2014-2015 *watts*mart Business Utah Strategic Energy Management Impact and Process Evaluation

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List of Acronyms

Acronym	Definition
BTU	British Thermal Unit: the amount of work needed to raise the temperature of one pound of water by 1 degree Fahrenheit
CDD	Cooling Degree Day
CEE	Consortium for Energy Efficiency
DSMC	Demand-Side Management Central
EMP	Energy Management Provider
HDD	Heating Degree Day
KPI	Key Performance Indicator
MMBTU	One Million British Thermal Units
MT&R	Monitoring, Targeting, and Reporting
RMP	Rocky Mountain Power
RR	Realization Rate
S.F. (s.f.)	Square Foot
SEM	Strategic Energy Management
TRC	Total Resource Cost
UCT	Utility Cost Test

Executive Summary

Rocky Mountain Power's (RMP) Strategic Energy Management (SEM) offering is one component of its *watt*smart® Business Energy Management Program, a portfolio of energy management offerings. Through SEM, RMP provides coaching, analysis, and support services at no cost to the customer. These services help customers to establish energy management programs that lead to more implemented projects and more efficient behaviors. RMP also offers performance incentives (based on verified savings) for savings captured beyond those achieved through capital equipment measures. These incentives have been designed to offset the customer's time-based cost of participating in SEM offerings.

The SEM offering focuses on operational and behavioral measures, it does not provide incentives for capital equipment measures. However, customers who identify energy savings and implement capital equipment measures during their SEM engagement may qualify for incentives through other RMP offerings under the *watt*smart Business Program. Savings resulting from capital equipment measures are subtracted from the total facility savings, with the remaining savings attributed to SEM. For SEM savings, RMP provides an implementation incentive of $0.02/kWh of verified savings.

RMP staff market and administer SEM with the help of a pool of approved Energy Management Providers (EMPs). EMPs deliver SEM to customers, typically working with customers' facility management staff. Customers participating in SEM must have an internal energy manager who can engage with RMP for 18 to 24 months. The SEM implementation process also can identify ways to improve productivity, reduce waste, and duplicate these results in other facilities.

Customers can participate in SEM using two options:

- A cooperative approach, where customers pair with a cohort of similar businesses through a primarily web-based engagement.
- A one-to-one consultative approach with RMP energy engineers (designed for unique projects). This approach requires executive sponsorship from customers and monthly in-person meetings.

The Utah Public Service Commission approved RMP's SEM plan and it became effective on July 1, 2013.

Projects Evaluated

RMP completed its first two SEM engagements during the 2014–2015 evaluation period. These one-to-one consultative projects included the following:

- A public school district, serving more than 70,000 students in K-12 schools
- A water district delivering municipal water to other cities and water districts as well as untreated water to irrigators in Utah

Evaluation Activities

Cadmus conducted the following evaluation activities:

- Reviewing SEM operational materials and Logic Model
- Interviewing stakeholders, including SEM staff and EMPs
- Surveying participants
- Determining SEM adoption
- Assessing customer satisfaction
- Developing appropriate regression models for evaluating savings
- Using regression analysis to estimate energy savings with an associated precision
- Determining realization rates for each project (i.e., school district and water conservancy)
- Developing recommendations to improve future monitoring, targeting, and reporting (MT&R) and impact evaluation methods

To determine SEM adoption, Cadmus assessed each customer's SEM practices against the Consortium for Energy Efficiency's (CEE) Strategic Energy Management Minimum Elements. The CEE SEM Minimum Elements describe, from an energy efficiency program's perspective: "the minimum conditions that an industrial company or facility should have in place in order to effectively and continuously improve their energy performance." These include a customer organization's minimum requirements to demonstrate its commitment through the following:

- Policy
- Goals
- Commitment of resources
- Planning and implementation of strategies to manage energy and to reduce energy consumption
- A system for measuring and reporting energy performance

Using regression analysis, Cadmus independently estimated energy savings for the SEM projects in Utah. The school and water districts achieved energy savings from implementing operation and maintenance and behavioral measures. The project completion reports did not include capital projects; so Cadmus based SEM savings solely on regression model estimates. The implementation team's communication with participants throughout the project periods produced high-quality data, appropriate for conducting the evaluation.

Summary of Key Findings

Key Process Evaluation Findings

The process evaluation resulted in the following key findings:

- Customers expressed satisfaction with the offering. The first projects exceeded savings goals.
- A majority of challenges encountered in the first two projects resulted from RMP's limited experience with the offering. RMP adapted the SEM offering's processes in real-time to accelerate its learning curve.
- Data exchange continues to improve, but RMP's older DOS-based billing system does not support easy or fully automated data collection and reporting.
- Methods still must be determined and tested for scaling the SEM offering to cost-effectively serve small customers.
- Though savings models can be simplified and improved when interval meter data are available, few customers use interval data meters.
- RMP identified a need for further refining its vetting of potential participants. This includes understanding individual business sector idiosyncrasies that may increase a project's complexity and implementation costs, while limiting implementation of behavioral changes.

Customers and EMPs expressed some confusion during the early months of the projects. RMP can improve EMPs' and customers' project experiences by setting clear priorities and goals for each project and by establishing realistic expectations upfront regarding customers' required time commitments.

Key Impact Evaluation Findings

Cadmus estimated savings from SEM for a school district and a water district. The school district evaluation covered 58 facilities, which were of four types: administration buildings, elementary schools, junior high schools, and high schools. The water district consists of three systems: a culinary water system, irrigation water system, and water storage system. Cadmus evaluated each of these water systems independently.

Cadmus computed the relative precision for each estimate based on the accuracy of regression model estimates. The target was 10% relative precision at 90% confidence. Cadmus estimates the actual precision to be 19.7% at 90% confidence.

Table 1 displays each project's savings by model. Both SEM projects produced an estimated total realization rate of 107%.

Table 1. SEM Period Savings by Model

Model	Reported Electricity Savings (MWh)	Evaluated Electricity Savings (MWh)	Relative Precision at 90% Confidence	Realization Rate
School District	2,289	3,089	25.2%	135%
Water District—Culinary System	1,025	1,056	75.5%	103%
Water District—Irrigation System	1,121	723	93.5%	64%
Water District—Water Storage System	1,743	1,743	N/A	100%
Total	**6,178**	**6,611**	**19.7%**	**107%**

Summary and Recommendations

The evaluation found RMP has emplaced the framework necessary for a successful SEM offering. The first two projects exceeded its savings goals and achieved ongoing customer commitment to SEM practices. RMP hired two experienced EMPs, who engaged with customers and delivered successful projects. One customer—the water district—elected to continue SEM for a second year to further its progress.

These findings reflect RMP's commitment to the success of SEM and their customers. EMPs and customers offered suggestions for specific improvements to SEM—featured throughout this report. RMP already has demonstrated its awareness of data collection and exchange challenges and has started addressing these problems. Rather than repeating those recommendations here, this summary identifies areas where changes could produce more widespread impacts on the offering.

Conclusion 1

Many of the challenges encountered with these first two projects resulted from the offering's newness for all stakeholders. These challenges included data exchange protocols, unclear project goals and priorities, confusion about participants' roles, and time commitment expectations.

Recommendation 1

New programs and offerings often encounter similar challenges early on. RMP has addressed such issues, with all parties reporting the SEM processes becoming smoother several months into engagement. RMP may, however, wish to review other SEM programs or offerings to shorten its own learning curve. CEE offers such resources—specifically, a 2013 Building Energy Management Program and Field Assessment Database, which contain detailed information on 12 SEM programs. This database is available to the public.[1] CEE's website also describes annual SEM Program Case Studies as "a source of valuable information about specific programs approaches and results." Only members, however, can access this annual report. If RMP is not currently a member of CEE, they may be able to access this information through one of their EMPs; CEE members include nonutility program implementers.

[1] http://www.cee1.org/content/cee-program-resources

Conclusion 2

SEM will benefit from further refinement of its customer vetting process, which may allow RMP to anticipate and account for the specific idiosyncrasies of individual customers or business segments. RMP's selection of the first two SEM projects proved very successful. RMP recognizes the intensive support provided by the EMP, requires recruiting customers with energy savings potential that can be cost-effectively captured through such vetting. The school district project particularly highlighted challenges that can arise when recruiting customers. Specifically, these include implementation costs for projects with a large number of sites and barriers that arise from factors beyond the customer's control (e.g., the impact of requirements of stakeholder groups, such as unionized teachers).

Recommendation 2

RMP should reevaluate the list of ideal candidate characteristics against experiences drawn from the two completed projects and those currently underway. This should include input from both EMPs and participants. Share this information with RMP staff who assist in identifying and recruiting SEM participants.

Conclusion 3

RMP can reduce customer confusion, and increase customer buy-in and satisfaction by making minor changes during the recruitment process.

Recommendation 3

For potential customers, engage senior-level executives during recruitment, and clarify why RMP recommends SEM and how it fits with the customer's current involvement in other RMP offerings. During this time, set clear expectations for staff involvement and time commitments. Clarify conditions under which customers may be eligible for a second term of engagement.

Conclusion 4

RMP can increase EMP satisfaction and efficiency by providing clear protocols and project priorities at a project's kick-off.

Recommendation 4

In addition to efforts started after Cadmus conducted these project interviews, RMP should further clarify all communication and data request protocols between RMP and EMPs, and between EMPs and customers. RMP should provide EMPs with clear priorities for each project.

Conclusion 5

Under the current design, RMP does not measure the persistence of savings gained through the customer engagement. Other SEM programs and offerings evaluated by Cadmus, indicate savings may extend three years or more. Tracking and measuring savings persistence will provide RMP a broader view of the full value of SEM.

Recommendation 5

Since conducting the RMP interviews, RMP has indicated they now plan for and claim a three-year measure life. This aligns with Cadmus' recommendation to extend savings measurement and tracking up to three years or more (to identify patterns in savings growth or declines after the initial project engagement period).

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SEM Offering Description

Rocky Mountain Power's (RMP) Strategic Energy Management (SEM) offering provides one component of its *watt*smart Business Energy Management Program, a portfolio of energy management offerings, for commercial, industrial, and agricultural customers. Energy management offerings include the following:

- Recommissioning
- Industrial recommissioning
- Persistent commissioning
- SEM

This evaluation addresses the SEM component. Through SEM, RMP provides coaching, analysis, and support services at no cost to the customer. Such services help customers establish energy management practices that lead to more implemented projects and more efficient behaviors. RMP also offers performance incentives (based on verified savings) for savings captured beyond those achieved through capital equipment measures. These incentives are designed to offset a customer's time-based cost of participating in SEM.

Customarily, measures fall into three categories:

- Organizational measures: no/low-cost energy reduction measures, based on operational behavioral changes
- Custom measures: situation-specific, capital measures with a payback greater than one year
- Typical measures: common items such as lighting, with predefined prescriptive incentives

SEM focuses on operational and behavioral measures, and does not provide incentives for capital equipment measures. However, customers that identify energy savings and implement capital equipment measures during SEM engagement may qualify for incentives through other RMP incentive offerings. RMP subtracts savings from capital equipment measures from total facility savings, with remaining savings attributed to the SEM offering. For such savings, RMP provides an implementation incentive of $0.02/kWh of verified savings.

RMP staff market and administer the SEM offering, with help from a pool of approved Energy Management Providers (EMPs). The EMPs deliver the offering to customers, typically working with their facility management staff. Customers participating in SEM must employ an internal energy manager who can engage with RMP for a period of 18 to 24 months. The SEM implementation process also can identify ways to improve productivity, reduce waste, and duplicate results achieved in other facilities.

SEM offers customers two participation options:

- A cooperative approach, which pairs customers with a cohort of similar businesses, primarily through web-based engagement.
- A one-to-one consultative approach with RMP energy engineers for unique projects. This approach requires executive sponsorship from the customer and monthly in-person meetings.

The two projects evaluated in this study participated in the one-to-one consultative approach.

Eligibility Requirements

Large retail electric customers that purchase power on a qualifying rate schedule and have an annual minimum peak electrical demand of 300 kW may apply for the SEM offering. Optimal targets for the offering include large commercial, industrial, government/education, and agricultural customers with multiple sites. Customers, which must provide executive engagement and commitment for SEM participation, must sign an SEM Agreement. RMP describes ideal candidates as having the following attributes:

- Customers with commitment to sustainability and environmental stewardship.
- Customers in regulated industries such as biotech and automotive, as they tend to have a high familiarity with process improvement.
- Companies that have well-established management systems like quality or safety, or those using continuous improvement practices like Lean or Six Sigma.
- Customers who actively participate in Rocky Mountain Power incentive programs, as they will already be familiar with utility resources.

Process Evaluation

Beginning in 2015, RMP commissioned Cadmus to conduct an evaluation of its 2014–2015 Energy Management offering. At that time, Cadmus received administration and operational manuals from RMP, and, from those, developed a SEM logic model.

In mid-2015, RMP reorganized its *watt*smart Business Program portfolio, combining some offerings and reassigning staff to align with the new structure. Consequently, RMP asked Cadmus to pause the evaluation until completion of the programs' reorganization. In November 2015, RMP notified Cadmus that the first SEM projects had been completed and were ready for evaluation. RMP directed Cadmus to continue the evaluation and focus exclusively on the Utah SEM offering.

Projects Evaluated

RMP completed its first two SEM project engagements during the 2014–2015 evaluation period. RMP selected these participants based on the SEM offering's eligibility criteria, the customers' previously demonstrated commitments to implementing energy management at their facilities, and the companies' ability to dedicate staff and resources for the 18 to 24-month commitment period required by the offering. Selected projects included the following:

- A public school district, serving more than 70,000 students in K-12 schools, and incorporating 88 schools across 15 cities and one military base. This project began on March 18, 2014, and completed on July 29, 2015. It evaluated 58 facilities located within RMP territory.
- A water district delivering municipal water to other cities and water districts as well as untreated water to irrigators in Utah. Its facilities include water treatment plants, pumping stations, wells and booster stations, and reservoirs and pipelines. This project began April 1, 2014, and completed its Year 1 engagement on July 31, 2015. RMP agreed to engage with the water district for another year to capture additional savings opportunities.

Both projects participated through a one-to-one consultative approach. At the time of this report, no cohort projects had completed the process. Thus, the following evaluation only reflects one path available to customers. Future SEM evaluations should include both cohort and one-to-one options as completed projects become available.

Methodology

Cadmus' reviewed materials provided by RMP; these included the following: [2]

- SEM Administrator and EMP operation manuals
- The SEM organizational profile and SEM walkthrough guide (documents used to assess customers' knowledge about energy efficiency and to gauge the suitability of their facilities for the SEM offering)
- Representative monthly reports
- One representative preliminary report
- Final reports for completed projects

Based on the manuals, Cadmus developed a SEM offering logic model in April 2015.

Following the SEM materials review and development of the logic model, the process evaluation took on three additional subtasks:

- Interviewing SEM stakeholders (e.g., RMP delivery staff and third-party implementation consultants [EMPs]).
- Interviewing SEM participants.
- Reviewing the offering's logic model against actual operations.

Table 3 shows interviews with SEM stakeholders and participants.

Table 2. Stakeholder and Participant Interviews

Stakeholder/Participant	Number of Interviews/Surveys	
	School District	Water District
Project Managers (In-depth interviews)	2	2
EMPs/Project Implementers (In-depth interviews)	1	1
Participant Customers (Survey)	2	2
RMP Regional Business Manager (In-depth interview)	-	1

[2] RMP Utah, SEM Program-Program Administration Manual dated December 6, 2012 (including samples of the SEM Agreement, Organizational Profile Questionnaire, and Final Report); RMP, SEM Program-Energy Management Provider Program Manual, dated October 1, 2013; RMP SEM Customer Organizational Profile, dated February 16, 2015; RMP SEM Preliminary Walkthrough Guide, dated February 16, 2015; SEM Report, [School District-Customer name omitted by Cadmus for the purpose of anonymity], dated October 28, 2015; SEM Year 1 Final Report, [Water District-Customer name omitted by Cadmus for the purpose of anonymity], dated November 11, 2015; [Customer] Monthly SEM Project Report-May, 2014, dated June 9, 2014 and [Customer] Monthly SEM Project Report-December, 2014, dated January 12, 2015; Preliminary Report SEM, [School District-Customer and facility name omitted by Cadmus for the purpose of anonymity], Energy Management –Site Walk through, dated October 20, 2014.

Cadmus designed the customer interview guides to assess each customer's SEM practices against the Consortium for Energy Efficiency's (CEE) Strategic Energy Management Minimum Elements. From an energy efficiency program perspective, the CEE SEM Minimum Elements describe "the minimum conditions that an industrial company or facility should have in place in order to effectively and continuously improve their energy performance."

These include a customer organization's minimum requirements to demonstrate its commitment to the projects through the following:

- Policies
- Goals and commitment of resources
- Planning and implementation of strategies to manage energy and reduce energy consumption
- A system for measuring and reporting energy performance

SEM Logic Model

SEM seeks to engage industrial and large government, institutional, commercial, and agricultural customers through RMP-approved EMPs, which work with customers and their facilities' management staff. The EMPs provide fully-funded, one-on-one coaching and analysis to help customers set up energy management practices and implement improvements. Alternatively, RMP may place companies in cohort groups, and the EMPs support those groups through workshops and webinars.

By successfully engaging with customers that own existing facilities, SEM seeks to achieve the following:

- Energy and demand savings sustainable over time
- Increased customer awareness of SEM and associated energy- and cost-saving benefits
- Increased market acceptance/penetration of SEM actions

The SEM offering may achieve additional energy and demand savings as customers extend SEM practices to their other facilities.

The SEM Administration Manual[3] notes two key performance indicators (KPIs):

- **Savings**: Demonstrate 23,273 MWh energy savings by end of the 2013–2017 SEM project cycle. These energy savings must be above and beyond capital equipment savings found at customers engaged in SEM.
- **Engagement**: Have 95% of engaged customers complete SEM by the end of the 2013–2017 SEM cycle.

The full Logic Model can be found in Appendix D.

[3] RMP Utah. *Strategic Energy Management Program-Program Administration Manual.* December 6, 2012. P. 5-3

Results

Following review of SEM documents and conclusion of the stakeholder and participant interviews, Cadmus concluded that the first two one-on-one consultative SEM projects had been implemented in the spirit of the offering's design. The SEM project implementation process has not continued long enough to determine the following:

- Impacts on other RMP program participation
- Whether energy-saving behaviors will persist long-term
- Whether the SEM offering's services will become mainstream

Notably, cohort projects remained unavailable at the time of the evaluation, and the evaluation did not include reviewing the pipeline of current projects. Therefore, this report does not address RMP's progress toward meeting savings or engagement KPI's for 2013–2017.

The remaining process evaluation sections discuss each project separately, with individual details adding an overall understanding of the SEM process and participant experience.

Stakeholder Interviews

After the SEM offering had been operating for one year, Cadmus conducted in-depth interviews with key utility staff and EMPs involved in delivering SEM in Utah.

Cadmus designed these interviews to assess each stakeholder's role, their involvement in recruiting participants, and their perspectives regarding which SEM components succeeded and where improvements could be made.

The key interview topics included the following for the SEM offering:

- Goals and objectives
- Design and implementation
- Project administration
- Marketing and outreach
- Customer and EMP participation
- Data management and tracking
- Customer and EMP participation barriers

Utility Staff Interviews

Staff interviewed for this evaluation responded quite openly to Cadmus and volunteered information about areas where they learned lessons during the first two projects' implementation. On more than one occasion, they expressed their commitment to continuous improvement of the SEM offering. During these interviews, utility staff and EMPs sometimes provided contradictory information about how the projects had been implemented. Cadmus believes, however, this indicates the SEM processes' newness, differences between the SEM offering's theory and field implementation, and the learning curve all

parties experienced. As reported by utility staff and EMPs, the projects followed a consistent overall trajectory and produced consistent results.

SEM Goals and Objectives

RMP's *SEM Program Administration Manual*[4] provides overall annual savings goals for SEM, and identifies individual goals on a project-by-project basis. RMP and the EMPs track savings during customer engagement, and consistent with the offering's design, they do not measure or track savings persistence over following years. (Since conducting the RMP interviews, RMP has indicated they now plan for and claim a three-year measure life.)

Individual Project Goals

During stakeholder interviews, RMP indicated they discussed a project's savings potential with EMPs during the EMP assignment process. For both projects, however, EMPs said RMP had not provided them with project-specific savings goals or priorities at the outset of their respective projects:

- School District: As reported by RMP's project manager, the school district aggressively pursued energy savings prior to engagement with RMP's SEM offering; therefore, the project manager recommended a 2% energy savings goal. At the end of the SEM engagement, they achieved 7.1% savings relative to annual consumption, based on the evaluated energy savings.
- Water District: Interviews or reports provided by RMP or the project EMP, did not specifically identify the water district's energy savings goals. The project achieved savings of 3,889,283 kWh in its first year, reflecting 5.8% savings and 19.3% savings at two of its three water district systems. A comparable percentage was not calculated for the third district.[5]

SEM Design and Implementation

The SEM offering has been designed for implementation by RMP or by a third-party hired by RMP, followed by delivery through the EMPs. Because the offering was new, RMP approached each of these first two projects as opportunities for continuous improvement of the offering's design and implementation. EMPs noted RMP's flexibility in making changes as needed. RMP staff currently administers and implements the offering.

Prior to extending invitations for customers' participation in SEM, RMP described a process by which they analyzed billing data to determine if they could achieve 3% savings from an SEM engagement, and

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[4] EnerNOC Utility Solutions Consulting. RMP Utah-Strategic Energy Management Program, Program Administration Manual. December 6, 2012.

[5] The EMP developed three baseline models for three water district systems (culinary water, irrigation water, and water storage), between December 1, 2012 and November 30, 2014. The savings contribution from the water storage facility was computed using average utilization of water resources rather than a typical regression estimation. Cadmus could not determine what consumption would have been in absence of the SEM offering; therefore, the study could not estimate percentage savings in the same manner as the other two water district models.

they spoke with EMPs to identify those with niche-specific knowledge of a potential customer's business sector. Other than conferring with EMPs, RMP did not report a formal process for identifying niche-specific idiosyncrasies.

RMP encountered challenges when selecting its first SEM customer. RMP invited a school district to participate in SEM due to the district's progressive nature, with forward-thinking district energy management staff that closely monitored energy use. Even before participating in the SEM offering, the district recommissioned its schools and established a fully operational energy management system across all its schools, providing districts with a continuous view of operations. Consequently, RMP said behavioral changes remained to be addressed.

In implementing this first project, however, (and with no prior SEM history to draw on), RMP did not anticipate the expense of implementing the EMP contract for the school district—a project covering 58 facilities. The contract proved sufficiently large to prompt RMP to issue an RFP. They received and evaluated bids from five approved EMPs before issuing the contract. This added six months to the school district's project timeline. RMP also initially planned to have an EMP provide individual reports for each school, but RMP found this redundant and not cost-effective due to the schools' similarity.

RMP also discovered it did not anticipate the schools' layer of complexity. This became apparent when some recommended behavioral changes, identified by the EMP for this project, could not be implemented. The schools did not have the staff to prioritize these changes, and teachers' union arrangements did not allow the energy manager easy or quick access to teaching staff meetings. Additionally, teachers lacked the time to add another program to their already full teaching schedules. For future projects, RMP reported planning to rely more heavily on EMPs to identify the types characteristics unique to specific business or institutional sectors.

RMP's project manager said, following the completion of the SEM engagement, the school district has continued the behaviors put in place along with measuring and monitoring of its energy usage, incorporating data management and billing systems that examine heating degree days (HDDs).

RMP designated usage at the end of Year-1 as the baseline for post-project, energy-use tracking. The school district also implemented a monthly energy meeting with teams from each school, using these opportunities to make behavioral changes with staff and to educate students in energy savings. RMP noted the school district would continue as an active user of the other *watt*smart Business portfolio of incentives to continuously upgrade its facilities.

RMP selected its second customer—the water district—to participate in SEM as the district and RMP had previously worked together and had established a good relationship. RMP noted that, prior to its SEM engagement, the water district tracked energy consumption by comparing month-over-month energy consumption and water flow rates. According to RMP, "Management and operations personnel considered energy, but were not fully aware of the way improvements could be made." RMP thought the water district was ready to move forward on energy management.

Beginning in April 2014 and continuing through the end of the calendar year, the EMP and water district, modeled 42 meters, completed an energy management assessment, developed the district's energy policy, and identified opportunities for achieving energy savings. The EMP contracted a water resource engineer known by the water district, and reported that the customer quickly felt confident with this team's combined industrial and water system expertise. Throughout 2015, the water district worked to establish savings persistence.

Unlike the school district project, the water district required the completion of all 42 modeled meters before implementing any system changes. This required RMP to expend 85%–90% of the project's budget upfront before seeing a deliverable. Initially concerned with this situation, RMP found the process illustrated that no two projects or customers were the same. In their own words RMP said, "We learned we can't put these projects in a box on how they roll out. [The EMP] was showing monthly reports, but we were not seeing savings until spring, when big savings are achieved in water systems." At the engagement's end, the water district exceeded savings expectations without yet implementing capital projects, which could bring additional energy savings.

By the close of the Year-1 engagement, the water district presented the savings results to the water district board to ensure board members understood the project and knew of its results. This extra step supported the district's goals to gain and retain executive buy-in after engagement. The water district chose to continue their SEM engagement for a second year, addressing additional savings opportunities not yet addressed during the first year.

In response to a final question from Cadmus ("How will you know when you have achieved all you can with a customer?"), RMP responded: "As customers implement more and more opportunities over time, savings will become harder and more expensive to capture…. We're not going to stop servicing the customer. The customer will probably tell us when they are not going to go forward because the cost [of improvements] will not be worth their efforts."

Best Practices

Based on Cadmus' experience evaluating SEM programs, we have identified best practices in program and offering design and implementation. These include the following:

- Beginning each customer engagement with a well-defined Opportunity Register. This allows for project longevity that passes a single year, and gives participants the chance to prioritize improvements.
- Identifying capital upgrades for which the customer could receive incentives by participating in a different incentive offering or program.
- Including easy maintenance opportunities in the Opportunity Register.
- Picking an individual in a leadership role—particularly one well liked and trusted within the SEM participant's organization—to champion the organization's participation and resulting recommendations throughout the organization (and specifically to the executive suite).

- Conducting yearly Energy Management Assessments (EMA).
- For schools, ensuring that students are involved, but that the SEM project staff lead the efforts (turnover in students is high and the staying power is low).

RMP followed best practices including beginning the projects with a well-defined Opportunity Register that included capital, operational and behavioral categories. Energy champions were identified at each project and the school district was offered but unable to implement an energy saving project that involved the students. EMAs were done at the beginning and end of the engagement with the school district, however, an EMA was done only once throughout the water districts engagement.

SEM Administration

Upon reviewing SEM materials, Cadmus found the offering's administration and operation manuals in place and complete, including quality assurance and measurement and verification protocols. Cadmus also found the necessary documents in place (e.g., customer agreements, savings memorandum templates, templates for project monthly and final reports). The customer *Energy Management Program Application*, cited by both the RMP *SEM Program Administration Manual* and the EMP *Energy Management Program Manual,* was not included in either manual; however, it can be easily located on RMP's website.

Reflecting RMP's continuous improvement outlook, during the offering's first year, RMP identified a need for (and created) a number of new forms for use when determining a customer's appropriateness for SEM. The first of these, the *SEM Customer Organizational Profile*, is a questionnaire used to assess a customer's knowledge, experience, and attitudes about energy management as well as their expectations of gains offered by SEM. EMPs used the second form, the *SEM Preliminary Walkthrough Guide*, when assessing the suitability of customers and their facilities. This guide standardized information collected for each site and provided a checklist of supporting information required to assess opportunities at the site, along with a decision matrix to objectively rate whether a facility proved appropriate for SEM participation. Recognizing no two SEM projects are the same, RMP developed a reporting guideline based on a customer's kWh usage. RMP reported they have incorporated this as *Measurement and Verification Table 1* in the *watt*smart program manual.

RMP project managers for both the school district and the water district considered the offering well-supported within RMP, providing all resources necessary to deliver SEM. They also reported smooth communications with customers. RMP reported some communication gaps between its own internal departments; the process for procuring customer monthly billing data proved particularly slow.

SEM Marketing and Outreach

Assisted by EMPs, RMP takes primary responsibility for marketing SEM. If RMP hires an SEM administrator in the future, that administrator will share this responsibility with RMP. RMPs staff recruited the first two customers through face-to-face outreach, with staff noting they have become better at screening customers for energy intensity and potential savings as well as for their willingness to participate.

Data Management and Tracking

As noted, RMP staff experienced some difficulties in collecting the billing data needed. An aging data system required much of this work to be completed manually. Additionally, when the first SEM projects rolled out, RMP learned to use a new product tracking system, Demand Side Management Central (DSMC), that could track actual and predicted energy use. This introduced a learning curve in applying this to the school district's multiple sites.

Energy Management Provider Interviews

RMP contracted with two EMP service providers to implement the school district and water district projects. Cadmus interviewed each EMP about their experiences with RMP staff and the customer, and asked how the SEM engagement rolled out for their respective projects.

School District

The EMP worked with the school district in implementing a first project for SEM. The EMP reported all customer and RMP team members proved responsive and easy to work with, and the customer fully committed to energy efficiency, having already achieved much with its facilities and systems. As the first time through RMP's SEM process implementation, all participants faced something of a learning curve.

The EMP cited the following challenges arising early in the process:

- Difficulties with engaging and incentivizing staff in energy-saving activities due to strict protocols about communicating with staff across organizations
- Ensuring staff at each facility understood the energy implications of their operations decisions
- Reluctance by maintenance staff to make changes that might risk successful work they had already implemented
- Engaging EMS (maintenance staff) in standardized procedures
- RMP's lack of guidance about its priorities and goals for the project

The EMP, however, also said the third-party measurement and verification engineer, provided to the project by RMP, was very knowledgeable and provided very useful feedback and clarifications regarding RMP's requirements.

Water District

As with the school district project, this represented the first SEM project the EMP conducted for RMP (though it now is involved in five other SEM projects with RMP customers). As discussed, this project included a consultant with expertise in water systems. The EMP and consultant began the engagement by setting expectations with the customer, outlining what the EMP could provide and what involvement was expected from the water district. The EMP followed this by conducting two to three group workshops, training water district staff, providing monthly follow-up reports, and the consultant meeting with the customer to help the district implement opportunities.

SEM Goals

School District: Though tasked to find energy savings at the school district, the EMP did not report receiving a specific kWh savings goal. The EMP and school district established two KPIs for the project. These included weather and occupancy normalized kWh/sq. ft., with a goal of establishing additional mentors outside of the energy team to specifically gain buy-in from the executive team and managers through facilities staff at the individual sites. The EMP reported, "The district showed consistent success in keeping MMBTU/sq. ft. under control." Additionally, the EMP reported that the district gained executive buy-in, as evidenced by the district building two zero-net energy schools (and in the process of building two more). The school district also gained approval to deploy the StruxureWare integrated control system, currently in limited use, to cover the entire district.

Water District: Similar to the school district project, the water district's EMP reported RMP did not set goals for this project. Rather, RMP asked the EMP to determine goals possible. The EMP agreed with this approach, given its experience with SEM programs far exceeded RMPs at the time of project initiation. The EMP set goals for energy savings, customer time commitments, and a timeframe for the entire engagement. The EMP suggested it would be helpful in understanding of RMP's priorities, if—going forward—RMP establishes KPIs or expresses its priorities for each project.

The EMP noted that RMP remained very flexible throughout this first project, allowing for necessary project plan changes as the engagement progressed. Going forward, however, the EMP said it would be important to more rigidly enforce timelines to prevent a project from extending longer than necessary.

The actual success of the water district in implementing changes and quickly reaching its goals presented a challenge. The water district uses a large amount of energy, and changes they made resulted in large savings impacts. In the EMP's words, the water district was "blowing [each] goal out of the water." In turn, this caused the project to quickly exhaust its first-year budget. RMP agreed to end Year-1 and roll the customer into a second year with a new budget and a new focus on savings available through reducing system inefficiencies such as the unnecessary recirculating of water.

SEM Design and Implementation

The EMPs cited a strength of the SEM offering: RMP allowing EMPs to work directly with the customer to establish a scope of work for the project. One EMP also noted that, though pointing out organizational change to a customer proves helpful, the technical knowledge provided through the SEM offering makes it possible for customers to operate their systems more efficiently. Neither EMP identified significant barriers or issues with the offering's design. They did, however, suggest several design changes plus implementation changes that could occur during the recruitment process or as the project rolls out. These would improve the experience for the customer, EMP, and RMP. The following list provides suggestions made by one or both EMPs.

Design changes:

- Establish one RMP project manager to overview all RMP SEM engagements. This will allow RMP to identify elements that work well and to identify SEM improvements. Currently, four project managers serve RMP; working in different geographical regions, they participate in SEM projects only occasionally.
- Extend the SEM engagement from 18 months to three years. This will allow RMP to measure the persistence of savings identified in Year-1. Currently, no plan exists for RMP to track or measure persistence; only the customer does this once engagement ends.

During recruitment:

- For potential customers, clarify why RMP recommends the SEM offering and how it fits with the customer's current involvement in other RMP offerings.
- Upfront, set clear expectations for customers' involvement and time commitments.
- Engage senior-level executives during recruitment to procure buy-in for the project and time commitments.

Project rollout:

- Implement the project in smaller batches (e.g., five schools per phase) to allow customers to respond to each phase over time. For each batch, bring custodial staff and school principals into small meetings with EMP staff.
- Bring area-wide directors or influencers into SEM discussions immediately after completion of the Energy Management Assessment.
- Decide how to establish a customer energy-use baseline for measuring persistence of behavioral changes.
- Determine if customers become eligible for incentives post-process, along with the measurement, verification, and reporting process for customers to receive incentives.

SEM Delivery and Management

Though both EMPs discussed RMP's hands-off approach for these first two projects, they noted RMP's willingness to be involved as required by the EMPs. One EMP thought this possibly resulted from RMP being new to SEM and not knowing what to expect from these initial projects. The EMPs felt RMP would have benefitted from becoming more involved, but did not consider it necessary as long as experienced EMPs had been selected for projects and effectively delivered these.

Noting RMP's newness to SEM, both EMPs suggested RMP look at successful SEM programs offered by the Bonneville Power Administration and the Energy Trust of Oregon; gaining from these organizations' experience could perhaps avoid making mistakes common to new programs. One EMP recommended

RMP "vigorously participate in CEE's[6] SEM exchanges and make sure their SEM offering looks like all the other SEM offerings going on now."

School District: "Broadly speaking," said the EMP for the school district, "the program is meeting customer needs." Initially, however, RMP asked the EMP to walk-through all buildings included in the project—a request later scaled back to approximately one-half of the sites. Because many sites were similar, the EMP said, walking 10 sites would have been sufficient and would have required less time from the customer.

Water District: The water district project's EMP met frequently with the customer at the beginning of engagement, and then less frequently as the project moved from ramp-up into implementation, becoming quarterly by the end of Year 1. The water resource engineer continued to meet with the district on a monthly basis. The EMP thought this offered an appropriate amount of face-to-face time for a large customer, such as the water district.

During Year 1, RMP selected a third-party consultant to review the EMP's baseline energy model and methodology for assessing energy savings. The EMP reported that the third-party consultant had less experience and suggested this would have been more beneficial if provided by someone with equal or greater experience.

By the beginning of Year 2, the EMP said they had the baseline model in-place and had established a good working relationship with the district. At this point, the EMP just tracks savings and identifies new energy-saving opportunities in the water district's system. Year 2, respondents said, runs more smoothly than Year 1.

This EMP used lessons learned with the water district to modify an approach to future RMP SEM customer engagements, saying their company streamlined some meetings and reduced the number of workshops.

In discussing the selection of customers for SEM, the water district project's EMP reinforced RMP's opinions (previously discussed in this report's Utility Staff Interviews section), about the necessity to scale the delivery of SEM services to smaller customers. As the EMP noted, the customer's size affects engagement methods.

When working with large customers (offering large energy savings potential), RMP can spend more money to allow EMPs to provide further time and technical resources upfront, securing savings on the project's back end. For small customers, EMPs must operate smarter regarding how they provide

[6] A nonprofit, member-governed consortium of energy efficiency program administrators from the United States and Canada, CEE members collaborate to accelerate energy-efficient products and services in targeted markets. For more information, see www.CEE1.org

technical assistance, possibly by limiting customer training, simplifying monthly reports, and delivering more information over the phone. Such efforts must scale to the savings potential.

Data Management and Quality Assurance

The EMP for the school district noted that no process had been put in place to request data from RMP. The EMP was uncertain who to request data from or what data RMP could provide. Initially, RMP delivered requested data slowly, which the EMP thought resulted from RMP needing to collect requested data from different sources within RMP. This situation improved as the project progressed. To streamline this process, the EMP suggested that RMP could describe data that could be provided and could provide forms used for requesting the data.

As noted, since Cadmus conducted these interviews with the EMPs; RMP reports it has implemented a process for receiving and fulfilling data request submissions, including a report designed to facilitate large amounts of data.

The water district EMP described a similar experience, saying—even with both parties collaborating, collecting the data required three to six months.

Customer Interviews

Cadmus conducted in-depth interviews with each project's senior energy management staff, assessing actions undertaken by each customer to implement SEM practices. These staff members were responsible for (or had oversight of) engineering, maintenance, information systems, data analysis, and identification and implementation of energy efficiency measures at their facilities prior to participation in SEM; they remained deeply involved throughout the SEM process.

SEM Adoption Scoring

As reported during the interviews, customers' SEM practices were assessed against three CEE minimum elements and 13 sub-elements. The key elements included the following:

- Customer commitment of company/organization resources
- Customer planning and implementation
- Measurement and reporting

Depending on sub-elements implemented, Cadmus assigned adoption scores of "full," "some," or "none" to each participant for these key elements. Both customers had the necessary systems in place and functioning to achieve a "full" SEM adoption rating for each minimum element. Findings from this analysis follow below. Appendix A provides a detailed SEM adoption scoring table, showing each SEM element, sub-element, survey questions, and scoring protocols. Appendix B provides the full customer interview document.

In addition to assessing customers' adoption of these key elements, Cadmus asked customers about the following:

- The SEM offering's influence on customer behaviors
- Customer satisfaction with SEM

Customer Commitment Element

Cadmus scored customer commitment based on two sub-elements:

- Policy and Goals
- Resources

These sub-elements refer to staff dedicated for the following:

- Energy and energy efficiency
- SEM policies or plans
- Goals
- Staff communications and employee engagement with participants in place at the time of the interview

Both customers have dedicated energy management staff in place. The school district has three dedicated staff, plus an energy committee with 20 individuals that include the school district assistant superintendent, custodial staff, the director of information technology, and the director of facilities. Core staff communicate daily, and the committee meets monthly. To communicate SEM policies and practices, the school district also provides periodic training for district custodians and support staff.

The water district has an energy team of 14 people who establish savings goals, look for savings opportunities, and make certain the water district does not "slip backwards" in its progress. Seven of these team members, serve as an Action Team, meeting monthly and making decisions about which resources (wells) to use and how to operate systems to achieve the greatest efficiency and savings.

The district provides space on its internal website where staff can view progress made on energy optimization and notes from past Action Team meetings, make suggestions, or download, for example, a hydraulic model to help operations staff optimize booster stations. Further, the water district's general manager sent a letter to water district staff that stated the importance of energy optimization.

Planning and Implementation

Planning and Implementation serves as the CEE's minimum element with the highest number of sub-elements. Shown in Table 4, these seven sub-elements focus on the following:

- Usage of tools developed during SEM engagement (e.g., energy management assessment, energy map, tracking of energy use, opportunities to reduce energy use)
- Projects implemented
- Regular reassessment of goals and performance

Table 3. Planning and Implementation Element

Sub-Element	Sub-Element Definition
Energy Management Assessment	Completed an energy assessment of the facility
Energy Map	Completed an energy map
Metrics and Goals	Have goals and action item plans to improve energy efficiency
Project Register	Still using the Opportunity Register
	Implemented energy efficiency projects identified in the register
Employee Engagement	Confirmation of specific employee engagement activities as part of SEM participation
Implementation	Confirmation of implementation of some Opportunity Register activities
Reassessment	Periodically review and update goals
	Regularly review energy performance
	Regularly update the Opportunity Register

Both customers developed the tools required to meet the CEE's Planning and Implementation minimum element. In addition to developing an energy map, the water district developed other maps that provided more granular seasonal data, used to determine the lowest-cost water sources.

The reassessment sub-element focuses on behaviors post-SEM engagement. Both customers received a full adoption rating for reassessing their goals, reviewing and updating their Opportunity Registers, and reviewing their energy performance on a regular basis. The school district reviewed its goals two months' prior to interviews with Cadmus, and the water district said they constantly review goals to ensure they make progress.

Both also said they continue to use and update the energy Opportunity Register. The school district does so upon project completion or upon identifying a new project with money available. The water district uses the register somewhat differently. Originally, it used it to record new opportunities suggested by staff, but it no longer receives many new suggestions. Consequently, it now uses the register in tracking the progress of implemented behavior modification projects, categorizing opportunities deemed not worth pursuing, and identifying capital projects.

Each customer considered the register somewhat useful conceptually, but both had suggestions for improvements or comments regarding their experience in developing and using the register:

- Prior to its SEM engagement, the school district compiled a list of potential projects (though not considered before the project site walks). Many items on the original list duplicated those on the SEM list. This lead, for example, to strains when the school district and EMP established different priorities about which opportunities to implement. The EMP, following the SEM offering's design, emphasized behavior changes and cited the opportunity to form energy teams with teachers and provide materials for students to take home. The schools did not have the staff to prioritize these energy teams, and union arrangements did not allow the energy manager easy or quick access to teaching staff meetings. Therefore, in the view of the school

district, this opportunity created too much resistance to pursue ahead of other opportunities. The district preferred a blending and prioritization of the existing list and the Opportunity Register.

- The water district recommended changing the Opportunity Register's format from a spreadsheet to a web-based tool. It considered this easier to use, particularly for employees working from remote locations or in the field.

In addition to reviewing goals and maintaining the Opportunity Register, both customers reviewed their energy performance regularly:

- Each month, the school district's accounts payable staff audited new utility bills against historical data from the past 11 years.
- The water district monitored energy performance on an ongoing basis, employing the data weekly to decide which wells to use in meeting its water delivery commitments. The district committed wells for one-month periods.

Both customers conduct ongoing employee engagement activities, as discussed in the Customer Commitment section.

Measurement and Reporting

The measurement and reporting element focused on tracking energy usage and on the frequency of communication about energy use within an organization. If participants tracked their energy usage and, at least annually reported their data with others in their organization, they received a full-adoption score.

Both customers received full credit for this metric. While the water district uses the energy model to track energy usage, the school district uses existing energy software into which its utility bills are input. The school district chose not to duplicate efforts by maintaining two systems. The school district also reported completing the installation of sub-meters, used to track and respond to peaking kW in real time (with a goal of leveling out the peaks).

Following its engagement with SEM, the water district has started developing new KPIs for future energy performance. It plans to use the baseline energy model developed during the SEM project to calculate how much energy it would have used had it not changed behaviors, and to project future energy usage, based on achieving the KPIs. The district indicated it continues to refine its energy model and improve it, and said it has been impressed with the model and its effectiveness, given the EMP's limited knowledge with the district's complex system. The district did say the model could be improved, and "modeling would be 1,000 times easier" if all sites had sub-meters, providing real-time data (rather than the current situation, where it must use monthly billing data).

Monthly, the school district reports to their energy teams; if issues arise, the school district reports these immediately, and provides an annual report to its board. The water district provides monthly reports to their board.

SEM Offering's Influence

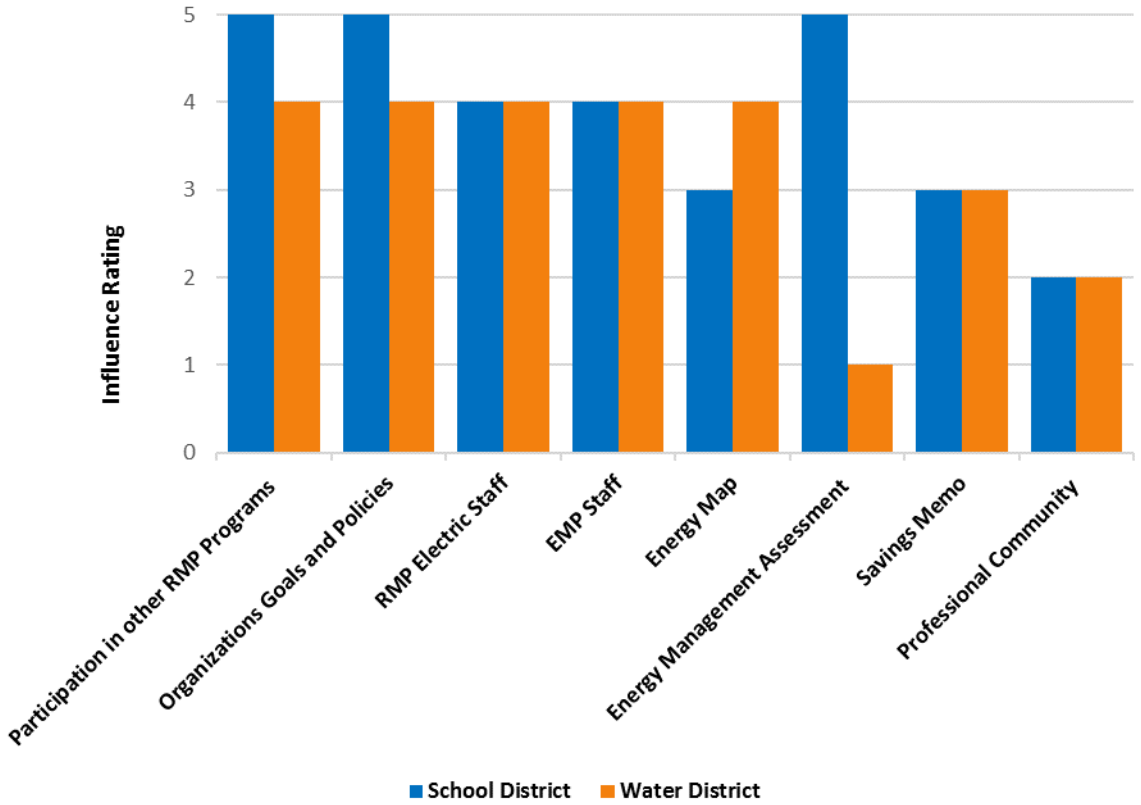
Cadmus asked customers to score the following nine elements for each element's influence on their decisions to participate in SEM:

- Participation in other RMP offerings
- Organization's goals and policies
- RMP staff
- EMP staff
- The Energy Assessment
- The Energy Map
- The Savings Memorandum (EMP estimates energy savings at the conclusion of SEM engagement)
- Professional communities, such as a respective school board, students, and parents, or city managers
- Staff or facility managers' interest in promoting energy efficiency

Customers rated each element on a 1 to 5 scale, with 1 meaning the element was of no influence in their decisions and 5 meaning the element was extremely influential.

The school district and the water district rated the nine elements very similarly, except for two differences. Their own internal organization policies and goals most influenced them, as did their participation in other RMP offerings. As might be expected in an engagement with a high level of face-to-face contact, both customers rated RMP and EMP staff as influential in their decisions to participate. Customers provided lower ratings (2) for the influence of their professional communities. As neither could rate staff or facility managers' interest in promoting energy efficiency, Figure 1—which shows how customers rated the remaining eight elements—does not include this element. The omission appeared to result from varied opinions across a large number of staff/teachers.

Figure 1. Customer Participation Influences*



*5 = extremely influential; 1 = no influence

Using the same 1 to 5 scale, both customers found the SEM services highly influential (4) on their decisions to implement operational and behavioral energy efficiency projects after their SEM engagement. The water district rated the engagement as highly influential (4) regarding its decision to implement capital projects, adding that, through the SEM offering, the district became more familiar with RMP incentives, and likely would not have participated without the implementation incentive ($0.02/kWh of verified savings).

The school district, however, rated this element as having no influence (1), saying the SEM engagement provided tools to do a better job, but it would have completed its capital projects anyway, and would have very likely participated in SEM had RMP not provided the implementation incentive.

At first, the school district's low rating appears to imply the SEM engagement did not prove as effective as possible. By design, however, the SEM offering focuses on behavioral changes. That the school district reported that the engagement enabled it to do a better job with its capital project indicates SEM influenced the project's quality, if not the decision to complete it.

RMP provides other energy efficiency offerings within the *watt*smart Business portfolio, designed to incentivize capital investments, which these customers can apply to capital projects.

Satisfaction with SEM

The school district and the water district expressed satisfaction with their interaction with RMP and the SEM offering overall, although each spent more time on the SEM engagement than originally anticipated through pre-engagement discussions with RMP or the EMPs. One reported spending as many as 40 hours during some weeks and only 10 during other weeks (the *SEM Program Administration Manual* estimated customers would spend a total of 84 hours per year).

The school district said its experience had been "a good give-and-take process." The engagement's first six months proved confusing, lacking a clear scope, clear goals, or a timeline. The district noted that, in the early stages, RMP seemed absent for much of the process, and communication with RMP had to go through the EMP. The respondent preferred more involvement from RMP and felt opportunities had been missed as the district did not understand all incentives it could have applied for.

On the other hand, the school district did maintain constant communication with the EMP. Initially, the district energy team felt pressured to implement a project that required student involvement. It took some time to convince the EMP that, although the district agreed the benefit was obvious, the team simply faced restrictions from district protocols and union rules, and could not implement that project.

At times, the customer said it educated and surprised the EMP, having already implemented many energy efficiency steps that would not be expected from a typical school district. After the first six months, a timeline had been established and the process settled down. The district said the EMP provided strategies to document and track its energy efficiency efforts, track equipment and pumps, and identify new opportunities on which it could focus. Respondents also noted the benefit of the EMP speaking to its district energy committee to validate its ideas and to convince the committee that these recommendations were necessary. At the end of the engagement, the school district was "very satisfied" with the incentive check received and, during the evaluation interview with Cadmus, expressed thanks to RMP, saying the SEM engagement benefited them a great deal in multiple areas.

The water district respondents expressed a slightly more satisfactory experience overall. They said the SEM engagement sparked the interest of employees and opened up conversations about energy efficiency. The combined SEM installation incentive and RMP Energy Project Manager Co-funding incentives succeeded in gaining executive support for participating staff to spend the time necessary on the project. As noted, just the SEM incentive alone probably would have been insufficient for the district to participate. In customer's words: "The incentives were seed money for an immediate return, and, over time, we get ongoing savings from our changes."

Prior to their SEM engagement, the water district staff already had effectively optimized demand and (somewhat) energy, leaving little "low-hanging fruit" to pursue. They said much of the savings attributable to their SEM engagement came from "getting creative" and shifting past methods to new, more-efficient processes. The customer noted that this required gathering, analyzing, and sharing a great deal of data, which proved challenging. They suggested that, rather than manually entering data

from monthly bills into their project tracking data base, they preferred receiving data via e-mail as an Excel spreadsheet or FTP transfer.

The water district reentered SEM for a second engagement period, citing that additional savings opportunities existed in optimizing processes and in educating employees. Respondents noted that RMP spent a great deal of time and money to help them improve their energy efficiency, and thus earn back money spent in other areas of their bills. They considered RMP staff knowledgeable, enthusiastic, and personally invested in the district's success, and they empowered the district to open to new ideas.

The EMP (who played a large role early on) continues to provide resources as needed by the district. The district reported not needing the same level of support as it did during its first engagement, and that the responsibility has shifted to the district to make identified changes. Respondents believed they would continue to find new SEM savings opportunities and to implement capital projects for one to two more years before exhausting opportunities through the RMP incentive offerings. After that, they would maintain SEM internally.

Barriers and Lessons Learned

The project managers and EMPs reported the following implementation barriers during project roll-outs and shared some lessons learned, which can be applied to future projects:

Barrier 1: Customers with multiple meters face a greater likelihood of seeing savings reflected in their monthly meter data versus customers with a few very large meters (i.e., in which savings would represent a smaller percentage of overall use).

Lesson Learned: RMP will look for customers with sufficient energy intensity to achieve savings commensurate with the work required.

Barrier 2: Data exchanges between different tracking and reporting systems can be difficult and slow. RMP's project manager for the school district said placing a system to provide the school district's EMP with necessary billing data proved difficult, citing that, in DOS-based systems, exporting and executing data dumps were not easy. Clerical work, required to provide data on 90 meters per month, presented the biggest internal hurdle, though, once a process was in place, exchanges went smoothly.

Lesson Learned: SEM projects, particularly those with a large number of meters, require significant support from data administration staff. Going forward, RMP will add temporary staff to provide such support.

Barrier 3: Lack of buy-in from facility operations staff.

Lesson learned: Buy-in must be gained from on-the-ground system operators for the success of recommendations that may change or impact working systems and protocols already in place. This requires operations staff to trust their executive management team and the project EMP to provide realistic views of day-to-day operation functions and staff responsibilities.

Barrier 4: Providing one-on-one contacts with customers through SEM's consultative approach may not prove cost-effective due to time and resources required versus the savings potential of a customer's facility. Additionally, the current consultative model will be difficult to scale down while remaining cost-effective for small customers with less savings potential.

Lesson Learned: RMP said its experience with the water district verified that, for some customer segments, (in this case, water/waste water), a cohort approach would prove more cost-effective. RMP currently is implementing the cohort model and can engage more customers at a reasonable cost.

Barrier 5: Interval data are not available for all meters and customers.

Lesson Learned: Both EMPs noted that, with interval data, modeling work can be accelerated and greatly simplified.

Conclusions and Recommendations

This process evaluation finds RMP has the framework in place for a successful SEM offering. RMP's first two projects exceeded their savings goals and achieved ongoing customer commitment to SEM practices. RMP hired experienced EMPs who engaged with customers and delivered successful projects, including the water district which elected to continue its engagement for a second year to further its progress. This illustrates RMP's commitment to the success of its SEM offering and its customers.

With any new offering, areas exist where incremental changes could improve results. EMPs and customers offered suggestions for specific improvements, featured throughout this report, and RMP already has demonstrated it is aware of and addressing challenges regarding data collection and exchange. Rather than repeat those findings here, this section identifies areas where changes could cause more widespread impacts on the SEM offering.

Conclusion 1

With these first two projects, many challenges resulted from the offering's newness to all stakeholders, including data exchange protocols, unclear project goals and priorities, confusion about roles, and expectations for time commitments.

Recommendation 1

The CEE offers SEM program resources—specifically, a public 2013 Building Energy Management Program and Field Assessment Database, which contains detailed information on 12 SEM programs. This information is available to the public. The CEE website also offers annual SEM Program Case Studies which provide information about specific program approaches and result; this annual report, however, is available to members only. RMP may gain useful insights by reviewing other program approaches and results. If RMP is not currently a member of CEE, they may be able to access this information through one of their EMPs; CEE members include nonutility program implementers.

Conclusion 2

The SEM offering will benefit from further refinement of the customer vetting process, which may allow RMP to anticipate and account for specific idiosyncrasies of individual customers or business segments. RMP's first two selected SEM projects proved very successful, and the company recognizes that such intensive support—funded by RMP and provided by the EMP—requires recruiting customers with energy savings potential that can be cost-effectively captured through the process. The school district project particularly pointed out challenges that can arise when selecting customers to recruit (e.g., the implementation costs for a project with a large number of sites) and the barriers that can arise from factors beyond the customer's control (e.g., impacts from the requirements of stakeholder groups—such as unionized teachers).

Recommendation 2

RMP should reevaluate the list of ideal candidate characteristics against experiences drawn from the two completed projects and those currently underway. This should include input from both EMPs and participants. This information should be shared with RMP staff who assist in identifying and recruiting SEM participants.

Conclusion 3

RMP can reduce customer confusion, and increase customer buy-in and satisfaction by making minor changes during the recruitment process.

Recommendation 3

For potential customers, engage senior-level executives during recruitment, and clarify why RMP recommends SEM, and how it fits with the customer's current involvement in other RMP offerings. During this time, set clear expectations for staff involvement and time commitments. Clarify conditions under which customers may be eligible for a second term of engagement.

Conclusion 4

RMP can increase EMP satisfaction and efficiency by providing clear protocols and project priorities at the project kick-off.

Recommendation 4

In addition to efforts started after these stakeholder and customer interviews, RMP should further clarify communication and data request protocols between RMP and EMPs and between EMPs and customers. The EMP's should receive clear priorities for each project.

Conclusion 5

Under the current SEM offering design, RMP does not measure the persistence of savings gained through the customer engagement. Other SEM programs evaluated by Cadmus indicate savings may extend three years or more. Tracking and measuring savings persistence will provide RMP a broader view of the full value of their SEM offering.

Recommendation 5

Since conducting the RMP interviews, RMP has indicated they now plan for and claim a three-year measure life, which aligns with Cadmus' recommendation to extend SEM savings measurement and tracking up to three years or more (to identify patterns in savings growth or declines after the initial SEM engagement period).

Impact Evaluation

Cadmus estimated savings from RMP's first two SEM projects for a school district and a water district. The school district consists of four facility types: administration buildings, elementary schools, junior high schools, and high schools. In total, the district contains 60 facilities. Two of these facilities had incomplete data and, therefore, were excluded from both RMP and evaluation estimates.

The water district project completion report defined three systems: a culinary water system, irrigation system, and water storage system. Cadmus created evaluation regression models for the culinary and irrigation water systems independently. Cadmus estimated water storage system savings differently than the culinary and irrigation systems. Rather than creating a regression model for energy consumption, Cadmus verified the difference in average water storage in the pre- and post-periods and computed energy savings using this difference.

Key Research Objectives

For the 2014 and 2015 RMP SEM impact evaluation, Cadmus focused on the following key research objectives:

- Review tracking data for appropriate assumptions and calculations.
- Identify and verify *ex ante* reported energy savings, drawing upon project completion reports and facility data workbooks.
- Determine an appropriate evaluation model specification for school and water districts.
- Using regression analysis of facility energy use, determine *ex post,* evaluated, gross energy savings from SEM activities implemented at the school and water districts.
- Develop recommendations for improved MT&R, and impact evaluation methods for the SEM offering.

Impact Evaluation Methodology

To achieve the key research objectives, Cadmus conducted the following evaluation activities:

- ***Project Documentation Review:*** Reviewed the project completion reports and tracking data to confirm facility characteristics, reported electricity consumption, and reported electricity savings.
- ***MT&R Model Review:*** Reviewed and verified statistical methods reported in the completion reports and project-tracking workbooks for estimating facility *ex ante* reported savings.
- ***Billing Analysis:*** Determined *ex post,* evaluated energy savings and developed realization rates using independently developed regression models for all facilities (except the water storage facility) within the water district.

Gross Savings Analysis

This section outlines three gross savings analysis components:

- A project documentation review.
- A project and participant tracking data review.
- Billing analysis.

Review of Project Documentation

RMP provided completion reports and MT&R model workbooks for both project participants (i.e., the school district and water district). The school district regression model consisted of 58 buildings, including three administrative buildings, 41 elementary schools, nine junior high schools, and five high schools. The MT&R workbook contained the following regression models:

- An all-buildings model
- A model for each building type
- An all-school buildings model
- A model for schools with heat pumps.

The water district estimated savings using a culinary system regression model, an irrigation system regression model, and an average change in water storage.

The completion reports document facility characteristics, facility changes, SEM activities completed each year, capital project savings, the regression model and diagnostics, and resulting savings. The annual MT&R model workbooks contain the regression models and cumulative sum calculations, supporting the savings values shown in the completion reports.

Cadmus reviewed the following information and data for each of the sampled facilities

- Background information about the industry, facility, and project implementation;
- Project implementation data, history, and savings estimates for any capital projects (if present)
- Project implementation data, history, and savings estimates for SEM projects;
- MT&R process reports and documentation
- Raw facility data (e.g., billing, weather, production, and other data used for the MT&R model)

Review of MT&R Model Data

Cadmus conducted an in-depth review of the data and MT&R models for each sampled facility and participation year, focusing on the following elements:

- The data series' completeness and quality
- The capital projects' timing and effects (if present)
- The baseline period definitions
- Potentially omitted variables, correlated with energy use and project participation

Cadmus performed a preliminary data review and discovered the following discrepancies in the project data:

- Lack of clarity regarding which data the EMP used to construct the culinary versus irrigation system models
- Computation method for the water storage system
- Lack of identifiers needed to link the billing (energy consumption) data to the corresponding water pump meters

Cadmus worked with RMP to address the preceding questions and then attempted to replicate model results and savings estimates in MT&R reports for each project. Cadmus conducted additional investigation when we identified discrepancies between the Cadmus evaluation analysis and the original MT&R analysis. For example, at one facility water flow during non-operation months was rolled into the next operation month—an anomaly detailed in the completion reports.

Analysis Methodology

Cadmus used the pre-post method to estimate facility savings for the following reasons:

- The industry widely accepts the pre-post method, and it serves as the convention for program evaluation using statistical and econometric analysis.[7]
- If correctly specifying the energy use model, the pre-post method will likely yield an accurate savings estimate.
- Savings estimates obtained from the pre-post model can be directly compared to those from the forecast model.
- Estimating the standard error and the confidence interval of the savings estimate is simpler using a pre-post model than a forecast model.

The pre-post model is specified so SEM can affect all energy-use relationships modeled by the forecast model. Generally, a pre-post model should include a standalone SEM indicator variable and an interaction variable between the SEM indicator and output (as well as other variables expected to affect baseline period energy use and SEM savings).

Evaluation Method

For each facility within the school and water districts, Cadmus estimated energy savings using the pre-post regression method, estimating facility savings by comparing a facility's electricity consumption prior to SEM implementation (the baseline period) to consumption in the period following implementation (the performance period). Each facility's regression specification was chosen to represent the

[7] Imbens, Guido W., and Jeffrey M. Wooldridge. 2009. "Recent Developments in the Econometrics of Program Evaluation." Journal of Economic Literature. 47: 5-86.

relationship between the facility's energy use and its production outputs, weather, and other energy-use drivers.

Cadmus applied two main steps to develop a pre-post regression model:

1. Selecting model variables using baseline-period data to identify the facility's energy-use covariates. Using baseline period data aided in identifying facility energy-use relationships before SEM implementation.
2. Adding SEM activity indicator variables and interaction terms to create a pre-post model, and estimating the model using baseline and performance period data.

For each facility, Cadmus estimated several regression model specifications with different functional relationships between energy use and energy-use drivers, or with different independent variables. In selecting the best model, Cadmus followed a step-by-step process of diagnostics analysis, variable selection, and model selection, with specific attention paid to signs and statistical significance of estimated parameters, the joint significance of the parameters, and model comparison tools (e.g., Akaike's information criterion [AIC], Bayes' information criterion [BIC], and the coefficient of determination [R^2]).

Cadmus estimated facility electricity savings in terms of the average facility savings per time interval. The coefficient on the SEM indicator interacted with output, indicating average facility savings per unit of output (if the regression included such interaction variables).

Cadmus computed the relative precision for the SEM offering according to RMP's target confidence level of 90%. It is important to note that modeling facility electricity savings using regression analysis may produce relative precision values that appear to be low. The accuracy of a regression model is dependent on many factors such as the number of observations, correctness of the model specification, and the ability of the selected variables to explain variation in energy use at the facility. In similar projects, Cadmus has found relative precision values of approximately 30% at 85% confidence.

The following sections detail processes that Cadmus followed in developing and selecting an appropriate regression model and in estimating facility and SEM energy savings. Where noted, Appendix C provides further details.

Step 1: Define the Baseline and Reporting Periods

Cadmus reviewed baseline period and reporting period definitions used in the MT&R model, following the same definitions for all evaluation models.

Step 2: Select Weather Variables

Cadmus routinely tests the addition of weather variables to facility energy models based on similar SEM studies, provided these variables significantly drove energy consumption. For the school district, weather can affect building heating and cooling loads. For the water district, Cadmus assumes ambient temperature variations could affect water pump efficiency and/or water flow at the facility. Cadmus

collected mean daily temperatures from the National Oceanic and Atmospheric Administration for each facility, selecting weather stations based on their proximity to facilities, followed by computing heating degree days (HDDs) and cooling degree days (CDDs) for a range of base temperatures (between 45°F and 75°F). These values could then be converted to the same frequency as the site data (i.e., monthly).

Step 3: Inspect Data and Select Variables

Cadmus developed a regression model of electricity consumption for each district or facility to establish valid reference energy usage for the performance period. We determined the regression model specification through an understanding of relationships between a facility's energy usage and output, season, weather, and other drivers, and through automated variable selection methods. The MT&R model served as a starting point for building the evaluation regression model.

Cadmus determined the baseline model specification by conducting a series of inspection and diagnostic tasks, using data provided in the MT&R reports. Appendix C further discusses diagnostic tasks details. The tasks included the following:

- Checking for multicollinearity
- Determining if a time-series correlation was present
- Performing automated variable selection

Variable selection proceeded in two steps:

1. Cadmus built regression models for each facility, with consumption regressed on every possible combination of HDD and CDD (using a constraint that the CDD base temperature was greater than or equal to the HDD base temperature), while accounting for other facility energy drivers. Cadmus then defined and selected the optimal HDD/CDD base temperature combination, based on the AIC/BIC score and R^2 statistics. Diagnostics used the optimal pair, with their significance tested in the variable/model selection process (described below).
2. The second step involved selecting the remaining independent variables using stepwise selection—an iterative regression procedure that identifies variables highly correlated with facility energy use. Appendix C describes the stepwise selection procedure in detail.

A purely automated variable selection process can identify variables affecting facility energy use that an engineering analysis does not identify, but it can leave out important variables as selection is based solely on statistical significance levels. To avoid omitting relevant variables, Cadmus reviewed the specification selected by the automated procedure and added or removed variables as necessary, based on knowledge of the site type modeled and the site's production.

The previous variable selection techniques could generate several models (as well as the MT&R model), from which the optimal model can be determined. The next section discusses the study's approach to model comparison and selection.

Step 4: Compare and Select Models

Once Cadmus identified a set of candidate model specifications through the variable selection process, we determined the evaluation model for each district or facility. The model comparison used an iterative process, in which Cadmus fitted a series of models, seeking to find the one that best represented facility energy use. The process used only baseline period data to fit the models as the objective was to identify facility-energy use relationships before SEM implementation. Using baseline period data in choosing a model specification provided the fairest comparison with the MT&R model.

After selecting a final model, Cadmus added indicator variables for SEM activity and estimated the model using the baseline period and performance period data. Cadmus assessed the candidate models per several different model performance metrics. During this model comparison stage, we introduced new variables to improve model performance or to address potential model misspecification. Appendix C provides more details about this process.

Step 5: Estimate Energy Savings

The final model selected to estimate savings for the school district took the following form:

$$KWH_t = \alpha + f(schoolID, \beta) + g(\boldsymbol{other_t}, \boldsymbol{\gamma}) + \theta * year_t + h(\boldsymbol{year_t} * \boldsymbol{other_t}, \boldsymbol{\varphi}) + \varepsilon_t$$

With model variables defined as follows:

t	=	The t[th] time interval (typically day, week, or month).
KWH_t	=	Metered electricity consumption at the facility during the t[th] time period.
α	=	The model intercept term.
f, g, h	=	Terms representing some function of variables (e.g. addition, subtraction).
$schoolID$	=	The vector of fixed effects defining baseline energy usage for each administrative and school facility.
β	=	The coefficient vector that defines the relationship between administrative or school facilities and energy usage; defined as the average energy usage per facility.
$other_t$	=	The vector of additional explanatory variables and/or indicators related to electricity consumption at the facility during the t[th] time period. This may contain weather variables, occupancy, seasonal indicators, or presence of heat pump.
γ	=	The coefficient vector that defines the relationship between the additional explanatory variables and electricity consumption; defined as the average electricity consumption per unit.

$year_t$ = A vector of indicator variables that indicates the t[th] time period within the performance year. For example, $year_t$ would equal 1 if time interval t occurred in the performance year.

θ = The coefficient vector that defines the average per-period effect on electricity consumption in the performance year.

φ = The coefficient vector that defines the average per-period effect of an explanatory variable on electricity consumption during the performance year.

ε_t = The model error term representing unobservable influences on electricity consumption in period t.

The final model selected to estimate a facility's savings within the water district took the following general form:

$$KWH_t = \alpha + f(output_t, \beta) + g(\boldsymbol{other_t}, \boldsymbol{\gamma}) + \theta * year_t + h_1(output_t * \boldsymbol{year_t}, \boldsymbol{\varphi}) + h_2(\boldsymbol{other_t} * \boldsymbol{year_t}, \boldsymbol{\psi}) + \varepsilon_t$$

With model variables defined as follows:

t = The t[th] time interval (typically: day, week, or month).

KWH_t = Metered electricity consumption at the facility during the t[th] time period.

α = The model intercept term.

f, g, h_1, h_2 = Terms representing some function of variables (e.g., addition, subtraction).

$output_t$ = The vector of the different water flow at the facility during the t[th] time period. The model might contain several different flow types (e.g., inflow or outflow).

β = The coefficient vector that defines the relationship between outputs and energy usage; defined as the average energy usage per unit of output.

$other_t$ = The vector of additional explanatory variables and/or indicators related to electricity consumption at the facility during the t[th] time period. This may contain weather variables or seasonal variables.

γ = The coefficient vector that defines the relationship between the additional explanatory variables (other than flow) and electricity consumption; defined as the average electricity consumption per unit.

$year_t$ = A vector of indicator variables that indicates the t[th] time period within performance year. For example, $year_t$ would equal 1 if time interval t occurred in the performance year.

θ = The coefficient that defines the average per-period effect on electricity consumption in the performance year.

φ = The coefficient vector that defines the average per-period effect of water flow on electricity consumption during the performance year.

ψ = The coefficient vector that defines the average per-period effect of the additional explanatory variables on electricity consumption during the performance year.

ε_t = The model error term representing unobservable influences on electricity consumption in period t.

Multiplicative terms represent interactions between the performance year indicator and other energy drivers.

Step 6: Calculate SEM Savings and Associated Standard Errors

The regression analysis yielded coefficient estimates for average electricity savings, per time interval (month), for the performance period indicator and interaction terms for the facility. Cadmus computed electricity savings as follows:

- Multiply the performance period's indicator coefficient estimate by the number of intervals in the reporting year.
- Multiply the interaction coefficient's estimate by the sum of interacted energy driver values during the performance year for each interaction term.
- The sum of these values determine the performance year's electricity savings. Cadmus calculated the standard error of the annual facility savings using the standard error of the estimated model coefficients for each performance year.

Table 5 lists the evaluated savings estimates in MWh for the school and water districts:

Table 4. MT&R and Evaluated Electricity Savings

Model	Reported Electricity Savings (MWh)	Evaluated Electricity Savings (MWh)	Precision at 90% Confidence
School District	2,289	3,089	25.2%
Water District—Culinary System	1,025	1,056	75.5%
Water District—Irrigation System	1,121	723	93.5%
Water District—Water Storage System	1,743	1,743	N/A
Total	**6,178**	**6,611**	**19.7%**

Step 7: Calculate Percentage Savings Relative to Consumption

Cadmus computed percentage savings attributable to the SEM offering using the following formula:

$$Percentage\ Savings = \frac{Estimated\ Program\ Year\ Savings}{Program\ Year\ Consumption + Estimated\ Program\ Year\ Savings}$$

Here, the denominator represents energy consumption estimated to occur during the performance period in the absence of SEM activity. Computing percentage savings in this manner accounted for any energy usage changes specific to the SEM reporting year and unrelated to SEM activities.

The EMP team computed the water storage facility's savings contribution by comparing the utilization of stored water for March through July of the performance year to the average utilization of stored water in the same months for the previous three years. This is a different estimation technique than the other two water district facilities, for which both RMP and Cadmus developed savings estimates using regression analysis. Savings estimates computed using this method do not determine consumption in the absence of SEM, in the same manner as a regression model. As a result, Cadmus agrees with the energy savings estimates, but did not estimate percentage savings for the water storage facility.

Table 6 presents SEM savings as a percentage of total performance period electricity consumption for the school and water districts:

Table 5. MT&R and Evaluated Savings (Percentage of Consumption)

Model	Reported Savings Relative to Consumption	Evaluated Savings Relative to Consumption
School District	5.4%	7.1%
Water District – Culinary System	5.8%	6.0%
Water District – Irrigation System	19.3%	13.4%
Water District – Water Storage System	N/A	N/A

Step 8: Compute Realization Rate

The realization rate (RR) is the ratio of evaluated to reported savings. For each district and facility, Cadmus determined ex *post* evaluated savings using regression analysis, then derived realization rates by comparing each project's *ex post* evaluated savings estimate to its *ex ante* reported savings estimate, as the following ratio:

$$RR = \frac{ex\ post\ savings}{ex\ ante\ savings}$$

Cadmus determined that the realization rate was 107% for the SEM offering as a whole. Table 7 presents the SEM realization rates for the school district, water district, and total across both districts.

Table 6. MT&R and Evaluated Savings Realization Rate

Model	Realization Rate
School District	135%
Water District – Culinary System	103%
Water District – Irrigation System	64%
Water District – Water Storage System	100%
Water District – All Systems	91%
SEM Total	**107%**

The school district achieved the highest realization rate at 135%. The school district model is a fully specified, pre-post panel model designed to model all schools in the district simultaneously. Cadmus tested several variables that serve as known drivers of electricity consumption in a typical school. The following variables proved significant in modeling energy consumption: mean temperature, season, occupancy, indicator variables for the month of July, and whether a school had a heat pump. Cadmus determined the addition of these variables to the school district model resulted in higher *ex post* than *ex ante* savings.

The water district's irrigation model produced the smallest RR at 64%. Cadmus determined this low RR resulted from the EMP team's decision to remove the intercept term from its model. Standard practice leaves intercept terms in a regression model, unless a compelling reason indicates they should be removed. Removing an intercept effectively forces the regression line to pass through the origin. This can alter the natural regression slope, which may potentially lead to biased savings estimates from a model. Cadmus found the model intercept statistically significant (p-value = 0.0008) for the evaluation model. Cadmus assumes removal of the intercept could have biased the EMP team's savings estimates upwards, leading to a small RR.

Benefit/Cost Analysis

Cadmus was unable to conduct a benefit/cost analysis for these two projects because they represented a subset of the larger *watt*Smart Business Program. RMP tracks some cost-effectiveness parameters by project, such as engineering costs, energy savings, and incentives. However, RMP, as with most utilities, does not track program costs, such as internal staff labor, by specific projects. The program costs are a critical input to the cost-effectiveness calculations. Without this information, a cost-effectiveness analysis of the individual projects would result in unreasonably high benefit/cost values.

We will include the cost and benefit data for these two projects in the cost-effectiveness analysis of the overall *watt*Smart Business Program. Cadmus anticipates completing the impact evaluation for that program in early 2017.

Overall Findings from the Impact Evaluation

Cadmus' evaluation of the RMP's SEM offering produced the following important findings:

- RMP's SEM savings proved statistically significant across all facilities, estimated using regression models.
- Realization rates varied widely both within and between districts.
- Cadmus found differences between modeling techniques for the different facilities. The following examples highlight areas where standardization of modeling practice could increase accuracy and align the MT&R and evaluation savings estimates:
  - Weather variables were included in the school district models; however, they were omitted from the water district modeling process.
  - The EMP team omitted the intercept term from their regression model for the irrigation system model but included the intercept term in the culinary system model. The completion report documents that the reason for this change is to create a time-independent estimate of savings.
  - The school district model rolled electricity consumption estimates for all schools into a single district-wide consumption to use as a regression response variable.
- In the water district irrigation system MT&R regression model, periods of non-operation were excluded from consideration during model specification. When computing savings estimates, the cumulative savings were summed across all periods, including those in which the pumps were non-operational.
- The evaluation confirmed the MT&R savings estimate. SEM savings of 6,611 MWh, estimated by Cadmus, were not statistically different from MT&R's savings estimate of 6,178 MWh at the 90% confidence level. Due to the EMP team's efforts to track energy use and measure energy savings, Cadmus could rigorously evaluate the SEM offering's savings.

Conclusions and Recommendations

The RMP SEM offering showed statistically significant savings for school and water districts, and the evaluated savings estimate did not statistically differ from the MT&R savings estimate. Still, some disagreement emerged between the RMP reported savings estimates and Cadmus' evaluated savings estimates, with realization rates ranging from 64% to 135%. Cadmus assumes discrepancies arose from differences in the regression model specifications, methodology, and savings estimation techniques.

Based on Cadmus' experience evaluating similar SEM programs, variable selection and model specification are crucial for providing accurate savings estimates. The pre-post model provides savings estimates that are robust to changes in the baseline and performance periods and allows for indication of non-routine adjustments or events occurring in the performance and baseline periods, which are expected to impact facility energy usage. Testing a wide variety of potential energy drivers for inclusion in facility energy models can provide a more robust estimate of SEM energy savings and help to protect

against omitted variable bias. Additionally, in other SEM studies, Cadmus has found evidence suggesting that higher-frequency data may be associated with a smaller regression error.

Cadmus offers the following recommendations:

Recommendations - General Regression Modeling

RMP may want to consider the following recommendations for improving the reliability and accuracy of savings estimates based on regression models:

- Routinely test for the influence of outdoor temperature on facility energy use. Options for incorporating weather data into baseline models include any combination of HDD, CDD, or mean temperatures.
- If not already used, consider incorporating automatic variable selection into facility energy-use model development. An automated approach allows an evaluator to identify energy-use relationships, not evident from an engineering analysis, to efficiently test a large set of variables for importance (including variable transformations or indicator variables). The technique also removes some subjectivity from the variable selection approach. Candidate baseline models should be compared to assess the best fit using AIC, BIC, and the R^2 value.
- Collect data at daily intervals, rather than monthly, when possible.
- Statistical best practice for regression analysis is to allow for an intercept term in the regression model unless there is compelling scientific or engineering evidence to suggest that it be removed. Removal of this term can potentially change the slope of a regression line and lead to biased estimates. The decision to remove the intercept should be made before modeling is conducted and the rationale for removing this should be discussed in detail in the completion reports.

Recommendations - Future Evaluations

To ensure that future SEM offering evaluation remains consistent with the current evaluation efforts, we recommend the following modeling practices:

- Future evaluations should continue to use a pre-post model, so the SEM offering can affect all energy-use relationships modeled during the baseline period. In general, a pre-post model should include a standalone SEM period indicator variable and an interaction variable between the SEM period indicator and output (along with other variables expected to affect baseline period energy use and SEM savings).
- Attempt to use consistent regression methodologies across SEM analyses. If using alternative methodologies, clearly outline why changes in techniques are necessary.
- When possible, use a full year of performance period data to fully capture SEM savings.

Recommendations - School District Models

- Consider incorporating a season variable (i.e., spring, summer, fall, winter) into the model in addition to the weather variables.
- Rather than summing consumption from multiple schools into a single district-wide consumption into one monthly consumption value, try indicating all schools in the model; so their individual effects can be detected and incorporated into the model's output.
- If allowing each school to have an individual effect in the model (as suggested above) create an indicator variable to indicate heat pump schools and test this variable's significance in the model.

Recommendations - Water District Models

- Intercept terms should remain in the regression models.
- Create indicator variables for any periods in which a facility shutdown occurred to account for reduced energy consumption during these periods.
- If periods of non-operation are not used for model specification, Cadmus recommends that these periods should not be used for saving computations.

Recommendation - Water Storage Estimation

Cadmus computed the water storage facility's savings contribution using average utilization of water resources rather than the typical regression estimation. As the evaluation could not determine consumption in the SEM offering's absence, Cadmus could not estimate percentage savings in the same manner as that used for the other two water district models. Cadmus recommends that, in future evaluations, RMP provide some form of electricity consumption during the performance period.

Recommendation - Savings Estimation

Percentage savings should be computed relative to total consumption during the performance period rather than using the baseline. Computing savings in this manner during the period would account for changes in total consumption that do not result from SEM engagement activity.

Appendix A. SEM Adoption Scoring Table

SEM Element	SEM Sub-Element	Survey Question(s)	Level of SEM Implementation		
			Full	Some	None
Customer Commitment	1a. Policy and Goals	Does your company or facility currently have goals or action item plans to improve energy performance?	Has a policy/plan or goals and communicates these to staff.	Any other response combination.	Does not have a policy/plan (or DK*), does not have goals (or DK), and has not communicated to staff (or DK).
		Have the energy performance goals or policies been communicated to staff?			
	1b. Resources	Do you have an energy team [dedicated staff for energy and energy efficiency] at your facility?	Has an energy manager or a team that meets regularly; or conducted employee engagement activities as part of SEM.	Any other response combination.	Does not have an energy manager (or DK) or energy management team (or DK), and does not conduct employee engagement activities as part of SEM (or DK).
		How frequently does the energy team meet?			
		Has the energy team conducted any specific employee engagement activities?			
Planning and Implementation	2a. Energy Management Assessment	Our records show that an energy management assessment was conducted for your facility as part of your participation in SEM. Is that correct?	Has completed an assessment.	Any other response combination.	Has not completed an assessment (or DK).
	2b. Energy Map	Has your company developed an Energy Map identifying your energy consuming processes?	Has an energy map, developed through SEM.	Any other response combination.	Does not have an energy map developed through SEM.

SEM Element	SEM Sub-Element	Survey Question(s)	Level of SEM Implementation		
			Full	Some	None
	2c. Metrics and Goals	Does your company or facility currently have goals or action item plans to improve energy performance?	Has goals for energy performance improvements.	Any other response combination.	No goals for energy performance (or DK).
	2d. Project Register	Are you still using the energy opportunity register?	Using opportunity register, updating the register, or planning to implement items on the opportunity register.	Any other response combination.	Not using opportunity register (or DK), and not implementing or planning to implement items on opportunity register (or DK).
		Has your company implemented any of the potential energy-efficiency projects or activities, listed in the energy opportunity register?			
	2e. Employee Engagement	Has the energy team conducted any specific employee engagement activities?	Conducts specific employee engagement opportunities.	Any other response combination.	Does not conduct specific employee engagement opportunities (or DK).
	2f. Implementation	Has your company implemented any of the potential energy-efficiency projects or activities listed in the energy opportunity register?	Completed one or more projects in the opportunity register.	Any other response combination.	Did not complete any projects in opportunity register.
	2g. Reassessment	Have you reviewed the goals since they were set to ensure they still align with business and energy performance priorities?	Reviews goals, updates opportunity register, and periodically reviews energy performance.	Any other response combination.	Does not update goals (or DK), never updates opportunity register, and does not periodically review energy performance.
		Do you regularly update the energy opportunity register?			

SEM Element	SEM Sub-Element	Survey Question(s)	Level of SEM Implementation		
			Full	Some	None
		How frequently is energy performance reviewed?			
System for Measuring and Reporting Energy Performance	3a. Measurement 3b. Data Collection and Availability 3c. Analysis	Do you reference the energy model developed through SEM to track your energy performance? [If not, how is energy performance tracked?]	Uses energy model or something else to track energy use.	Any other response combination.	Not using energy model, or something else to track energy use.
		Does the energy model use energy performance indicators to measure progress towards goals? [If so, how is it used?]			
	3d. Reporting	Does your senior management require regular updates from the energy team?	Management requires regular updates or shares energy-use data with others in organization.	Any other response combination.	Management does not require regular updates (or DK), and energy-use data not shared with others in organization (or DK).
		How often is energy-use data shared with others in your organization?			

*DK= Survey response, “Don’t Know”

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Appendix B. Customer Interview Instrument

RMP SEM Participant Interview Guide 2016

Researchable Topics	Item
Company and contact information	Section A
Customer Commitment – Resources	Section B
Customer Commitment –Policy and Goals	Section C
Planning and Implementation – Energy Assessment and Energy Map	Section D
Planning and Implementation – Action Plan, Employee Engagement, and Implementation	Section E
Monitoring, Targeting and Reporting – Metrics and Goals, Measurement and Reporting	Section F
Customer Satisfaction	Section G
Program Influence	Section H

CEE Minimum Element	Data Source for SEM
1a. Customer Commitment – Goals	C1, C2
1b. Customer Commitment – Resources	B1, B2
2a. Planning & Implementation – Energy Management Assessment	D1
2b. Planning & Implementation – Energy Map	D2
2c. Planning & Implementation – Metrics and Goals	F2
2d. Planning & Implementation – Savings Memorandum	E1
2e. Planning & Implementation – Employee Engagement	E5
2f. Planning & Implementation – Implementation	E5
2g. Planning & Implementation – Reassessment	C3, E2
3a. System for Measuring and Reporting Energy Performance—Measurement	F1, F3
3b. System for Measuring and Reporting Energy Performance – Data Collection and Analysis	
3c. System for Measuring and Reporting Energy Performance – Analysis	
3d. System for Measuring and Reporting Energy Performance – Reporting	B3, F4

Target Quota = 2

Variables to be pulled into interview

- Contact Name
- Facility/company name
- Savings memorandum recommendations

General Instructions

- Interviewer instructions are in green **[LIKE THIS]**.
- CATI programming instructions are in *red* **[LIKE THIS]**.
- Items that should not be read by the interviewer are in parentheses like this ( ).

A. Introduction

A1. May I speak with [CONTACT NAME]? [IF THAT PERSON IS NOT AT THIS PHONE NUMBER, ASK FOR NAME AND PHONE NUMBER AND START AGAIN]

1. (Yes)
2. (No, person is not able to come to phone) [GET NAME, PHONE NUMBER, AND SCHEDULE CALLBACK]
3. (No, person no longer works there) [ASK FOR THE CONTACT NAME AND PHONE NUMBER FOR THE PERSON MOST FAMILIAR WITH PARTICIPATING IN the Rocky Mountain Power Strategic Energy Management Program IN 2014 and 2015]

A2. Hello [CONTACT NAME], I'm [INSERT NAME] calling from Cadmus on behalf of Rocky Mountain Power. Nikki Karpavich contacted you about participating in an interview about your experience in Rocky Mountain Power's, Strategic Energy Management program. The interview will take about 20 minutes. Is this a good time, or may I schedule a time to interview you in the next week? It is our understanding that you are the energy champion at **[facility name]**. Is this correct?

1. (Yes)
2. (No) [ASK FOR THE CONTACT NAME AND PHONE NUMBER FOR THE ENERGY CHAMPION]
98. (Don't know) [ASK TO SPEAK WITH SOMEONE WHO KNOWS AND BEGIN AGAIN]
99. (Refused) [THANK AND TERMINATE]

A3. How long have you had this role of energy champion?

Before we get started, I'd like to note that your responses are confidential and will only be publicly reported in aggregate. Individual facility responses will not be identified in public documents. [IF NEEDED: individual responses will be reported anonymously as part of a group. We will not publicly report any identifying information]

B. Customer Commitment—Resources

B1. Do you have an **energy team** [dedicated staff for energy and energy efficiency] at your facility?

1. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

B2. **[ASK IF B1= YES]** How frequently does the energy team meet?

1. (Daily)
2. (Weekly)
3. (Monthly)
4. (Quarterly)
5. (Twice a year)
6. (Annually)
7. (Other) [SPECIFY]
8. (We don't meet)
98. (Don't know)
99. (Refused)

B3. Does your senior management require regular updates from the energy team?

1. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

C. Customer Commitment—Energy Policies & Goals

C1. Does your [INSERT SCHOOL DISTRICT/WATER DISTRICT] currently have goals or action item plans to improve energy performance?

1. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

[IF C1=YES, ASK C2 THROUGH C3]

C2. Have the energy performance goals or policies been communicated to staff?

1. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

C3. Have you reviewed the goals since they were set to ensure they still align with business and energy performance priorities?

1. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

D. Planning & Implementation—Energy Management Assessment and Energy Map

D1. Our records show that an energy management assessment was conducted for your [INSERT SCHOOL DISTRICT/WATER DISTRICT] as part of your participation in SEM. Is that correct? [IF NEEDED: This is an assessment of the energy management structure that identifies how management can better support energy efficiency efforts.]

1. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

D2. Has your company developed an Energy Map identifying your energy consuming processes? [IF NEEDED: This is a breakdown of energy end uses broken down by facility/processes either by estimated energy use or % of facility energy use.]

1. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

[IF D2=YES ASK D3-D4]

D3. Did you find the Energy Map useful at helping you identify key energy drivers and end uses?

1. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

D4. Do you have any suggestions to make the Energy Map more useful?

1. [RECORD RESPONSE]
2. (No)
98. (Don't know)
99. (Refused)

E. Planning & Implementation—Project Register, Implementation, and Employee Engagement

When you first started SEM, an Energy Opportunity Register was developed listing potential energy-efficiency projects and activities at your facility. [READ IF NEEDED: The Energy Opportunity Register describes the actions to be undertaken over the course of the time. These actions can be capital projects, improvements to operations and maintenance practices, procurement procedures for energy efficient equipment or awareness programs.]

E1. Are you still using the Energy Opportunity Register?

1. (Still using it)
2. (No longer using it)
98. (Don't know)
99. (Refused)

E2. Do you regularly update the Energy Opportunity Register? [IF NEEDED: INCLUDES ADDING NEW PROJECTS OR UPDATING PROJECTS ALREADY IN THE PLAN]

1. (Update regularly)
2. (Update occasionally)
3. (Almost never update it)
98. (Don't know)
99. (Refused)

E3. **[ASK IF E1=1]** How useful do you find the Energy Opportunity Register**?** Is it… [READ IF NEEDED: The Energy Opportunity Register describes the actions to be undertaken over the course of the time. These actions can be capital projects, improvements to operations and maintenance practices, procurement procedures for energy efficient equipment or awareness programs)

1. Very Useful
2. Somewhat useful
3. Neutral
4. Not Very Useful
5. Definitely Not Useful
6. (Not using the Energy Opportunity Register/have never used the memorandum) **[ASK: WHY?]**
98. (Don't know)
99. (Refused)

E4. **[ASK IF E3=2, 3, 4, OR 5]** What would make it more useful?

1. [RECORD RESPONSE]
98. (Don't know)
99. (Refused)

E5. Has your company implemented any of the potential energy-efficiency projects or activities, listed in the Energy Opportunity Register?

1. [RECORD RESPONSE]
98. (Don't know)
99. (Refused)

E6. Has the energy team conducted any specific employee engagement activities? [IF NEEDED: INCLUDES ANY ACTIVITIES THAT INVOLVE STAFF OUTSIDE THE ENERGY TEAM, SUCH AS ENGAGING STAFF TO TURNING OFF EQUIPMENT WHEN NOT USED, AWARENESS CAMPAIGNS, ETC.]

1. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

F. Monitoring, Targeting, and Reporting (MT&R) Model

As part of SEM, an energy model was developed and is periodically updated to track your energy usage and energy performance over time.

F1. Do you reference the energy model developed through SEM to track your energy performance?

1. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

F2. Does the energy model use energy performance indicators to measure progress towards goals? [READ IF NEEDED: For example, an energy performance indicator could be energy consumption per unit of production]

1. (Yes)
2. (No)
98. (Don't know)
99. (Refused)

F3. How frequently is energy performance reviewed?

1. (Daily)
2. (Weekly)
3. (Monthly)
4. (Quarterly)
5. (Twice a year)
6. (Annually)
7. (Continuously)
8. (Other) [SPECIFY]
98. (Don't know)
99. (Refused)

F4. How often is energy use data shared with others in your organization?

1. (Daily)
2. (Weekly)
3. (Monthly)
4. (Quarterly)
5. (Twice a year)
6. (Annually)
7. (Other) [SPECIFY]
98. (Don't know)
99. (Refused)

G. Customer Satisfaction

G1. Thinking about your project, how satisfied are you with your experience with the Energy Management Provider (contractor) assigned by RMP? Are you … **[READ LIST]**

1. Not satisfied at all
2. Not too satisfied
3. Somewhat satisfied
4. Very satisfied
98. (Don't know)
99. (Refused)

G2. **[Ask if G1=1, 2, 3, or 4]** Why do you say that? [RECORD ANSWER]

G3. Thinking about your project, how satisfied are you with your interaction with RMP? Are you … **[READ LIST]**

1. Not satisfied at all
2. Not too satisfied
3. Somewhat satisfied
4. Very satisfied
98. (Don't know)
99. (Refused)

G4. **[Ask if G3=1, 2, 3, or 4]** Why do you say that? [RECORD ANSWER]

G5. Thinking about your overall experience with the program, how would you rate your satisfaction? Are you … **[READ LIST]**

1. Not satisfied at all
2. Not too satisfied
3. Somewhat satisfied
4. Very satisfied
98. (Don't know)
99. (Refused)

G6. What is working particularly well with this program?

1. [RECORD ANSWER]
2. (Nothing)
98. (Don't know)
99. (Refused)

G7. What provided the most value to your organization?

1. [RECORD ANSWER]
2. (Nothing)
98. (Don't know)
99. (Refused)

G8. What challenges have you had with the program? **[IF NOT MENTIONED, PROBE FOR CHALLENGES: (DAVIS= ENGAGING SCHOOL MANAGEMENT AND TEACHING STAFF OR GETTING CUSTODIANS AND MAINTENANCE STAFF INVOLVED.) (JORDAN VALLEY = ENGINEERING STAFF BUY-IN)]**

1. [RECORD ANSWER]
98. (Don't know)
99. (Refused)

G9. **[ASK IF G8=1]** What would be the best way to overcome the challenges **(DAVIS= ENGAGING SCHOOL MANAGEMENT AND TEACHING STAFF OR GETTING CUSTODIANS AND MAINTENANCE STAFF INVOLVED.) (JORDAN VALLEY = ENGINEERING STAFF BUY-IN)**?

1. [RECORD ANSWER]
98. (Don't know)
99. (Refused)

G10. Rocky Mountain Power currently provides a $0.02/kWh incentive to customers for savings achieved in the first year. How would you describe your satisfaction with the incentive amount provided by RMP? Would you say you are … **[READ LIST]**

1. Very dissatisfied
2. Somewhat dissatisfied
3. Neither satisfied nor dissatisfied
4. Somewhat satisfied
5. Very Satisfied
98. (Don't know)
99. (Refused)

G11. How likely would you have been to participate if RMP did not provide an incentive? Would you say … [READ LIST]

1. Very likely
2. Somewhat likely
3. Not too likely
4. Not at all likely

98. (Don't know)
99. (Refused)

G12. Why do you say that? [RECORD ANSWER]

G13. Was the time you spent on the SEM program, more, less, or about what you expected based on discussions with your Energy Management Professional advisor, at the beginning of your participation?

1. (More)
2. (About Same)
3. (Less)

98. (Don't know)
99. (Refused)

G14. How can RMP improve the program experience for you?

1. [RECORD ANSWER]

98. (Don't know)
99. (Refused)

G15. Does the **[INSERT SCHOOL DISTRICT/WATER DISTRICT]** intend to continue participating in the program?

1. Yes [ASK G15a AND G15b]

G15a. How long do you think you will continue to participate?

G15b. Why do you think your organization will continue to participate?

2. No [ASK G15c]

G15c. Why won't you continue participating in the program?

98. (Don't know)
99. (Refused)

H. Program Influence

Finally, we have a few questions about the influence of the program.

H1. I'm going to read the following list of items. Please rate each item on how much influence each item had on the decision to participate in the SEM program. Please use a scale where 1 means no influence, to 5, means the item was extremely influential in your decision. [RANDOMIZE STATEMENTS]

Item	No Influence				Extremely Influential	Don't know	Not applicable
	1	2	3	4	5	98	99
a. RMP Electric staff							
b. [EMP] staff							
c. [School District community such as School Board, Parents or Students] OR [Water District community such as the City managers or water district customers]							
d. [ASK IF D1=1] Energy management assessment that was completed as part of the program							
e. Energy Map							
f. Savings Memo							
g. Internal [INSERT SCHOOL/WATER] district goals and policies							
h. Interest of staff or facilities manager to promote energy efficiency							
i. Participation in other RMP energy efficiency programs?							

H2. What else, if anything, was highly influential in your decision to participate in the Rocky Mountain Power Strategic Energy Management Program?

1. [RECORD RESPONSE]
2. (Nothing)
98. (Don't know)
99. (Refused)

H3. What energy-efficiency improvements were planned before you decided to participate in the program?

1. [RECORD RESPONSE]
2. (None)
98. (Don't know)
99. (Refused)

H4. Please describe any energy-efficiency improvements or activities since participating in the program that were not included in the Savings Memorandum?

1. [RECORD RESPONSE]
2. (None)
98. (Don't know)
99. (Refused)

H5. Please rate how influential the SEM program was on your [INSERT SCHOOL DISTRICT's/WATER DISTRICT's] decision to implement the following types of projects using a scale from 1, meaning no influence, to 5, meaning the SEM program was extremely influential. [RECORD 1 – 5 FOR EACH STATEMENT, 98=DON'T KNOW AND 99=REFUSED]

1. Capital energy-efficiency projects
2. Operational energy-efficiency projects
3. Behavioral energy-efficiency projects

98. (Don't know)
99. (Refused)

I. Closing

Those are all my questions. Thank you very much for your time and for your support of this important study. Have a great day!

Appendix C. Impact Evaluation Methodology Additional Details

This appendix provides further details on Cadmus' methods for inspecting the data and selecting variables (Evaluation Method Step 3) and for comparing and selecting models (Evaluation Method Step 4).

Step 3: Inspect Data and Select Variables

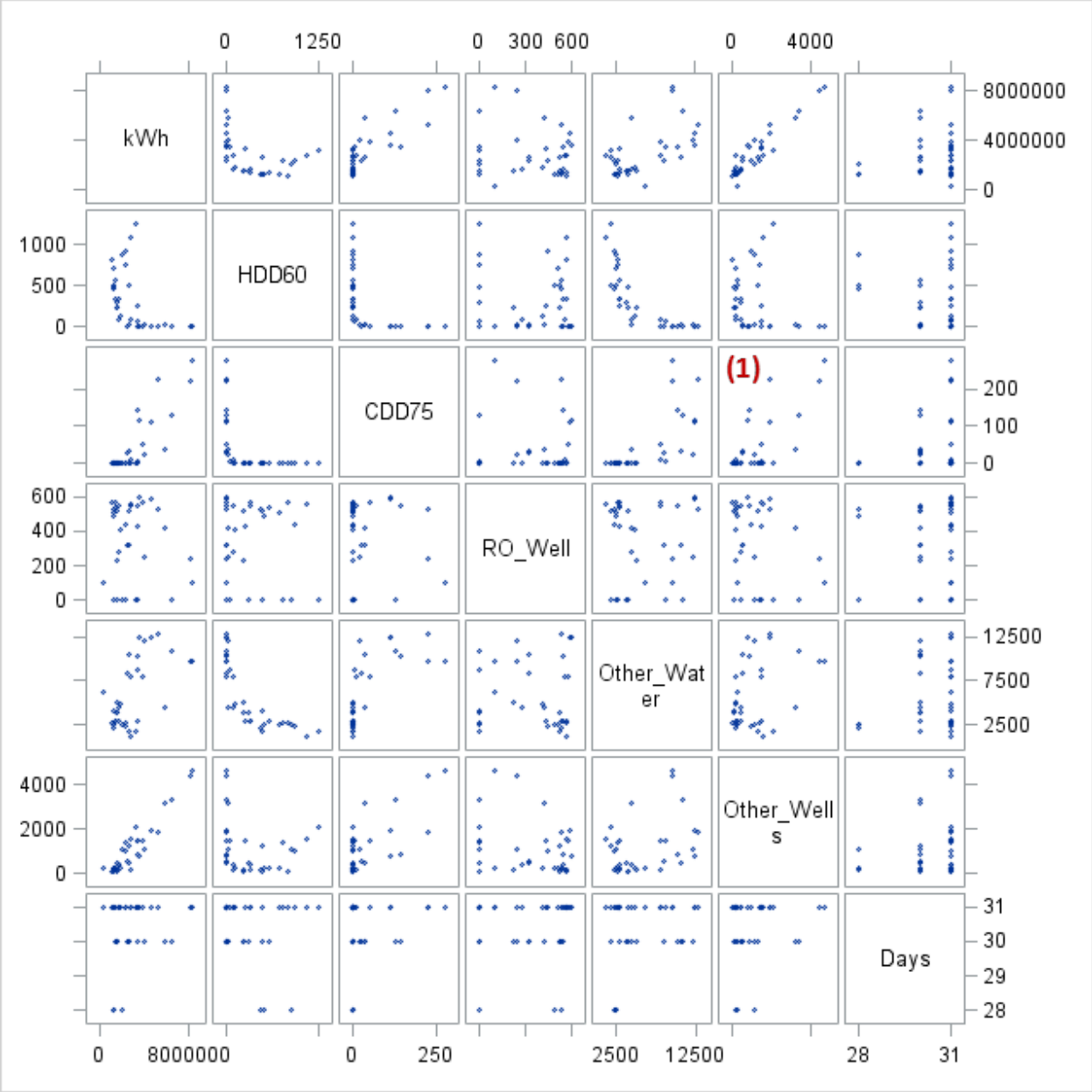
As noted, Cadmus determined the baseline model specification by conducting a series of inspection and diagnostic tasks on data provided in the MT&R reports. These tasks included the following:

- Checking for multicollinearity
- Performing an automated variable selection

The following sections provide further detail on these tasks.

Check for multicollinearity. Cadmus utilized scatterplot matrices to visually inspect independent variables for correlation. If found, these were noted as considerations for the variable selection process. Figure 2 shows a scatterplot matrix generated for one site. For a single scatterplot within this matrix, the horizontal scale is determined by the variable listed above or below the plot, and the vertical scale is determined by the variable listed to the right or left. For example, the subplot labeled (1) is a scatterplot of cooling degree days versus other wells. This subplot highlights a potential linear relationship, suggesting collinearity between the two variables.

Figure 2. Scatterplot Matrix Example



Perform an automated variable selection. Cadmus built an initial comparison model with baseline period data, using a stepwise variable selection procedure. An iterative variable selection technique, stepwise selection consists of the following steps:

1. *Regress kWh consumption on each of the independent variables in turn*. Cadmus selects the starting variables as: a combination of variables provided in the MT&R models; weather variables; and indicator variables representing documented changes to the site (e.g., an indicator equaling 0 during normal production and equaling 1 under reduced or increased production).
2. *Choose the variable with the most explanatory power to update the model*. An F test determines a variable's explanatory power. The variable with the largest change in the F-statistic and with a p-value greater than 0.2 (corresponding to an 80% confidence level) is selected for inclusion in the next model iteration.
3. *Refit the model with the added variable*, testing all remaining independent variables, and choosing another variable with the next-largest explanatory power.
4. *Refit the model with the added variable* and verify that none of the independent variables included in the model have lost significance after adding the preceding variable. If so, remove the nonsignificant variable.
5. *Repeat steps 2 through 4 until no remaining variables can be added* (i.e., when no additional variables are statistically significant in the model).

Step 4: Compare and Select Models

Cadmus used the following comparison and diagnostic criteria to assess model performance:

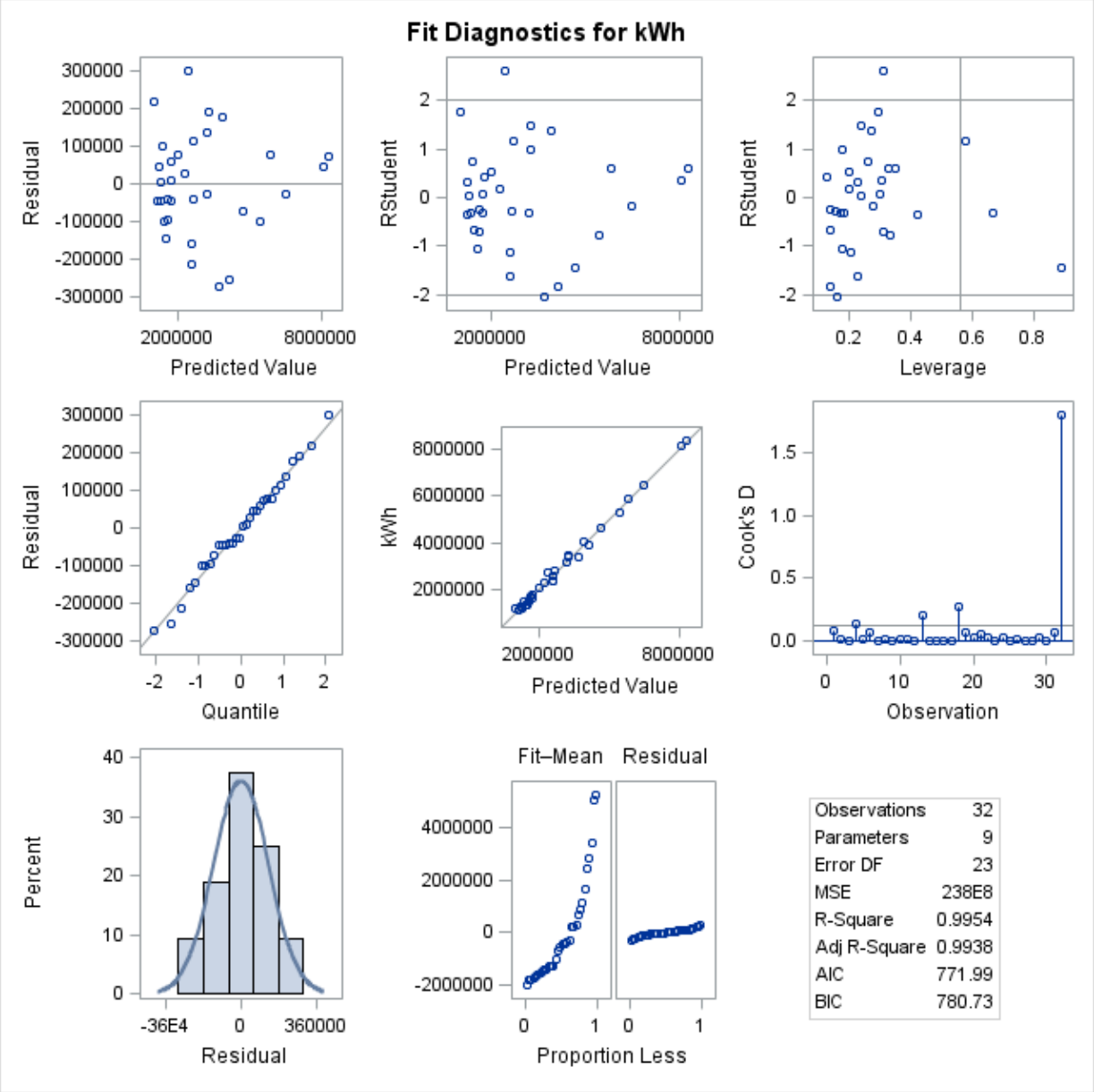
- Diagnostic plots.
- Residual-fit plot: Used to detect the presence of systematic errors or heteroscedasticities.
- QQ plot (residual quantile) and a histogram of residuals: Used to assess the normality of errors assumption.
- Cook's D plot: Used to investigate the presence of outliers.
- R-F plot: Used to determine whether the model sufficiently explains variations present in the data.
- Adjusted R^2: A parameter describing how much of the observed variation in the data can be explained by the model.
- AIC/BIC: Information criterion used to compare all model specifications relative to each other. These are compared in a manner similar to the R^2, but they enact stricter penalties for each new variable added to a new model specification. This penalty manifests as an increase in AIC/BIC

value, hence the best model indicated by these criteria would be the one with the smallest AIC/BIC.[8]

- Statistical significance of parameter coefficients.

Figure 3 shows a diagnostic plot panel with R^2, AIC, and BIC from the example site.

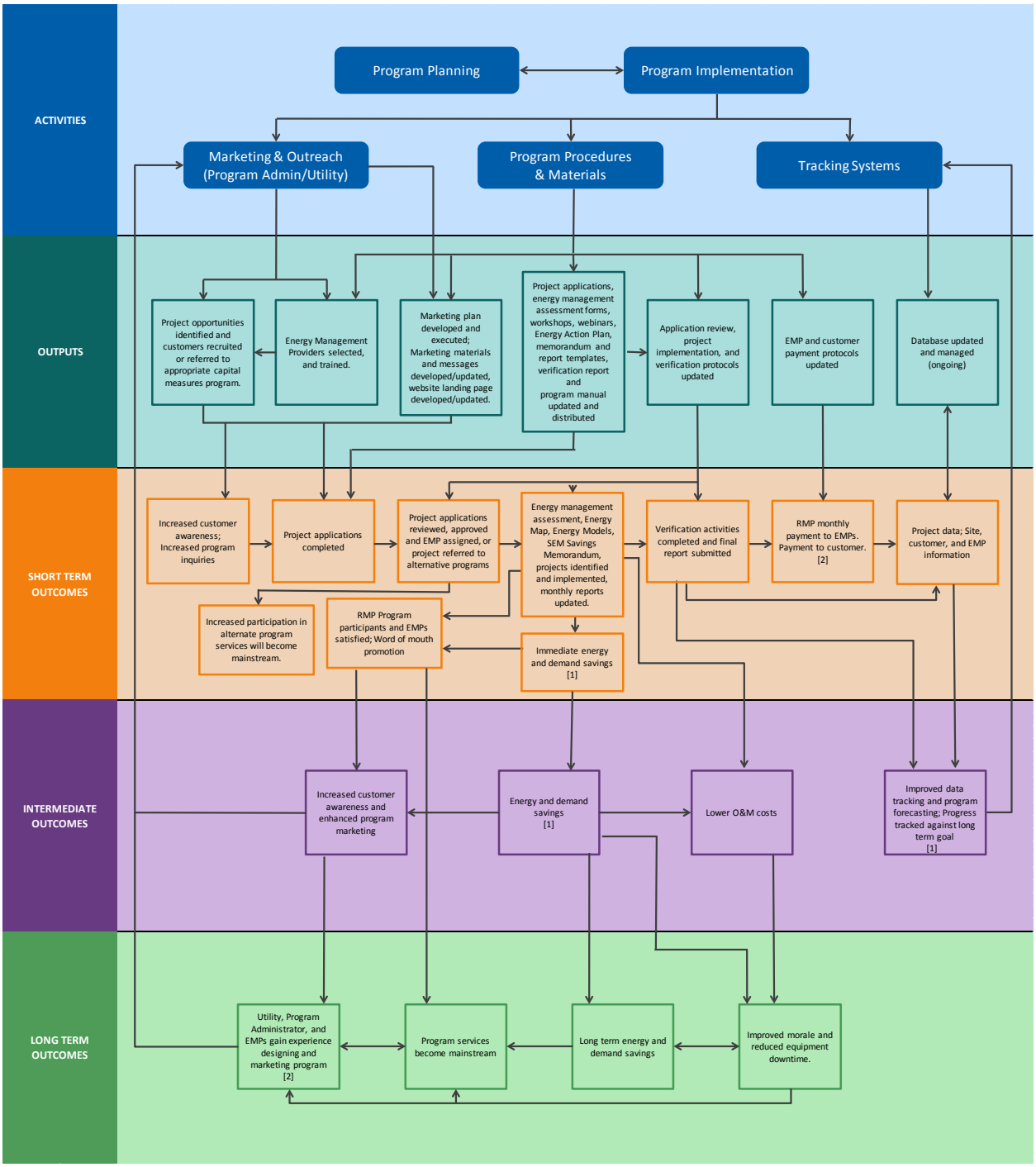
Figure 3. Panel of Diagnostic Plots with Additional Decision Criteria



[8] For the AIC and BIC comparison criteria, the values have no explicit meaning except as a basis to compare one model to another. AIC and BIC suggested the model specification with the smallest AIC/BIC value served as the best candidate for the final model.

Appendix D. Logic Model

Figure 4. Strategic Energy Management Logic Model



SEM Offering Theory
The Rocky Mountain Power (RMP) Strategic Energy Management (SEM) offering provides customers energy management services and incentives to help them understand, measure, and reduce energy use across all aspects of their business operations. The SEM implementation process can also identify ways to improve productivity, reduce waste, and duplicate the results in other facilities. The SEM offering achieves savings through providing coaching, analysis and support at no cost to the customer, along with performance incentives based on verified energy savings. These incentives encourage customers to aggressively pursue savings and to invest the time necessary to participate in the SEM offering. SEM's intent is to engage with industrial as well as large government, institutional, commercial and agricultural customers via RMP-approved Energy Management Providers (EMPs), who work with customers and their facilities' management staff. The EMPs provide fully funded, one-on-one coaching and analysis to help customers set-up an energy management program and implement improvements. Alternatively, RMP may place companies in cohort groups, and support those groups through workshops and webinars. By successfully engaging with customers who own existing facilities, the SEM offering will achieve energy and demand savings which are sustainable over time, will increase customer awareness of SEM and the associated energy- and cost-saving benefits; and will increase market acceptance and market penetration of SEM actions. The offering may also achieve additional energy and demand savings as customers extend their SEM practices to their other facilities.
Key Performance Indicators (KPIs)*
1. Savings: Demonstrate 23,273 MWh energy savings by end of the 2013-2017 SEM offering cycle. These energy savings go above and beyond any capital equipment savings found at the sites of customers engaged in SEM. 2. Engagement: Have 95% of engaged customers complete their SEM engagement by the end of the 2013-2017 SEM offering cycle.

*NOTE: KPI numbers correspond to bracketed numbers in logic model.

KPI Source: Rocky Mountain Power Utah—Strategic Energy Management Program, Program Administration Manual. December 6, 2012.