Energy Management in Poudre School District

Kentucky High Performance School Buildings Workshop
Frankfort, Kentucky
May 10-11, 2005
Make Commitment

Assess Performance and Set Goals

Create Action Plan

Implement Action Plan

Evaluate Progress

Recognize Achievements
Make Commitment

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Make a Commitment!

✓ Catalyst
  • 1 Million Square Feet
  • Budget Constraints
  • Opportunity
  • Conservation and Stewardship

✓ Board of Education Policy ECF-Energy Conservation
  http://www.psdschools.org/psdinfo/policies.aspx?policyid=139

“The Board of Education shall ensure that the district conserves energy and natural resources while exercising sound financial management. The Board believes that public education should provide leadership in developing a realistic energy use ethic and awareness of energy needs and their associated costs.”
June 2000

Poudre School District is committed to being a responsible steward of our natural resources and believes that public education should provide leadership in developing an ethic of sustainability in all of its practices. The District has both Energy Conservation and Waste Management policies, making environmental stewardship an integral part of the physical plan operation.

The purpose of the Sustainable Design Guidelines is to provide direction for applying these policies to the construction of new facilities and renovation of existing schools.

As stewards of the natural environment, we challenge the design community to help us build better schools. We believe that by working together in an integrated approach, we can build higher performance schools that provide a superior learning environment, while reducing energy and natural resources.

We recognize that sustainable design may require a fundamental shift from certain aspects of conventional design and construction. However, we stand committed to sustainable design and are confident it will yield positive outcomes for our students and the community. Poudre School District is excited about this new direction. We look forward to working with you to achieve our goals of designing, building, and learning from sustainable schools.

Sincerely,

Don Unger, Ph.D.

Superintendent of Schools

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- Research funding for energy savings/sustainable design projects
- Improve district wide benchmarking scores
- Certify all eligible sites as Energy Star Buildings
- Increase awareness and support district wide
- Reduce electric usage district wide by 15% using benchmark
- Secure a long term source of funding for energy efficiency projects
- Develop document to track and report district wide energy savings
- Establish and sustain partnerships with utility providers and others
Energy Modeling
1990 vs. 2002 Prototype

**1990 Prototype**
- 51,384 square feet
- No Air Conditioning
- Daylighting provided by “light monitors”
- “Energy Star” Award Winner…

**2002 Prototype**
- 63,000 square feet
- Fully Air Conditioned
- “Cool Daylighting” provided by “clerestories”.
- “Micro-Loaded”
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- Energy Manager Position and Energy Efficiency Team
- Create Measurement Tools and Monitoring Process
- Establish Procedures for Implementation of Energy Policy
- Efficiency Project Goals
  - Rule of 72
- Secure Funding and/or Process
  - Performance Contracts
  - Energy Service Companies – ESCo
  - Internal Funding
  - Grants
  - Demand Side Management Opportunities – DSM
- Specialized Contracts with Utility Provider
  - Rate Structure
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✓ Energy Efficiency Coordinator per Site
✓ Judicious Use of Energy Systems at each Site
  • Joint responsibility for Principal, Custodian, Coordinator & Energy Manager
✓ Curriculum Developed to Ensure Student Participation
✓ Energy Conservation Groups
  • Energy Rebates
✓ Maintenance of Equipment
  • Reroute Percentage of Energy Savings into Maintenance
✓ Energy Efficiency Design in New and Remodel Construction
✓ Priorities to Purchasing Department for Acquisition of Materials
  • Reusable
  • Returnable for reuse
  • Recyclable
  • Disposable
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- Review the Costs
- Compare to the Goals
- Make Adjustments when Necessary
Continuous efforts by both the schools and the Energy Efficiency Team, continues to stabilize electrical use even with added schools and square footage.

PSD's HVAC procedures and conservation efforts continue to stabilize the use of natural gas even with added schools and square footage.

Through Outdoor Service's improved irrigation procedures, we were able to reduce our water usage substantially from previous years.
Annual Total Utility Cost Breakdown
Poudre School District

- Trash: $124,782 (4%)
- Water: $204,454 (8%)
- Electricity: $1,220,246 (41%)
- Natural Gas: $760,002 (26%)
- Sewer: $71,037 (3%)

$2,982,090 — Total Utility Bill for
Year Ending September, 2003
Annual Total Utility Cost Breakdown
Poudre School District

- Natural Gas $872,020 (25.4%)
- Sewer $862,228 (25.5%)
- Water $203,258 (6.2%)
- Trash $119,626 (4.0%)
- Electricity $1,277,473 (39.8%)

$3,288,511 --- Total Utility Bill for Year Ending September, 2004
Elementary Energy Costs

Cost per SF
- PSD Average ES: $0.67
- 1990 Prototype: $0.42
- 2002 Prototype Model: $0.35

Utility Cost per year
- PSD Average ES: $28,711
- 1990 Prototype: $21,491
- 2002 Prototype Model: $22,000

Legend:
- PSD Average ES
- 1990 Prototype
- 2002 Prototype Model
Total Utility Cost

- Sept 2004
- Oct 2004
- Nov 2004
- Dec 2004
- Jan 2005

- $0.00
- $5,000.00
- $10,000.00
- $15,000.00
- $20,000.00
- $25,000.00
- $30,000.00

Fort Collins HS
Fossil Ridge HS
FRHS vs FCHS

Electrical consumption 9/1/04 to 9/10/04
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“Awards not only recognize and draw attention to excellence, they are a proven way to encourage and inspire thinking beyond convention and exploration of new ways and means.”

School Running on Wind

“Students help to power Rocky on wind energy for a month.”
Fort Collins Coloradoan - April 11, 2005

RMHS Students Buy Wind Energy
PSD Web Site – News & Events

Rocky Mountain High School's Environmental Club students and teacher saved about $1,000 in electric utilities last year by championing their school’s ‘Energy Rules’ energy rebate program, and decided to use the rebate along with matching funds from PSD to purchase wind power to operate their school in April in celebration of the 35th anniversary of Earth Day 2005. RMHS received a district-wide award for energy conservation in both the Spring of 2003 ($3000) and Spring of 2004.

“The money we will spend for the wind power is from 2003, and the students decided to direct this money to wind power, which is just outstanding,” says Dave Swartz, RMHS science teacher.
plus a little National Recognition doesn't hurt either...

- 2001 Colorado Renewable Energy Society Recognition Award
- 2001 Environment Protection Agency “Energy Star” Award
- 2002 American Institute of Architects Design Merit Award
- 2002 American Association of School Administrators Citation Award
- National Renewable Energy Laboratory Case Study
- 2003 ASID 1st Place: Sustainable Project
- 2003 ASID 2nd Place: Sustainable Space
- 2004 International Federation of Consulting Engineers Case Study presented in Copenhagen, Denmark
- 2005 International Federation of Consulting Engineers Case Study to be presented in Beijing, China
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