



School Districts Can Take Steps to Reduce Facility Operating Costs Through Conservation, Productivity

at a glance

In recent years, Florida school districts have faced growing costs to operate schools and other facilities, due in part to rising costs of energy and employee wages and benefits. Some districts are taking steps to contain energy usage and increase employee productivity that could be adopted by other districts. Some of the more successful strategies include

- developing energy management programs that include partnerships with energy providers, contracting with energy management companies, and creating school-based energy incentive programs;
- updating staffing formulas to better determine the number of employees needed to maintain facilities; and
- developing standards to assess and improve maintenance and custodial employee productivity.

Scope

This report is one in a series that highlights cost savings opportunities identified in Sharpening the Pencil reviews of Florida school districts.¹ This report identifies effective strategies school districts can use to reduce costs for operating educational facilities. Other reports in this series examine opportunities to reduce school transportation and food service expenses.

School districts can strengthen energy management to contain costs

Florida's school districts spend a significant portion of their budgets on energy expenses. The Department of Education estimates that districts spent \$342.5 million on energy in Fiscal Year 2001-02. While most districts have taken some steps to control these costs, others have implemented comprehensive energy management programs that have produced significant savings. The amount of savings that districts can save by implementing an energy management program depends on several factors such as the number, usage, and age of their facilities. However, successful programs can save between 5%-10% annually in energy costs.

¹ Enacted in 2001, the *Sharpening the Pencil Program* ([Chapter 1008.35, F.S.](#)) is intended to improve school district management and use of resources and to identify cost savings. The reviews are conducted by OPPAGA and the Auditor General with 29 districts reviewed to date.

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Key components of a successful energy management program include developing an energy management plan, designating an energy manager, and regularly monitoring program progress. Districts also can partner with energy providers, contract with energy management companies, and create incentive programs for schools.

Establishing energy management plans. A first step in controlling energy costs is developing a written energy management plan that provides an overall framework for reducing energy usage and expenses. A good plan should set districtwide goals and quantifiable objectives, such as reducing energy use by 5%. To ensure broad input and buy-in among district employees, the plan should be developed through a collaborative effort involving district stakeholders (maintenance employees, custodians, site-based administrators, and instructional personnel), utility providers, and other experts on energy conservation. A district's energy management plan should be well publicized and distributed to users that play a key role in implementing the program, such as principals and teachers. Among the districts we have reviewed, the Duval, Sarasota, and Osceola county school districts have strong energy management plans that can serve as examples for other districts.

Designating energy managers. Designating a specific person who is responsible to serve as the district's energy manager helps ensure that planned activities are carried out. A district energy manager should contact peer districts, state and local agencies, utility providers and other stakeholders to identify resources available to the district for effective energy management. For example, the Brevard County School District has a designated energy control manager who is responsible for coordinating and overseeing energy management in all district facilities, and the district has been successful in containing energy usage.

Energy use monitoring. An effective energy management program also includes a mechanism to regularly assess the extent to which planned strategies are implemented and goals and objectives in the plan are accomplished. This information should be shared with school board members and district employees, and used to identify changes or future energy management strategies. While most school districts we reviewed have done some monitoring, others have established strong oversight mechanisms. For example, the Hillsborough County School District's energy management plan specifies that HVAC systems are to be routinely inspected and maintained in order to keep the systems operating as designed, and its maintenance department generates routine reports to verify the energy management system is working within the parameters set in the energy plan.

Implementing districtwide energy management systems. Some school districts have implemented sophisticated energy management systems to control energy usage. For example, some districts have established computer-controlled systems that enable staff to regulate and monitor equipment such as heating and cooling systems for all facilities from a central location. These systems can maintain an energy-efficient temperature for all facilities both during and after normal working hours. These systems also can generate reports on usage trends that allow maintenance administrators to assess major building system conditions and identify inefficiently operating systems that may need service or upgrading. By tracking conditions and maintenance services, these systems also increase service efficiency by helping to eliminate the need for emergency calls.

The Monroe and Broward county school districts have implemented energy management systems to monitor and control energy usage. Because total replacement or installation of a new energy management system can be expensive, some districts such as Osceola have budgeted for system enhancements in their five-year maintenance

work plans. Similarly, the Collier County School District has collected data on major building systems' projected replacement dates, which it uses to forecast capital renewal expenditures for the next 20 years.

Partnering with energy providers. Several school districts have reduced their energy usage and costs substantially by working with utility providers and other organizations to identify energy efficiency benchmarks and implement actions to increase cost-efficiency. Utility companies can provide districts with information on their energy usage, allowing districts to make adjustments as necessary, and also can provide rate reductions and rebates. For instance, the Osceola County School District has an agreement with a local municipal utility provider that includes guaranteed pricing. In this agreement, the district agrees to purchase power exclusively through the provider in exchange for a rate that does not exceed an agreed-upon amount. Osceola also worked out a "demand charge consideration" agreement with a utility provider in which the district receives discounts for using energy during low usage times.² The Broward County School District also has worked with its energy providers to cut costs and has received \$630,640 in energy rebates since 1991 for installing energy-efficient lighting, chillers, air conditioners, and thermal energy storage equipment in its facilities.

Several school districts including Okaloosa have taken advantage of free energy audits offered by utility providers and local universities. These audits can identify and recommend measures districts can take to reduce energy consumption and utility costs. The audits also are valuable in evaluating the success of energy management programs. Energy providers often provide free annual inspections, such as gas companies inspecting gas-powered units and fixtures, and follow up

with reports recommending repair and replacement of equipment.

Some districts also have received assistance from educational consortia in the form of energy grants and educational programs. For instance, the Hamilton County School District entered into an agreement with the Panhandle Area Educational Consortium in 1996 for energy management services. Through this agreement, the district received \$85,000 from a federal grant for initiating energy efficiency projects and the opportunity to apply for further grants through the consortium pool. The district identified the replacement of HVAC equipment at their high school as the first priority for use of these funds. The consortium is presently not offering these grants, but is seeking funding to provide future grant opportunities.

Contracting with energy management companies. Some districts have contracted with private companies for energy management services. These companies evaluate the district's energy usage and equipment, and estimate the potential savings that can be achieved by adopting better energy management strategies. In addition to managing the district's energy usage, these companies provide quarterly reports to monitor use and annual savings targets. Miami-Dade, Brevard, and Franklin county school districts have contracted with energy management companies.

Some companies offer shared savings arrangements in which they are paid through a portion of the energy savings achieved by the district. Some companies also can provide guaranteed minimum savings. For example, the Brevard County School District contracted with a company that offered a guaranteed minimum savings of \$41,106; actual first year savings were \$127,260. Districts interested in these types of agreements should be careful to review their contracts annually to ensure that they receive the cost savings, benefits, and services outlined in the contract.

² The demand charge is related to the maximum demand for electricity that a customer places on the utility's system during the customer's peak use in the billing period.

Creating school-based energy incentive programs. Some school districts have implemented energy incentive programs that allow individual schools to share in the savings that result from controlling utility costs. In these districts, principals are responsible for paying for energy costs from their school-based budgets, which give them an incentive to conserve energy. An essential component such school-based incentive programs is providing training to school personnel and students about program goals and strategies. Some districts provide principals with monthly cost and energy utilization reports to help them monitor program progress.

For example, the Okaloosa County School District implemented a school-based energy incentive program and experienced a 12% decline in energy costs and a 15% decline in all utility costs within six months. The Hillsborough County School District also implemented a school-based energy incentive program whereby schools received half the savings if they reduced energy use by at least 10% over the baseline year. As a result of this program, six Hillsborough County schools received incentive awards and saved the district \$92,786.

Other energy containment measures. Other successful energy savings strategies used by districts we examined are shown in Exhibit 1.

School districts can reduce maintenance staffing and improve productivity

Florida's school districts also incur substantial costs to provide custodial and maintenance services in their educational facilities. Some of the 29 school districts we have reviewed have taken steps to reduce these costs by developing workload formulas to prescribe the number of employees needed for maintenance functions and by developing productivity standards that establish expected lengths of time for repetitive tasks. Districts using these approaches are better able to determine whether they are properly staffed and whether employees are productive on the job. School districts also have improved productivity by standardizing equipment, ensuring appropriate use of overtime, developing and implementing an annual training plan, and obtaining customer feedback.

Exhibit 1 School Districts Have Used a Variety of Methods to Cut Energy Costs

- \$ Maintain indoor temperature at 75-78 degrees during warmer months and 68 degrees in cooler months.
- \$ Initiate a campaign to turn off lights and computers when rooms in district facilities are not in use.
- \$ Routinely replace filters in air conditioning/heating systems.
- \$ Chemically clean all HVAC evaporator and condenser coils approximately every three years for savings of 15-30% in air conditioning costs.
- \$ Insulate roof top air conditioning refrigerant lines.
- \$ Convert constant-volume fan systems to variable air volume (VAV) systems. Equip existing VAV systems with variable frequency drive (VFD) air controls.
- \$ Paint outside air conditioning equipment white to reflect solar heat.
- \$ Paint darker roofs with white elastomeric paint to reflect heat.
- \$ Replace 8-foot, 60-watt, T-12 fixtures with more efficient T-8 fixtures with electronic ballasts for a 30% gain in lighting energy. Payback can be expected in three years.
- \$ Weather-strip door and thresholds.
- \$ Turn down temperatures on water heaters if higher temperatures are not needed. Disconnect those not being used.
- \$ During outdoor sports season, monitor on/off times for gym lights.
- \$ Convert all EXIT signs from incandescent to LED lighting.
- \$ Use thermal ice cooling units to cool buildings during peak energy usage times.

Source: Okaloosa and Indian River County School Districts.

Establishing proper staffing levels through the use of workload formulas. Some districts have used staffing formulas successfully to help determine the number of employees needed for maintenance functions and enable administrators to assign employees in a logical and equitable manner across schools. Benchmarks exist that districts can use as a starting point to develop these staffing formulas (see Exhibit 2). For instance, the Department of Education recommends a standard of one custodian per 19,000 square feet. In addition, the *American School and University Magazine* annually publishes national medians that can be used by school districts in developing their standards. In 2002, the national industry median was one custodian per 24,167 square feet.

**Exhibit 2
Florida and National Standards Exist for
School Custodial and Maintenance Staffing**

	Area Maintained Per Worker	
	Florida Department of Education	National ¹
Custodian	19,000 square feet ²	24,167 square feet ³
Maintenance Worker (General)	45,000 square feet	95,120 square feet ⁴
Groundskeeper	40 acres	36 acres

¹ Results of the 2002 national cost study of maintenance and operations spending by schools conducted by the *American School and University Magazine*.

² The Department of Education’s staffing formula provides one custodian for each 19,000 square feet plus a modifier. This modifier provides an additional 0.5 custodian for elementary schools, 0.75 for middle schools, and 1 for high schools.

³ The median square footage ratio for custodians has increased nationally over the past three years from 21,429 to 24,167 square feet per custodian.

⁴ The *American School and University Magazine* cautions the use of this figure since job responsibilities for maintenance professionals vary significantly from district to district.

Source: Florida Department of Education and *American School and University Magazine*.

However, many districts we reviewed had not adopted the DOE or national benchmarks in developing staffing levels. Instead, these districts relied upon local standards such as assigning a set number of custodians per school regardless of the facility’s size or age. In

some cases, districts can realize substantial savings by readjusting their staffing. For example, the Lee County School District saved \$480,000 annually by implementing our recommendation to modify its custodian staffing ratio.

The Department of Education also should examine its staffing benchmark to determine whether it should be adjusted due to improvements in cleaning equipment, supplies, and techniques that allow for more efficient cleaning and maintenance. We noted that some districts have been able to set workload standards that exceed the department’s ratio of one custodian per 19,000 square feet. For example, the Okaloosa school district successfully uses a ratio of one custodian per 19,879 square feet and has well-maintained and clean facilities.

Developing employee productivity standards. Districts also can achieve savings by establishing employee productivity standards that set benchmarks for the length of time a worker should be able to complete certain common tasks such as replacing air conditioner filters, changing light bulbs, and replacing smoke detectors. Employee productivity standards help to set clear expectations and give managers consistent tools for assigning work and evaluating employee productivity. For instance, if an employee consistently does not complete all assigned tasks on time, managers can assess whether the employee needs additional training, reassignment, or to be terminated. The Manatee County School District effectively uses task-oriented productivity standards and has reported a 5% to 35% increase in productivity, depending on the task. The Lee County School District similarly reported saving \$250,000 over a three-year period from increased staff efficiency through implementing productivity standards for common maintenance tasks.

Districts can use several sources of information to develop employee productivity standards. For instance, districts can use guidance materials provided by the Department of

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Education, such as the *Maintenance and Operations Administrative Guidelines for School Districts and Community Colleges*. Districts also can use historical data contained in their work order systems as a starting point for defining benchmark standards. From this data, time requirements for a variety of tasks, along with benchmark standards, can be developed. The Hillsborough and Brevard county school districts developed productivity standards based on information reported by private companies that collect estimated cost and time data on construction, facilities, and maintenance trades. As shown in Exhibit 3, this data identifies the amount of time needed to complete common maintenance tasks and can provide the basis for productivity standards.

Exhibit 3 Examples of Maintenance Standards

Task Description	Job Allocation Times Taken from Industry Standards (in Labor Hours)
Replace boiler circulator pump	7.80
Install weather strip	3.40
Refinish concrete floor	4.16
Replace emergency fixture	2.69
Replace smoke detector	1.75

Source: RS Means Corporation.

Standardizing equipment. Some districts have standardized equipment and building systems to reduce employee training and avoid the costs of maintaining multiple parts inventories. These districts' construction and maintenance departments worked cooperatively to coordinate construction and maintenance projects and maximized the ability to maintain new and renovated facilities and better standardized building management systems. For example, the Wakulla and Okaloosa county school districts standardized equipment and building systems to reduce operating costs.

Other districts have standardized replacement chillers by purchasing a single brand, which reduced the need to store multiple manufacturers' repair and replacement parts.

Ensuring appropriate use of overtime. Several districts we examined were experiencing increases in the number of overtime hours due to short-term, nonrecurring events such as emergency situations that required employees to work additional hours. For example, one district was mandated to correct code violations by a certain deadline, which resulted in employees working overtime to complete the task. Given that employees are generally paid at a higher hourly rate during overtime periods, districts have the potential to save substantial money by limiting inappropriate or excessive overtime.

Some districts have taken steps to reduce overtime hours. These include placing limits on overtime hours and closely monitoring overtime use to identify trends and excessive or inappropriate use of overtime. Districts that experienced increasing overtime hours assessed employee productivity and evaluated whether it would be more cost-effective to hire additional staff or outsource certain functions.

Developing and implementing an annual training plan. Some school districts have benefited from strong training programs for maintenance and operations employees. These districts use training to establish clear job expectations for employees, which helped to reduce the number of call-backs to correct work that had been improperly done.

For example, the Duval County School District has used a combination of in-house staff development programs and safety videos to train employees. Contractors who regularly visited the district also provide training for technical trades. Foremen maintain records to ensure that each maintenance employee receives the required training and that the training received is appropriate to job requirements.

Obtaining customer feedback through surveys and good communication methods. Some districts use survey results to gauge how well the maintenance department is serving its customers and also to make needed adjustments. Districts have developed satisfaction survey instruments with input from maintenance employees and include questions relating to quality, timeliness, and overall facility appearance and cleanliness.

To be effective, the type of feedback mechanism used be tailored to the size of each district. For instance, one relatively small district (the Wakulla County School District) monitors customer satisfaction through an

informal customer feedback process based on conversations with principals and teachers. Larger districts typically need a more formal process to gauge the satisfaction level of school principals and school-based employees with facility maintenance. The Hillsborough County School District annually surveys personnel (principals and teachers) on custodial and maintenance quality. In addition, principals are provided with maintenance evaluation cards that they can send in any time throughout the year. Findings from these survey instruments are used to improve procedures and implement program improvement.

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