints for capital projects, requirements for fast payback periods, challenges measuring energy savings, overextended facilities staff and ensuring future executive commitment.

6. **NEEA website SEM content is perceived to be relevant, useful and accurate by NEEA's participant hospitals.**

7. **Participant hospitals staff perceive that SEM is not yet firmly embedded in their organizational culture, and could regress with new senior management in the future.**

8. **Hospital participants' primary concern with NEEA's planned exit from the market is the loss of an outside advocate for SEM.** Specifically, utilities and hospitals facilities staff may not have time available or the necessary skillset to build a strong case to keep hospitals management supporting SEM.

9. **The hospital systems have positive and productive relationships with their local utilities.** Five of the six hospitals reported that they have very good relationships with their local utilities and are satisfied with the support they receive for SEM in the form of rebates, project development assistance, energy consumption data and energy savings estimations.

10. **The utilities are prepared to continue promoting SEM, particularly capital projects, using their current program designs.** They are also eager to learn more about NEEA's detailed planning to transition SEM leadership to them.

11. **Key hospitals associations and alliances in Washington and Montana are planning to promote SEM to their member hospitals in the short-term future.** Although hospitals management is currently focused on restructuring patient care delivery, the association executives also perceive interest in energy efficiency and want to promote this along with other resource conservation.

12. **ASHE is disseminating NEEA's website tools for SEM into the broader national market via its own Sustainability Roadmap website.**

13. **NEEA's Initiative logic model reflects the primary demand-side barriers at a high-level, appropriate for a logic model.** The main barriers identified in this evaluation (executive commitment, insufficient capital and constrained facilities staff) are included in the model. On the supply side, we did not specifically inquire about the skillsets of private firm architects, engineers and service contractors to see if this barrier still remains or has become worse. If the model is to be updated, the Northwest utilities should be reflected in the supply-side infrastructure, since many capital projects would not be possible without their financial assistance, some utilities offer complementary SEM or RCM programs, and utilities are expected to become SEM leaders in the future.

Recommendations:

1. **Conduct annual interviews with current Initiative participating hospitals to confirm they are still implementing the key elements of SEM.**

2. **Deliver periodic presentations to groups of regional hospitals executives to describe and promote SEM.** This would help to ensure that changing management has the opportunity to consider SEM or is not inclined to eliminate existing, successful efforts. These presentations could replicate the recent presentation to a Montana hospitals alliance on the benefits derived at Kalispell Regional Medical Center, which was effective in convincing hospital executives to pursue SEM. NEEA and participating utilities should launch these presentations after finalizing details regarding how NEEA's SEM tools and knowledge will be transferred to the utilities, so the utilities are prepared to respond to increasing inquiries about SEM.

3. **Conduct advocacy training with hospitals SEM staff and utility account managers before leaving the market.** Providing RCMs, facilities managers and utility account representatives with advocacy tools and skills could help to maintain an executive focus on SEM.

4. **Work with BPA to expand or replicate its Track and Tune program to serve the hospitals segment.** According to interviewees, BPA's program to induce operational improvements in the industrial sector has been very successful, and NEEA (and the utilities) could collaborate with BPA to explore if and how they could expand the program to serve regional hospitals. This could be a valuable complement to existing utility rebate programs, which are generally focused on capital projects.

5. **Update website SEM content with case studies on new energy efficient hospitals.** Several interviewees suggested adding case studies on the Swedish Medical Center in Issaquah, Washington and the Peace Health Hospital in Friday Harbor, Washington.

6. **Adjust the ACE model assumptions as recommended in Chapter 8.** For HVAC equipment, either adopt a more detailed categorization scheme with more distinct measure lives, or use an overall average of 17 years. Include HVAC controls with other O&M measures and use an average life of 8 years.

7. **NEEA will need to utilize a combination of top-down/whole building and bottom-up approaches to conduct long-term monitor and tracking**. Historically, the types of projects completed and the types and quality of savings data submitted by hospitals and utilities have varied significantly, and the quality and formats of future data are unknown. For some projects, detailed data will be needed in the form of utility meter data and lists of measure and actions, supplemented by interviews of key personnel to clarify the context for installations. The party responsible for this effort may also have to sample some sites and develop a quantification scheme based on available information.

Appendix A: Interview Guides

Hospitals Participants In-Depth Interview Guide

Key Objectives:

- Understand how participant hospitals currently implement SEM, and possible future implementation challenges
- Identify expected 2013 capital and behavioral/O&M projects
- Collect feedback on the usefulness of BetterBricks web content pertaining to SEM for hospitals
- Identify potential concerns related to NEEA's exit from the Initiative
- Solicit future assistance needed from NEEA and/or utilities to maintain or enhance SEM

Target Audience: Key staff at NEEA's participating hospitals that are involved in SEM planning and capital projects development.

Hi, this is _____ with Evergreen Economics, an energy program evaluation firm in Portland, Oregon. My company is evaluating the Hospitals and Healthcare Initiative for the Northwest Energy Efficiency Alliance (NEEA), which is focused on Strategic Energy Management, often referred to as "SEM." Key elements of SEM include:

- Formal written plans, with timelines and budgets, to reduce building energy use;
- Numeric goals for energy savings or use;
- Implementation of capital and operations management projects; and
- Regular tracking and reporting of progress towards plan goals.

Right now we're interviewing staff at NEEA's participating hospitals, to learn about how they implement SEM, the capital and operations projects they have planned for 2013, and how they plan to implement SEM in the future as NEEA winds down its Initiative.

Can we schedule a time to talk about your current and expected SEM activities for about an hour?

Please know that your answers will be kept confidential and will be grouped with other respondents for reporting in aggregate form only. Neither your name nor utility will be mentioned in any reports or documents.

** AFTER INTERVIEW SCHEDULED: Before our interview, we'd like you to review some website information that NEEA has compiled on SEM for hospitals. This information can be found at: http://betterbricks.com/healthcare.

This website includes technical tools for SEM planning, case studies, published articles and recordings of regional Peer Technical Forums on SEM. During our interview, I'll want to learn if and how you have used these resources in the past, and how useful they may be in your future SEM work.

Current SEM Efforts and Interviewee Role

First, I'd like to get some details about your plan to reduce building use.

1) First, is your plan written? (If needed, "not just generally understood")
   a) (If Needed) Can you please confirm which of your facilities the plan pertains to?

2) Does your plan include numeric goals for energy savings or use?
   a) If YES: Get details for affected facilities.
   b) If NO: Why don't you have specific goals?

3) Does the plan include a timeline? (If needed, "for when certain projects should be completed, or energy savings should be obtained")

4) Does the plan include a budget?

5) Has the plan been authorized by senior management?

6) Does senior management receive updates on plan achievements?
   a) How are these updates provided? (Get details on frequency, method, etc.)

7) When was the last time you updated your SEM plan? (Get this info for each facility doing SEM, from above)
   a) Do you know when the plan(s) will be updated next?
   b) Do you have policies that require you to update your SEM Plan(s)? (Get details on scheduled frequency versus ad-hoc or continuous updates)

8) Do your SEM plans include prioritized project lists?
   a) If NO: Why don't you have detailed project list?
   b) If YES: Who is responsible for developing and updating the lists?
   c) If YES: <u>How</u> are projects identified and prioritized?

9) About how many people, in terms of FTE, are involved in implementing SEM for your facilities?
   a) And what are their titles and roles (include interviewee)?
   b) Have any of these staff received any training to help them implement SEM? (Get details)

10) How do you track your hospital's projects and energy savings over time, to track <u>long-term</u> progress?

11) (If not mentioned) Does your hospital review monthly or annual energy consumption data, or benchmarking data?
   a) If YES: How often do you do this, and what do you try to accomplish through your reviews?
   b) If NO: Might you do this in the future?

12) (Do NOT ask St. Al's in Idaho, and Kalispel Health Center, Kalispel Regional Medical Center – are using Energy Expert) Are you familiar with Energy Expert software, which can be used to measure total facility energy savings from capital and operational improvements?

13) If YES: Have you considered using Energy Expert software?

   a) If NO: Why not?
   b) If YES: Do you think you are likely to utilize this or similar software in the future? (Get details on which software they would utilize.)

14) (For St. Al's in Idaho, and Kalispel Health Center, Kalispel Regional Medical Center) Do you envision any challenges in continuing to use Energy Expert software to measure facility energy savings?
   a) If YES: Get details – probe on internal staffing/budget issues, NEEA's exit from the market, other reasons.

15) Do you think your hospital has any SEM best practices that other hospitals should be aware of?

16) What are the main barriers your hospital has in implementing SEM, if any? (Probe on lack of dedicated staff, insufficient budget, knowledge gaps, other priorities, etc.)

17) Has your hospital's SEM planning or implementation been impacted by health systems consolidation in any way?

18) What are the biggest benefits to your hospital from implementing SEM?
   a) How are the benefits communicated to the rest of the staff?

Interactions

Now let's talk about your interactions with NEEA, their SEM implementation contractors and your local utility.

19) How does your local utility support your SEM efforts? (Probe if needed: This could include SEM plan development, energy savings estimating, projects prioritization, financing, qualified contractor references or other services.)

20) Which NEEA staff or implementation contractors have you worked with for your hospital's SEM efforts?
   a) For any contractors, Market Specialists or consultants used: Does your hospital pay for their assistance?

21) What have NEEA, SEM contractors and your local utility done in the past 12 months to transition hospitals SEM leadership to your local utility, since NEEA is planning to end its Initiative in 2014?

22) How effective have these efforts been in your opinion?

23) How do you stay apprised of NEEA's planning to exit the hospitals SEM market?

24) Is there anything about NEEA's exit plans that are unclear to you?

25) (Legacy Only) We understand that your hospital's transition to work primarily with Energy Trust for your SEM efforts has gone well. Why do you think this has occurred – what factors have been most important?

Website SEM Content

Now let's talk about NEEA's website content to promote hospitals SEM. These are the technical tools, case studies, articles and regional Peer Technical Forum recordings I referred you to when we set up this interview.

26) Have you utilized any of these materials in the past two years?
   a) If YES: Which ones, and for what purposes?
   b) If NO: Why not?

27) Have you attended any training that was NEEA-sponsored or presented concepts from these website tools and materials?
   a) If YES: Get details.

28) Thinking about what you have used in the past and recently reviewed, did you find any of the SEM website content to be inaccurate?
   a) If YES: Get details.

29) Did you find any of the SEM website content to be irrelevant or not useful?
   a) If YES: Get details.

30) Do you recommend any additional SEM content for inclusion on the website – whether it currently exists or would need to be developed?
   a) Get details on what/why.

31) How would you prefer to access this SEM information in the future? (Probe on alternative website hosts, distributed to utilities, no changes, etc.)
   a) Why do you say that?

Future Plans and Wrap Up

Let's talk about your plans for SEM and then we'll be done.

32) What capital energy saving projects do you plan to install in 2013? These could be projects that receive utility incentives or not.

33) And what operational or behavioral changes might you implement to save energy in 2013?

34) Do you think your hospital will have high-level management commitment and facilities staffing for SEM in the next few years?
   a) If NO: Why is that?

35) Are you expecting to implement comprehensive SEM at additional facilities?
   a) If YES: Get details
   b) If NO and they have other facilities: Inquire about what barriers are preventing it.

36) After NEEA exits the hospitals market in 2014, do you think your hospital will have the expertise and resources needed to maintain SEM progress? Why do you say that?
   a) If NO: What technical SEM assistance are you likely to seek to maintain your SEM progress?
      i) Who will you seek this assistance from?
      ii) What role could your utility play?

37) (If Needed) Do you think your hospital staff will be able to develop and update its SEM plans going forward, or will you likely need additional assistance from anyone? [If assistance needed] Who will you seek assistance from?

38) What are your biggest concerns regarding NEEA's exit from the hospitals SEM market? (Probe to see if any market gaps.)

39) So that NEEA can continue to track future regional hospitals energy savings, would you be willing to provide NEEA with projects and energy information in standardized data format? These data could pertain to whole building energy consumption, specific capital projects, commissioning projects, or operations and maintenance changes.
   a) Without knowing what that format might be, do you think your utility would require reimbursement from NEEA, or do you regularly and easily reformat energy and projects data for different uses?

40) What additional assistance do you need from NEEA, its contractors or your utility to maintain or enhance your hospitals' SEM efforts in the future? (Probe on SEM training, overview of existing Initiative content, technical projects support, etc.)

41) Is there anyone else at your hospital we should interview about the SEM topics we have been discussing?

Those are all the questions I have right now. Thank you very much for your time and good information!

Utilities In-Depth Interview Guide

Key Objectives:

- Understand current and expected future utility assistance to hospitals (e.g., SEM planning, SEM education and training, projects development, funding/rebates)
- Understand how hospitals' historical efforts/projects are tracked by utilities
- Identify potential concerns related to NEEA's exit from the Initiative (e.g., utility resource constraints, regional leadership, hospital customer constraints)
- Determine how NEEA can further assist the utilities in the short-term as utilities become the primary drivers of SEM

Target Audience: Key utilities staff that assist the hospitals that currently participate in NEEA's Initiative.

Hi, this is _____ with Evergreen Economics, an energy program evaluation firm in Portland, Oregon. My company is evaluating the Hospitals and Healthcare Initiative for the Northwest Energy Efficiency Alliance (NEEA), which is focused on Strategic Energy Management, often referred to as "SEM." Key elements of SEM include:

- Formal written plans, with timelines and budgets, to reduce building energy use;
- Numeric goals for energy savings or use;
- Implementation of capital and operations management projects; and
- Regular tracking and reporting of progress towards plan goals.

Right now we're interviewing utility staff that work with NEEA's participating hospitals, to understand how you help them to implement SEM and capital projects, how you expect to assist these hospitals in the future and how NEEA can potentially assist you in the near term.

Can we schedule a time to talk about your involvement with NEEA's Initiative for about an hour?

Please know that your answers will be kept confidential and will be grouped with other respondents for reporting in aggregate form only. Neither your name nor utility will be mentioned in any reports or documents.)

Current SEM Efforts and Interviewee Role

1) First, what SEM planning or technical assistance does your utility currently provide to hospital customers? This could include SEM plan development, energy savings estimating, projects prioritization, contractor training or references, or other services.

2) (If not mentioned) Is this assistance provided through a stand-alone SEM program, or other energy efficiency programs or services at your utility?

3) What is your personal role in the assistance you have just described?

4) And what financial assistance or incentives does your utility provide to hospitals customers? (Probe on rebates, studies cost defrayment, other).

5) Do you review monthly or annual energy consumption data, or benchmarking data, with your hospital account?
   a) If YES: What do you try to accomplish through your reviews?
   b) If NO: Might you do this in the future?

6) (If not already mentioned) Do you provide energy consumption download capabilities to your hospitals customers, for Portfolio Manager benchmarking and other purposes?
   a) If YES: Are detailed, interval-level data available?
   b) If NO: Are you planning to provide this data access in the future?
      i) IF NO: Why not?

7) (If not mentioned) Do you encourage your hospitals customers to participate in the ASHE Region 10 E2C Benchmarking Initiative?
   a) If NOT: Why don't you do this?

8) Besides (NEEA PARTICIPANT HOSPITAL), are there other hospital accounts that are implementing SEM with the help of your utility? The key elements of SEM include:

   - A written plan to reduce energy use
   - Plan authorization by senior management
   - Numeric goals for energy savings or use
   - A timeline for accomplishments
   - A budget
   - Updates to senior management on plan achievements

9) (If Other Hospitals Doing SEM): Can you give an overview of the work you are doing with these other hospitals?

10) Does your utility have specific goals for energy savings at hospitals and healthcare facilities?

11) How do you track your hospitals' projects and energy savings over time, to track long-term progress?

12) Do you think your hospitals accounts have implemented any SEM best practices that other hospitals should be aware of?

13) What are the main barriers to SEM adoption and persistence within hospitals?

14) Are there any gaps you can identify in your utility's support of hospitals implementing SEM?

Interactions

Now let's talk about your interactions with NEEA and their SEM implementation contractors.

15) Which NEEA staff or implementation contractors have you worked with for your hospitals SEM efforts?
    a) For any contractors, Market Specialists or consultants used: Does your utility pay for their assistance?

16) What have these staff done in the past 12 months to transition hospitals SEM leadership to your utility, since NEEA is planning to end its Initiative in 2014?

17) How effective have these efforts been in your opinion?

18) How do you stay apprised of NEEA's planning to exit the hospitals SEM market?

19) Is there anything about NEEA's exit plans that are unclear to you?

Future Plans and Wrap Up

Let's talk about your future plans for SEM and then we'll be done.

20) (ENERGY TRUST) First, please describe how you have worked with NEEA and Legacy Hospitals to facilitate the transition of SEM leadership from NEEA to ENERGY TRUST.
    a) What elements of the transition have worked particularly, well, and why do you think this is?
    b) What challenges are you experiencing with this transition, and how to do you expect to overcome them?

21) After NEEA exits the market in 2014, do you think your utility/organization will have the expertise and resources needed to maintain SEM progress with your hospital customers? Why do you say that?

    22) If YES: Do you plan to promote SEM to new hospitals that are not currently implementing SEM?
        a) If YES: How do you plan to do this?
    23) If NO: What technical SEM assistance are you likely to seek to maintain your SEM progress?

24) What program(s) changes related to hospitals SEM might you implement in the future?

25) What are your biggest concerns regarding NEEA's exit from the hospitals SEM market?

26) So that NEEA can continue to track future regional hospitals energy savings, would you be willing to provide NEEA with capital projects data in standardized data format?
    a) Without knowing what that format might be, do you think your utility would require reimbursement from NEEA, or do you regularly and easily reformat projects data for different uses?

27) What additional assistance do you need from NEEA or its contractors to maintain or improve your hospitals' SEM efforts in the future? (Probe on SEM education and training, overview of existing Initiative content, technical projects support, etc.)

28) Is there anyone else at your utility we should interview about the hospitals SEM topics we have been discussing?

Those are all the questions I have right now. Thank you very much for your time and good information!

Key Market Actors In-Depth Interview Guide

Key Objectives:

- Understand energy efficiency trends in hospitals market
- Identify hospitals' barriers to energy efficiency
- Identify any potential issues related to the transition of E2C benchmarking content/practices to national ASHE
- Identify concerns related to NEEA's exit from the H&H SEM market
- Solicit views on the role Northwest utilities can take in promoting/leading hospitals energy efficiency activities going forward

Target Audience: Two executives of regional hospital associations/alliances, and key staff at the engineering firm that transitioned E2C benchmarking content from Region 10 to the national chapter of ASHE.

Hi, this is _____ with Evergreen Economics, an energy program evaluation firm in Portland, Oregon. My company is evaluating the Hospitals and Healthcare Initiative for the Northwest Energy Efficiency Alliance (NEEA), which is focused on promoting energy efficiency projects and planning at Northwest Hospitals.

ASSOCIATION/ALLIANCE: We'd like to learn about your members' efforts to save energy, how your Association/Alliance is involved, and also how NEEA or local power utilities can potentially assist these efforts going forward.

ENGINEERING: We'd like to learn about your experience and motivations for transitioning NEEA's E2C benchmarking effort to the national chapter or ASHE, and also learn about your hospitals clients' efforts to save energy.

Can we schedule a time to talk about your involvement with NEEA's Initiative for about an hour?

Please know that your answers will be kept confidential and will be grouped with other respondents for reporting in aggregate form only. Neither your name nor organization will be mentioned in any reports or documents.

Questions for Hospitals Associations/Alliances

1) First, what high level trends are you seeing regarding efforts to save energy in the hospitals sector? Compared to five years ago, are hospitals and healthcare facilities doing more planning to save energy or installing more energy saving equipment? Or is energy efficiency becoming less important to them for any reason?
   a) What is driving this trend?

2) What types of energy saving projects, goals or policies are you hearing about among your members?

3) What percentage of your membership do you think is actively trying to save energy?

4) (MT) Do your alliance members collaborate to develop plans for energy efficiency or to implement capital projects?
   a) If Yes: Get details, and probe to see if any actual economies of scale/cost reductions realized.

5) What are the main barriers to energy efficiency planning and projects within hospitals?

6) (If Needed) What are the most important topics in the hospitals sector now, and how does energy efficiency compare in importance?

7) Compared to now, how important do you think energy efficiency will be to hospitals in the next five years?
   a) Why is that?

8) How does your Association/Alliance currently address energy efficiency? For instance, is energy efficiency a regular or ad-hoc topic at Association/Alliance meetings, is it promoted in newsletters, or is there information accessible from your website?
   a) Get details on activities and participants.

9) Does your Association/Alliance partner with local power utilities to present information on energy efficiency opportunities?
   a) If Yes: How does this occur? Probe to see if utilities presentations, if utilities info integrated into print materials, etc.

10) (If Needed) Compared to other topics your Association/Alliance attends to, how much attention does energy efficiency receive? Is it a higher or lower priority for the Association?
   a) Why is this?

11) Do you think energy efficiency will receive more or less attention by your Association/Alliance in the next three years?
   a) Why is this? (Probe to see if any Association/Alliance goals related to energy efficiency, if they want to lead or follow their membership)

12) Are there any specific energy efficiency topics you or your members want to know more about?
   a) If needed, probe on planning, common project types, potential energy savings, available incentives, etc.

Let's talk a little about NEEA's planned exit from the Hospitals market in late 2014, and then we'll be done.

13) What concerns, if any, do you have regarding NEEA's exit from the hospitals market?

14) Is there a role for local power utilities to help increase energy efficiency among Northwest hospitals and healthcare facilities?

a) If YES: How would you like to see local power utilities work with your members to implement energy efficiency projects or planning?
b) If NO: Why do you say that?

15) (MT) Why did you approach NEEA about their Strategic Energy Management efforts in Montana – what information or assistance were you hoping to get from NEEA in the short-term or longer term when you approached them?
a) How could MIHA potentially partner with NEEA to help your members?

16) (WA) Is there anything NEEA could do to help your ASSOCIATION during this transition period, so that you are better positioned to promote energy efficiency in the longer-term?

Questions for Engineering Firm

17) First, can you give an overview of how you have helped NEEA to migrate its E2C benchmarking effort to the national ASHE chapter?

18) What challenges have you experienced during this transition, if any?
a) (If Needed) How did you overcome these challenges?

19) For the national E2C effort, did you make any changes or enhancements to NEEA's Region 10 content or design?
a) If YES: Why did you do this?

20) Why did you recommend to ASHE that they utilize the Northwest E2C effort to create a national platform? What is compelling about NEEA's E2C effort?

21) What feedback have you received from ASHE or others about the initial uptake and experiences with the new E2C platform?

22) Are there plans to make any more changes to ASHE's program or website for E2C?

Now I have a few questions about your firm's experiences with its hospitals and healthcare clients, and then we'll be done.

23) What high level trends are you seeing regarding efforts to save energy in the hospitals sector? Are hospitals and healthcare facilities installing more energy saving equipment or making other changes? Or is energy efficiency becoming less important to them for any reason?
a) What is driving this trend?

24) What types of energy saving projects, goals or policies are you hearing about among your clients?

25) Have you observed any best practices for energy efficiency among your hospitals clients?

a) If YES: Get details.

26) What are the main barriers to energy efficiency within hospitals?

27) Compared to now, how important do you think energy efficiency will be to hospitals in the next five years?
    a) Why is that?
    b) Are you promoting energy efficiency to your hospitals clients? How so?

Those are all the questions I have. Thank you very much for your time and good information!

Appendix B: ACE Model Review Details

We will insert the complete final memo as a PDF when the final MPER is approved and a PDF version is submitted.

We will do this to retain SBW's formatting.

Appendix C: 2012 Savings Validation Details

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