

A Cooperative Approach to Resource Conservation in Public Schools

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The Energy Smarts Partnership is a unique finding and staffing collaboration among Bonneville Power Administration (BPA), Northwest Natural Gas (NNG), Portland General Electric (PGE), the Oregon Department of Energy (ODOE), and the Oregon Department of Education (ODE), representing a variety of private and public entities. The Partners work together to help Oregon schools meet the challenges imposed by the 1990 passage of ballot Measure 5. The effect of Measure 5 resulted in limiting the schools ability to maintain or increase their operating budgets. The Partners help schools achieve bottom line savings in combined energy and other resource budgets of \$2.5 million, resulting in actual and projected savings of \$288,050, in the first year of the project, from July 1, 1993, through June 30, 1994.

The Energy Smarts Program (Energy Smarts) is a multi-faceted program integrating three distinct components: the Oregon Collaboration for Energy, Education, and the Environment (OCEEE) Small Grants program, the Resource Conservation Manager (RCM) Project, and Energy Smarts Education (Education). These components each had a different genesis, but came together under the Energy Smarts umbrella in 1992. Each component of the Energy Smarts program is a collaborative and fuel-blind effort that differentiates this program from other programs in the nation by going beyond the transfer of information to the actual accrual of monetary savings. This paper describes the program components, pilot program activities and initial results of the RCM Project.

Introduction

The questions individually facing the BPA, NNG, PGE, ODOE, and ODE in 1991 were: What can we do to help Oregon schools after the passage of Measure 5; how can we help schools adopt energy management and environmental strategies; and what will motivate the school users to take action? In March 1991, representatives from the organizations met to discuss these questions and how, in collaboration, they might be answered. Energy Smarts was announced as an official collaborative demonstration program in July 1991 (Ecker et al. 1992).

The Energy Smarts Partners are now concentrating their efforts on two aspects of the original demonstration, the OCEEE Small Grants Program and the RCM Project. The OCEEE Small Grants Program has presented 27 grants to students, teachers, classes, and schools for a total of \$23,100 during the last year. Grants have ranged from an organic garden at an elementary school to the construction of an energy-efficient house by high school students.

The RCM Project utilizes a staff position at each school district to encourage identification and implementation of conservation measures through a better understanding of the connection between energy use and the environment in which we live. This staff person or RCM is responsible for four distinct elements comprising the project: 1) school facility conservation programs, 2) school district resource savings, 3) energy and resource tracking, and 4) involving teachers and students in school conservation activities.

The first three elements address opportunities on school campuses to reduce resource consumption and save money. An energy use profile of the entire school district is performed followed by resource efficiency recommendations designed to reduce energy, water, and solid waste budgets. The funds generated through energy and natural resource savings, resulting from these recommendations, are used to pay the salary, benefits, and project costs of

the RCM position. The fourth element is designed to induce permanent change in how students use natural resources. This element provides teachers with supplemental classroom materials and activities to increase student awareness of the impact of their resource consumption on the campus and their environment.

The Energy Smarts Partners provide training for the RCM staff position and guarantee that in two years the school districts will save in resource costs what they pay the RCM staff in salary and benefits. If not, the Partners will reimburse the districts the difference between the salary and savings.

The Energy Smarts Partners are working with five school districts, representing a total of 106 buildings, in the initial phase. Through the month of January 1994, the school districts have actual and projected savings in excess of \$288,000 in avoided costs during the current school year. These savings exceed the amount needed to cover the costs of the RCM positions. The RCM Project will continue with the existing school districts and be expanded to at least one more large school district during the 94-95 school year. The lessons learned through this project will be used to make it available to all school districts throughout the nation.

This paper describes the importance of a collaborative salary guarantee as a means of encouraging school officials to develop a resource conservation program for school building operations. We have determined that the salary guarantee is an extremely effective marketing tool and risk-reducer for school districts. But, it must be accompanied by a comprehensive program of technical assistance and emphasis on implementation. The information below will focus on the current design of the project and the results of the first field test.

Program Design

Collaboration has been critical to the success of the Energy Smarts Project to date. Alone, any one utility could not undertake all of the project's components to the degree each has been pursued for the following reasons: 1) share project costs and risks equally among all Partners; 2) acquire savings in all resource areas due to the fuel blind nature of the project; and 3) ensure that the utilities place the interests of the schools first. By building an alliance among utilities, state agencies, regional authorities, and school districts, each Partner has been able to leverage its resources while increasing the scope and depth of its activities. This collaborative effort benefits each of the Partners, allowing them to achieve demand side management goals while building better relationships with each other and their customers. Of particular note is the

collaboration between PGE, an electric utility, and NNG, a natural gas utility, given their direct competition for market share.

In early 1993, the Energy Smarts Partners met with representatives of utilities served by BPA and key decision makers within school districts served by PGE, NNG, and BPA. These meetings and reports completed by ODOE, ODE, and the Oregon State University/Extension Energy Program (OTF 1991), Washington State Energy Office (WASA 1988), and the California Extension Energy Service (CEES 1985) identified several barriers that prevent most school districts from developing and implementing a comprehensive energy management plan. The first barrier encountered was that many administrators and school boards underestimate the cost of poor maintenance, inefficient equipment and undefined building operating schedules. The second barrier is a perception that energy conservation and management are highly technical, requiring large sums of money and a great deal of engineering expertise, therefore outside the experience of school district staff. And finally, school district officials are not convinced that energy management saves money. Based on the barriers noted in the interviews and the reports, the Energy Smarts Partners designed a multi-faceted project beginning with staffing an RCM position supported by the members of the Partnership. To minimize the perceived risk that energy management might not save money and to overcome the barriers to establishing new positions in the school districts' budgets, while teachers were being laid off due to Measure 5, the Energy Smarts Partners (BPA, NNG, and PGE) created a salary guarantee. This incentive guarantees that if the RCM staff do not save in resource costs an amount equal to their salary and benefits, the Partners will provide the difference. ODOE and ODE, while not participating in the salary guarantee, provide technical assistance to help RCM staff in many of their job duties.

Once the salary guarantee was in place and the RCM position staffed, the project then proceeded on the recommended steps for the implementation of the RCM Project based on model programs described in the above cited reports from Oregon, California, and Washington. Figure 1 provides an overview of the elements comprising the RCM Project. Each element is described below.

RCM Project Coordinators

The RCM Project is coordinated by a senior project administrator responsible to the school districts, the utilities and representatives from the State Departments of Education and Energy. In each school district, a school board that is committed to resource management sends a strong and needed message to administrators, teachers,

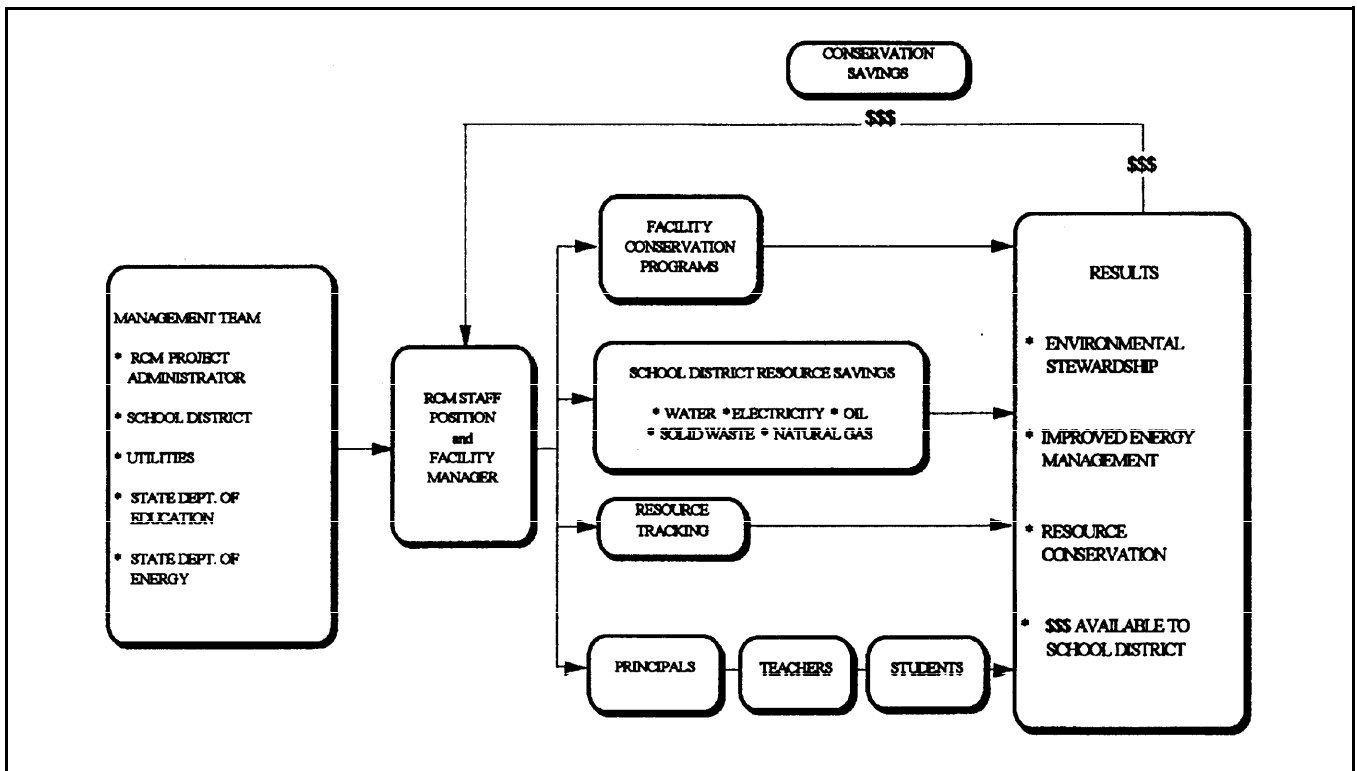


Figure 1. Resource Conservation Manager Program Elements

and other staff that energy and natural resource conservation is not a one-shot problem, but a continuing effort for the district to reduce consumption and save money (WSEO 1988). The initial step in establishing an RCM Project is to secure the buy-in of the district superintendent and endorsement from the school board. The superintendent together with the sponsoring organizations direct the project.

RCM and Facility Managers

The Project gives responsibility to one individual, the RCM staff person, to direct, coordinate, and track the progress of the district's conservation activities. This person orchestrates the entire district program and keeps the momentum going. Through this project, the RCM staff person has a reporting relationship with the Facilities Manager. This relationship ensures the building operational and maintenance decisions will support the judicious use of energy in schools on a daily basis. It is essential the RCM staff person be positioned in the same department as the facilities manager and maintenance staff. Custodians and maintenance personnel are the first line of defense against energy and natural resource waste. They must be part of the resource conservation team.

School Facility Conservation Programs

The School Facility Conservation Program component addresses the need for the RCM Project to lend support to existing and planned school retrofit and energy efficiency measures. The RCM Project is not intended to replace or eliminate the necessity of equipment related efficiency measures. The desired outcome is for school districts to reinvest conservation savings in long-term efficiency measures such as lighting retrofits. The RCM Project is designed to generate seed capital to fund more extensive projects.

School District Resource Savings

The RCM staff person is responsible for achieving people-oriented natural resource and energy savings. The RCM staff person conducts a resource survey to identify areas of waste and gather basic data for a prioritized list of practices and measures to improve efficiency. The survey emphasizes resource management opportunities in the areas of lighting, heating, ventilation, and transportation as well as solid waste and water use reduction.

Resource Tracking

Data on energy and resource cost and usage trends form the basis of a resource conservation management program. The RCM Project provides the school district with energy accounting software, computer equipment and training to develop consumption and cost profiles of each campus and facility in the district. This information reflects how efficiently schools use resources and gives monthly bottom line savings in both dollars and energy units. The RCM staff person tracks facilities over time to analyze consumption trends and thereby identify likely targets of conservation opportunities.

Principals, Teachers, Students

The full participation of principals, teachers and students is essential in achieving conservation savings at the school sites. The RCM Project employs the strategy of developing a site-based Energy & Resource Conservation Savings Plan (E&RC\$P) for every school. The principal and teachers participate in developing these plans and associated consumption reduction goals. Goal setting in the RCM Project relates to a 10% annual reduction or the maintenance of existing savings. Case studies conducted in Washington State and California underline the importance of establishing attainable goals at the school level to achieve savings (CEES 1989) and (WSEO 1988).

E&RC\$P Introduction. The Energy & Resource Conservation Savings Plan presents specific recommendations for the school which will result in savings in their operating budget. The plan calls for a people-oriented approach to resource management based on the following considerations:

1. It is recommended every employee and student be asked to contribute to the school's efforts to conserve energy and natural resources.
2. It is recommended all unnecessary lighting in unoccupied areas be turned off. All lights should be turned off when students and teachers leave the school. Teachers and custodians are asked to turn on lights only in the areas in which they are working.
3. It is recommended that the custodian have the responsibility for the complete shutdown of the facility when closed each evening, on weekends, holidays and vacations.
4. It is recommended that the building heating guideline be established and followed. Suggested guidelines are presented in the E&RC\$P.

5. It is recommended that a comprehensive recycling program be encouraged to reduce the production and disposal of solid waste.

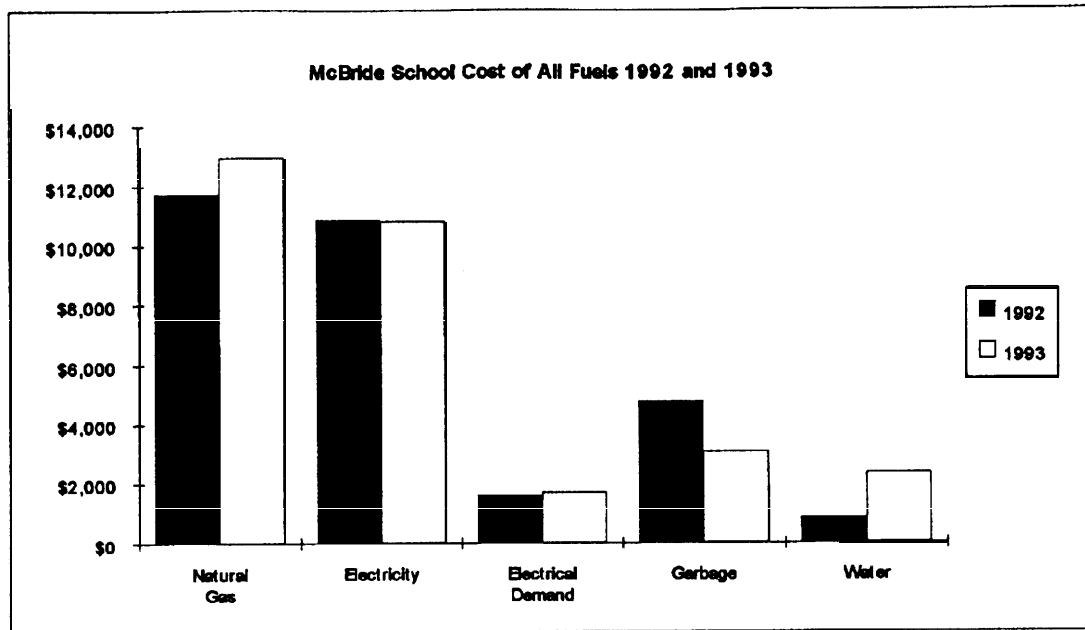
E&RC\$P School Profile. The E&RC\$P presents a profile of the school buildings annual energy, garbage, and water costs. The profile demonstrates the need and potential for resource savings. Based on this information the RCM staff person and the principals and teachers in the school district establish a goal of reducing expenditures by 10%. Figure 2 represents an example of the pre-RCM Project resource use for McBride Elementary School in St. Helens, Oregon, profiling a two-year comparison of annual costs.

For the twelve month period ending June 1993, McBride school spent \$30,776 on energy and waste disposal costs. Compared to the same period in 1992, the school incurred a 3% increase in these expenses. The 1993-94 adopted budget for natural gas, electricity, water and garbage disposal is \$42,600. Based on the 1993-1994 budget, the RCM Project savings for McBride Elementary School are projected to be \$4,260.

E&RC\$P Lighting Guidelines. The following guidelines are designed to reduce costs associated with school lighting. The recommendations will result in an improved learning environment and the avoidance of unnecessary lighting use.

1. Lights in classrooms should not be turned on unless definitely needed. Teachers are asked to make certain that lights are off when leaving the classroom, even for a short period of time.
2. Gymnasium lights should not be on unless the gym is being occupied.
3. All outside lights should be turned off during daylight hours.
4. Night custodians should turn lights on only in the specific area in which they are working.
5. Hallway lighting should be turned off at the end of the instructional day.

E&RC\$P Heating Guidelines. The E&RC\$P presents specific guidelines for heating in Oregon schools. These guidelines were developed by the RCM Project in association with the Oregon Department of Energy and school districts in the state.



	1992	1993	93-94 Budget
Natural Gas	\$11,744	\$12,933	\$21,400
Electricity	\$10,854	\$10,799	\$12,200
Electrical Demand	\$1,560	\$1,673	
Garbage	\$4,756	\$3,034	\$4,000
Water	\$849	\$2,337	\$5,000
Total:	\$29,763	\$30,776	\$42,600

Figure 2. McBride Elementary School Resource Cost Profile

- The heating systems should always be operated in the most economical way possible and operated for the minimum amounts of time required to provide the required climate for a specific activity.
- Custodians should constantly monitor the weather and make daily adjustments of the heating control system time clocks to compensate for temperature changes; i.e., boilers and fans should start later when weather is warmer and earlier when weather is cold.
- Every opportunity to decrease unnecessary use of the heating system should be considered by the building operator. For example, the heating system requirements should be reduced on days of early dismissal, canceled school, inclement weather days, and canceled games and activities. Weekends and vacation periods are opportunities to eliminate heating.
- If below freezing weather is predicted or occurs during a weekend, holiday or vacation period, the principal and head custodian are responsible to verify that adequate night low limit heating is being maintained to protect the building and contents.
- On regular school days, the heating system time clocks should be adjusted to provide the following maximum temperatures from the time of teaching staff occupancy to the time of last class dismissal in the majority of the classrooms in the building. Temperatures are measured five feet above the floor level on either the wall opposite the heating unit or in the center of the room.

Classrooms (grades 4-12)	68 deg. F.
Classrooms (grades K-3)	70 deg. F.
Gymnasiums and Locker Rooms	65 deg. F.
Offices	68 deg. F.
Shops	65 deg. F.
Halls	62 deg. F.
Kitchens	65 deg. F.
- When officially sponsored school activities occur on school days, the space(s) occupied by the activity

may be provided with heat and/or ventilation for the duration of the activity according to the standards above.

7. After class or activity hours, all areas should be set back to the target night low limit setting of 55 deg. F with the maximum night low limit not to exceed 60 deg. F.
8. Portable electric heaters are not to be used.
9. On vacation days, weekends and holidays when school is not in session, the entire building shall be operated on a target night low limit setting of 55 deg. F with maximum night low limit not to exceed 60 deg. F.
10. If offices are occupied by regularly assigned staff, zoning shall be used in lieu of operating the central heating plant.
11. Normal heat and ventilation may be provided for scheduled activities and athletic contests, but not for practices. Only the area of the activity should be heated and temperature maximums shall be the same as regular school days.

E&RC\$P Solid Waste Guidelines. The E&RC\$P presents recommendations to encourage a program of full recycling in schools.

1. The school will make recycling a priority to reduce the production of solid waste. Efforts will be made to purchase materials that can be recycled or reused in lieu of disposal.
2. The custodian will monitor the capacity of the garbage dumpsters. Garbage pick-up service will be adjusted according to need. Garbage pick-up service will be canceled during extended holidays. Service will be reduced or eliminated during summer vacation.

E&RC\$P Reporting Guidelines. Schools participating in the RCM Project receive monthly energy accounting reports designed to communicate conservation savings and avoided costs. The monthly reports include:

1. At-A-Glance Comparison

The principal and head custodian receive a chart that compares last month's energy and garbage costs and usage to the same month last year. This information reflects how effectively the program is paying off and if adjustments are necessary.

2. Summary of Energy Usage

The principal receives energy use consumption data and the cumulative cost avoidance for the current report period to track dollar savings accrued by the school. The energy use and cost information is weather adjusted to compensate for extreme temperatures, either hot or cold, as compared to the typical base year.

3. Progress Updates

The RCM staff person conducts periodic on-site visits to the school campus and develops a series of recommendations for the principal. The suggestions are in the form of a checklist developed from the site-based conservation plan adopted by the school. The RCM staff person also serves as a resource to teachers and students that desire to take an active role in resource management and environmental stewardship. Conservation is easily infused into the curricula because it is relevant, interdisciplinary, and can be taught at all grade levels (ODOE 1989). Through the RCM Project, students and teachers conduct daily monitoring surveys of resource consumption. Students use the survey information to track energy use in their buildings. This experience helps improve students' science and mathematical skills by analyzing data that have relevance to the real-world problem of reducing consumption at their school.

Results

The RCM Project originally listed four results to be realized by school districts: increased environmental stewardship, improved energy management, resource conservation, and dollars available to the school district. All school districts in the RCM Project are achieving a reduction in energy and resource costs with the savings being returned to the district.

Conservation Savings

The conservation savings are being treated by the school districts as incentive rebates to schools that accrue reductions in consumption. Additional savings are either being assigned back to the general fund or reinvested in energy-efficiency capital projects.

Recognizing that long-term behavioral changes would need constant reinforcement and that economic benefits could induce change (Harrigan 1991), rebates were offered to schools as recognition and as an incentive to keep people interested in saving energy and resources. The RCM Project rewards everyone who contributes to the success of the program in a way that is meaningful to them. Principals and school teams receive 25% of the avoided

cost savings returned to the school for discretionary spending. The district is encouraged to reinvest the remaining 75% in further conservation activities. Custodians and students receive certificates of achievement. The school district and school board receive positive coverage in print and electronic media.

Barriers

Several logistic and programmatic issues had to be resolved once the school district and utility management agreed to participate in the project. A legal contract had to be written, negotiated, and signed by all parties. The facility directors had to buy-in to the project, since their staffs were heavily involved. This buy-in was problematic in some instances, as the decision was made to hire a specific staff person without their involvement. The training on resource accounting software required an extensive amount of time as did accumulating historic billing information from the various utilities, despite their eagerness to help. The business managers then had to agree to the baseline established for their school district from which avoided costs are measured. Accurate calculation of resource cost savings is complicated, requiring substantial effort. There are a variety of accepted methods for calculating actual savings. Since the salary guarantee is structured around avoided costs, one method must be chosen and agreed upon by all participating parties. The method chosen by the Energy Smarts Partners calculates savings for each facility dividing resource savings into categories based on end use (WSEO 1987). Corrections are made for weather and changes in occupancy, schedule, square footage, and equipment. The dollar savings are calculated using the current and base consumption as well as kW demand and the current applicable rate schedules. The actual rate schedules as opposed to the average cost per unit of energy are used to account for changes in demand and to better reflect the actual change in the energy bills. These issues, once resolved, assured a fairly smooth initial implementation.

Performance requirements were written and included in every contract. These requirements were negotiated with each school district and all agreed on them. The requirements for the district include: 1) school board must approve an energy policy for the district, 2) office space and clerical support services are provided, 3) administrative support by the facilities manager(s) as well as curriculum administrator, 4) willingness to implement a district-wide and building energy tracking system, and 5) willingness to jointly select an RCM staff person with the participating utilities.

The requirements and job responsibilities for the RCM staff person are: a) Assess the current resource consumption profile of each campus and identify people-oriented

energy efficient and resource conservation opportunities in each school; b) Report baseline consumption data to the principal and building staff, and assist in the development and implementation of school-based conservation plans to increase energy-efficient operations and reduce natural resource consumption; c) Prepare monthly status reports which include an assessment of conservation savings for review by principals, building staff, administrators and the program advisory committee; d) Coordinate with the building principals to provide information and training for all staff of each school alerting them to conservation opportunities; e) Develop a recognition program that encourages monthly monitoring of conservation savings and provides incentive for individual buildings to achieve beyond minimum threshold levels; f) Coordinate with interested teachers the development and implementation of student conservation groups to monitor and reduce energy and natural resource consumption in their school buildings; g) Encourage the use of school buildings as laboratories to model energy conservation and environmental stewardship practices which may apply both at school and at home; h) As appropriate, cooperate with the Curriculum Department to integrate energy and environmental education into the district's curricula and to facilitate teacher instructional workshops; i) Prepare end-of-project period summary report of activities and accomplishments including dollar savings achieved; and j) Attend meetings, communicate with other RCM staff positions in other school districts as appropriate.

The Utilities are required to: a) Provide staff time for grant administration; b) Provide staff time for training and technical assistance; c) If appropriate, provide additional funds for curriculum/educational materials; d) Participate in an advisory group which might include but not be limited to the facilitator, local water bureau representative, and local recycling organization representative; and if necessary; e) Agree to make up the difference between resource dollar savings and the amount required to support the RCM position at the district. The salary guarantee alleviated the risk perceived by the school districts during a time when their budgets were being reduced on the average of 5 to 10 percent each year. And since the districts cannot receive the salary guarantee unless the RCM staff perform their assigned tasks, the salary guarantee motivates the district to implement the recommendations identified by the RCM staff person and the utilities. Funding is shared equally among the utility sponsors: PGE, NNG, and BPA. ODOE and ODE provide staff time and in-kind contributions. None of the Partners in Energy Smarts have assigned a full-time employee (FTE) to the Project. Rather, the Partners provide an RCM senior project administrator (1 FTE), through an independent contractor, and .1 FTE for engineering expertise, as needed.

Lessons Learned

The Energy Smarts Partners had not originally agreed on criteria for selection of school districts. Some decisions were made based upon expediency and political pressure, however, criteria have since been established based on the lessons learned during the first phase of the project. The first criterion is the total number of buildings in each school district. There must be a minimum number of school buildings to support the salary of the RCM position. In Oregon, that number is 25 buildings. If there are more than 40, then it is too great a burden for one person, and if it is less than 25, the savings will not cover the cost of the RCM staff person's salary in a 2 year payback period. In one case, an RCM staff person was hired to work in three contiguous districts to acquire the critical number of buildings.

The second criterion is current Btu's per gross square foot of energy consumption. The Btu's per square foot must exceed 75,000 to assure that savings will cover the cost of the RCM position and get the project off to a good start. The beginning successes are critical in getting and maintaining staff, management, and board support.

The third criterion is the initial buy-in of the school board. It was originally not clear just how important it was for the board to establish the framework for the project. But, our experience has clearly shown that school board support is essential.

Other lessons learned were the need to establish policy level guidelines for heating temperature, cooling temperature and building operating hours, and the need to establish energy accounting procedures similar in many respects to the financial accounting procedures common to all school districts. It was unanticipated by the Partners that none of the school districts had operational guidelines in place that set normal heating and cooling temperatures for their facilities. In addition, normal operating hours were not defined, and schools were essentially fully conditioned irrespective of occupancy. The discipline of energy accounting was not in place and the energy use was monitored by the facility department only to the extent that actual costs would not exceed the fiscal year budget. Therefore, facility managers were not taking advantage of information regarding energy use profiles of their facilities to determine the best opportunities to improve resource efficiencies in their schools.

Results

The results achieved through the RCM Project are in the dimensions of behavioral changes and quantifiable

resource reductions. The RCM Project integrated two fundamental behaviors into the school districts: the practice of energy accounting and the discipline of adhering to energy use guidelines as district policy. As a direct result of these behaviors, school districts realized quantifiable savings in utility bills.

Behavioral Changes

The basis for encouraging behavioral-based resource savings through the RCM Project is providing school decision makers and consumers with energy consumption data on a routine basis. Many school districts have found that sustaining an energy management program relates directly to communication both in developing the program initially and recognizing achievement (CEES 1986). The RCM Project utilizes an energy accounting method that allows the regular recording of energy use in a school district to measure changes in consumption and to track and forecast costs. Implementing energy accounting involves the following series of steps:

Select the Method of Analysis. The RCM Project recommends the selection of a method of energy accounting that takes into consideration the influence of heating degree days and cooling degree days. Essentially, a method of this type normalizes the need for heating and cooling by accounting for changes in outside temperature. Conservation savings are calculated and reported in terms of avoided costs. Avoided costs represent dollars that would have been spent and energy units consumed if efficiency had not been improved (WSEO 1987).

Develop an Energy Use Baseline. The development of an energy use baseline requires the school district to identify all sources of energy for each building. Once the energy sources are identified a baseline year is determined by calculating average monthly energy usage per building over three years using weather adjusted data. This becomes the "Standard Use Rate" to which future building use patterns are compared and savings determined. Changes in building use, structural changes and code compliance can alter energy use patterns, in which case a new baseline will be calculated.

The data to be obtained for energy accounting includes: fuel type, monthly consumption, monthly cost, electrical demand, unit cost, square footage of conditioned space, type of building use, dates of energy efficiency retrofits, hours of occupancy, average occupancy numbers and climate data. Once this information is entered in the energy accounting software the school district and RCM Project sponsors are in a position to agree upon the baseline year.

Develop a Ranking for Each School Building.

The purpose of ranking buildings is to compare sites and determine conservation opportunities. It is necessary to group sites by function: 1) high schools; 2) junior high; 3) elementary; and 4) administrative buildings. Annual energy consumption in a building can be compared to other buildings of similar function.

To compare schools it is recommended energy use (oil, natural gas, electricity) be converted to British Thermal Units (BTUs). Comparisons can then be made by total BTU consumption per square foot and cost per square foot. Buildings with higher use rates are the best candidates for energy conservation measures first.

Quantifiable Resource Reductions

The RCM Project reports avoided costs to school district officials, principals and facility operators on a monthly basis. The avoided costs quantify the savings achieved and are used to calculate the percentage of the RCM staff person's salary paid by savings. Table 1 lists the avoided costs through the initial nine months of the RCM Project in Oregon.

A total avoided cost savings of \$239,300 has been accrued to date in the combined school districts in the initial phase of the project. Based on current energy use trends, a total of \$288,050 is projected to be realized by the end of the first year. Avoided costs will pay between 112% and 201% of the RCM staff person's salary and project costs depending on the school district considered. The utility sponsors will not be required to pay any of the salary guarantees for the RCM positions.

Conclusions

One of the fundamental components to success is the collaborative fuel blind aspect of the effort. All the RCM Partners fully support the efforts of the RCM staff in their recycling, solid waste, and water reduction efforts, in addition to cutting energy use. The Partners believe that this is one of the reasons the RCM Project found unexpected success in acceptance by school administrators and facilities managers.

Another key to the success of the program is the top level support of school boards and school administrators' willingness to adopt school operational guidelines and institute energy accounting practices. In all cases, school districts did not have these components in place nor were they aware of their importance in effective energy management. Additionally, it was found that local school districts need assurances that reduced or eliminated the

financial risks associated with establishing an RCM position. The utility backed salary guarantee proved to be an effective incentive.

From an operational perspective, it is essential that each school campus make a commitment to the success of the project. This was achieved through the development and approval of school Energy & Resource Conservation Savings Plans which set a goal of 10% reduction in consumption. To further ensure school participation, an incentive rebate was offered in which 25% of the savings are returned to the school for discretionary spending. The RCM Project experience is that the incentive program created a sense of competition among schools to achieve or exceed site conservation goals.

The first nine months of the RCM Project has demonstrated to the Partners and the school districts the importance of tracking resource use. The tracking system truly helps move this Project from information transfer only to a performance based venture. Without the tracking system, it would be difficult to identify the critical number of buildings required to generate the savings needed to support the RCM position. The tracking system also provides the baseline information on which the incentive back to the schools could be based. The Partners found that the information from the tracking systems convinced the school districts on the need to address all the elements of the Energy & Resource Conservation Savings Plans.

To date, the avoided costs in school districts have exceeded energy efficiency projections in total dollar amount of savings. Additionally, the savings were generated in a shorter than expected time. Both these unexpected benefits have served to generate enthusiasm among the RCM staff and participating school district staff, and interest among other school districts throughout the state to replicate the RCM Project.

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Table 1. Resource Conservation Manager Project Avoided Costs

RCM Avoided Cost Summary																
School District		Feb - Jun '93	Jul '93	Aug '93	Sep '93	Oct '93	Nov '93	Dec '93	Jan '94	Feb '94	Mar '94	Apr '94	May '94	Jun '94	Actual Accrued	Total Projected
Ashland SD	Fuels	\$4,501	\$1,373	\$1,634	\$2,657	\$3,004	(\$795)	(\$2,498)	\$538	\$7,576	\$5,540	\$3,500	\$3,000	\$1,500	\$23,530	\$31,530
	Garbage	\$0	\$296	\$492	\$131	\$394	\$321	\$1,296	\$1,222	\$1,222	\$1,222	\$300	\$300	\$200	\$6,596	\$7,396
	Total	\$4,501	\$1,669	\$2,126	\$2,788	\$3,398	(\$474)	(\$1,202)	\$1,760	\$8,798	\$6,762	\$3,800	\$3,300	\$1,700	\$30,126	\$38,926
Rainier SD	Fuels		\$4,053	\$1,012	\$1,035	\$1,345	\$2,086	\$2,868	\$954	\$3,808	\$3,546	\$500	\$500	\$500	\$20,707	\$22,207
	Garbage		(\$228)	\$220	\$650	\$313	\$416	\$497	\$366	\$693	\$1,206	\$300	\$300	\$150	\$4,133	\$4,883
	Total		\$3,825	\$1,232	\$1,685	\$1,658	\$2,502	\$3,365	\$1,320	\$4,501	\$4,752	\$800	\$800	\$650	\$24,840	\$27,090
St. Helens SD	Fuels		\$1,791	\$590	\$730	\$587	\$2,467	\$1,868	\$3,903	\$7,392	\$7,079	\$1,000	\$1,000	\$1,000	\$26,407	\$29,407
	Garbage		\$559	\$974	\$294	\$770	\$813	\$2,013	\$1,997	\$1,337	\$1,468	\$500	\$500	\$500	\$10,225	\$11,725
	Water			\$2,059											\$2,059	\$2,059
	Grant							\$200							\$200	\$200
	Total		\$2,350	\$3,623	\$1,024	\$1,357	\$3,280	\$4,081	\$5,900	\$8,729	\$8,547	\$1,500	\$1,500	\$1,500	\$38,891	\$43,391
N. Clackamas SD	Fuels		\$3,275	\$3,544	\$4,174	\$5,693	\$9,159	\$9,399	\$5,398	\$12,265	\$14,594	\$5,000	\$4,000	\$4,000	\$67,501	\$80,501
	Garbage			\$0	\$0	\$608	\$2,785	\$6,070	\$2,689	\$2,522	\$4,472	\$2,700	\$2,700	\$2,700	\$19,146	\$27,246
	Total		\$3,275	\$3,544	\$4,174	\$6,301	\$11,944	\$15,469	\$8,087	\$14,787	\$19,066	\$7,700	\$6,700	\$6,700	\$86,647	\$107,747
Hillsboro SD	Fuels		\$8	\$698	\$123	\$648	\$3,690	\$7,293	\$13,572	\$18,519	\$17,981	\$2,000	\$2,000	\$2,000	\$62,532	\$68,532
	Garbage		\$0	\$732	\$344	\$264	\$682	\$291	(\$177)	\$426	\$464	\$400	\$300	\$100	\$3,026	\$3,826
	Total		\$8	\$1,430	\$467	\$912	\$4,372	\$7,584	\$13,395	\$18,945	\$18,445	\$2,400	\$2,300	\$2,100	\$65,558	\$72,358

Projected
 Actual

District	RCM Project Costs	Actual Avoided Cost Accrued	Paid by Actual Savings	Total Avoided Cost Projected	% of Cost Paid by Savings Projected
Ashland	\$33,458	\$30,126	90%	\$38,926	116%
Rainier	\$21,582	\$24,840	115%	\$27,090	126%
St. Helens	\$21,582	\$38,891	180%	\$43,391	201%
N. Clackamas	\$80,718	\$86,647	107%	\$107,747	133%
Hillsboro	\$40,000	\$65,558	164%	\$72,358	181%
TOTAL	\$197,340	\$246,062	125%	\$289,512	147%

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