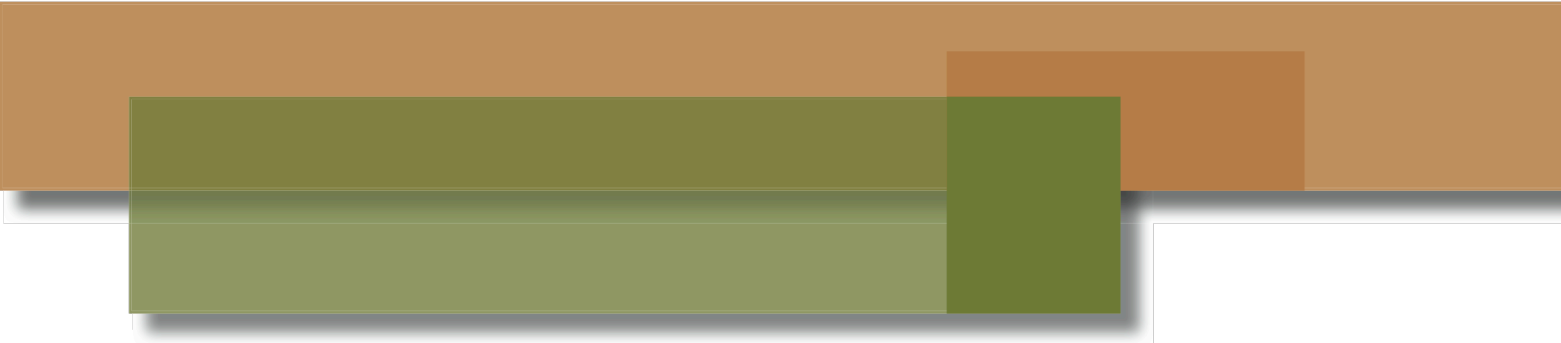


## Utility Strategic Energy Management Programs



*Three successful utility strategic energy management programs from the Northwest pave the way for other utilities considering this type of program.*

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**About SWEEP:** The Southwest Energy Efficiency Project is a public interest organization that promotes energy efficiency in Arizona, Colorado, Nevada, New Mexico, Utah and Wyoming. For more information, visit [www.swenergy.org](http://www.swenergy.org).

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## Executive Summary

Strategic energy management (SEM) programs deserve serious consideration by utilities seeking ways to achieve more energy savings from industrial and other large customers. SEM programs offer funding of energy management staff positions at large companies or public sector entities and/or training in developing systems for continuous improvement of energy management.

Three utilities or third party energy efficiency program administrators in the Northwest—Bonneville Power Administration, Energy Trust of Oregon, and Puget Sound Energy—have achieved documented energy savings from SEM programs of 15-25% of their total savings for all commercial and industrial efficiency programs. These three programs have also demonstrated that it is possible to measure savings from operations and maintenance (O&M) improvements in a rigorous way, and that SEM programs can be very cost effective.

For other utilities considering developing these types of programs, we recommend beginning with the energy manager co-funding program, which helps many large customers develop the staff resources needed to implement energy efficiency improvements and to begin to develop a more comprehensive strategic energy management program.

Second, we suggest developing a pilot program to train a group of customers in the comprehensive principles of strategic energy management and developing systems to measure progress.

And third, we suggest that utilities offer a program to help industrial customers find, implement, and measure savings from O&M improvements, to help them get started on the SEM path.

## I. Utility Strategic Energy Management Programs

Utility strategic energy management (SEM) programs help large customers develop a more systematic, strategic approach to energy management, going beyond the often sporadic, one-project at a time approach. As companies implement SEM programs, they begin to achieve greater energy savings through operations and maintenance (O&M) improvements and through implementing an increasing number of capital projects. In addition to achieving greater energy savings, these programs also help increase customer satisfaction. SEM programs are relatively new, but are gaining in popularity as utilities search for ways to achieve greater energy savings from industrial or other large customers.

There are a few program options under the general umbrella of strategic energy management programs. The most important are: 1) co-funding of energy managers at customer facilities, and 2) training staff at industrial facilities on how to implement the management systems and procedures for achieving continuous, long-term energy-saving goals. A third type of program is a “track and tune” program, focusing on finding low-cost operations and maintenance (O&M) opportunities, and on measuring these savings through better energy monitoring and analysis. These three types of programs are complementary and could be offered as a suite of SEM program options.

SEM programs are well established in the Pacific Northwest, having been developed and successfully implemented there by the Northwest Energy Efficiency Alliance (NEEA), Energy Trust of Oregon (ETO), Puget Sound Energy (PSE), BC Hydro, and the Bonneville Power Administration (BPA) and several of its customer utilities. One of the key challenges of SEM programs is rigorous measurement of energy savings from behavior change/O&M improvements; however, BPA, ETO, and PSE have pioneered effective ways to measure and verify O&M savings. The remarkable success of these programs in the Northwest could be replicated by utilities in the Southwest and elsewhere.

### What is Strategic Energy Management?

From the customer’s point of view, strategic energy management helps companies put systems in place to allow them to achieve significant, on-going energy savings over a period of five years or longer. Strategic energy management is essentially a continuous improvement approach to energy management, similar to the “plan, do, check, act” approach that has been successfully applied to quality improvement in manufacturing for many years. Based on the experience of NEEA, BPA and ETO, there are six key elements that allow an industrial company to achieve on-going energy efficiency improvements (Wallner, 2011):

1. Obtain management support for long-term energy reduction goals
2. Dedicate staff, including an energy champion, to oversee and monitor energy management planning and implementation
3. Develop and regularly update energy management plans
4. Implement a system for tracking energy use
5. Quantify energy savings from energy-efficient equipment upgrades
6. Quantify energy savings from O&M process improvements

From the utility's point of view, the benefits of developing a SEM program include the following (BPA 2012a):

- Increased number and size of traditional energy efficiency projects implemented
- Measurement of operations and maintenance- based energy savings
- Increased likelihood of high-complexity or process- oriented projects.
- Greater persistence of energy savings.
- Greater customer satisfaction.

## Overview of Utility SEM Program Options

There are three program options under the umbrella of SEM.

1. **Provide co-funding for an energy manager.** The energy manager is a new hire who is typically required to develop and implement a plan to achieve a certain minimum level of annual energy savings in order to ensure that the program funding will be cost-effective. Utility co-funding for energy managers may be limited in duration, e.g., provided to a company or public sector entity for one or two years. Also, the energy manager may be responsible for implementing energy efficiency projects and process changes in multiple facilities, for example across a school district.
2. **Provide comprehensive training or assistance in strategic energy management.** The training could be one-on-one or provided for a group of companies or public sector entities. The training helps the facility to develop performance goals, a set of metrics and systems to measure progress, and a plan for achieving the goals.

Along with the training, some programs (e.g., BPA and ETO) provide incentives for annual energy savings achieved. The savings are measured by developing a baseline of energy use vs. production indicators, and then tracking progress over time relative to this baseline.

Another option is to provide the training or assistance, without measuring the overall energy savings. Wisconsin Focus on Energy, for example, provides SEM training to groups of companies, without any attempt to measure energy savings due to those efforts alone.

3. **Provide assistance in making low-cost O&M improvements and measuring O&M energy savings.** BPA includes its *Track and Tune* program under the SEM umbrella because of its focus on energy information systems and more sophisticated tracking of energy savings as a means to drive improvements. The program focuses on low-cost improvements identified through a track and tune audit, involving the facility's production and maintenance teams. Early implementation of low-cost "easy wins" can help companies build support towards a more comprehensive and strategic energy management approach.

## II. Developing a Utility Strategic Energy Management Program

While the three program options described above are complementary and could be offered as a suite of SEM program options, utilities can start by developing just one or two of these. Because they are more fundamental and comprehensive, we recommend that utilities start with one or both of the first two program options.

For example, a utility could start with energy manager co-funding, and then consider a pilot of the SEM training component. PacifiCorp/Rocky Mountain Power is taking this approach in Wyoming, where it started by offering a pilot program to fund energy managers for large customers in the state. Alternatively, a utility could offer the first two options concurrently, as RMP is doing in Utah by developing both SEM training and energy manager co-funding programs for its customers in that state.

The low-cost O&M improvement option (e.g., BPA's *Track and Tune*) is a complementary SEM program that can help some companies get started towards a more comprehensive SEM approach. However, having a dedicated energy manager is more fundamental in helping a facility get started on the SEM path, and a track and tune program is definitely not as comprehensive as the SEM training program. Therefore we suggest utilities consider it as a third option, after developing the first two.

### Energy Manager Co-Funding

A shortage of staff time to focus on energy management is a significant barrier to energy efficiency improvement for many industrial facilities. To help overcome this barrier, several utilities have programs to co-fund energy managers for industrial or other large customers (see Table 1). Energy manager co-funding can be a useful beginning towards developing the more comprehensive approach described in the next section. It can also function as a stand-alone program to help utilities achieve more energy savings from large customers (e.g., through increased implementation of custom rebate projects). The energy manager can work at one large facility, or work across a number of buildings or facilities owned by the same company or public sector organization (e.g., a chain of grocery stores or a school district).

BPA's program is a good model for energy manager co-funding. BPA will subsidize a percentage of an energy manager's salary, on a sliding scale depending on the level of energy savings estimated (and later verified). The minimum amount of energy savings is 1 million kWh per year, which qualifies a company for 25% funding of an energy manager's salary. For 100% funding of a full-time energy manager, the customer would have to save at least 5 million kWh per year. Initially, BPA and the customer estimate achievable energy savings. The energy manager is then required to develop a plan for achieving this level of energy savings within 18 months of the energy manager starting work. Before the final payment from BPA to the customer, all energy savings are measured and verified, and the final payment is adjusted as needed. Savings can come from either capital projects or O&M improvements for customers who participate in BPA's High Performance Energy Management (HPEM) or *Track and Tune* programs. (These programs allow measurement O&M savings, as described below.) The energy manager co-funding can be suspended if the facility fails to achieve its energy-savings goal.

**Table 1: Energy Manager Co-funding Programs**

Utility	Customer Size Threshold	Expected Customer Savings	Program Savings
BC Hydro	\$200k per year in electricity costs	NA	No attributable savings
BPA	1,000 MWh/yr in projected energy savings	Depends on level of funding; for 100% funding of a full-time energy manager, 5,000 MWh/yr of savings would be required.	No attributable savings
Puget Sound Energy	Guideline of 20,000 MWh/yr of consumption, for funding of a full-time energy manager	3-5% per year, or 10-12% savings over three years	20,000 MWh/yr in 2010, 32,500 MWh/yr in 2011

Sources: CEE 2012, Eskil 2013, Simpkins 2012.

Only one of the programs shown in Table 1 attributes specific energy savings achieved to the energy manager co-funding program. Puget Sound Energy calculates the energy savings for the energy manager’s O&M improvements through regression analysis (similar to the methods described below by BPA and ETO), and by subtracting out savings from specific capital projects whose savings are attributed to other programs (Simpkins, 2012). Bonneville Power Administration (BPA) and BC Hydro do not attribute savings to the energy manager program; rather, they consider the program as an important enabler to achieving more savings in other programs (e.g., custom or prescriptive incentive programs, or BPA’s HPEM program). However, as explained above, BPA does measure the overall savings achieved through the energy managers’ efforts in order to justify the level of funding provided. We recommend this latter approach, which avoids the challenge of how to measure the savings for this type of program while avoiding double-counting of savings.

Co-funding an energy manager position can help many facilities begin the process of developing a more strategic approach to energy management. The process of preparing a plan to achieve the required level of energy savings is a key step in this process. In BPA’s case, the facility’s energy plan can include participating in BPA’s HPEM program, or its *Track and Tune* program (both described below). In addition, the process of developing an energy plan can lead facilities to devote more of their own resources toward energy management. BPA has found that several facilities have gone on to hire their own energy managers after receiving this type of funding support from BPA for several years (Eskil, 2012).

The energy manager will need to engage the upper management of the facility or organizations to get their support for capital investments. In addition, the energy manager needs to identify opportunities for savings, work with a team to implement projects and operational changes, and develop systems for tracking energy savings. Thus, to be successful, it is critical that the energy manager have both strong technical and communications skills.

## Training and Assistance in Strategic Energy Management

Several utility programs train and coach one or more industrial customers in developing comprehensive strategic energy management (SEM) programs (see Table 2). However, only two programs (those of BPA and ETO) also measure total energy savings achieved through the SEM training process (including O&M savings) and provide incentives per unit of energy savings. Xcel Energy’s Process Efficiency program provides some guidance in SEM to individual companies, and encourages them to develop a two- or three-year energy efficiency project plan. The program measures savings from specific prescriptive or custom efficiency projects, including some O&M improvements, implemented as a result of program participation. However, the program does not provide incentives for, or measure savings from O&M improvements that do not involve capital investments.

**Table 2: SEM Training/Assistance Programs**

Utility and Program	Customer Size Threshold	Brief Program Description	Incentives	Program Savings
BPA - HPEM	At least 2 aMW (18,000 MWh/yr) is a guideline	Provides training and individual assistance to a group of 8-15 companies over 1-year period	\$.025/kWh for 3 or 5 years, for O&M savings	2010: 5,800 MWh 2011: 8,700 MWh
Energy Trust of Oregon	About 18,000 MWh/yr	Provides training and individual assistance to a group of 8-15 companies over 1-year period	\$.02/kWh, \$.20/therm for 1 year of savings, for O&M savings; with option of 1 more year at \$.01/kWh, \$.20/therm	2010: 24,000 MWh 2011: 16,200 MWh
Wisconsin Focus on Energy	No size threshold	Provides 1-day workshops on SEM and follow-up assistance to groups of companies	For capital projects only	No attributable savings
Xcel Energy Process Efficiency Program	At least 2,000 MWh/yr of savings potential (~20,000 MWh/yr of total consumption)	Provides individual assistance in developing 2-3 year energy plan	For capital projects only	6,600 MWh for 2011 (from capital projects only)

Sources: BPA 2012a, ETO 2012, Xcel 2011

BPA’s and ETO’s programs were developed initially through pilot programs developed by the Northwest Energy Efficiency Alliance (NEEA). Both of these programs involve training a group of industrial customers, referred to as “cohorts”, over the course of approximately one year. The cohorts are typically groups of 8-15 non-competing companies within a reasonable geographic region such as a 60-mile radius. The training guides the companies through a step-by-step process which includes developing a break-down of energy use at the facility, identifying and evaluating energy efficiency



improvements, developing a model to measure energy savings, forming an energy team, and developing a plan. The companies typically meet monthly, with homework and coaching provided between meetings. The utility provides incentives to implement the plan, with the incentives paid per unit of measured O&M energy savings (BPA 2012a, ETO 2013). There are separate incentives for capital projects, and O&M savings are measured as described below. BPA provides incentives to the SEM program participants over a three- or five-year period. ETO provides incentives to its SEM participants for a one-year period initially, giving companies the option to continue with the program for one additional year while offering a smaller incentive, as shown in Table 2.

**Measuring energy savings.** BPA and ETO essentially measure energy savings using the same methodology (but using different time frames). The key step is to develop a model of the facility's energy consumption as a function of production and other variables such as weather. Then the facility tracks improvements and energy savings relative to the projected energy consumption of the model. For example, the model might predict a 5% increase in energy consumption for each 10% increase in production relative to a baseline level. If production during a particular time period is 15% greater than the base period but energy consumption only increases by 6%, the measured energy savings would be about 1.5%. This is a simplified model in which the only variable is production level.

To develop a good model, the industrial facility's staff members discuss with the utility's consultants the factors that contribute to energy consumption. For industrial customers the primary energy-drivers are typically units of production. Other factors like ambient (dry or wet bulb) temperature, product mix, or raw material characteristics often influence energy consumption, in which case they would be incorporated into the model as additional energy-drivers (BPA 2012b).

This method of measuring energy savings will include all types of savings, both O&M improvements and capital projects. To calculate the annual SEM incentive for the customer, savings from all capital projects are subtracted out, since capital projects receive their own incentives. Both BPA and ETO include only O&M savings in the cost-effectiveness evaluations of the SEM training programs.

However, follow-up evaluations of companies participating in BPA's HPEM program show that companies tend to significantly increase the number of capital projects implemented after enrolling in this program (Wallner, 2011). See Table 3 below. Therefore, it would be possible and quite reasonable for the utility to credit towards the SEM program the energy savings from capital projects that are identified and developed through the SEM training process. Including these capital projects would help the cost-effectiveness ratios significantly (Wallner, 2013). Of course, the utility should be careful to avoid double-counting savings for these projects in the SEM program and also in other DSM programs such as custom or prescriptive incentive programs.

**Table 3: New Capital Projects by HPEM Program Participants**

Industry SIC Code	Pre-HPEM Project Completion		Projects Submitted After HPEM Kickoff	
	Savings (kWh/yr)	Projects	Savings (kWh/yr)	Projects
39 – Misc. Manuf	1,123,328	1	1,049,021	4
49 – Water / Wastewater	234,843	2	1,131,731	2
49 – Water / Wastewater	151,428	1	238,287	1
39 – Misc. Manuf		-	1,106,649	1
39 – Misc. Manuf		-	2,633,959	2
20 – Food Processing	1,942,892	4	746,975	3
24 Wood Products	1,230,064	-	1,030,647	3
26 – Pulp and Paper		2	2,443,945	1
14 – Mining		-	2,552,995	3
49 – Water / Wastewater		-	1,287,716	3
<b>TOTAL</b>	<b>4,682,555</b>	<b>10</b>	<b>14,221,925</b>	<b>23</b>

Sources: Bonneville Power Administration, Project Completion Reports 7/1/2009 - 11/30/2010 and Proposals 7/1/2010-5/1/2011 (from Wallner 2011).

BPA offers its HPEM participants the option of either a three- or five-year performance period, which includes the initial one-year training period. A performance period of at least three years allows the facilities to implement and measure more energy savings from O&M improvements (and from capital projects). Both BPA and ETO offer incentives for energy savings achieved during the performance period, as shown in Table 2 above. No funding is provided for energy management hardware (e.g., sub-meters and sensors) or software, but the SEM training includes development of the monitoring and targeting approach that allows facilities to measure their overall energy savings. Both BPA and ETO hire contractors to help the companies develop the necessary models, which normally involve multi-variable regression analyses.

BPA's energy savings and cost-effectiveness data for its SEM program are shown in Table 4. As explained above, these results are conservative because they only include savings from O&M improvements; savings from capital projects identified through the HPEM process were not included. Despite this, the results show that overall the SEM program is marginally cost-effective using the Total Resource Cost (TRC) test. The results also indicate better cost-effectiveness for companies that also received funding for an energy project manager (EPM). This shows that the co-funded energy managers do help facilities implement more efficiency improvements, and also implies that many facilities that do not receive this support remain short of energy management manpower.

ETO measures energy savings after only one year of training/engagement with the companies. To measure cost-effectiveness, ETO develops the facility's baseline, similar to the way BPA does, using one to two years of energy consumption and production data. Then during the "measurement period" (the first 90 days of the year in which the facility receives the SEM training) ETO verifies that the baseline model accurately reflects the facility's energy consumption patterns, and makes any adjustments

necessary. Finally, during the last 90 days of the training year, called the “treatment period”, ETO measures the energy efficiency improvements that have occurred, and projects these savings over a one-year period to calculate annual savings. ETO backs out energy savings from all capital projects implemented after the measurement period, so that it measures O&M improvements only.

**Table 4: Cost-Effectiveness of BPA’s SEM Programs, (O&M Savings Only) 2011**

	Test	Benefits	Costs	Benefits-Costs	B/C Ratio
All Facilities (n = 17)	Total Resource (TRC)	\$5,306,888	\$5,086,816	\$220,072	1.04
	Utility (UCT)	\$5,306,888	\$5,452,329	-\$145,441	0.97
	Participant (PCT)	\$8,698,086	\$2,233,352	\$6,464,734	3.89
Facilities with EPM funding (n = 9)	Total Resource (TRC)	\$2,498,482	\$1,968,907	\$529,575	1.27
	Utility (UCT)	\$2,498,482	\$2,111,907	\$386,574	1.18
	Participant (PCT)	\$3,804,265	\$873,706	\$2,930,559	4.35
Facilities without EPM funding (n = 8)	Total Resource (TRC)	\$2,808,406	\$3,117,909	-\$309,503	0.90
	Utility (UCT)	\$2,808,406	\$3,340,420	-\$532,014	0.84
	Participant (PCT)	\$4,893,819	\$1,359,646	\$3,534,173	3.60

*Note: The data shown is for 17 companies, of which 15 participated in BPA’s HPEM program, and 2 in BPA’s Track & Tune program (Eskil 2013).*

Cost-effectiveness results for all of ETO’s large customer efficiency programs are shown in Table 5 (ETO, 2010). This table shows that the levelized cost of energy savings from the SEM programs are less than \$0.02 per kWh saved, meaning the programs are very cost effective. ETO has seen that for many companies, ETO’s investment of about \$40,000 - \$80,000 per facility in training and coaching services can result in up to 8,000 MWh per year in first-year O&M savings (Batmale 2013).

Overall, BPA estimates that its SEM programs (HPEM and Track & Tune) achieved about 15% of BPA’s total savings for its commercial and industrial (C&I) programs in 2012. BPA projects the savings from the programs will increase to about 20% of total C&I program savings in 2013 (Eskil 2013). Similarly, ETO’s SEM programs achieved about 20-25% of ETO’s total savings for industrial and agricultural programs in 2010 (ETO 2010). In 2011, Puget Sound Energy achieved 18% of its total savings from C&I programs through its energy manager co-funding program (Simpkins 2012).

**Table 5: Comparison of Cost-effectiveness for ETO’s Large Customer Efficiency Programs**

Measure type	Avg. Measure Life (yrs)	Cash Incentive (\$/annual kWh)	Avg. Acquisition Cost (\$/kWh)	Levelized Cost (\$/kWh)
Custom capital – non-lighting	10	0.25	0.150	0.015
Capital < 1 yr payback	10	0.02	0.025	0.003
Custom O&M	3	0.08	0.038	0.013
Custom O&M – 90 by 90 special	3	0.08	0.043	0.014
Custom O&M – SEM	3	0.08	0.41	0.014
O&M / SEM < 1 yr payback	3	0.02	0.020	0.007

Notes: 1) Average acquisition cost includes both cash and technical service incentives. 2) Levelized cost is incentives only; it does not include program management or delivery.

Source: ETO, 2012.

**Customer satisfaction.** In addition to achieving more energy savings, SEM programs can help achieve greater customer satisfaction. ETO has had 50 industrial customers participate in its SEM training program (called Industrial Energy Improvement, or IEI) over the past several years. Of these 50 customers, ETO estimates that 35-40 are now very supportive of ETO and willing to help with its marketing efforts, including directly helping to recruit other customers to participate in the SEM programs, or agreeing to list their name in a marketing brochure. In addition, the plant managers of these companies attend a bi-annual “breakfast of champions” networking meeting to discuss their SEM efforts. These customers are very engaged, and very supportive of ETO, as a direct result of their involvement with the IEI program (Batmale 2013).

### Track and Tune Program

The third option for a utility SEM program component is to help companies find and implement low- and no-cost energy saving opportunities and to measure the associated savings. BPA offers this type of program in addition to the more comprehensive SEM training program discussed above. (ETO had an offering called “Kaizen Blitz,” which was very similar to BPA’s *Track and Tune* program, but ETO recently redesigned the offering to be more like a traditional re-commissioning of industrial systems and reduced the SEM aspects of the offering.) A track and tune type of program includes some elements of strategic energy management, such as assistance with developing more sophisticated systems for monitoring energy consumption and measuring savings. The main focus of a track and tune program is to help the company to identify and implement some low cost/no cost “easy fixes” to achieve immediate energy savings. The BPA *Track and Tune* program provides limited training for company staff, but not nearly to the extent of the full SEM training programs described above. According to Chad Gillless, a consultant who specializes in utility SEM programs and ISO 50001, “The SEM training program is more clearly focused on teaching the companies how to fish, while the track and tune program helps them catch a few fish without having to wait too long” (Gillless, 2013).

There is some potential overlap between the SEM training and track and tune programs (as implemented by BPA), since track and tune also involves developing a regression-based model to

measure O&M improvements. For BPA, facilities can choose to enroll in both programs, but most choose one or the other. Facilities that are more sophisticated tend to choose the more comprehensive SEM training program, which helps the company achieve greater savings and develop the more robust energy management systems. For smaller and/or less sophisticated facilities, a track and tune program makes more sense, and is a more manageable way for them to get started on the SEM path.

Because it is difficult to implement several programs at the same time, we recommend that utilities consider a track and tune type of program after first implementing the energy manager co-funding and SEM training programs. Another option is to consider enhancing an existing re-commissioning program by adding a more industrial focus, and if necessary, hiring staff or contractors with more industrial expertise.

Many utilities offer re-commissioning programs which may be somewhat similar to a track and tune program. However, most utility re-commissioning programs tend to focus on building systems (lighting and HVAC systems) and may not provide much assistance with industrial process-related O&M improvements. In addition, most re-commissioning programs rely on project-based savings analysis or deemed savings values to evaluate the energy savings from O&M improvements, rather developing sophisticated regression analyses and providing assistance with sub-metering or energy monitoring software to measure overall energy savings.

**Table 6: BPA Track and Tune Program**

Brief Program Description	Provides assistance in establishing energy performance metrics and tracking system; and track and tune audit to identify opportunities
Energy Monitoring Incentives	\$10 - \$50,000 for energy tracking system, depending on customer size
Energy Saving Incentives	\$.075 per kWh of first-year savings for implementation of measures, up to 70% of project cost; \$.025 per kWh per year for 3 or 5 years for on-going savings
Program Savings	2011: 3,800 MWh 2012: 3,900 MWh

Source: BPA 2012a.

### III. Recommendations

Adding one or more components of a Strategic Energy Management program can help utilities achieve additional energy savings and greater satisfaction from industrial customers. To make these programs as successful and cost-effective as possible, we offer the following recommendations:

- Start by offering co-funding of energy managers at industrial facilities as well as companies or public sector entities with multiple buildings, along with some training for the energy managers to support them in developing energy plans for their facilities.
- Utilize energy manager co-funding to stimulate and enable greater participation in other programs, rather than trying to measure savings for this program separately. However, require that the energy managers develop plans to achieve minimum levels of energy savings, and document the savings that are achieved. The level of co-funding should be tied to energy savings achieved.
- Build upon the energy manager co-funding over time with comprehensive training in strategic energy management, following the model of BPA and ETO. Consider offering the training for groups of companies that are geographically close but not competitors.
- Support companies in developing and applying the techniques for developing a model of energy consumption as a function of production and other variables, and then tracking overall energy savings over a period of at least three years if possible. In addition, to demonstrate cost-effectiveness from the SEM training program, we suggest including energy savings from capital projects identified through the SEM process in addition to the savings from O&M improvements.
- Finally, add a track and tune program component, or expand an existing building re-commissioning program by adding an industrial sector component. This type of program helps industrial facilities achieve some quick and easy energy savings, and to develop a methodology for measuring the energy savings from O&M improvements. In many cases, this is very helpful in getting companies started on the path towards developing a more comprehensive SEM program.

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