

Energy & Environmental Conservation Workshop

Facilities Management Division

*Most school districts spend more money
on energy than they do on school supplies.*

November 15, 2006

School District of Palm Beach County

Outline

- Goals for today
- Facilities Management's Energy and Environmental Conservation Team
- What we are already doing
- Explore some of the possibilities
- Suggested next steps

Goals for Today

1. Explain what we are currently doing so Board Members can be in the position of explaining the District's efforts to others.
2. Educate the public about the efforts of the District to use their funds wisely.
3. Set the stage for the actions which will follow including development of relevant policies and investment in additional conservation efforts as it relates to facilities and their occupants.

Facilities Conservation Team

- Charlie Cromatie, M&PO
- Chris Skerlec, ECO
- Devra Cornman, Program Management
- Eileen Lacey, Program Management
- Jacques Brisson, M&PO
- Lee Kapp, ECO
- Mark DeStefanis, M&PO
- Mark Starkoski, M&PO

Facilities Conservation Team

- Michael Hall, Program Management
- Paul Straus, ECO
- Ralph Bair, M&PO
- Randy O'Hara, M&PO
- Rohan Parsons, M&PO
- Victor Chodora, Building Department
- Wayne Atzrodt, Treasury
- Joseph Sanches, Facilities Management

Background

- Over 26 million square feet of buildings
- More than 1,400 buildings
- Over 4,400 acres of land

Background

FY 2007 Budget (\$ mil.)

\$44.1 Utilities (electric, water/sewer, trash)

\$40.3 Instructional Staff Training

\$25.8 Community Services

\$24.5 Vocational 6-12

\$21.9 Guidance Counselors

\$18.6 Instructional Media Services

\$14.9 Adult Education

\$14.6 Choice/Magnet

\$9.3 Physical Education

\$6.7 Art

\$6.7 Music

\$4.5 K-12 Reading

What we are doing: Buildings

Chapter 13 of the Florida Building Code requires new construction to comply with minimal energy efficiency standards and is introduced as follows:

13-100.2 Intent.

The provisions of this code shall regulate (1) the design of building envelopes for adequate thermal resistance and low air leakage and (2) the design and selection of mechanical, electrical, and illumination systems and equipment which will enable the effective use of energy in new building construction, additions, alterations or any change in building configuration.

13-101.0 General.

This code is a statewide uniform code and shall not be made more stringent or lenient by local government. The code provides for a uniform standard of energy efficiency by, at a minimum, setting forth minimum requirements for exterior envelopes, lighting, electrical distribution, and selection of heating, lighting, ventilating, air conditioning and service water heating systems. It shall apply to all new buildings, to additions to existing buildings and manufactured homes, to renovations to existing buildings, both public and private, with certain exceptions, to changes of occupancy type, to the site-installed components and features of manufactured homes at their first set-up, and to the installation or replacement of building systems and components with new products for which thermal efficiency standards are set by this code.

What we are doing: Buildings

- Electronic ballasts with T8 lamps
- Low flow devices
- Waterless urinals
- LED exit lights
- High efficiency chillers – earned substantial rebates from FPL
- Energy Management System
- Computerized utility database tracking every account at every school for excesses.
- Use the best utility rate structures and get the best rates from FPL.
- We use statistical data (i.e. cubic/yards/student) to reduce costs.

What we are doing: Buildings

- We use natural gas for water heating and cooking to lower costs.
- We do not use city water for irrigation.
- We use high intensity discharge lighting (metal halide and high pressure sodium) for exterior lighting.
- New projects require occupancy sensors to control the lights in classrooms and offices.
- We use an EMS to control the lights in the corridors, gym, media center, and other large multi-purpose spaces.
- We have implemented preventative maintenance programs for HVAC systems and the building envelope.

What we are doing: Buildings

- Use of EMS to control the exterior lights.
- Lighting retrofit projects.
- Use energy efficient step down transformers.
- We used recycled, crushed concrete for road base on Congress MS.
- We allow the use of recycled materials to make wheel stops.
- The Civil Design Criteria encourages use of xeriscape planting materials to reduce irrigation volume and system cost.

What we are doing: Buildings

- Using building commission on all new projects over \$5 million.
- We have bids for trash and propane to lower costs.
- We have been recognized by the EPA, Solid Waste Authority and magazines for our programs.
- We have co-located schools with parks to minimize development.
- We will be building the first LEED-certified K-12 school in Florida.

What we are doing:

Working with Building Occupants

- FPL provided daily "tips" which promoted energy awareness during Energy Conservation Week, October 5-11.
- We recycle 3,000 tons of paper products per year which equates to 52,000 trees saved. We save over \$300,000/yr by recycling.
- Some schools receive money for recycling high grade paper and newspaper
- We have built bio-ponds, planted memorial trees and other plantings on campuses.
- Provide excess latex paint to the Solid Waste Authority which recycles it.

What we are doing: Working with Building Occupants

- We have worked with schools to build 116 butterfly gardens.
- Obtained grants for trees from Keep Palm Beach County Beautiful.
- Examples:
 - Verde has applied for a grant for solar energy project
 - Wm. T. Dwyer's Finance Academy is working on a Wind Power Project with FPL

Planting Trees and Shrubs



Some Possibilities

- Increasing Energy & Environmental Conservation can:

- Save money
- Improve indoor air quality
- Help schools
-
-
- Improve the environment
- Provide educational opportunities
- Teach environmental stewardship

It's the right thing to do!

Some Possibilities: Buildings

- Florida Solar Energy Center is funding the installation of photovoltaic demonstration sites at schools via its Sunsmart Program. The installation will be able to provide the power to support a small portion of the selected school's energy needs. FPL has offered to provide the additional funding to minimize the cost to the School District.
- Use of recycled materials in the asphalt pavement mix and concrete sidewalk mix.
- Use of recycled fiber reinforcement in our sidewalk concrete.

Some Possibilities: Buildings

- Additional requirements to install xeriscape at more locations.
- Better control of the HVAC system in the portables.
- Use of the generator sets for peak demand shaving.
- Use of water sensors to minimize irrigation during wet weather.
- Installation of windmills/solar cells to produce power.
- Increase spending on lighting retrofit projects.
- Add the EMS to the remaining 15% of the schools that do not have it.

Some Possibilities: Buildings

- Creating our own recycled concrete storage area for re-use on our own projects.
- Specify use of sustainable building materials.
- Use of reclaimed water for irrigation and toilet flushing.
- Build schools on brownfield sites and repurpose buildings when feasible.
- Establish a minimum standard (ex. min. number of LEED points) for all newly constructed buildings.

Some Possibilities: Buildings



Greening America's Schools

On average, building green would save enough money to pay for an additional full-time teacher.

Gregory Kats

Sponsoring Organizations:

American Federation of Teachers
American Institute of Architects
American Lung Association
Federation of American Scientists
US Green Building Council

October 2006
A Capital E Report
www.cap-e.com

This national review of 30 green schools demonstrates that green schools cost less than 2% more than conventional schools - or about \$3 per square foot (\$3/ft²) - but provide financial benefits that are 20 times as much. Green schools not only save money, but also enhance student learning, reduce health and operational costs and, ultimately, increase the quality of life for everyone.

Table A: Financial Benefits of Green Schools (\$/ft²)

Energy	\$9
Emissions	\$1
Water and Wastewater	\$1
Increased Earnings	\$49
Asthma Reduction	\$3
Cold and Flu Reduction	\$5
Teacher Retention	\$4
Employment Impact	\$2
TOTAL	\$74
COST OF GREENING	(\$3)
NET FINANCIAL BENEFITS	\$71

Some Possibilities: Buildings

- Green schools use an average of 33% less energy than conventionally designed schools
- The 30 green schools evaluated achieved an average water use reduction of 32%.
- As a rough estimate, a green school could lead to the following annual emission reductions per school:
 - 1,200 pounds of nitrogen oxides (NO_x) – a principal component of smog.
 - 1,300 pounds of sulfur dioxide (SO₂) – a principal cause of acid rain.
 - 585,000 pounds of carbon dioxide (CO₂) – the principal greenhouse gas and the principal product of combustion.
 - 150 pounds of coarse particulate matter (PM₁₀) – a principal cause of respiratory illness and an important contributor to smog.

Some Possibilities: Buildings

- An analysis of two school districts in Illinois found that student attendance rose by 5% after incorporating cost effective indoor air quality improvements.
- A study of Chicago and Washington, DC schools found that better school facilities can add 3 to 4 percentage points to a school's standardized test scores, even after controlling demographic factors.
- A recent study of the cost and benefits of green schools for Washington State estimated a 15% reduction in absenteeism and a 5% increase in student test scores.

Some Possibilities: Buildings

- Several states and agencies have established minimum requirements for sustainable design and construction that exceed Building Code requirements:
 - U.S. General Services Administration - LEED
 - California – CHPS
 - Oregon - SEED

Some Possibilities: Working with Building Occupants

- We can go into other areas of recycling, such as, composting, aluminum cans and plastic and glass. Some districts have set a goal of recycling up to 50% of their waste.
- By increasing recycling capacity by 10% and by stopping a 10% attrition rate we could save an additional \$60,000/yr
- Establish voluntary programs that acknowledge and reward schools for participating in efforts to reduce utility cost to the district.
- Participate in programs such as Ecology Kids, Energy Star and Earth Day Every Day.
- Share information through newsletters and websites.
- Use construction projects and consultants for field trips, guest speakers, and living labs.

Some Possibilities: Working with Building Occupants

- Energy and Environmental Conservation relates to:
 - Mathematics
 - Science
 - Social Studies
 - Health
 - Engineering
 - Various Academies & Programs (Environmental, Construction, Finance, Pre-Medical, Information Technology)

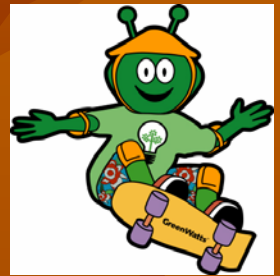
Some Possibilities: Working with Building Occupants

- Reduce use of a/c during off peak hours (weekends/holidays).
- Use portables instead of main buildings for small groups during off hours.
- Manually turn off lights.
- Increase recycling programs.
- Joint effort with FPL - By creating "teams" at seven (7) "pilot" schools, we will work with them to:
 - a) Identify areas of opportunity for electricity savings
 - b) Determine methods to control electricity usage
 - c) Develop control plans to be utilized at the school site to track adherence
 - d) Compare usage before and after with a goal of 5 % reduction in electricity usage

Some Possibilities: Working with Building Occupants

Energy Patrol

- An energy patrol is a group of students who monitor energy waste in classrooms and other rooms in the school. Energy patrol students help schools save energy, reduce utility bills, and conserve natural resources.



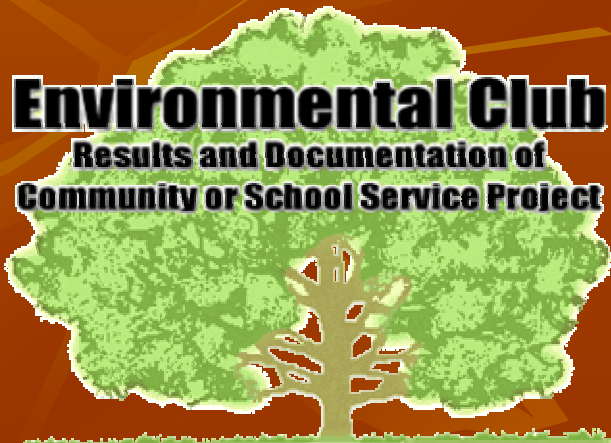
District of Columbia Schools Energy Patrol The Energy Patrol is a program covering 123 public schools. Students are taught to identify energy wastes in their schools and homes. Students monitor school facilities, assisting where possible in the reduction of energy usage and report where additional assistance may be needed. Certificates are awarded to students at the end of the school year who demonstrate the best use of energy efficiency tips.

Environmental Clubs

Renewable Energy



Plant Trees



Clean Beaches



Recycle

Grants
Available



Environmental Academies & Clubs

Forest Hill High School

Glades Central High School

Jupiter High School

Guest Speakers



Energy News

CHRISTINA SCHOOL DISTRICT

ENERGY CONSERVATION PROGRAM

DID YOU KNOW?

- Energy production and use account for nearly 80 percent of air pollution.
- Gas-filled, double pane windows with low-e coatings can lower your cooling bill as much as 30 percent.
- Your refrigerator alone (which is on 24 hours a day) accounts for 10 percent of the total home electricity bill.

The end of the month of May marks the end of the second year in the Energy Conservation Program. The district's cost avoidance goal for year two was set at \$880,000. With only a portion of May's utility bills in, the cost avoidance is approximately \$884,000. This is money that the district avoided having to pay the utility companies because of energy saving activities. The successful cost avoidance is a result of combined efforts of building faculty and staff, maintenance personnel, custodial staff, child nutrition services staff and administration.

The district's total cost avoidance for the two years it has been using the energy conservation program is approximately \$2.7 million. Thank you for your continued support and dedication to this important program!

Cost Avoidance

Year 1: June 2004-May 2005 Year 2: June 2005-May 2006

\$888,122

\$884,000

10%

21%

*reflects only a portion of May's utility bills

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If you have energy related news you would like to share, contact the Energy Manager!



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Green Thumb Tip

Lawn watering is best done between 4:00 a.m. and 6:00 a.m.



- Adopting ravines, parks and highways
- Energy audits
- Composting
- School ground naturalization
- Waste reduction
- Transportation alternatives
- Advocacy
- Tree planting
- Speakers Series

way to get started. You can map your school's impact on the environment by measuring its "Ecological Footprint". This is a great way to focus your E-Club and give you a starting point for further action.

Recycling programs are simple start-up programs that set springboard for further action. Although all schools are required to—and most that do, run inefficient programs. This program environment clubs. Fundraising for environmental action & areas of event planning, proposal and report writing.

Establishing gardens or tree planting help create a visible beautification and sequestering of CO₂ and create visible, your community. Critically examining consumer issues as students to confront the inextricable linkages between development introduces them to public speaking at events and meetings complexities of the political process.

Club members often develop a sense of community and an worthwhile accomplishments, build confidence, and can gain population on important initiatives. Beware though! Don't let Club bureaucracy or Robert's Rules or order. Make sure you

THE
BEX II Levy
Oversight
Committee
Building
Rentals/Leases
Capital Leases
Capital Projects
Construction
Terms
Contractor
Info/Bid
Design
Standards
Drinking Water
Quality
Facility
Condition Report
Facilities Map
(pdf)
Facilities Master
Plan
News &
Resources
Playfield
Projects

The Energy Patrol Teacher's Manual

Hi, I'm Sunny the GreenWatt, and I want to turn you on to SAVING ENERGY.

The UES Energy Patrol Program is a creative way to save your school money by reducing energy use. Take a look!

The Energy Patrol, sponsored by UniSource Energy Services, provides an educationally enriched experience for students and monetary savings benefits for the participating school.

The program enlists students to patrolling the hallways looking and other energy-wasting practices and energy management system report inappropriate thermostat

yl

key is spent on utility bills than on cost or most school districts is energy.

it the lights when out of the classroom an average classroom, it will cost the number of classrooms in your district.

program will help to cut energy use at saving energy, our program offers training responsible citizens.

teams of 10 – 20 students who check lighting. UES provides the needed materials (a lanyard and badge holder), reclosers, classrooms, office areas, portables, etc.

Seattle Public Schools RESOURCE CONSERVATION

ENERGY CONSERVATION

WATER CONSERVATION

ENERGY CONSERVATION

Seattle Public Schools is actively promoting energy conservation. Conserving energy saves money, reduces pollution, and preserves natural resources.

Pasco County Schools: Benefiting from the Education Energy Managers Association of Florida

Pasco County Schools are taking big steps in all aspects of energy efficiency, working as a Rebuild America partner through the "umbrella" strategic partnership of the Education Energy Managers Association of Florida (EEMAF). EEMAF is a growing organization that currently represents two-thirds of the school districts in Florida. Pasco County is a charter member of EEMAF and has representation on its Board of Directors.



Christina School District Energy CAP

Cost Avoidance Program

Cost Avoidance Summary - Buildings

Sorted by Building

Building Code & Name	Cost Without CAP	Actual Cost	Cost Avoidance \$	Cost Avoidance %
AUT - AUTISTIC	\$5,709.00	\$7,803.09	(\$2,093.73)	(35.25%)
BAN - BANCROFT ELEMENTARY	\$20,102.00	\$11,936.28	\$8,165.72	40.61%
BAY - BAYARD ELEMENTARY	\$26,006.05	\$14,042.33	\$11,963.72	46.00%
BRAD - BRADER ELEMENTARY	\$12,507.45	\$10,815.31	\$1,692.14	13.53%
BROOK - BROOKSIDE ELEMENTARY	\$4,789.53	\$4,411.46	\$378.07	7.89%
CHR - CHRISTIANA HIGH SCHOOL	\$43,671.86	\$29,383.56	\$14,288.30	32.70%
DOUG - DOUGLASS SCHOOL	\$2,294.99	\$2,307.10	(\$12.11)	(3.14%)
DOWN - DOWNES ELEMENTARY	\$10,596.13	\$11,344.79	(\$748.66)	(7.07%)
DREW - DREW EDUCATIONAL SUPPORT CENT	\$5,426.84	\$3,755.19	\$1,671.65	30.30%
EDEN - EDEN FACILITY	\$7,353.93	\$4,095.86	\$3,258.07	44.30%
ELB-PAL - ELBERT-PALMER ELEMENTARY	\$5,207.06	\$4,602.02	\$605.04	11.50%
GALL - GALLAHER ELEMENTARY	\$4,828.17	\$3,653.85	\$1,174.32	24.33%
GHS - GLASSGOW HIGH SCHOOL	\$43,000.00	\$45,084.14	(\$2,083.45)	(4.79%)
GMS - GAUGHER-COBBS MIDDLE SCHOOL	\$31,100.00	\$22,073.12	\$9,026.88	29.13%
JONES - JONES ELEMENTARY	\$12,008.00	\$6,972.81	\$5,035.19	41.88%
KEENE - KEENE ELEMENTARY	\$8,783.64	\$6,607.70	\$2,175.94	24.77%
KMS - KIRK MIDDLE SCHOOL	\$22,123.64	\$22,597.33	(\$473.69)	(2.14%)
LEAS - LEASURE ELEMENTARY	\$12,555.46	\$8,705.56	\$3,849.90	30.66%
MACLARY - MACLARY ELEMENTARY	\$3,748.03	\$3,646.02	\$102.01	(2.69%)
MARSHALL - MARSHALL ELEMENTARY	\$11,022.67	\$5,586.13	\$5,436.54	49.26%
MOVEY - MC VEY ELEMENTARY	\$634.99	\$1,081.27	(\$446.28)	(70.25%)
NETWORKS - NETWORKS	\$10,597.46	\$610.33	\$9,987.13	94.25%
NHS - NEWARK HIGH SCHOOL	\$55,571.69	\$39,234.30	\$16,337.39	29.39%
PUL - PULASKI ELEMENTARY	\$9,139.01	\$11,498.06	(\$2,359.05)	(25.48%)
PYLE - GARA WEBB PYLE ES	\$4,607.25	\$6,282.79	(\$1,675.54)	(36.36%)
SHUMED - SHUMED MIDDLE SCHOOL	\$14,730.08	\$12,987.86	\$1,742.22	11.83%
SPOFFICES - STUDENT SERVICES	\$1,010.80	\$652.68	\$358.12	35.44%
STERCK - STERCK SCHOOL	\$13,362.55	\$10,591.20	\$2,771.35	20.74%
STU - STUBBS ELEMENTARY	\$7,733.57	\$7,312.86	\$420.71	5.44%
TRANS - TRANSPORTATION	\$915.44	\$884.26	\$31.18	3.41%
WEST - WEST PARK ELEMENTARY	\$17,978.24	\$11,118.13	\$6,860.11	38.19%
WILSON - WILSON ELEMENTARY	\$4,538.70	\$5,388.02	(\$849.32)	(18.88%)
Totals:	\$447,826.11	\$340,230.81	\$107,595.30	23.80%

Notes: Billing Period Equal To 200604

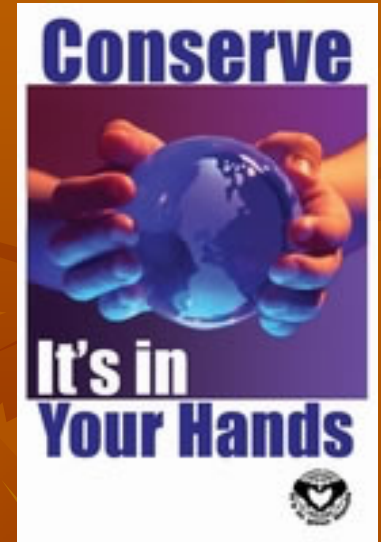


CAP 01B

Cost Avoidance Summary - Buildings

Proposed Next Steps

- Fund building occupant programs through energy rebates from FPL - \$25,000.
- One position which will be more than paid for by the savings.
- Establish policies and guidelines that address:
 - Sustainable design & construction practices
 - Energy conservation
 - Resource conservation (water, recycling, products with recycled content)
 - Indoor air quality





Questions & Answers