



ENERGY STAR

Partners of the Year

April 20, 2005

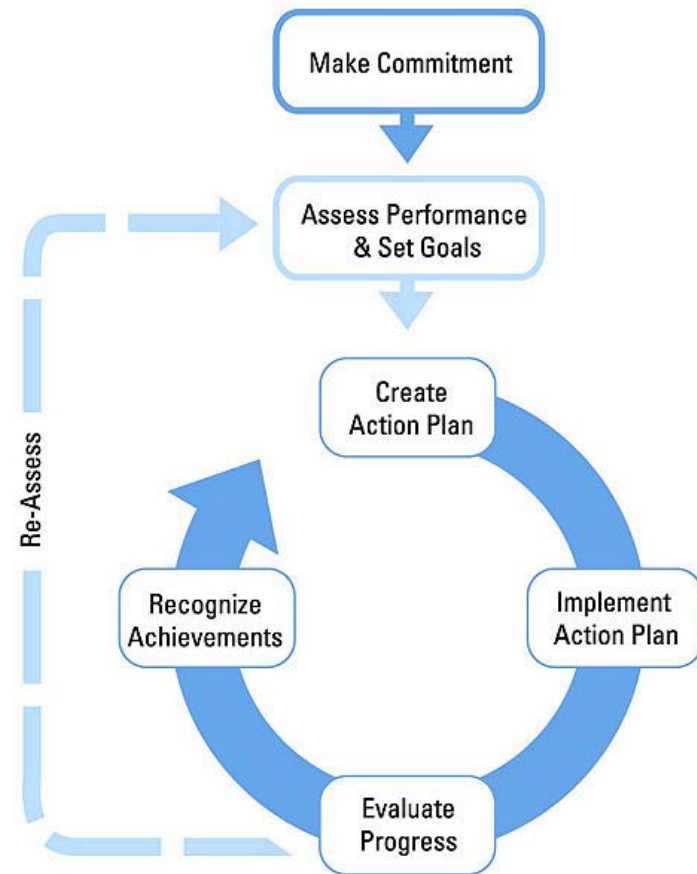
Call-in Number: 1-800-914-3396

Access Code - 9307720

About The Web Conferences



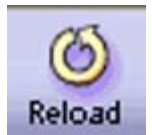
- **Monthly**
- **Topics are structured on a strategic approach to energy management**
- **Help you continuously improve energy performance**
- **Opportunity to share ideas with others**
- **Slides are a starting point for discussion**
- **Open & Interactive**



Web Conference Tips



- Mute phone when listening! Improves sound quality for everyone.
- Turn Pop-up blockers off.
- If slides are not advancing, hit reload button or close presentation window and press the launch button again.



Web Conference Tips



- Chat Feature



- Presentation slides will be sent by email to all participants following the web conference.
- Hold & Music – If your phone system has music-on-hold, please don't put the web conference on hold!



Today's Web Conference



- Welcome
- Jean Lupinacci – ENERGY STAR
- E.J. Hilts – Marriott International
- Thomas Fernandez – Colorado Springs School District 11
- Questions & Discussion
- Announcements

ENERGY STAR Awards



- Across all partnership categories
- Large and small organizations
- Public Institutions and corporations
- Over 12 award winners for corporate energy management in 2005.

ENERGY STAR Awards



Gives partners an opportunity to:

- Be distinguished as an environmental leader
- Gain public recognition for superior energy management program
- Create momentum at high levels of organization
- Secure additional resources to leverage their programs
- Recognize employees

ENERGY STAR Awards



Gives EPA an opportunity to:

- Identify leadership characteristics
- Learn from partners
- Create incentives for energy efficiency upgrades
- Reward environmental protection
- Reinforce achievements of voluntary approach

2005 Awards



Categories

- Leadership in Energy Management
- Excellence in Business & Institutional Outreach
- Sustained Excellence In Energy Management

2005 Award Criteria



1. Organizational Commitment
2. Organizational-wide Energy Use
3. Energy Benchmarking
4. Implementation Approach & Value of Achievements
5. Communications

Characteristics Of Winners



- Energy manager with authority across organization
- Solid senior management support
- Measured performance and sustained reductions
- Unique efforts to motivate and train employees
- Internal educational and incentive programs
- External communication with customers, tenants, community

2005 Award Winners



Leadership in Energy Management:

- California Portland Cement Company
- Colorado Springs School District 11
- Giant Eagle, Inc.
- Marriott International
- New York-Presbyterian Hospital
- The Saunders Hotel Group
- Toyota Motor Manufacturing North America
- Transwestern Commercial Services

2005 Award Winners



- Sustained Excellence in energy management
 - continuous improvement demonstrated over several years
 - consistently strong energy programs
 - establish a benchmark for leadership

2005 Award Winners



Award For Sustained Excellence

- 3M
- Eastman Kodak Company
- Food Lion
- USAA Real Estate Company
- Servidyne Systems

Award PSA



3M
Asteria Homes
Austin Energy
Avista Advantage
California Portland Cement Company
Cambridge Homes
Cenex U.S.A., Inc.
CenterPoint Energy
Colorado Springs School District 11
D.R. Horton, Inc. - Sacramento Division
David Powers Homes
Eastman Kodak Company
Ecoia Homes
Energy Sense
Food Lion, LLC
GE Consumer and Industrial
Giant Eagle, Inc.
Gorall Enterprises, Inc.
Governor Robert L. Ehrlich Jr. and the Maryland Energy Administration

Guaranteed Watt Saver Systems - West, Inc.
Lennox Industries, Inc.
Love's Companies, Inc.
Marriott International, Inc.
Maytag Corporation
MidAmerican Energy Company
Nevada ENERGY STAR Partners
New York-Presbyterian Hospital
New York State Energy Research and Development Authority
NSTAR Electric & Gas Corporation
Office of Clean Energy, New Jersey
Board of Public Utilities
Pacific Gas and Electric
Panasonic
Pardee Homes
San Diego Gas and Electric
Santitas Hotel Group
See Gull Lighting Products, Inc.

Stearns, Roebuck and Co.
Servidyne Systems, LLC
Southern California Edison Company
Southern California Gas Company
Sponsoring Organizations of NEEP
SYLVANIA
The Home Depot
Toyota Motor Manufacturing North America, Inc.
Transwestern Commercial Services
TXU Electric Delivery
USAA Real Estate Company
Veridian Homes
Whirlpool Corporation
Wisconsin Focus on Energy



CONGRATULATIONS TO THE 2005 ENERGY STAR® AWARD WINNERS

For helping Americans prevent greenhouse gas emissions equivalent to those from 18 million cars and for protecting our environment for generations to come, ENERGY STAR is a program administered by the U.S. Environmental Protection Agency and the U.S. Department of Energy, designed to help businesses and individuals protect the environment through superior energy efficiency. For more information, visit www.energystar.gov.



Other Recognition



- EPA offers recognition for achieving energy performance milestones:
 - Building level: Top 25% based on EPA's energy performance rating earns ENERGY STAR label
 - Organizational level: Demonstrating 10, 20 and 30 point reductions across portfolio or 75 point portfolio-wide average rating earns ENERGY STAR Leader

Marriott International, Inc.

April 20, 2005

E. J. Hilts

Regional Director of Energy

Marriott Western Region

Marriott International, Inc.

- **Marriott International is a leading worldwide hospitality company with nearly 2,800 operating units in the United States and 68 other countries and territories**
- **The company is headquartered in Washington, D.C., and has approximately 133,000 employees**

Marriott's Portfolio Is Diverse...

Marriott.
HOTELS & RESORTS


RENAISSANCE[®]
HOTELS & RESORTS

BVLGARI
HOTELS & RESORTS


THE RITZ-CARLTON[®]
HOTEL COMPANY, L.L.C.


JW MARRIOTT.
HOTELS & RESORTS


COURTYARD[®]
Marriott


SPRINGHILL
SUITES[®]
Marriott


FAIRFIELD
INN[®]
Marriott


TownePlace
SUITES[®]
Marriott


Residence
Inn[®]
Marriott


THE RITZ-CARLTON CLUB[®]

Marriott 
VACATION CLUB.
INTERNATIONAL


NEW WORLD HOTELS
INTERNATIONAL


Marriott
GRAND RESIDENCE
CLUB

THE RESIDENCES
AT THE RITZ-CARLTON

Marriott
EXECUSTAY


MARRIOTT
EXECUTIVE APARTMENTS.
Marriott

Tiers in the Upscale Hotel Market

High-End Luxury

BVLGARI
HOTELS & RESORTS



Luxury



JW MARRIOTT
HOTELS & RESORTS

Upper Upscale

Marriott
HOTELS & RESORTS


RENAISSANCE
HOTELS & RESORTS

Upscale





Marriott®

VISION

**“To Be the Number One
Lodging Company in the
World”**

Marriott International



- **Fortune magazine - "100 Best Companies to Work For"**



- **Working Mother magazine - "100 Best Companies for Working Mothers"**



- **Latina Style magazine - "The 50 Best Companies for Latinas to Work in the U.S."**



- **InformationWeek 500 - "Top 25 Companies" most innovative users of information technology in the U.S.**



- **DiversityInc magazine - Top 50 companies for Diversity"**



MARRIOTT INTERNATIONAL, INC.
2004 ANNUAL REPORT





FOSTERING DIVERSITY

Diversity is more than a goal at Marriott. From our associates to our vendors, owners and franchisees, to our customers and communities, we thrive on the differences that give our company its unique strength.

- Marriott has been named a best company to work for and do business with by many respected organizations and publications, including *Fortune*, *Latina Style*, *Working Mother*, *Essence*, *DiversityInc* and the NAACP.
- We surpassed our goal of 7 percent spending with minority- and women-owned businesses, reaching 10 percent, and set a new goal of spending \$1 billion over the next five years.
- Over 10 percent of Marriott's franchise properties are owned by minorities and women. We are committed to doubling the number of properties owned by minorities and women over the next five years.

ENRICHING OUR COMMUNITIES

Through our "Spirit To Serve Our Communities" program, we are fulfilling our pledge to help make all of our communities better places to live and work.

- We continue to partner with Habitat for Humanity International on home builds throughout the world. In the U.S., we launched Fairfield Inn's "Hospitality at Home" program.
- Marriott was recognized as a finalist for the U.S. Chamber of Commerce's prestigious 2004 Corporate Stewardship Large Business Award.

OUR RICH CULTURE

MARRIOTT'S "SPIRIT TO SERVE" PHILOSOPHY IS ALL ABOUT TAKING CARE OF PEOPLE—BEING A GREAT PLACE TO WORK, CHAMPIONING DIVERSITY, HELPING NEIGHBORS IN NEED, FOSTERING EDUCATION AND CAREER OPPORTUNITIES, AND CONTRIBUTING TO THE SUCCESS OF OUR COMMUNITIES. OUR RICH CULTURE IS THE FOUNDATION FOR OUR SUCCESS, AND WE ARE PROUD TO SET THE STANDARD FOR OUR INDUSTRY.

- We are working with the International Federation of Red Cross and Red Crescent Societies, United Way International and other agencies to assist communities affected by natural disasters.
- We marked the 22nd anniversary of Marriott's support of Children's Miracle Network, totaling over \$35 million in company donations and associate fundraising.

SAFEGUARDING OUR ENVIRONMENT

Marriott's "spirit to serve" philosophy extends to critical environmental issues. Our Environmentally Conscious Hospitality Operations (ECHO) program promotes eco-friendly practices at our hotels worldwide.

- We became the first hospitality recipient of the Alliance to Save Energy's Star of Energy Efficiency Award, reflecting our efforts to improve the environment through energy-saving practices and improved energy performance.
- Marriott was named "Partner of the Year" by the U.S. Environmental Protection Agency for reducing greenhouse gas emissions by 64,000 tons annually.
- Marriott associates volunteered for local environmental projects, such as neighborhood clean-up campaigns, planting indigenous trees in local parks and caring for the natural habitats of various species of wildlife.

Marriott Energy Management Program

Three Fundamental Components

Efficient Commodity Purchasing

Purchasing energy at lowest available unit cost

Efficient Equipment

Upgrading or replacing equipment with energy efficient versions

*Marriott
Energy Management
Program*

Efficient Operation

Operating energy using equipment as efficiently as possible

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Efficient Equipment Examples

- ✓ **Central Plant Retrofits**
- ✓ **Renovations**
- ✓ **Flat Plate HX**
- ✓ **Thermal Storage**
- ✓ **Variable Frequency Drives (VFD's)**
- ✓ **Energy Efficient Motors (where appropriate)**
- ✓ **DDC and Building Automation Systems**
- ✓ **Room Occupancy Sensor**
- ✓ **Guest Key Sensor**
- ✓ **Photo Voltaic**



Wattstopper

Test Program with Southern California Edison

Irvine Marriott and Costa Mesa Suites



DOE Fuel Cell Project

- **50-kw Electrical Output**
- **70-kW Thermal Output (Hot Water)**



25 kW alpha prototype co-developed with GM for Nextel demonstration



The E SOURCE Member “Network”

Over 400 Organizations Around the World

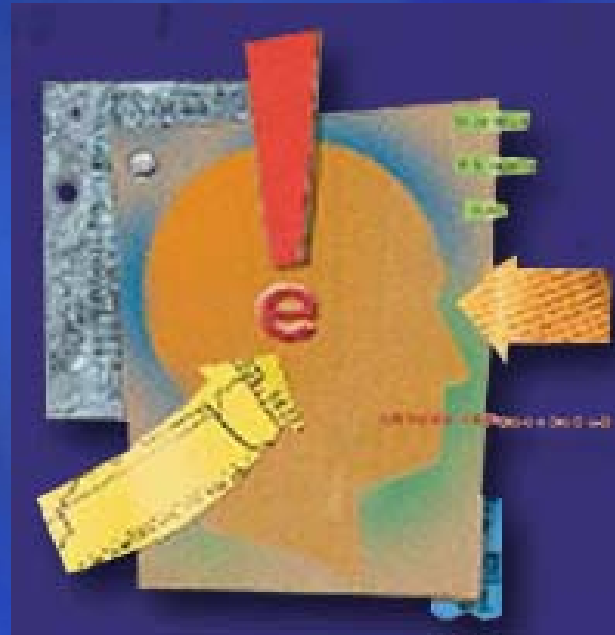
Major
Energy Users

Electric & Gas
Utilities

International
Organizations

Consultants

Research
Institutions



Energy Service
Companies

Government
Agencies

Manufacturers

Three Fundamental Components

Efficient Commodity Purchasing

Purchasing energy at lowest available unit cost

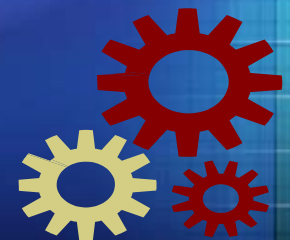
Efficient Equipment

Upgrading or replacing equipment with energy efficient versions

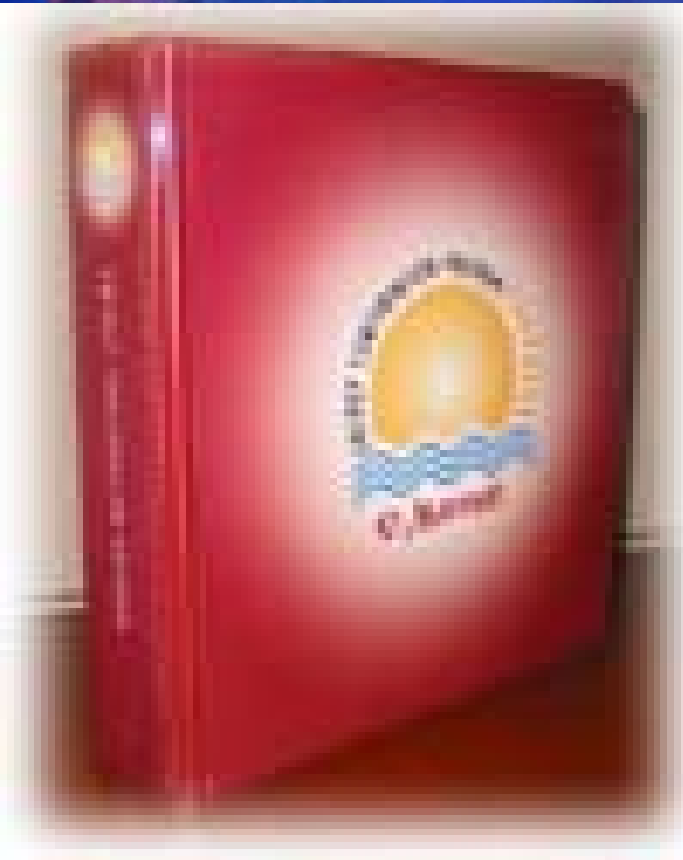
*Western Region
Energy Management
Program*

Efficient Operation

Operating energy using equipment as efficiently as possible



ENERGY CONSERVATION MANUAL & ENERGY CONSERVATION COMMITTEES



- **Updated 2004**
- **Web Based**
- **Links to other Web Sites**

Energy Champion



- **Renewed Emphasis**
- **Energy Conservation Committee**
 - Representatives from all departments
 - Conduct monthly meetings
 - Incentives for new actionable ideas

Energy Benchmarking & Tracking

- **ENERGY STAR**
 - Benchmarking
- **Regional Metrics**
 - Electricity / Gas / Water Consumption





Energy Conservation (Benchmarking)



Using Energy Performance Rating System
within ENERGY STAR Portfolio Manager

Zip Code

- **Climate and weather normalization (HDD & CDD)**
- **Energy Consumption**
- **12 consecutive months**

Space Type Data

- **Hotel type (e.g., upscale, economy)**
 - **number of rooms**
 - **occupancy**
 - **food facility**
 - **laundry facility**



ENERGY STAR PROGRAM

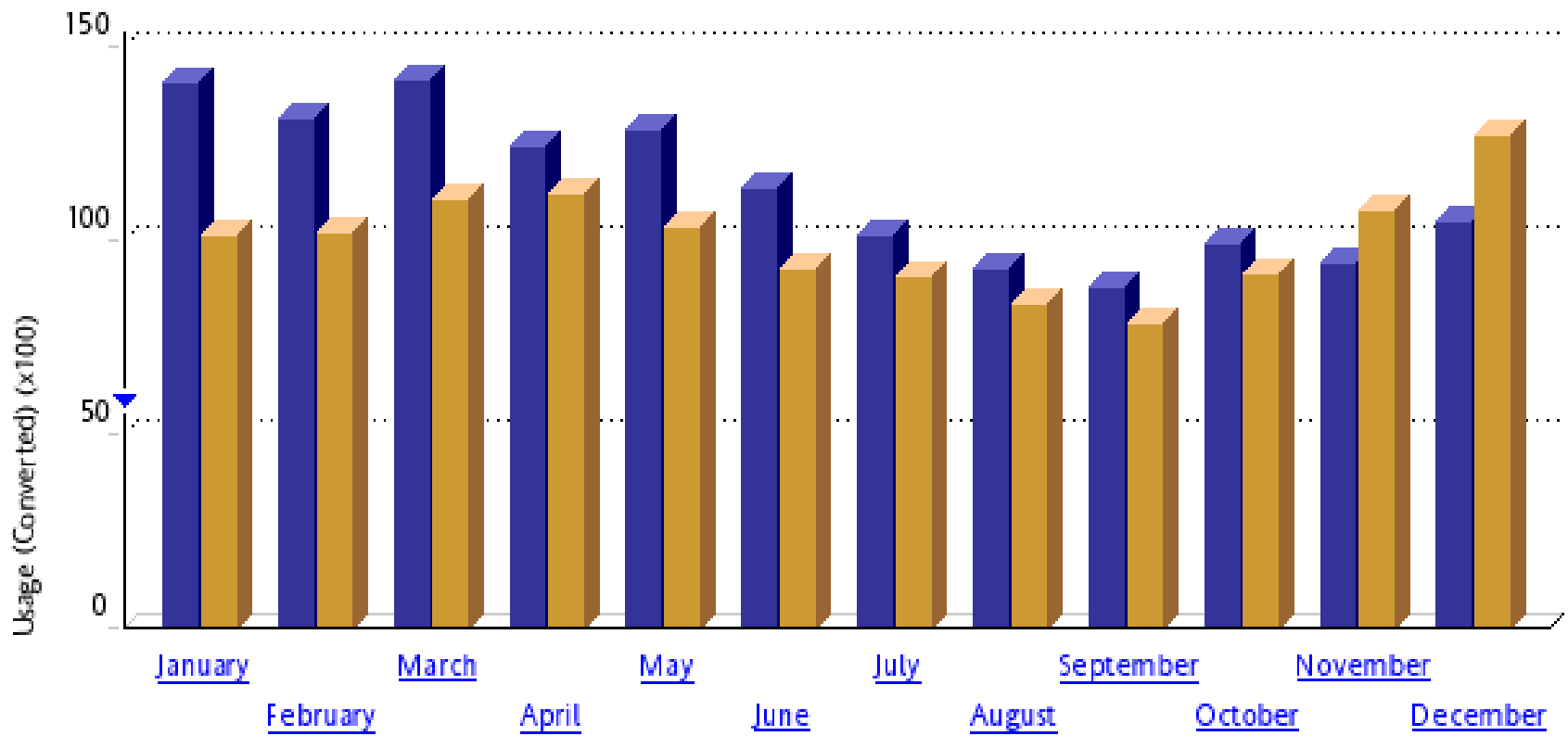


- **2004 - 19 Properties Received Labels**
- **2005 – 100% of properties benchmarked**
- **2005 - 90+ Properties will receive labels**

Regional Metrics

- **Full Service / CFRST**
- **EIWO**
- **Electric, Gas, & Water Consumption**
- **Compliance Tracking Tab**
- **Graphical Analysis**

AVISTA BI Tool Graphs





Marriott's Retro-commissioning Program

What is



???

Comprehensive, systematic process of optimizing the existing hotel systems so they operate as efficiently and effectively as possible.

(Building Tune-up)

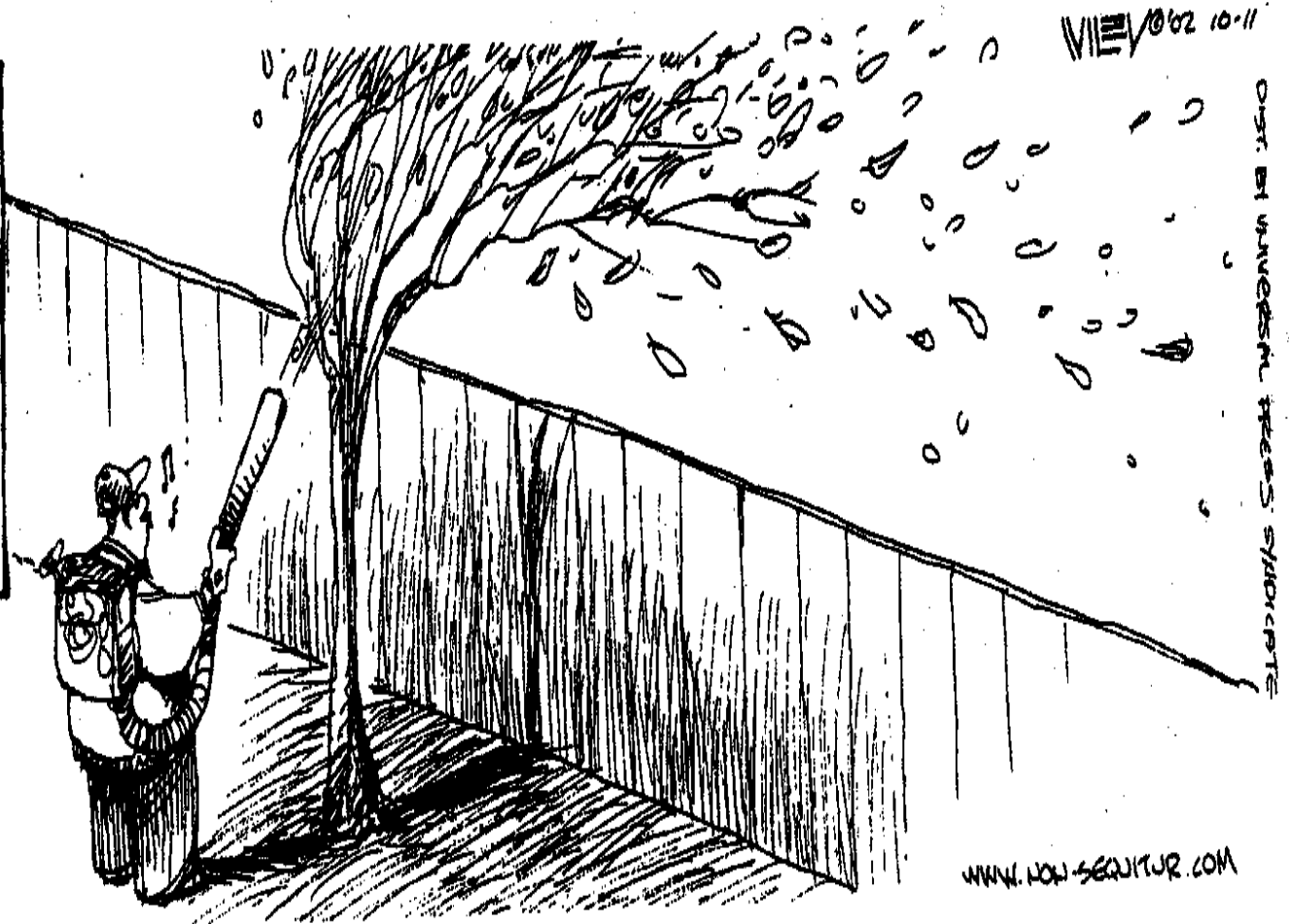
Focuses on energy-using equipment such as mechanical systems, controls and lighting.

(No-cost / low-cost measures)

What is MRCx ?? (non-technical)

NON SEQUITUR

FALL ENERGY
CONSERVATION TIP:
YOU CAN OPTIMIZE
THE EFFICIENCY OF A
LEAF BLOWER BY
USING IT BEFORE
THE LEAVES FALL.



WILEY 10/02 10-11

DR. B. WAGNER, PEER-SUPPORTED

WWW.NON-SEQUITUR.COM

WILEY@NON-SEQUITUR.COM



Benefits

- Retro-commissioning will result in a 5-15% improvement in building energy performance.
- California Public Utility Commission (CPUC 2004)

Commodity	2004 Total
Electricity	\$36.6 M
Nat. Gas	\$9.0 M
Total	\$45.0 M

This represents between \$2 to \$6 million in savings.

Benefits of Energy Reduction

For Western Region Full Service Hotels:

A 10% Reduction in Energy Costs
is Equivalent to...

Increasing Flow-Through by.... 5.93% / year

Increasing Occupied Rooms by ... 17,000 / year

Marriott – 2004 Case Study

**Identified over
\$153,000 annually
in no-cost & low-
cost saving
measures.**



Important Ingredient (Skilled and Willing Engineering Team)



Findings Summary Table

Low Cost/No Cost Findings

Item	Finding
Double Duct and Multizone AHUs	
DD 01	Two of the units probably operate at nearly 100% OA all of the time
DD 02	Terminal units are constant volume, Consider retrofit to variable volume when repairs are made
DD 03	High velocity duct connections to plenums may have high losses
DD 04	AHU3 has the cold deck set point at 45°F
DD 05	AC-3 appears to be running round the clock
DD 06	AHU4 and 5 CHW valves never modulate
DD 07	AHU4 and 5 CHW valve wide open with unit off
DD 08	Three way valves generally do not have balance valve in the bypass
DD 09	Several AHUs represent constant flow loads on a variable flow CHW system
DD 10	The hot deck plenum ceiling has been blown loose and bows up under pressure, repair recommended
DD 11	The double duct units appear to be moving twice as much air as is necessary
DD 12	Hot and cold deck reset schedules could minimize simultaneous heating and cooling
Other AHUs	
AHU 01	AHU8 fan status point appears non-operational
AHU 02	AHU7 runs continuously, night set-back/set up may be appropriate
AHU 03	AHU7 appears to run out of capacity under peak load conditions
AHU 04	AHU8 runs continuously, incremental volume control may be possible
AHU 05	AHU8 HW and CHW valve control loops seem to be not well integrated
AHU 06	AHU8 HW and CHW valve control loops need tuned
AHU 07	AHU8 appears to run out of capacity under peak load conditions
AHU 08	Many of the AHUs are equipped with electric heating coils, periodic inspection and testing recommended
AHU 09	Kitchen AHU economizer not active
Chilled Water Plant	
CHW 01	Evidence suggests the condenser pump head is excessive
CHW 02	The chilled water system exhibits over-flow tendencies
CHW 03	Cooling tower fan control loop is hunting
CHW 04	Cooling tower fan capability is not exploited
CHW 05	Condenser water set point may benefit from optimization
CHW 06	Three way valves generally do not have balance valve in the bypass
CHW 07	Many of the three way valves could be two way, saving pumping energy and improving performance
CHW 08	CHW system working like a constant flow system instead of variable flow
CHW 09	Evidence suggests the evaporator pump head is excessive
Heating Hot Water System	
HW 01	Evidence suggests that the pumping head is excessive for the system
HW 02	Automatic hot water supply temperature reset could optimize energy use
HW 03	Three way valves generally do not have balance valve in the bypass
HW 04	Observation indicates that there is a significant but unidentified base load, possibly wasted energy
HW 05	The current pumping configuration for the Hx has potential for performance improvements
HW 06	Converting the 3-way hot water valves to 2-way could save HW pumping energy
HW 07	The hot water system seems to operate at a low differential temperature, implying over pumping
Steam System	
ST 01	Missing insulation at valves may generate viable savings if replaced or repaired
Pool Pumps	
FP 01	Throttled valves indicate the potential for impeller trims to reduce energy consumption
Domestic Water System	
DW 01	Logging may confirm savings potential already identified by the LAX staff
DW 02	Logging may reveal savings and maintenance improvement potential on the DHW return pumping
Guest Rooms	
GR 01	FCU Performance verification may reveal minimal low ambient cooling load
GR 02	FCU data logging reveals several items worthy of additional investigation
GR 03	Some make up units are not operating, this poses an IAQ liability but will increase energy use
GR 04	FCU performance verification may reveal improved MAU and EF performance options
GR 05	Air flow monitoring may reveal opportunities for optimizing make up rates
Lighting	
LI 01	Anticipate scheduling lighting to a low energy mode after occupancy based on logger data
Total Savings for All Findings Identified	
Capital Projects	
Item	Finding
CP 01	Three of the units do not have economizer capability
CP 02	Energy recovery from the condenser water system for use in hot decks and DHW preheat may be viable
CP 03	The guest room make up and exhaust systems lend themselves to heat recovery when they are upgraded

Dual Duct and Multizone AHUs

Other AHUs

Chilled Water Plant

Heating Water System

Steam System

Domestic Hot Water

Guest Rooms

Lighting

Capital Projects

Two Case Study MRC_x Examples

MRC _x Finding	Annual Savings	Cost to Implement	Simple Payback
Double Duct Excessive Air Flow	\$53,600	\$15,400	0.30
Simultaneous Heating & Cooling	\$21,280	\$7,711	0.40

Marriott Case Study Results

- **Improvements in Indoor Environmental Quality**
- **Improvements in Performance**
- **Low Cost Savings in Electricity and Gas**
 - Annual savings potential = \$153,000
 - Implementation costs = \$131,000
 - Simple payback = 0.9
 - Estimated 9% energy cost savings

Three Fundamental Components

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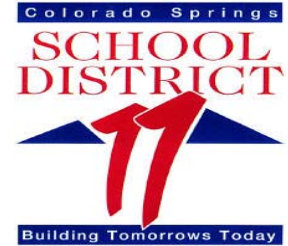


**D11 Energy Initiatives
Leading To
The ENERGY STAR
Leadership in Energy Management
Partner Of The Year 2005 Award**

Presented by Thomas Fernandez, Energy Manager

4/20/2005

Objective



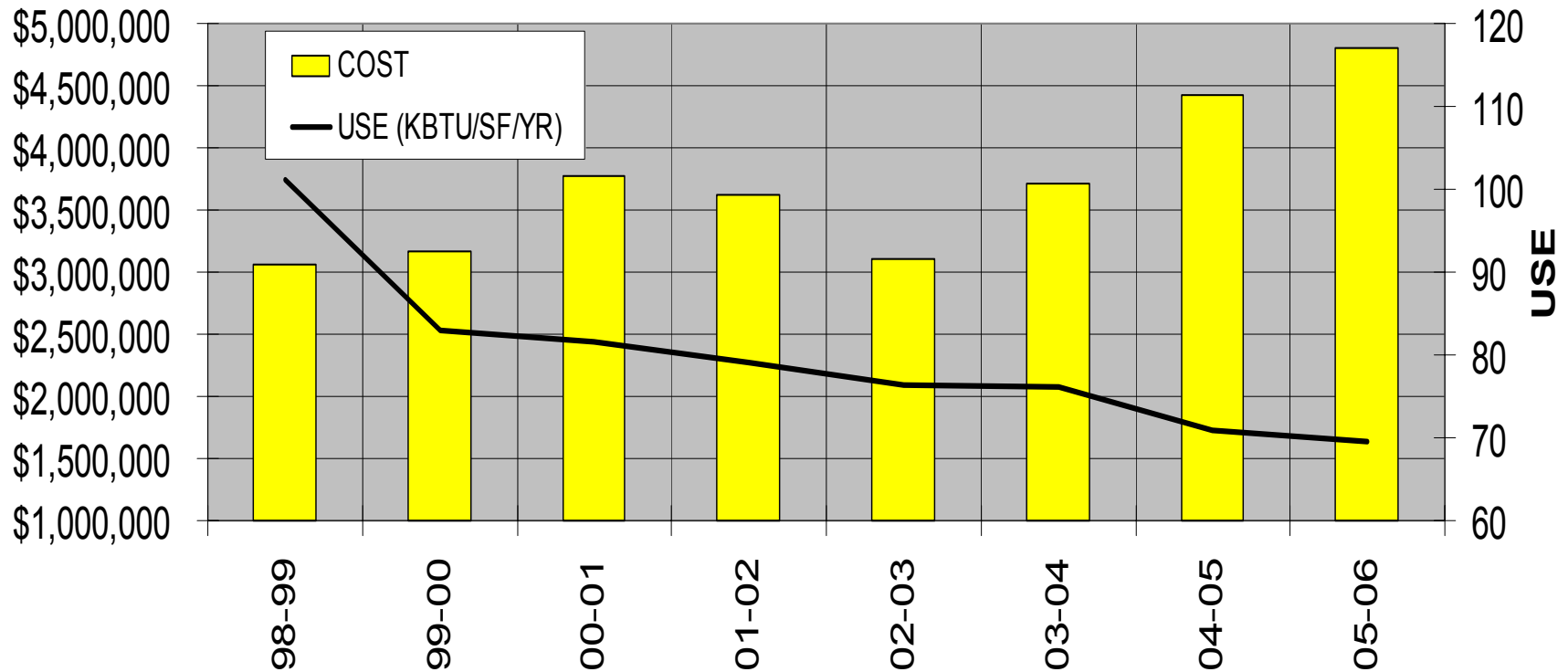
- EPA Award
- D11 energy initiatives
- Energy results
- Significance of award to D11

D11 – Statistics Overview

- 31,000 students
- 3,500 staff
- 70 facilities
- 4,200,000 SF
- 700 acres
- \$4M utility budget
- 2nd largest non-industrial utility consumer

The Energy Challenge

D11 Energy Cost & Use

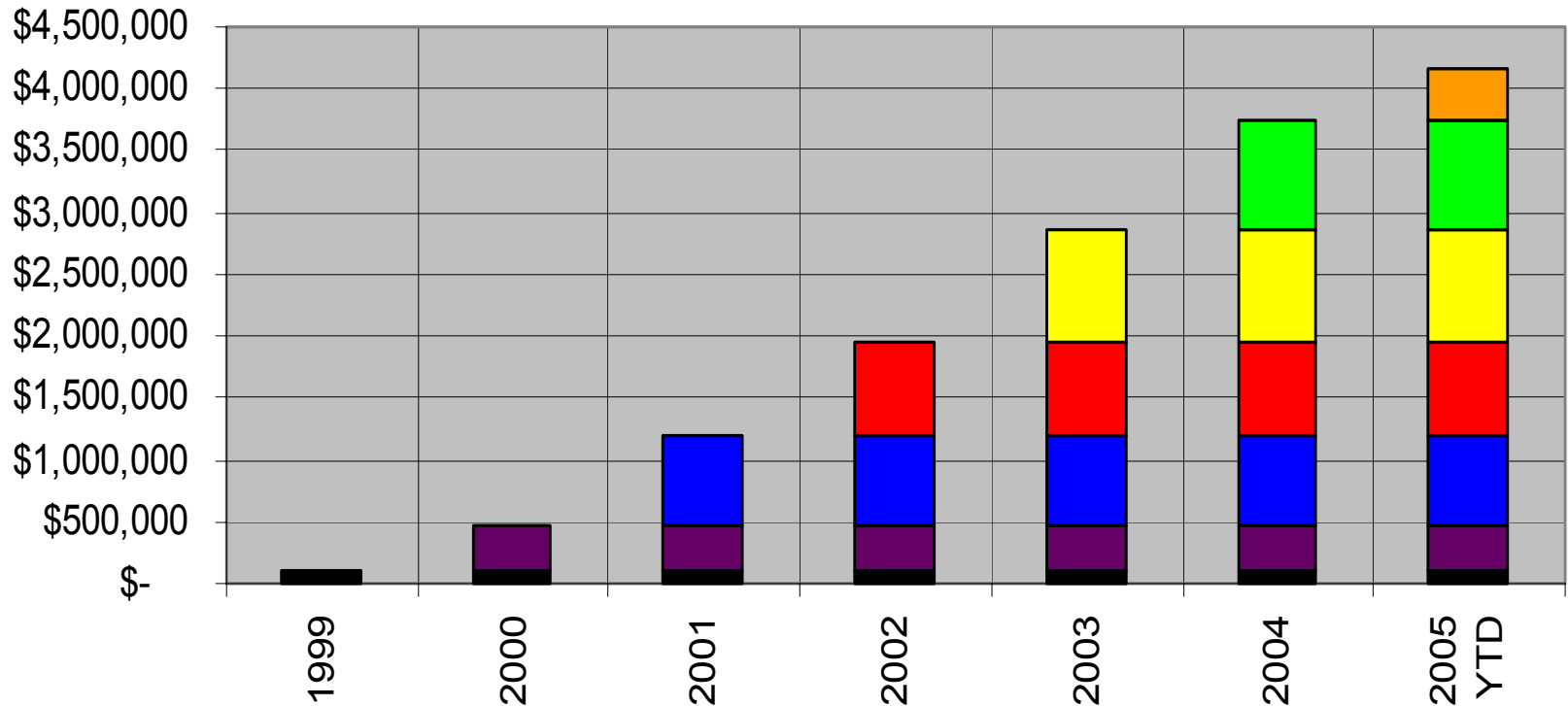


D11 Energy Initiatives

- Resource Conservation Management Program
- Lighting Retrofits
- Retro-commissioning
- GeoExchange Pilot Project
- Sustainable High Performance School Design
- Energy Performance Contracting
- EPA ENERGY STAR Program

Results – Energy Cost Savings

Total Cumulative Energy Savings



Resource Conservation Management (RCM) Program

- Energy Bill Tracking
- Energy Benchmarking
- BAS Control & Scheduling
- BAS Load Profiling
- Energy awareness/behavioral Changes
- Cash Back Incentives
- Energy improvement projects

EPA Benchmarking Tool

- EPA “Portfolio Manager” web based benchmarking tool
- Energy Intensity Index (KBTU/SF/YR)
- Easy to use
- EPA will help with data entry if necessary
- Energy Intensity Index very useful

BAS As A Scheduling Tool

Over 7000 scheduled events per year:-

- Regular school schedules
- After hours & weekend activities
- Community rentals
- Weekend & holiday shutdowns
- Spring, summer & winter break shutdowns
- Weather related closures & delays

HVAC Zone Guide

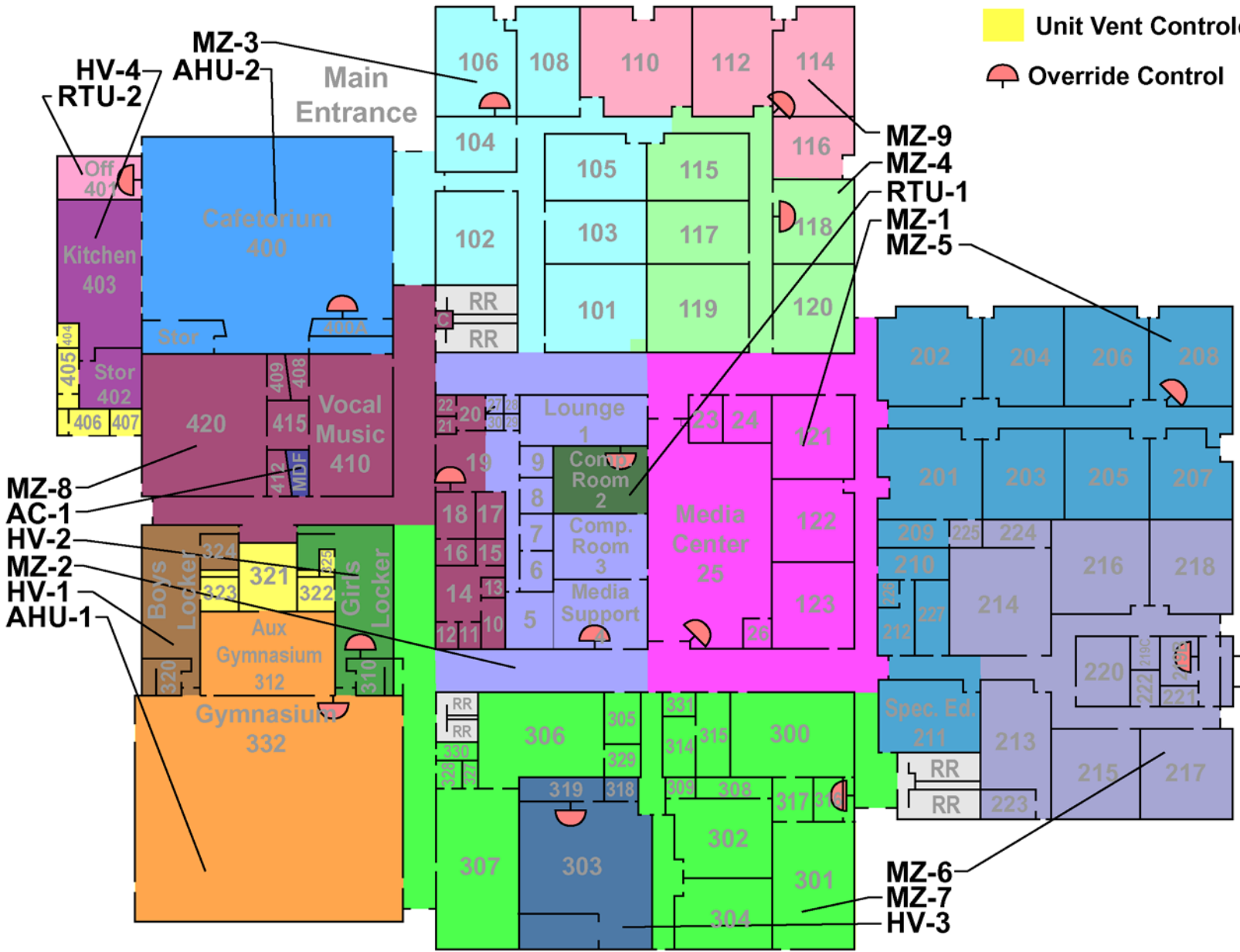
Sabin Middle School

Main Floor Plan

HVAC Legend

 Unit Vent Controlled

 Override Control

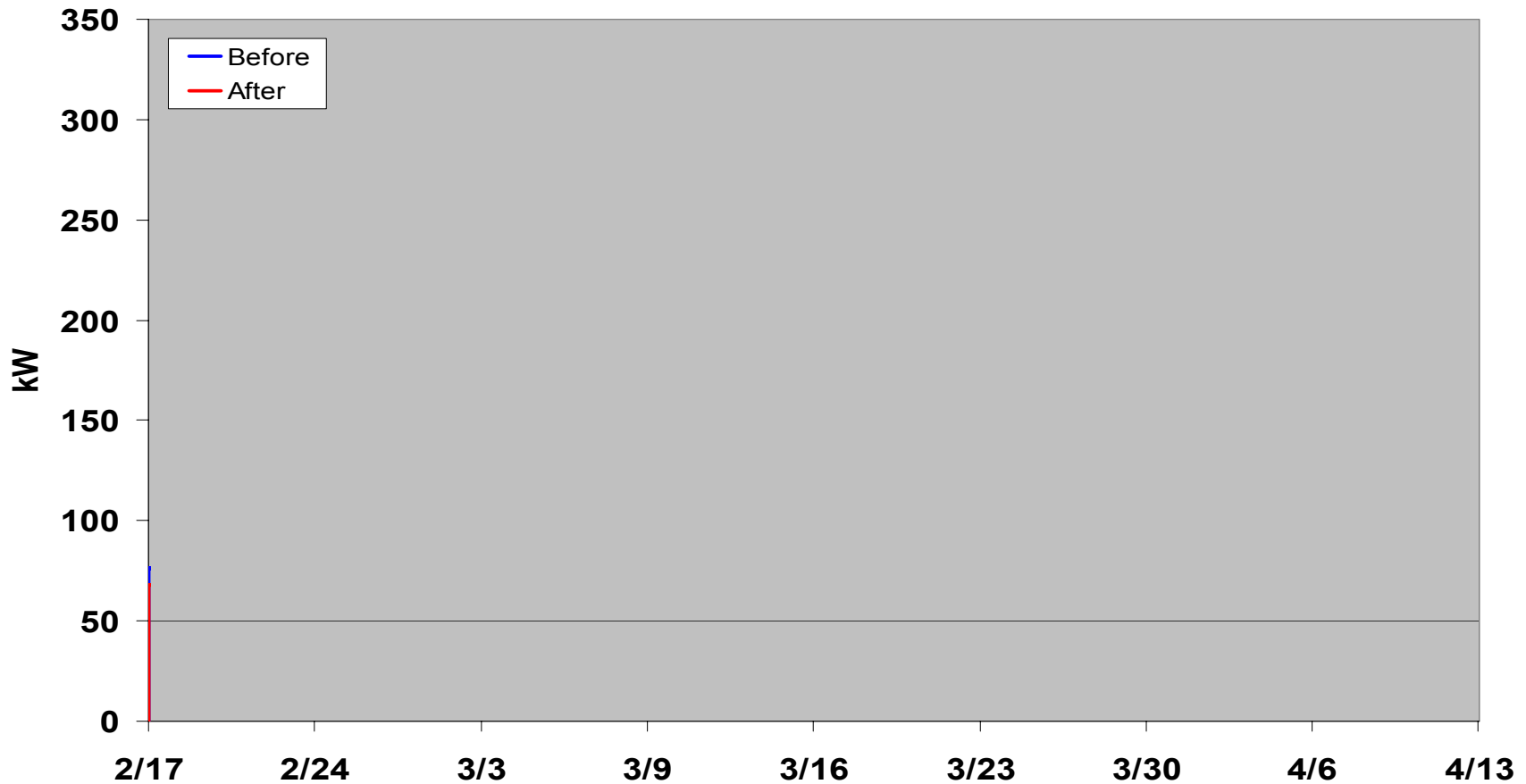


BAS Load Profiling Tool

- Pulses from electric, gas or water meters fed into BAS
- BAS displays real-time energy profiles
- Gives immediate indication of energy waste
- No waiting for utility bills
- Immediately identifies operational failures or inappropriate use
- Allows immediate response & remediation
- Requires substantial data storage capabilities

Load Profiling Example

Irving MS - Lighting Retrofit



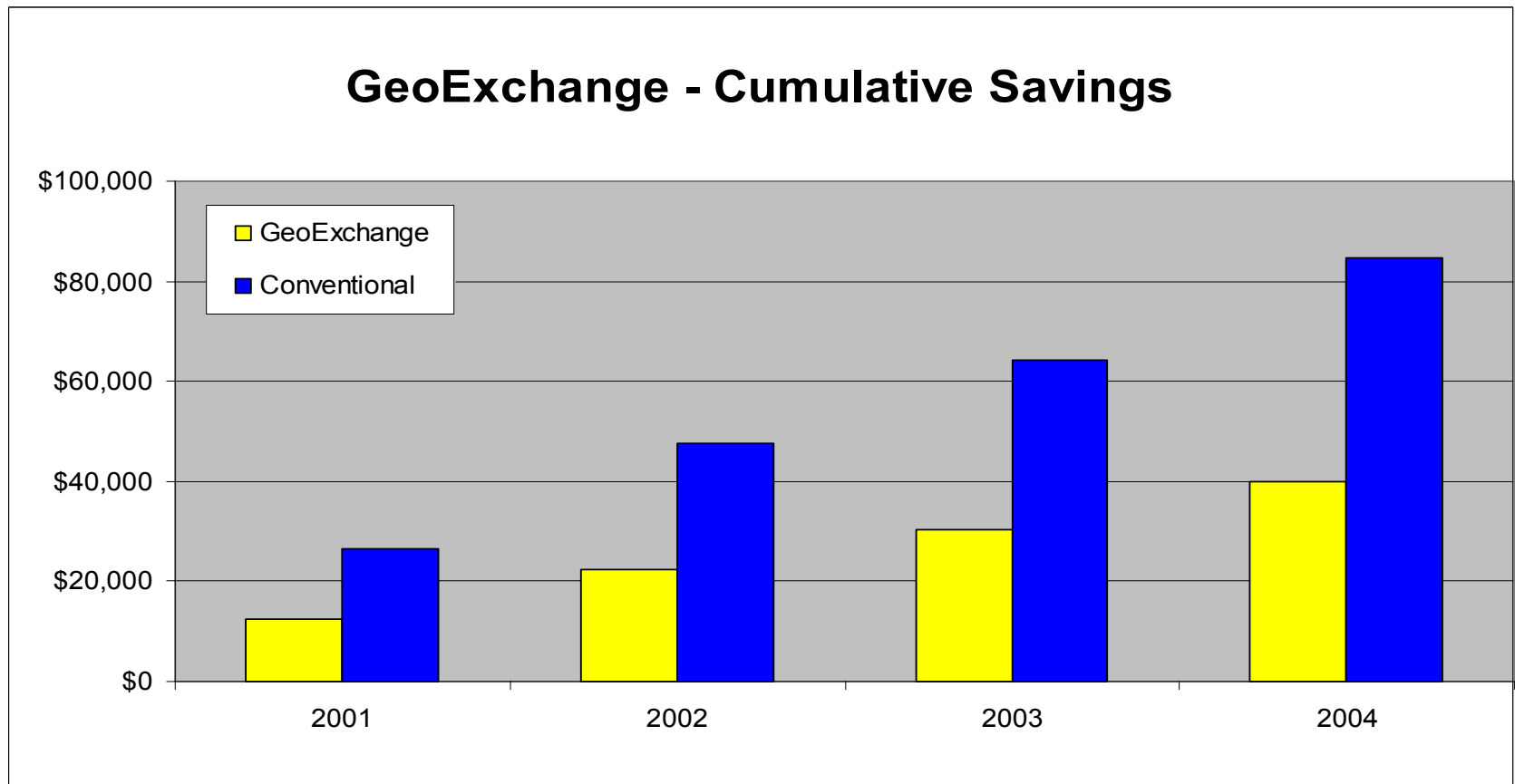
Lighting Retrofits

- Retrofitted 65 facilities (4,000,000 SF)
- Cost \$2.6M
- Improved classroom environment
- 20% - 60% energy savings
- Significantly reduced maintenance

D11 GeoExchange Pilot

- Pilot project at D11's new FOTC building
- 52% less energy than conventional system
- 30% less maintenance cost
- Reliable
- High comfort level
- Environmentally responsible
- D11 will use GeoExchange on all new schools

GeoExchange Results

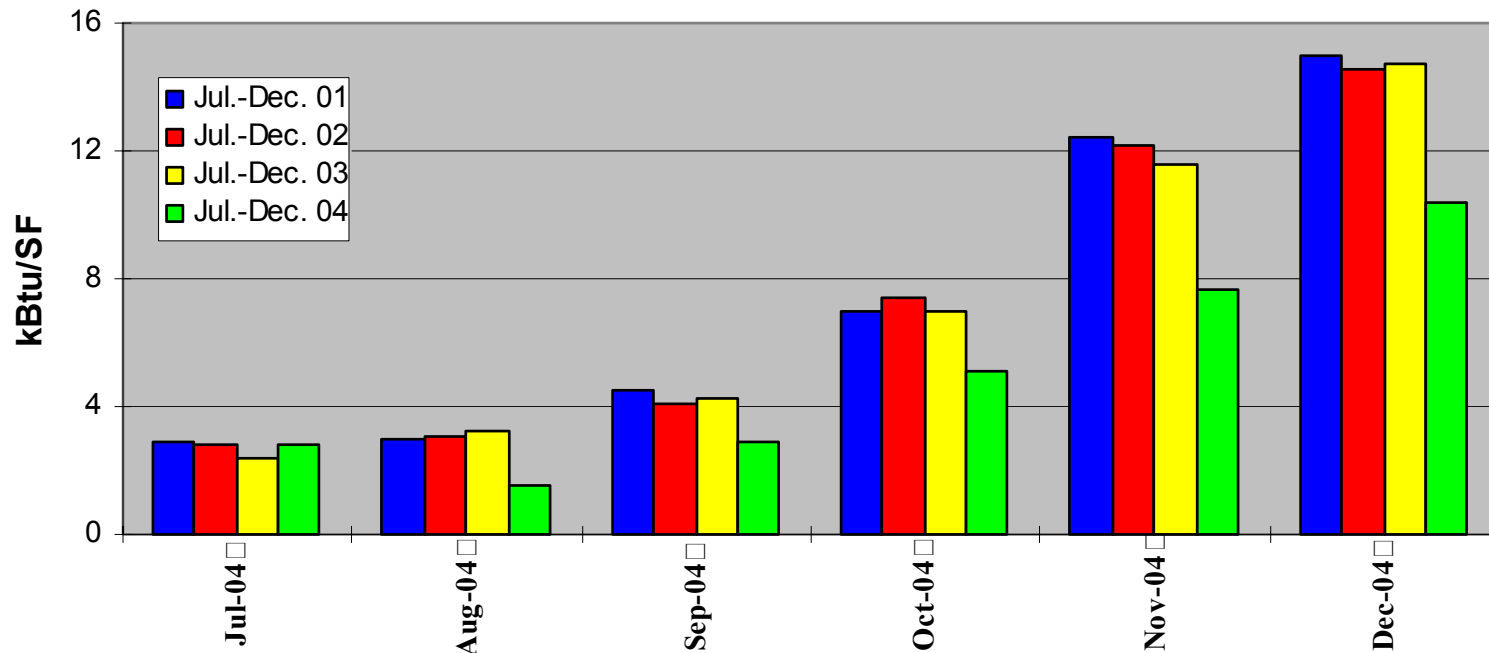


Retro-commissioning

- Bring all HVAC systems back to peak efficiency
- HVAC uses 50% of total building energy
- Typical 10% -20% energy savings for buildings over 5 years old
- Improved learning environment - comfort & IAQ

Retro-commissioning Results

**Grant ES - 1st Half FY Combined Gas and Electric kBtu/SF
 Weather Corrected**



Getting High Performance School Designs

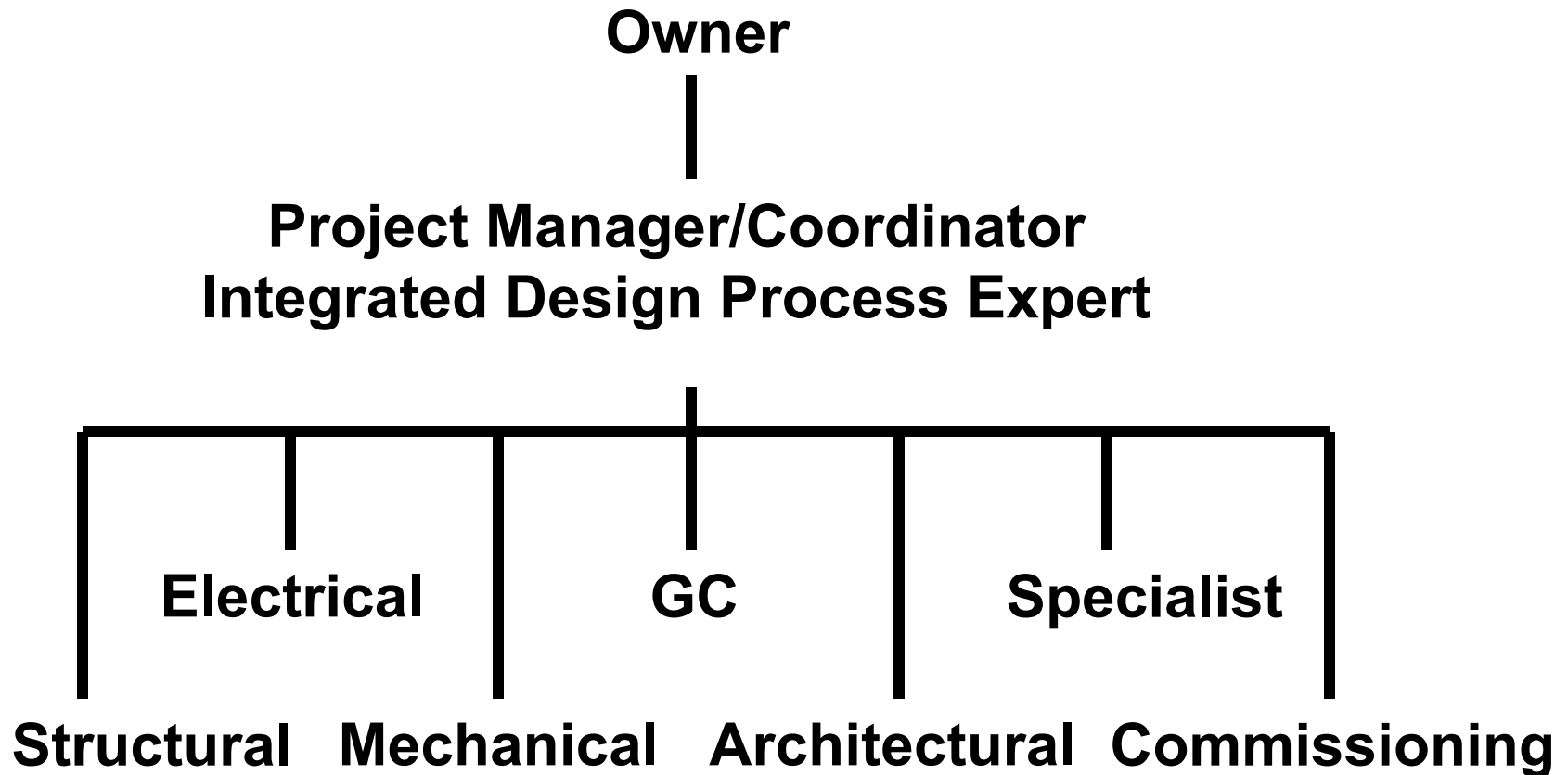


- Disappointing energy performance
- 4 new schools 68 – 100 KBTU/SF/YR
- D11 average 70 KBTU/SF/YR
- National Average 80 KBTU/SF/YR

Lessons Learned

- No clear understanding HP buildings
- No clear understanding of the integrated design process
- No specific building energy goals
- Passive during design
- Design was first cost driven
- Traditional architect down design approach

Alternative Design Team Structure

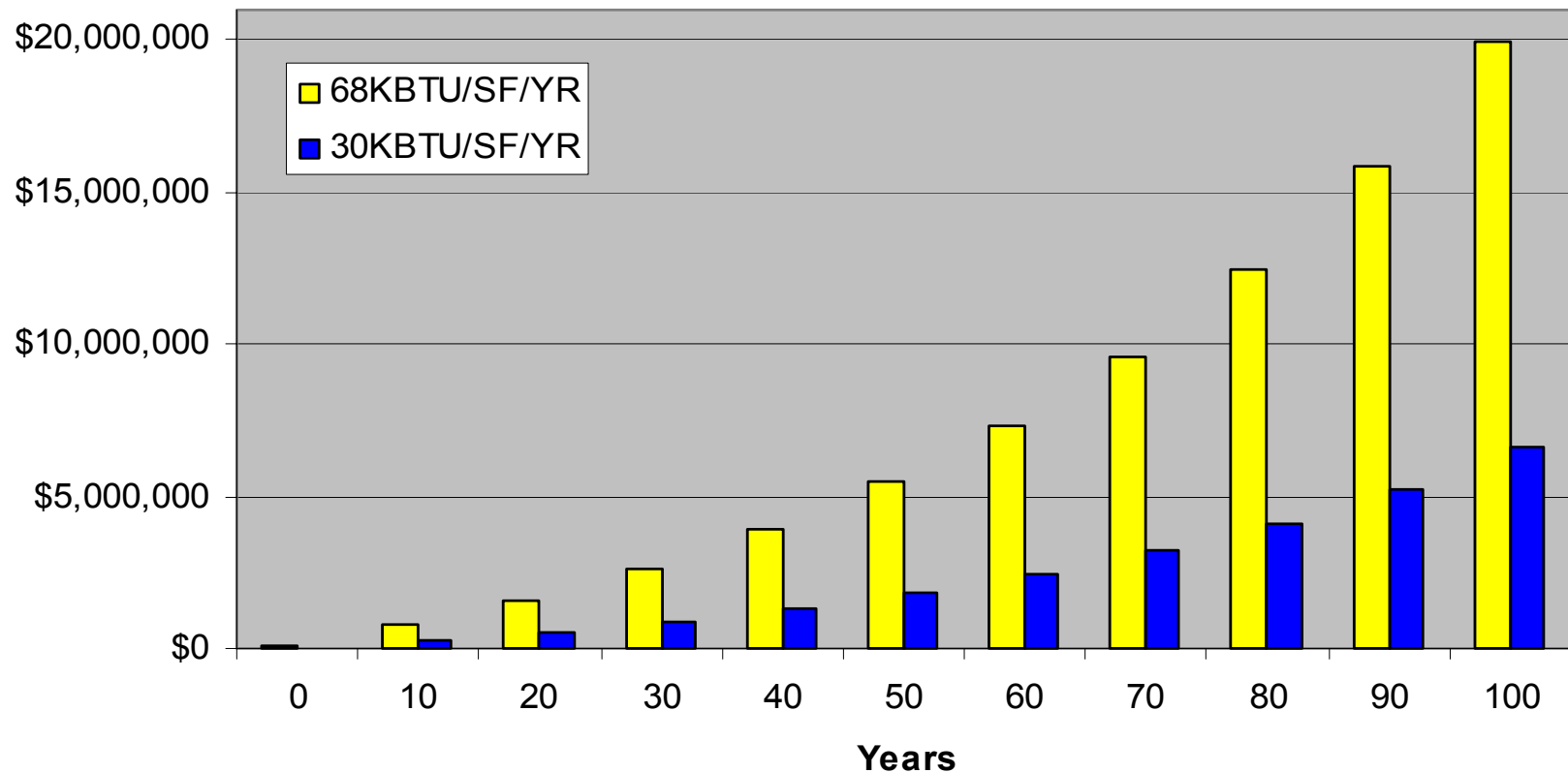


D11 Building Performance Goals

- Use EPA “Target Finder” design tool
- 30 KBTU/SF/YR - gas + electric
- 2.4 GAL/SF/YR - domestic water
- 4.5 GAL/SF/YR – irrigation
- Building acoustic levels
- Indoor air quality standards

The Lifecycle Cost Difference

**Lifecycle Cummulative Difference
 Trailbalzer Elementary**



\$5M Energy Performance Contract



- ESCO performs detailed energy audit (\$200K)
- Identify best payback ECM's (\$9M)
- Develop cash-flow model and financing (\$5M)
- Obtain 3rd. Party financing
- Design and construction (18 Months)
- M&V for savings guarantee (\$500K)
- D11 makes annual payments from savings

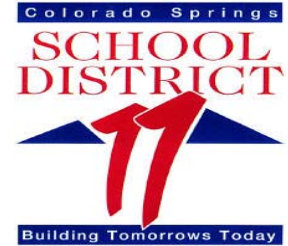
EPA ENERGY STAR Program

- Utility Manager benchmarking tool
- Target Finder design assistance tool
- 7 schools ENERGY STAR Building Label
- EPA 2004 ENERGY STAR Leaders
Recognition for 10% improvement

Award Significance For D11

- Recognizes efforts of D11's staff & students
- Keeps utility dollars in the classroom
- Sends a clear message to the community
- Instills in our students a sense of caring for our environment

Contact Information



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(719) 477-6011
fernatom@d11.org



Questions & Discussion

Upcoming Web Conferences



May 18 – Assessing Your Energy Program

June 15 – Auditing and Technical Assessments
for Energy Performance

July 20 – Green Power Primer

www.energystar.gov/networking



Thank You!