

# Case Study: School RCM Program

## Save some energy . . . and hire 22 teachers

In the 2004-05 school year, the Gresham-Barlow School District will save the equivalent of 22 teaching positions by turning off lights in unoccupied rooms, monitoring building equipment and schedules, standardizing room temperatures and encouraging energy conservation practices.

“We expect to reduce our energy bills by \$1.1 million this school year and use less energy than we did in 1998,” said Dave Cone, the assistant director for facilities for Gresham-Barlow. “Last school year, we saved \$870,000.”

The district, located east of Portland, accomplished this feat while it enrolled more students, hired more teachers, installed 3,000 more computers, added 140,000 square feet of classroom, and allowed more community access to school facilities during non-school hours.

*“We expect to reduce our energy bills by \$1.1 million this school year (2004-05) and use less energy than we did in 1998.”*

**-Dave Cone**  
Gresham-Barlow School Dist.  
Asst. Director of Facilities



*Assistant Facilities Manager Dave Cone, standing, and Suzanne Murphy with Gresham-Barlow School District compare a school's energy use during the current school year with use during past years.*

Compared to the 1997-98 school year, the 2003-04 school year, Gresham-Barlow reduced total energy use by 32 percent and the 2004-05 should save even more.

Betty Merrill, manager of the Oregon Department of Energy Schools Team, confirms that the Gresham-Barlow district results are not an anomaly.

“From our experience with schools, I can say that every district can achieve 10 percent energy savings with very little work,” Merrill said. “We see districts saving 20 percent with an RCM (Resource Conservation Management)



625 Marion St. NE  
Salem, OR 97301-3737

(503) 378-4040

Toll-free  
1-800-221-8035

Fax  
(503) 373-7806

Web site  
[www.oregon.gov/energy](http://www.oregon.gov/energy)

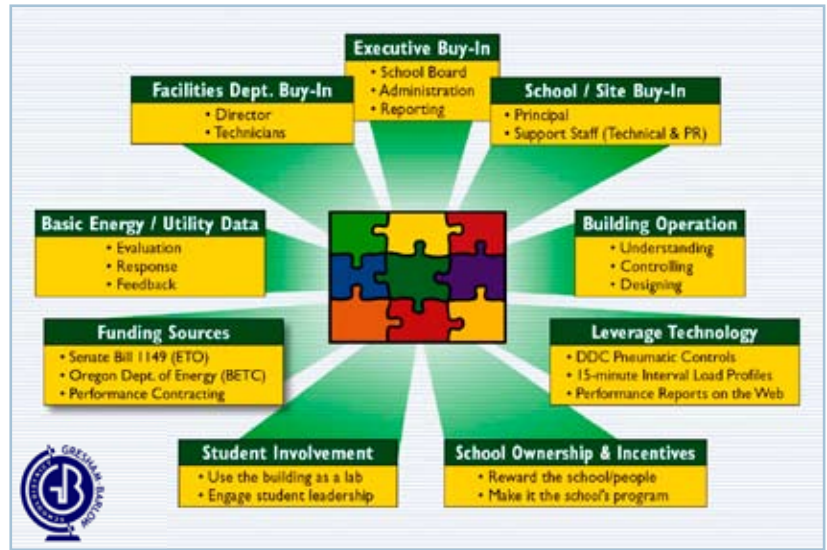
program in place. And those that work at it, like Gresham-Barlow, can save 30 to 40 percent of their energy costs.”

Cone says Gresham-Barlow has no secret or complicated process to achieve the savings. He sees the district’s success as a result of a district-wide RCM program that he compares to a simple puzzle locking into place. (See graphic.)

**Puzzle piece – Buy-in**

“First and foremost is the buy-in,” said Cone. “A facilities department can’t do it alone. You have to have the superintendent and other administrators, school board members, principals and support staff, teachers, custodial staff, technicians and students endorsing the idea that we can and will save energy.”

**Puzzle pieces of a comprehensive Resource Conservation Management (RCM) Program**



*Courtesy of Dave Cone and Gresham-Barlow School District*

The Gresham-Barlow School Board adopted a formal Energy Conservation and Resource Conservation Policy so there was no doubt that this was a priority for the district. Cone meets monthly with all head custodians to review problems and successes and to strategize on future practices. He reports regularly to the administration and school board.

Cone is proud that you can go to any of the district’s school principals or head custodians and ask them about their school’s RCM program. “They can tell you exactly what is happening in their schools to conserve energy,” Cone said. “You won’t get referred to me for details.”

**Puzzle piece - data**

Cone was a multi-family property manager in the Gresham area when he was hired in 1998 as assistant facilities manager for the school district. He, along with the district superintendent at the time, attended a presentation by an energy service company vying for district business.

“They were guaranteeing us tremendous energy savings with very little knowledge of our district,” Cone said. “We scratched our heads and thought maybe we should first try this ourselves before spending district money with an out-of-state company.”

Cone began slowly. He recognized he needed to find out where he was energy-wise in order to know where he should go. He needed basic energy and utility data, another puzzle piece according to Cone.

**GRESHAM-BARLOW SCHOOL DISTRICT**

**RESOURCE CONSERVATION POLICY STATEMENT**

The District encourages and supports the prudent management of its energy resources and utility services, and believes that these should be managed with a focus on conservation as well as education. The district further believes that, to this end, it is the responsibility of each district employee and student to participate in energy and resource conservation whenever possible.

It is the responsibility of district administrators, by way of the direction of the superintendents office, to implement, direct, monitor, evaluate and report district energy conservation efforts.

His first move was to purchase a relatively inexpensive data utility software program that would track energy use in the district's facilities. Gresham-Barlow has 11 elementary, five middle schools, and three high schools plus a charter school building.

He collected utility bills and entered energy use for each school facility for the previous four years. Cone realized he could now compare each building's use year to year, but he had no benchmarks for what a specific building should be using. He called Betty Merrill and the Schools Team at the Oregon Department of Energy for assistance.



*Recently constructed Hogan Cedars Elementary has clerestory windows that provide sufficient natural light and reduce electricity use.*

The Department of Energy, a state agency headquartered in Salem, has a team of energy analysts to assist school districts.

The Department's Schools Team helped Cone analyze his buildings' energy use data and to focus on buildings that showed above average energy use. They provided him with information on an RCM program and helped him prioritize energy projects. And, they helped him with another puzzle piece—access to funding sources.

#### **Puzzle piece - Funding**

The Oregon Department of Energy, in cooperation with Educational Service Districts (ESDs), administers public purpose charge funding for schools. Senate Bill 1149 came into effect in March 2002. It provides that PGE and PacifiCorp must collect a public-purpose charge from consumers within their service areas equal to 3 percent of the total revenues from electricity services. Of these funds, 10 percent must go towards energy efficiency efforts in the public schools within their service areas. Gresham-Barlow will receive approximately \$180,000 in SB 1149 funds each year for 10 years.

At the same time that SB 1149 funding became available to schools, another funding source from the Oregon Department of Energy became available for schools. The Pass-through Option allows schools (non-profits and public entities) to participate for the first time in the Business Energy Tax Credit Program. If a school energy project qualifies for the program, the school can partner with a business or individual with a tax liability. The school can transfer its tax eligibility in exchange for a cash payment from the business partner.

The option was a big incentive for Cone and the school district to replace current systems with energy efficient equipment, to install digital controls and to replace one-speed motors with variable speed motors. When the district completes an energy project and partners with a private business to use the Business Energy Tax Credit Pass-through Option, they receive a cash payment of approximately 25 percent of the eligible project costs.

#### **Puzzle piece - Building operation**

Another piece of the puzzle in a comprehensive RCM program is understanding and controlling each building.

“We were shocked when Hogan Cedars, one of our new school buildings, had much higher than expected energy use the first few months it opened,” said Cone. “It had all the new technology and was designed for energy efficiency.”



**Basic Energy / Utility Data**

- Evaluation
- Response
- Feedback

School	kBtu/SqFt/Year with Year Ending February						
	98/99	99/00	00/01	01/02	02/03	03/04	04/05
Sam Barlow High School	118	90	95	88	76	70	53
Gresham High School	110	114	119	98	83	80	73
Kelly Creek Elementary School	84	73	46	42	43	45	39
Clear Creek Middle School	70	72	58	50	50	39	38
Gordon Russell Middle School	67	69	59	52	44	45	37
East Orient Elementary School	67	68	59	55	55	57	55
Dexter McCarty Middle School	65	61	55	50	47	47	44
Highland Elementary School	64	60	59	54	47	46	46
Hall Elementary School	62	54	46	43	37	36	35
North Gresham Elementary School	61	59	57	52	44	49	40
Powell Valley Elementary School	56	48	44	42	37	36	31
Deep Creek Elementary School	54	54	48	40	32	35	34
West Gresham Elementary School	54	56	54	48	52	53	47
West Orient Middle School	53	64	55	42	48	39	28
Hollydale Elementary School	52	55	46	40	36	34	33
East Gresham Elementary School	47	46	41	38	31	31	27
Damascus Middle School	41	46	42	37	34	40	36
Springwater Trail High School	N/A	N/A	N/A	N/A	N/A	53	50
Hogan Cedars Elementary School	N/A	N/A	N/A	N/A	N/A	37	36
<b>Year End Total</b>	<b>73</b>	<b>69</b>	<b>66</b>	<b>58</b>	<b>52</b>	<b>52</b>	<b>45</b>
% Improvement over Previous Year		5%	4%	12%	10%	0%	13%
% Improvement over Base Year	8%	13%	16%	27%	34%	34%	43%



**Year to Year Performance for the District using kBtu/SqFt/Year**

Before construction of Hogan Cedars, the district had hired an independent commissioning agent whose job it was to ensure that all the systems worked as the district had intended. The agent caught one cause of the high energy use in his work—several classrooms had not been properly balanced. However, he missed another problem—internal lighting controls that were placed in a 24/7 zone—because the controls had been designed incorrectly. The agent, who was not involved with the design of Hogan Cedars, had verified that the controls were working as designed. Once the problem was detected, it was corrected and energy use decreased.

Another new building also showed high-energy use in its initial operation but it had not been commissioned. Cone and staff monitored the energy use for 24 hours and discovered the direct digital control linkage was broken. Once fixed, the energy use was in the range that was expected. Had the building been commissioned, the problem would have been detected and fixed before the school opened.

These experiences made Cone a proponent of the commissioning process when building a new facility. “But, they really need to be part of the design process, too,” said Cone.

**Puzzle piece - Leveraging technology**

Gresham-Barlow is using technology to help reduce energy use. The school district will soon have all school buildings on an internal Web site that will monitor “real time” energy use of all district buildings.

“This means the head custodian can see what is going on in the building at all times and take care of a mal-function immediately,” Cone said. “We’re very excited about this technology. It will give each school more control over their energy use.”

**Puzzle piece - Behavior modification**

Cone sees the most potential for saving energy in the human factor puzzle piece – behavior modification. “Training people to conserve energy is a lot cheaper and more powerful than buying equipment,” said Cone.

The district standardized temperature settings for classrooms. Staff and students now take responsibility to dress appropriately for the season. During cool months, for example, they bring a sweater. Custodians ensure that classroom temperatures are set correctly.

According to Cone, standardizing temperature settings was a key step. Previously, custodians spent considerable time and effort trying to respond to numerous requests for temperature settings that were often many degrees apart. Custodians were put in a no-win situation. One teacher was too hot while the teacher in the adjacent classroom was too cold. When the School Board and Administration developed a policy and set a classroom temperature standard, teachers and students were supportive. The custodial staff found that this action took considerable pressure off their shoulders to try and please everyone and gave them more time to devote to other maintenance issues.

Gresham-Barlow's RCM program includes an incentive program to further encourage behavior change. The incentives are based on criteria for each school's energy performance, staff and student efforts and participation. High schools can earn \$3,000; middle schools earn \$2,000 and elementary schools earn \$1,000 to spend on educational materials that aren't in the budget.

In 2004-05 school year, the district will pay \$29,000 for the incentive program while saving \$1.1 million.

### **Puzzle piece - Educational component**

Cone is currently reviewing national material for a student education component to his RCM program.

"We know how important this is," Cone said.

Rod Maynard, the head custodian at Hollydale Elementary, went to the teachers at his school and asked to speak in each classroom about how students can save energy and the importance of every one working together. Students learned how to do an energy audit.

"Rod took this on and students responded," said Cone. "Between 1999 and 2004, Hollydale and the students reduced the energy use in their building 30 percent, and it was not one of the buildings that had above average use to start with."

Cone hopes to have regular educational material for all Gresham-Barlow students in place next fall. The district has also implemented a new program for students at the Center for Advanced Learning. The Student-to-Energy Tech (SET) program gets high performing students, under teacher supervision, involved in the day-to-day management of the school's energy and water consumption. The school building essentially becomes a lab for the students.

### **Other Funding Sources**

There are other funding sources available to schools in addition to the SB 1149 funds and the Business Energy Tax Credit Pass-through Option.

The Oregon Department of Energy manages the Energy Loan Program that allows schools and others to borrow funds for an energy project at a low-interest, fixed-rate, and long-term. Gresham-Barlow has not used the Energy Loan Program, but other districts are using it to go ahead with projects. The schools use the operating cost savings to make the loan payments according to Betty Merrill, supervisor of the Department of Energy Schools Team.

The Department of Energy also introduced Dave Cone and the Gresham-Barlow district to Energy Savings Performance Contracting (ESPC). This type of contract for an energy project includes a provision that the energy service provider guarantees that the district will save a specific amount in energy use. The Department of Energy has the ESPC guidebook on its Web site ([www.oregon.gov/energy](http://www.oregon.gov/energy)), including document and contract templates. Merrill sees that school districts that use the Energy Savings Performance Contract experience greater success in lowering energy costs.

"There are lots of advantages to using an ESPC," said Merrill. "Most important, of course, is that it shifts the financial risk of an energy project from a school district to a contractor."

### **The future**

Cone is now looking at fine tuning the district's RCM program.

"How can we get rid of the extremes?" asked Cone. "We're looking at the data very closely to see what we can do to gain control of energy use spikes."

Cone also recently attended a long-term planning meeting. There are no immediately plans for new buildings, but Gresham is growing. Because of urban growth boundary expansion, the district forecasters expect to see more people move to the Damascus area of the district. If the district does add or replace school buildings, Cone knows that energy efficiency will have priority.

Gresham-Barlow schools are close to achieving national recognition for their results from the national Energy Star program. The Oregon Department of Energy presented an award to the district for their RCM Program. The Association of Professional Energy Managers honored Cone as the Energy Manager of the Year for Oregon and Washington for 2004.

During 2004, he will speak to the Confederation of School Administrators (COSA) and the Oregon Association of School Business Officials (OASBO) this year.

Cone is happy to share the information and how he puts the RCM "puzzle" together. He continues to set new district-wide goals for saving energy. For Gresham-Barlow, it means the district is spending \$1.1 million on education and not on energy use.



## **What is Resource Conservation Management?**

Resource Conservation Management (RCM) is a management tool that gives school districts more control over the operating costs of their facilities. It helps reduce operating costs, increase efficiency, and promote environmentally friendly operations.

An RCM program is a well-coordinated effort to manage the resources and services used, and the waste generated, by the facilities. It involves careful tracking of resources and attention to operational efficiency. The program focuses on occupant comfort, cost-effectiveness and assuring that equipment is used only when needed. Operational savings are gained through organization, analysis and communication.

With a comprehensive RCM program in place, you can expect to see quantifiable results in the first one to six months. Most RCM programs achieve 10 to 15 percent savings on utility bills after the first year, depending on the number of facilities involved and level of management commitment. RCM strategies have been used in industry and large corporations for many years. As markets become more competitive and public-sector budgets shrink, RCM programs are cropping up in many schools.

The Oregon Department of Energy Schools Team is available to assist Oregon school districts. Contact the Department's Schools Team toll-free at 1-800-221-8035.

The RCM Guidebook is available on the Department's Web site at: [www.oregon.gov/energy](http://www.oregon.gov/energy)

**[www.oregon.gov/energy](http://www.oregon.gov/energy)**