



# **Identifying Projects & Creating Action Plans**

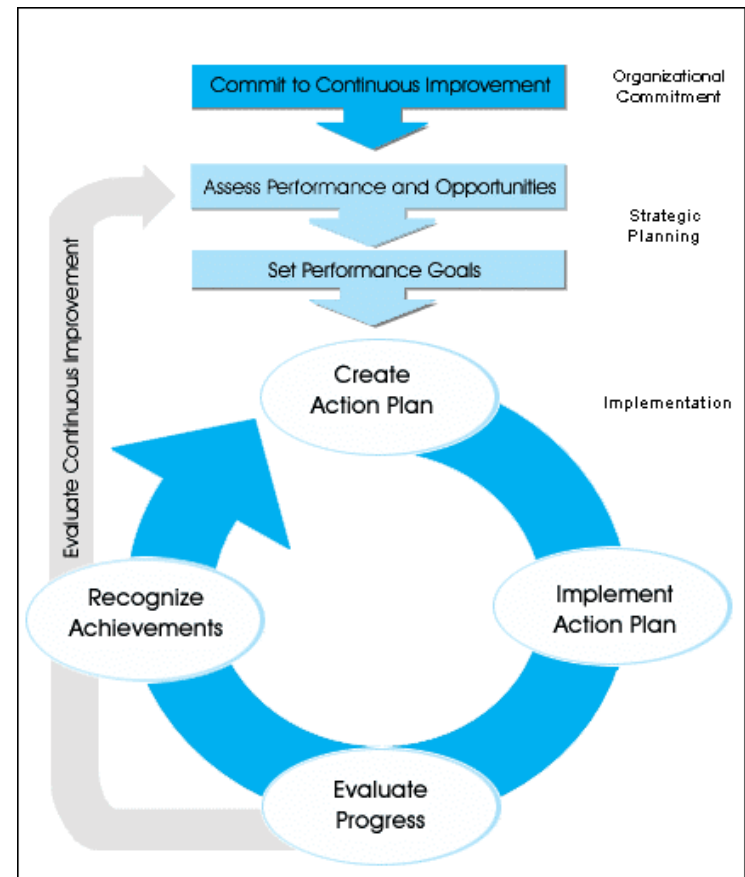
September 17, 2003



ENERGY STAR

# About the Web Conferences

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





ENERGY STAR

# Web Conference Tips

- Mute phone when listening! Improves sound quality for everyone.
- If slides are not advancing, hit refresh or close presentation window and press the re-launch button again.



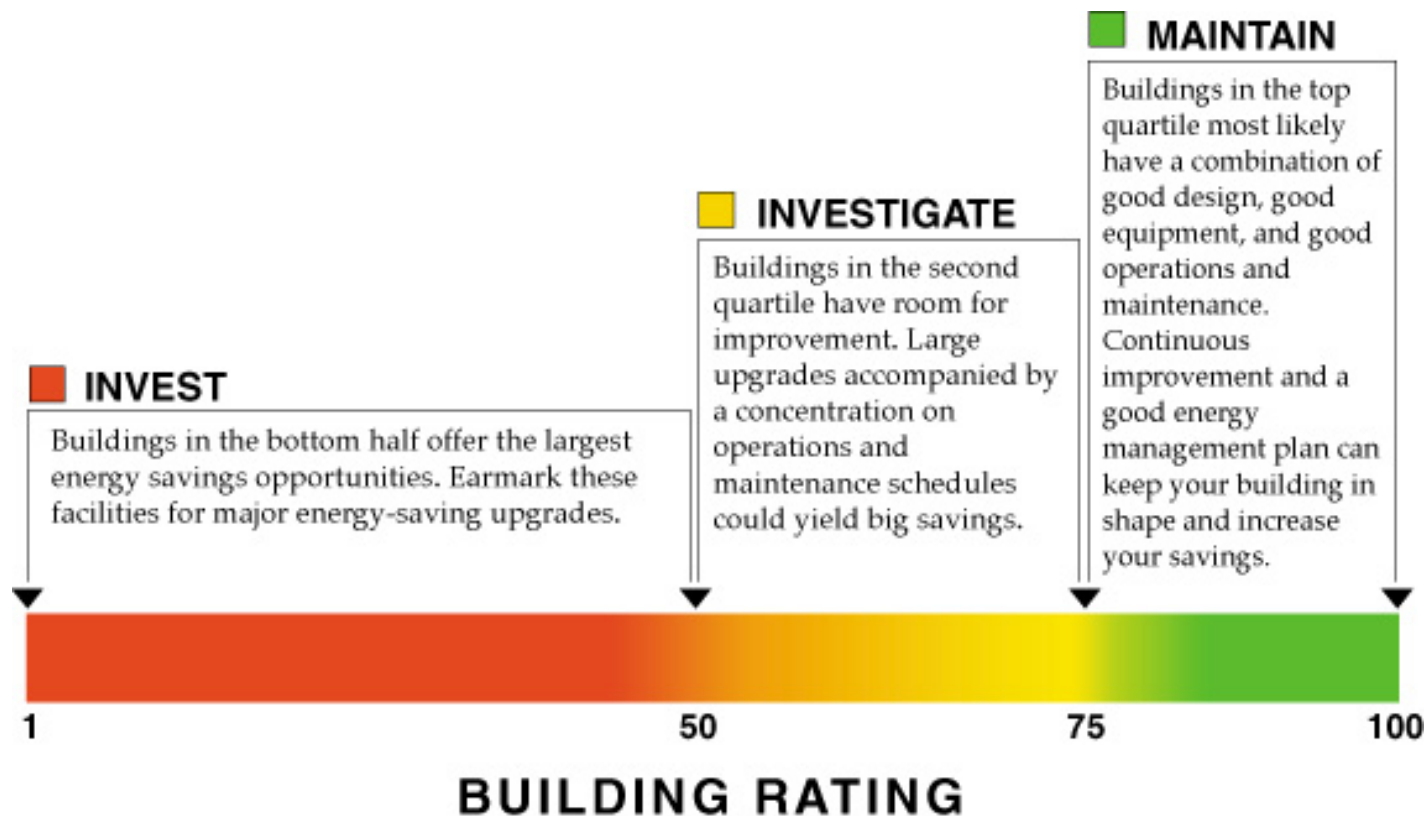
# Today's Web Conference

- Welcome
- Dennis Thurman – Transwestern Commercial Services
- Paul Allen – Walt Disney World
- Questions & Discussion



ENERGY STAR

# Identifying Opportunities



# Creating Action Plans



**Continuous Maintenance & Measuring**



**TRANSWESTERN**  
COMMERCIAL SERVICES



# Identifying Energy Projects and Implementation

September 17, 2003



# DISCUSSION AGENDA

- > Background on Transwestern Commercial Services
  - > Company overview
  - > Partnership history with ENERGY STAR®
  
- > Transwestern's ENERGY STAR identification and implementation process
  - > Tools utilized
  - > Benchmarking process
  - > Energy use improvement process
  
- > Next Steps
  
- > Project Case Studies







# TRANSWESTERN OVERVIEW

- > Transwestern is one of the country's largest privately held commercial real estate companies, with offices in 22 major cities nationwide
- > We provide a wide range of real estate advisory and representation services to commercial property owners, including:

Leasing

Investment Sales

Property & Facilities  
Management

Site Selection &  
Development

Corporate Advisory

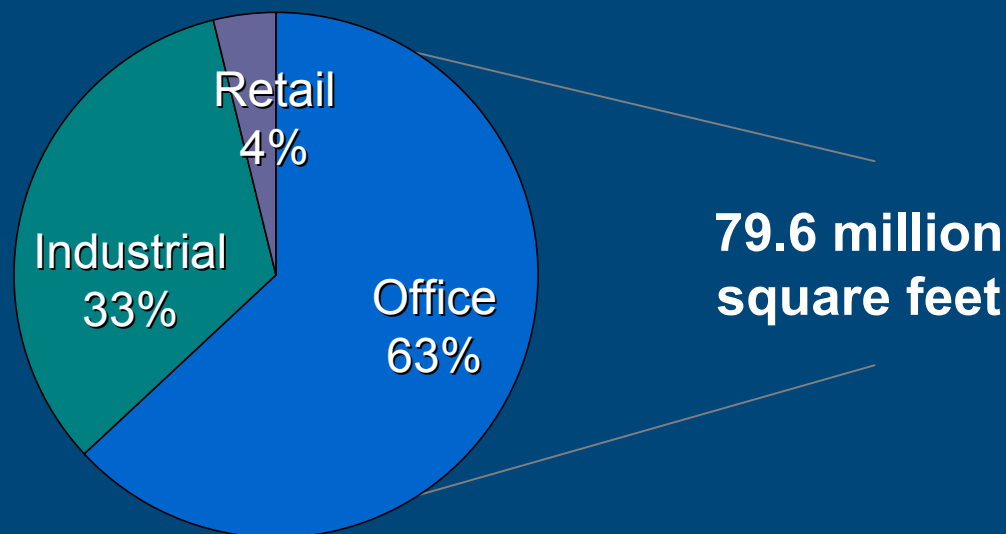
Research





# TCS PROPERTY PORTFOLIO

- > Transwestern currently manages more than 400 properties on behalf of our clients



- > Comprehensive energy benchmarking and “use improvement” services are included within our standard property management practices





# PARTNERSHIP HISTORY WITH ENERGY STAR

- > **2002:** Transwestern embraced the ENERGY STAR benchmarking program as an additional way to reduce property operating costs and to reduce carbon dioxide emissions
  - Realized a significant market advantage as the **only** third-party service provider to undertake such efforts on behalf of the properties' actual owners
- > Created company-wide “Energy Team”, led by East Coast, Midwest and West Coast engineering directors
- > Began employing ENERGY STAR strategies and tools to evaluate property portfolio





# PARTNERSHIP HISTORY WITH ENERGY STAR

- > **2003:** 91 properties have now been benchmarked; 27 have earned the ENERGY STAR label; and over 200 have undergone energy use upgrades
  
- > It is simply good business to be a good corporate citizen! By championing the ENERGY STAR program, Transwestern has been able to:
  - Reduce property energy usage by up to 30%
  - Lower property operating costs
  - Earn publicity for our company as well as our clients' buildings
  - Become an early leader among service providers for a worthy cause





# ID / IMPLEMENTATION PROCESS

## T O O L S

- > Transwestern uses a variety of tools to track energy consumption:
  - ENERGY STAR's benchmarking software "Portfolio Manager"
  - Utility tracking sheets
  - Energy savings matrices
  - Metering and commissioning reports
  - Annual utility incentive spreadsheets
  - Other local, regional or national incentive information





# ID / IMPLEMENTATION PROCESS

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- > Using *Portfolio Manager* software, Transwestern developed our in-house “Operations and Maintenance” checklist
  - Verification of building operating hours
  - Energy control measures
  - Unoccupied space management
  - On-peak load shedding
  - Nighttime group janitorial services
  - Natural versus electrical lighting use
  
- > Benchmarking scores are then examined, based on each property’s completed checklist





# ID / IMPLEMENTATION PROCESS

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- > General steps in the ID/implementation process include:
  - Identifying all areas where property energy upgrades are needed
  - Performing annual energy audit
  - Listing all opportunities to improve the efficiency & control of HVAC, lighting, plug load and hours of operation
  - Prepare justification for upgrade implementation for property owners
    - Present all areas of potential cost reductions
    - Present all areas improved asset values and ROI





# ID / IMPLEMENTATION PROCESS

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- > General steps (*continued*)
  - Communicate utility incentives to all local property managers on regular basis
  - Seek out state/regional/national energy incentive programs on a regular basis
  - Seek ENERGY STAR label status for building
  - Continue to improve and upgrade labeled properties







# ID / IMPLEMENTATION PROCESS

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- > Reinforcement of energy efficiency benefits is crucial to maintain good practices and proper care of equipment
  - External communication through reports to property owners and tenant newsletters from building manager
  - Internal communication through employee newsletters and email reminders
  - Corporate brochures marketing ENERGY STAR program as a value-add service provided by Transwestern
  - Applying for other energy-saver awards
  - Seeking publicity opportunities for engineers to explain energy programs and environmental impact





## NEXT STEPS

- > Benchmarking has been completed at over 91 of Transwestern's managed properties (40% of the office portfolio)
  - Estimate 100% benchmarking of office properties by Mid Year 2004
  
- > Encourage expanded use of ENERGY STAR products and practices through communication with employees, tenants and clients



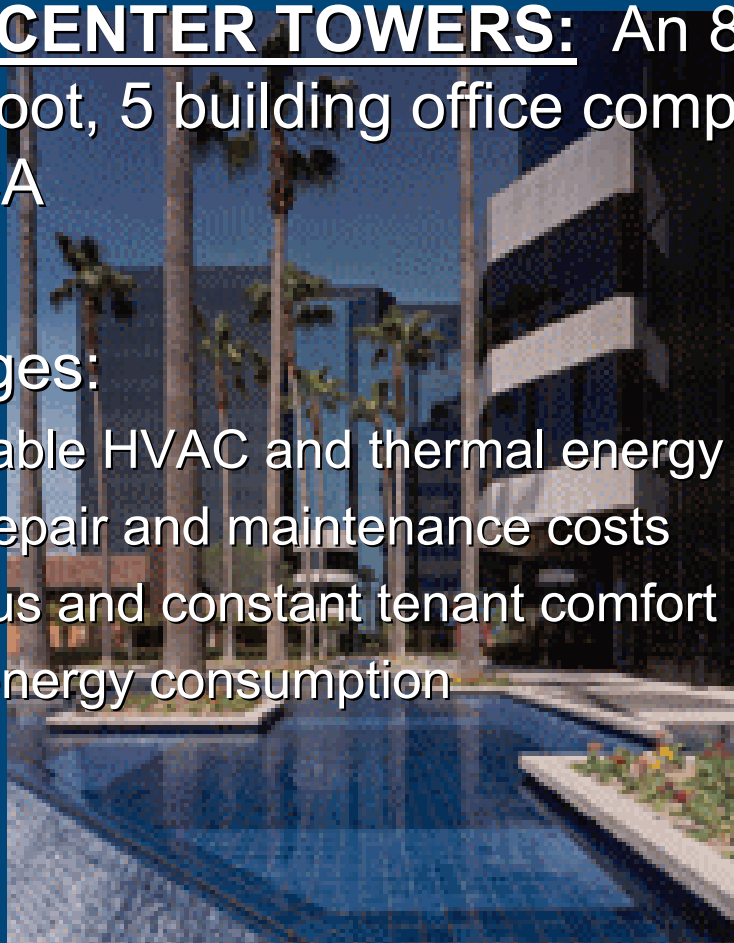


# CASE STUDY

> **IRVINE CENTER TOWERS:** An 898,948 square foot, 5 building office complex located in Irvine, CA

> **Challenges:**

- Unreliable HVAC and thermal energy storage systems
- High repair and maintenance costs
- Obvious and constant tenant comfort problems
- High energy consumption

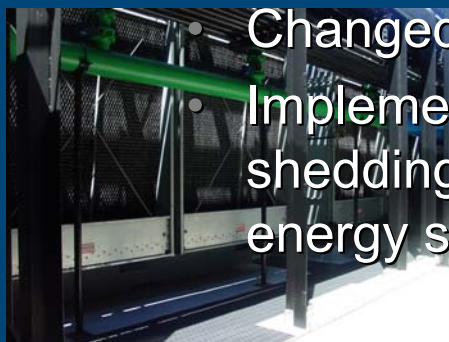
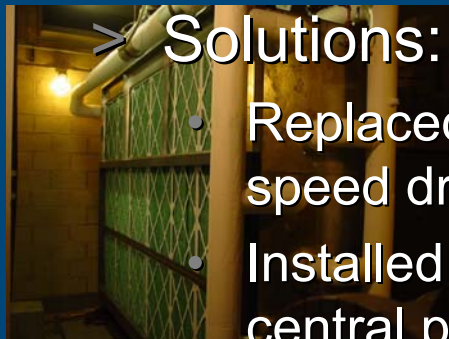




# IRVINE CENTER TOWERS

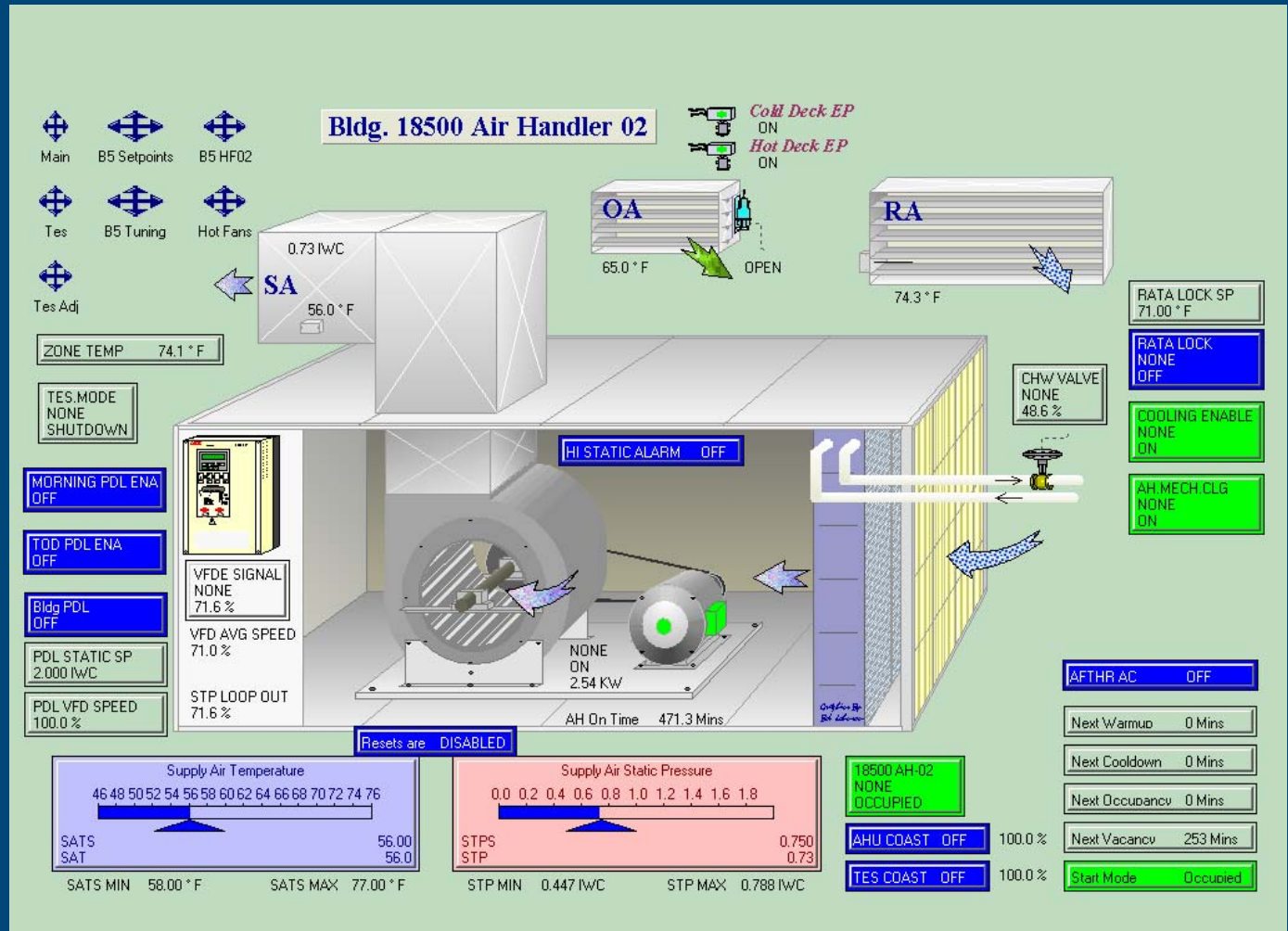
## > Solutions:

- Replaced chillers with more efficient units with variable speed drives
- Installed energy management system for optimal central plant control
- Installed larger variable speed cooling tower system
- Upgraded thermal energy storage system
- Re-piped chiller plant to accommodate increased chiller capacity and efficiency
- Changed out 6 row cooling coils to 8 row coils
- Implemented lighting and sensor retrofits, load shedding technologies and other low-to-no cost energy strategies





# IRVINE CENTER TOWERS







# IRVINE CENTER TOWERS

## > Results:

- Incentive payments from SCE and the CEC of over \$800,000 dollars
- Annual savings of over \$300,000
- KWH reduction of over 2.5 Million
- Electrical usage decreased by 30%
- Electrical expenses have steadily decreased since 2001, from \$2.29/sf to \$1.89/sf currently
- Increased tenant comfort and control





# CASE STUDY

- > **Tricentre:** A \_\_\_ square foot, \_\_\_ story Class A office tower near Anaheim Stadium in California
- > **Challenge:**
  - Abnormally high energy consumption



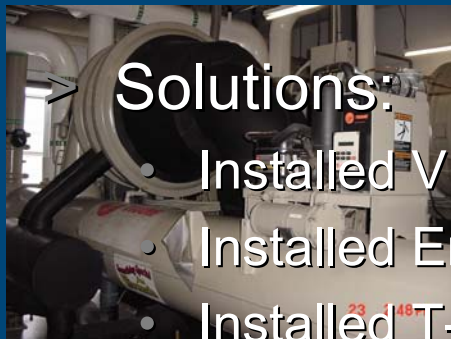




# TRICENTRE

## Solutions:

- Installed VFD's on cooling tower fans
- Installed Energy Management System
- Installed T-8 lighting throughout with occupancy sensors
- Installed variable pumping system for domestic water
- Installed 600 KW Co-Generation plant
  - Heat recovery with absorption chiller
  - (3) 200 Kw Hess Generators
  - Hot water recovery
  - 174-ton absorption chiller





# TRICENTRE

## > Results:

- The Co-Gen plant will:
  - Supply up to 86% of the building's electrical requirements
  - Provide 100% of the building's hydronic heating
  - Provide 48% of the chilled water needs
  - Provide partial redundant electrical use in a power outage
  - Help load profile the building for more effective commodity purchasing
- Energy cost savings to date: **20%**
  - Additional demand side savings as well operational expense savings projected as Co-Gen plant's impact continues



# THANK YOU!

**For more information:**

Dennis Thurman, FMA, CPE, CEM  
Director of Engineering  
21530 Oxnard Street, Suite B  
Woodland Hills, CA 91367  
818-737-3000



**TRANSWESTERN**  
COMMERCIAL SERVICES



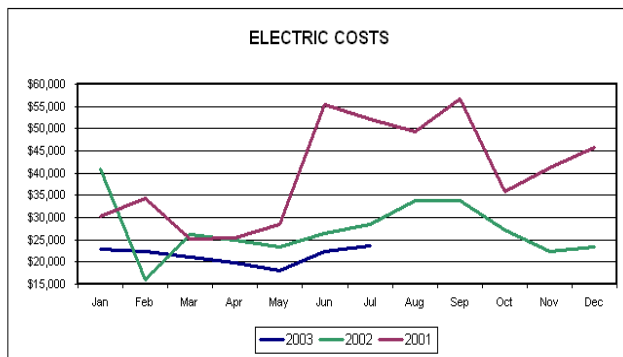
# IRVINE CENTER TOWERS



## ELECTRICAL SERVICE ANALYSIS

18200 Von Karman

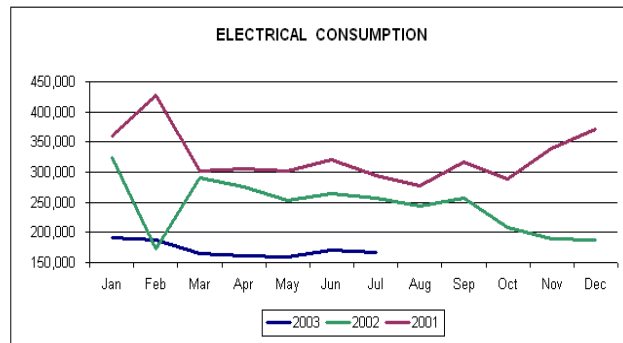
### ELECTRICAL COSTS



Month	2003	2002	2001
Jan	\$ 22,758	\$ 40,982	\$ 30,216
Feb	\$ 22,283	\$ 16,085	\$ 34,368
Mar	\$ 21,081	\$ 26,290	\$ 25,171
Apr	\$ 19,884	\$ 24,969	\$ 25,385
May	\$ 17,981	\$ 23,466	\$ 28,416
Jun	\$ 22,369	\$ 26,529	\$ 55,386
Jul	\$ 23,600	\$ 28,600	\$ 52,098
Aug	\$ 33,803	\$ 33,770	\$ 49,205
Sep	\$ 33,770	\$ 56,677	\$ 55,386
Oct	\$ 27,107	\$ 35,826	\$ 36,826
Nov	\$ 22,449	\$ 41,285	\$ 41,285
Dec	\$ 23,455	\$ 45,735	\$ 45,735
<b>Total</b>	<b>\$ 149,956</b>	<b>\$ 327,505</b>	<b>\$ 479,768</b>

ELECTRICAL COSTS INCREASED 2.7 CENTS/KVWH IN 2003

### ELECTRICAL CONSUMPTION



Month	2003	2002	2001
Jan	191,998	324,780	360,737
Feb	188,096	173,113	426,996
Mar	165,121	290,907	301,181
Apr	160,480	275,346	305,416
May	159,133	252,899	302,410
Jun	171,338	263,539	319,822
Jul	167,532	256,973	295,190
Aug	243,933	243,933	276,681
Sep	256,894	256,894	316,764
Oct	208,890	208,890	288,763
Nov	189,184	189,184	339,082
Dec	187,902	187,902	371,421
<b>Total</b>	<b>1,203,698</b>	<b>2,923,360</b>	<b>3,904,463</b>

Thumbnail images of electrical service analysis reports for various locations:

- ELECTRICAL SERVICE ANALYSIS 18350 Von Karman (Central Plant)
- ELECTRICAL SERVICE ANALYSIS 18500 Von Karman
- ELECTRICAL SERVICE ANALYSIS 18300 Von Karman
- ELECTRICAL SERVICE ANALYSIS 18300 Von Karman
- ELECTRICAL SERVICE ANALYSIS 18300 Von Karman





# IRVINE CENTER TOWERS

## Burbank Water and Contact: Jeanette M

Approved energy saving program up to their annual maximum 1,000 are eligible for up to \$10,000. The dollar amount is per project basis.

## Glendale Water and Contact: 818-548-2750

- Business Energy
  - o Program project served
  - o Custom
  - o Must be
  - o Custom
  - o are not
  - o Must call
  - o Must pre
  - o Must pre

## Additional Websites

California ISO  
California's Manufacturing  
California Public Utilities

## EXPRESS EFFICIENT

### Southern California

Maximum Incentive is \$25,000

- Air Conditioning:
  - Package Term
  - Package or Split
  - Set Back Program
  - Evaporative Cooler
  - Cooling Roof
  - Reflective Film
  - Variable Frequency
  - Lighting: Must meet
    - Screw-in CFL
    - Hard-wired Fluorescent
    - High Efficient T8 or T5 with
    - High Intensity Discharge
    - Occupancy Sensor
    - High Output

### Pacific Gas & Electric

Maximum Incentive is \$25,000

- Air Conditioning:
  - Package Term
  - Package or Split
  - Set Back Program
  - Evaporative Cooler
  - Cooling Roof
  - Reflective Film
  - Variable Frequency
  - Lighting: Must meet
    - Screw-in CFL
    - Hard-wired Fluorescent
    - High Efficient T8 or T5 with
    - High Intensity Discharge
    - Occupancy Sensor
    - High Output

### San Diego Gas & Electric

Maximum Incentive is \$25,000

- Air Conditioning: Menu of
  - Package Terminal and Package or Split System
  - Set Back Program
  - Evaporative Cooler
  - Cooling Roofs
  - Reflective Film
  - Variable Frequency Drives
  - Lighting: Must meet minimum
    - Screw-in CFL (upto 100)
    - New Compact and Lamps
    - High Efficiency Exit Sign
    - T8 or T5 with Electronic Ballast
    - High Intensity Discharge
    - Occupancy Sensor (upto 400)
    - High Output T5 (per 400)

### Los Angeles Department of Water

Website: [www.ladwp.com](http://www.ladwp.com)

### Chiller Efficient

operational between 60-70 degrees Fahrenheit. rebate will be based on energy savings.

### CLEO Lighting

2, 3, and 4 ft. Fluorescent

PWP provides a collection of customer programs. Most programs are funded from the Public Works Fund.

8-ft. Fluorescent

### Business Services

Energy Partnering Program provides a PWP efficiency measures. Currently, they are not available.

### Anaheim Public Utilities

Website: [www.anaheim.net/utilities](http://www.anaheim.net/utilities)

Business Solutions – Energy Efficiency Incentives

- Program Criteria
  - o All participants must be electric customers.
  - o Before energy-efficient equipment is completed by Anaheim Public Utilities.
  - o Equipment installations must be completed within the following time frame:
    - o Inspection of energy-efficient equipment
    - o Motors
      - \$35 - \$630 depending on size
    - o Heat Pump Incentive
      - \$200 - \$300 per unit
    - o Lighting
      - \$.075 per kWh saved

HVAC Rebate Program - \$20,000 to be calculated by LADWP based on reservation will be valid for 90 days

### Commercial Rebate

SEER	Tier	Amount
2-5 Tons	Tier 1	12
	Tier 2	13
	Tier 3	14 or >

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SEER	Tier	Amount
2-5 Tons	Tier 1	12
	Tier 2	13
	Tier 3	14 or >

### Pasadena Water and Power (PWP)

Website: [www.ci.pasadena.ca.us](http://www.ci.pasadena.ca.us)

PWP provides a collection of customer programs. Most programs are funded from the Public Works Fund.

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Energy Partnering Program provides a PWP efficiency measures. Currently, they are not available.

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      - \$.075 per kWh saved



Date: June 23, 2003

To: Managers & Engineers  
Transwestern Commercial Services

From: Dennis Thurman  
Transwestern Commercial Services

RE: Utility Incentives

Please find below the incentive programs for utilities located throughout California that are currently available. I have broken down the programs by utility for your review.

## INVESTOR OWNED UTILITIES: SCE, PG & E AND SDGE & E

Website: [sce.com](http://sce.com), [pge.com](http://pge.com) and [sdge.com](http://sdge.com)

### Southern California Edison

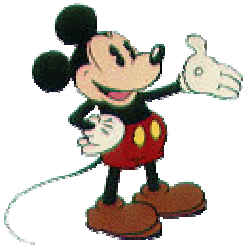
Standard Performance Contract:

Currently, SCE is accepting applications for fiscal year 2003 program. The incentive programs has been officially announced and has approximately \$1,500,000 available that is not approved or pending. Thus, it would be beneficial to submit applications and reserve the monies as soon as possible.

### Standard Performance Contract for all three Investor Owned Utilities:

- Project Sponsors are limited to a maximum of 50% of project cost and the customers are limited to a maximum of \$300,000 per customer site and \$1,500,000 per parent.
- Kilo-watt savings must be greater than 250,000
- Customers that have a greater than 500 kW consumption
- Lighting – must include other measures that account for at least 20% of the project savings.
- Eligible technologies
  - o Lighting
  - o Variable Speed Drives
  - o Lighting Controls
  - o High Efficiency Air Conditioning
- Incentive Amounts
  - o Lighting
    - 5.0 cents per kWh saved
  - o Air Conditioning & Refrigeration
    - 14.0 cents per kWh saved
  - o Motors/Other Equipment
    - 8.0 cents per kWh saved
- Total Incentive is paid in one installment after approval of the Installation Report (IR). If the SPC Measured Savings Approach is used the 1<sup>st</sup> payment is 60% of the estimated incentive, plus an additional payment equal to 10% of the estimated incentive to defray cost of M&V.





# Walt Disney World's Energy Star Program

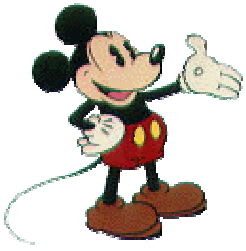
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## Disney's Building Tune-Up Program

Paul Allen, P.E.

Chief Engineer Energy Management

Reedy Creek Energy Services



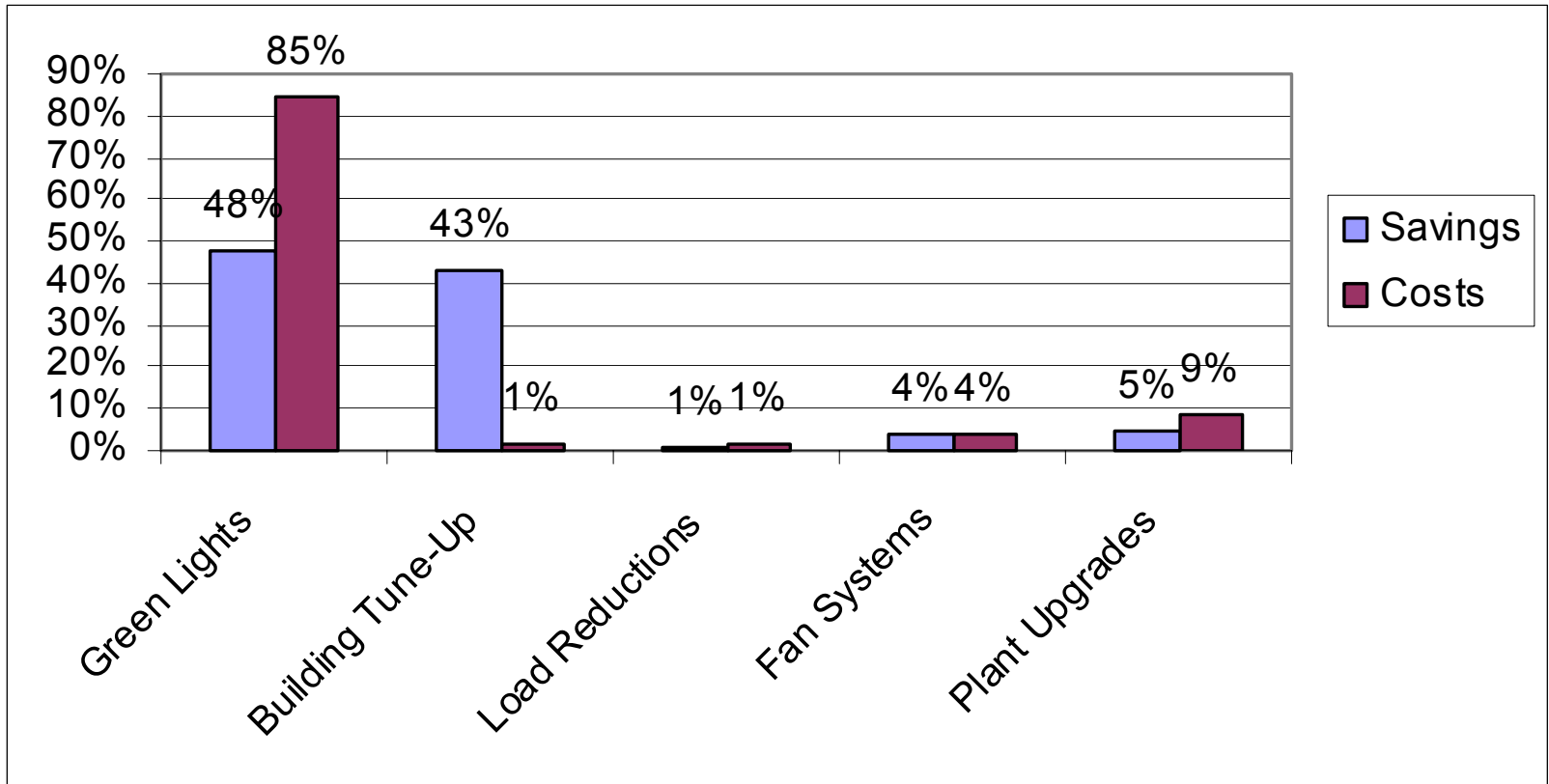
# Energy Star Buildings Program

1. Green Lights Upgrades
2. **Building Tune-Up**
3. Load Reductions
4. Fan System Upgrades
5. Heat and Cooling Plant Upgrades



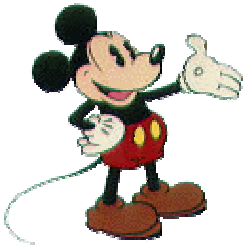


# Energy Star Results



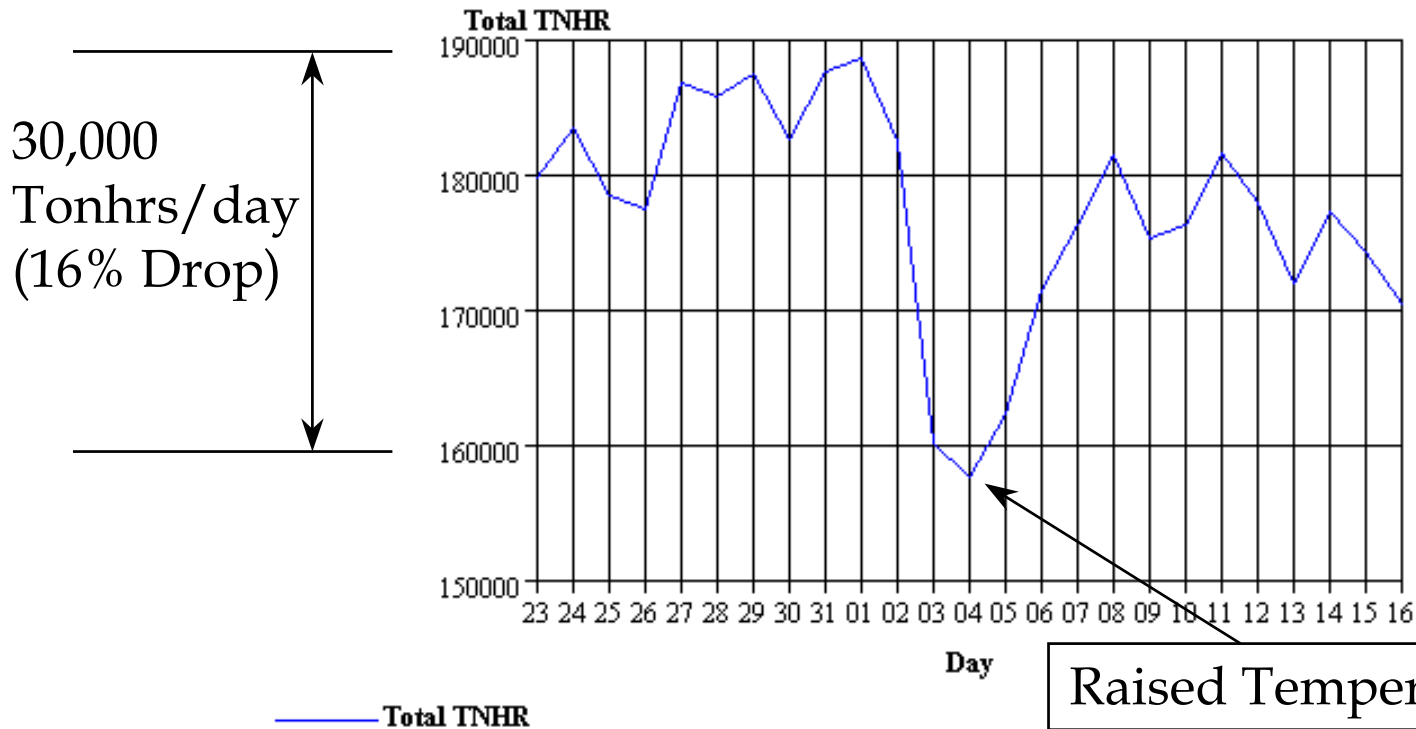
Overall Program Results - 44% IRR



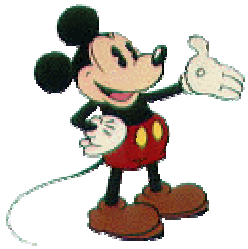


# Epcot's Building Tune-Up

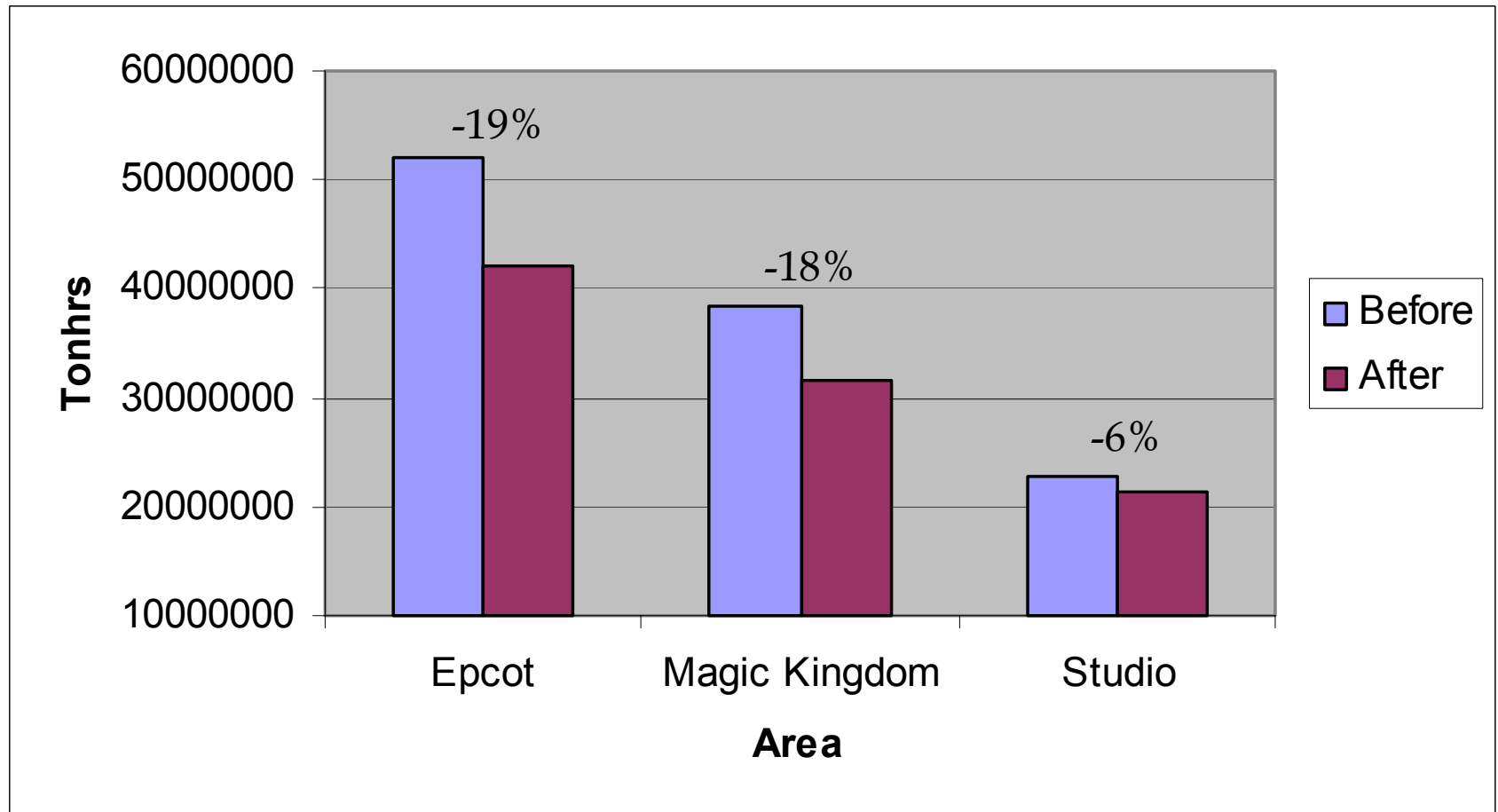
DAILY TOTAL Graph of TNHR PROFILE for Subarea; ECEP-PLANT-CW; ECEP-PLANT-CW

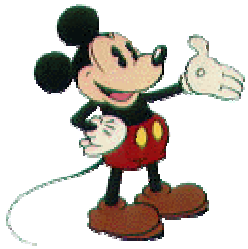


Lesson Learned: Slow & Steady Wins the Race



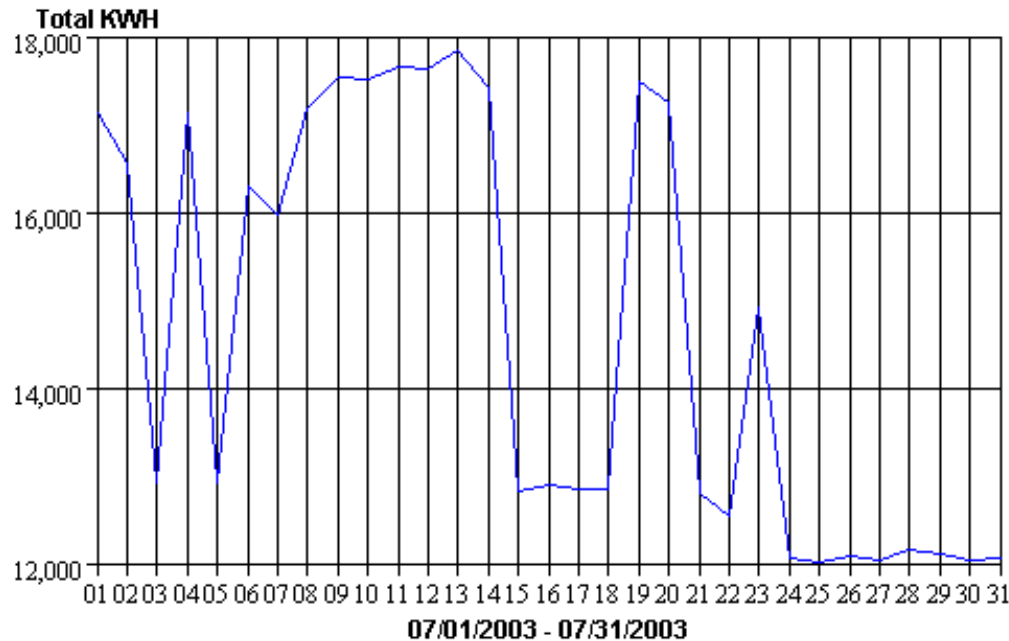
# Chilled Water Savings





# Epcot Compressed Air Tune-up

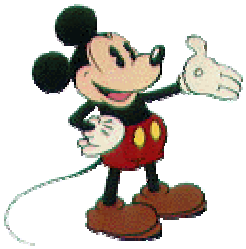
DAILY TOTAL - Division = RCID - Area = ECEP-PLANT-AIR  
SUBAREA = ECEP-PLANT-AIR



-30%

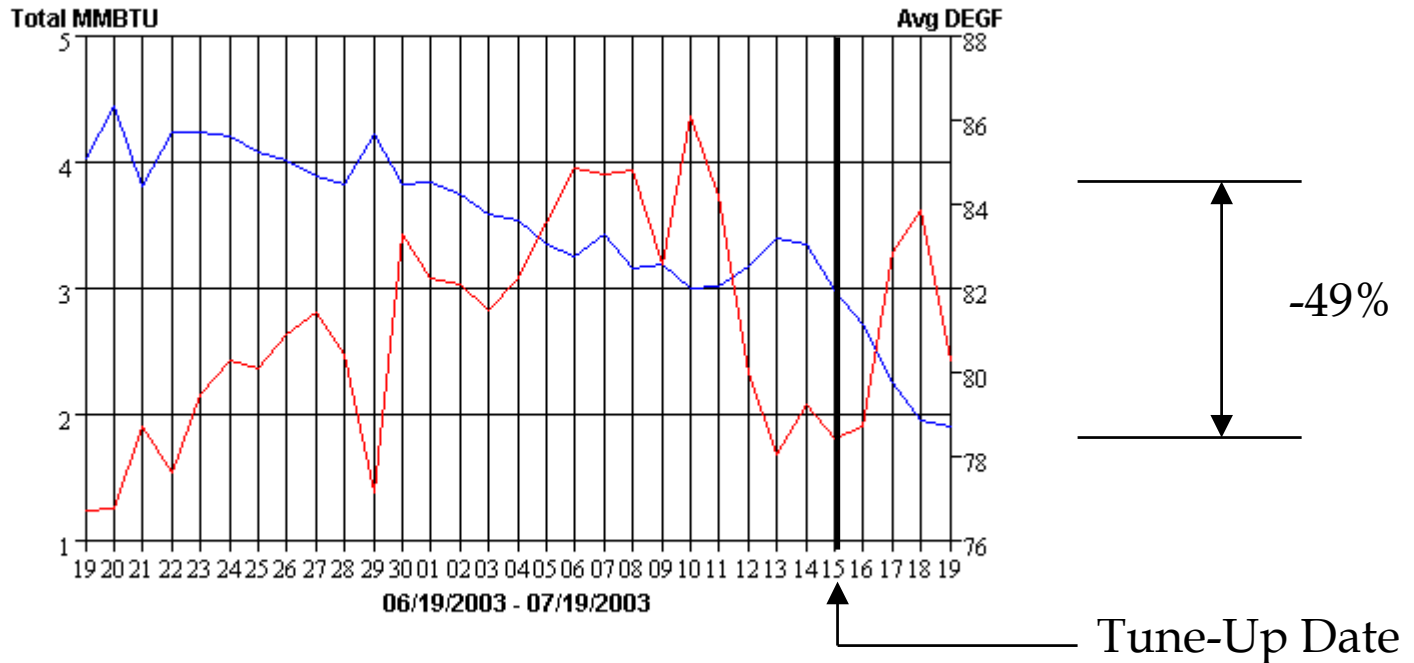
— ELECTRIC

Tuned-Up Attraction Compressed Air Actuators, Eliminated  
Need for 2<sup>nd</sup> Compressor, 500Kw Demand Reduction



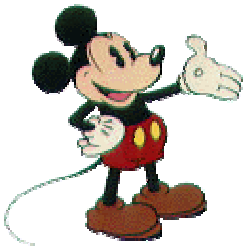
# Disney University Tune-Up Hot Water Reduction

DAILY TOTAL - Division = SUPPORT - Area = DISNEY UNIVER  
SUBAREA = DISNEY UNIVERSITY



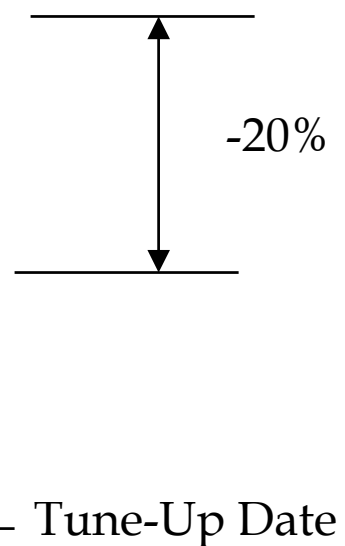
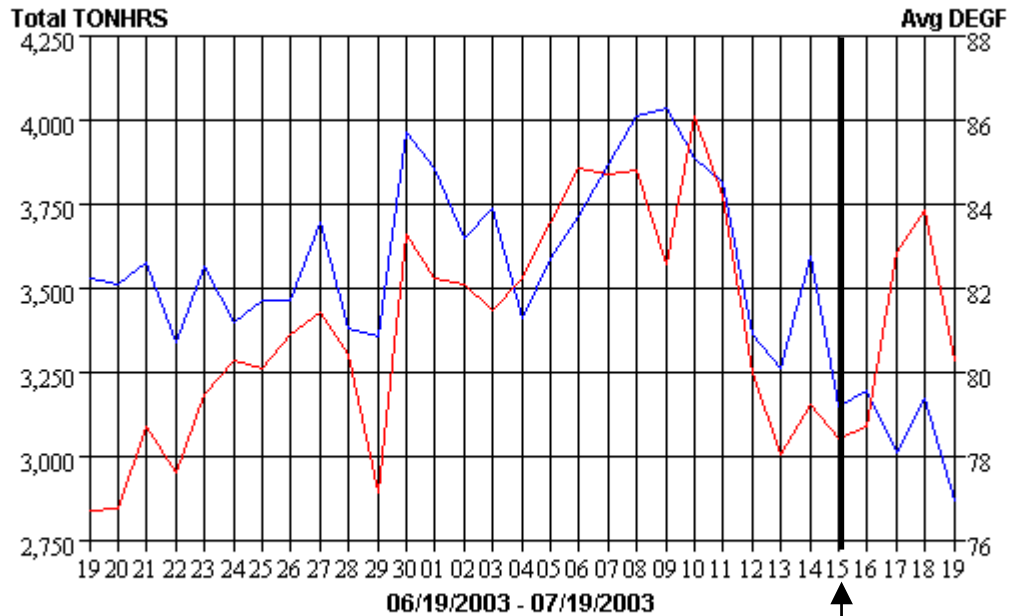
- HOT WATER
- Temp, Rcid, Weather Station, Ambient Air Temperature, Ambient Air Temperature

Re-calibrated VAV box minimum air flow settings which reduced reheat requirement.



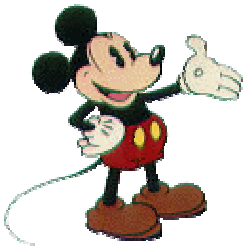
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DAILY TOTAL - Division = SUPPORT - Area = DISNEY UNIVER  
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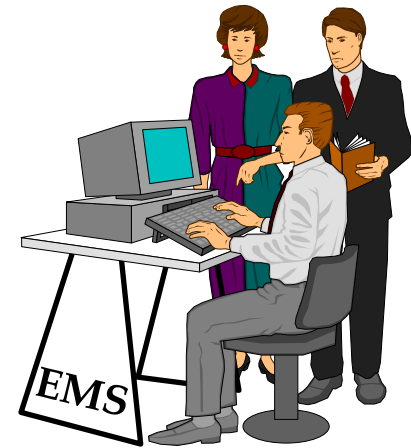
- CHILL WATER
- Temp, Rcid, Weather Station, Ambient Air Temperature, Ambient Air Temperature

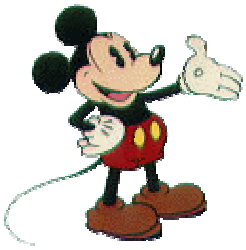
Turned off or Setback HVAC Systems at Night, Optimized Temperature Setpoints



# Building Tune-Up Process

- **Tune-Up HVAC Control System**
  - Optimize time/setpoint schedules - Auto-reset daily
  - Understand energy management system control strategies
- **Repair Controls that have Failed**
  - Control valves, dampers and sensors
- **Measure Utility Consumption**
  - Track monthly utility bills
  - Install submetering strategically
  - Publish the data on an Intranet

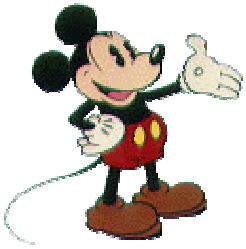




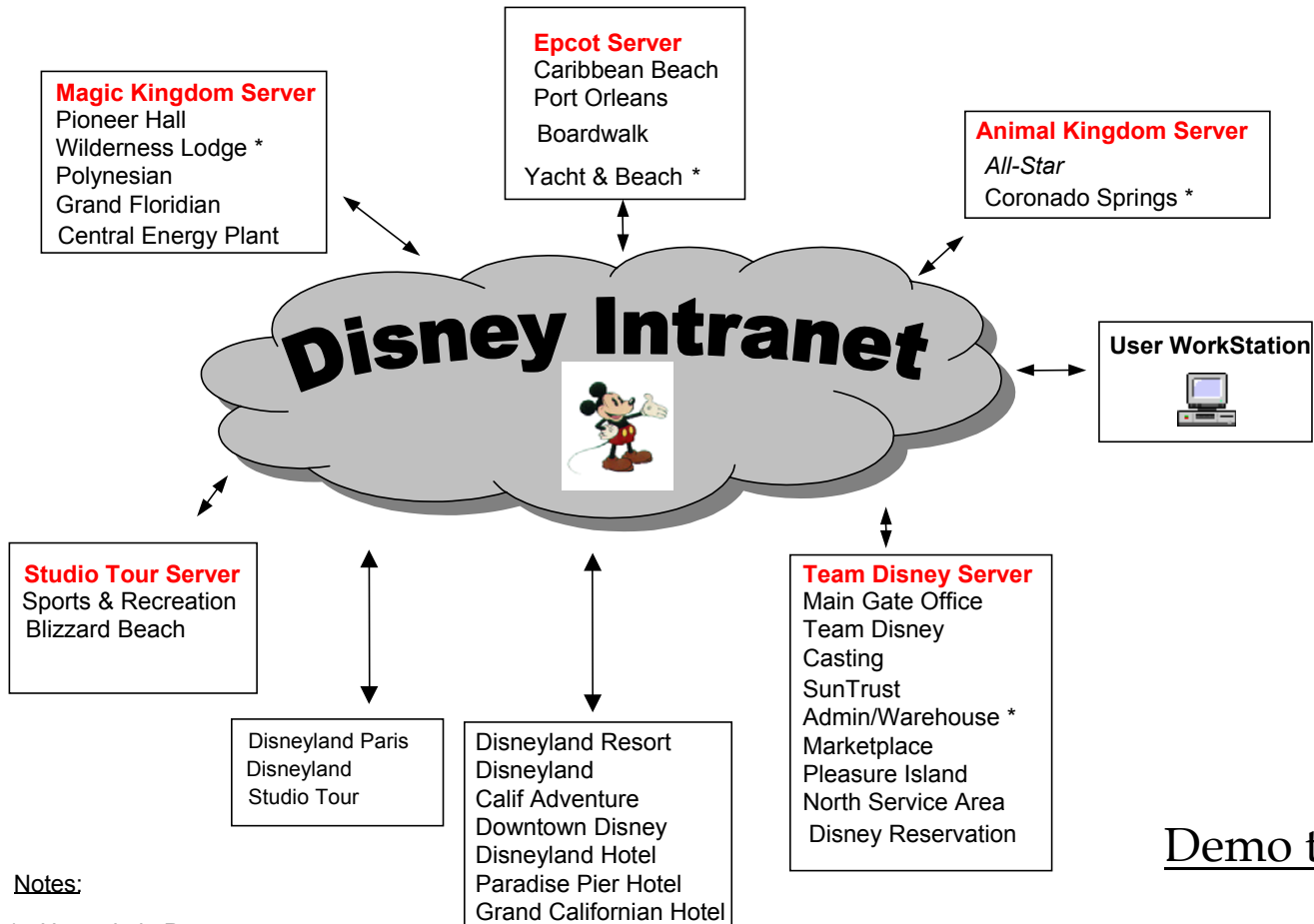
# Building Tune-Up System (BTUS)

- **Energy Management System**
  - HVAC Equipment
  - Time Schedules
  - Setpoint Schedules
  - Link to Temp/RH Trends
- **Facility Time Schedule Program (FTS)**
  - Nightly Download of Time and Setpoint Schedules
- **Demo to Follow**





# Central Energy Mgmt System

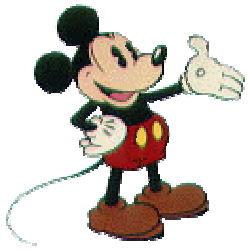


Notes:

\* - Upgrade in Progress

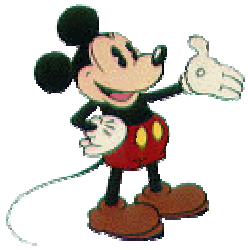
Demo to Follow





# Energy Management Field Panels





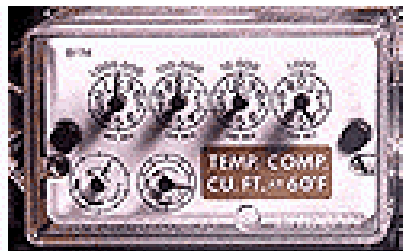
# Metering Examples



Electric Meters



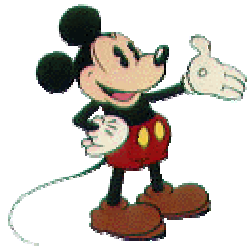
Chilled/Hot Water Meters



Gas Meters



Water Meters



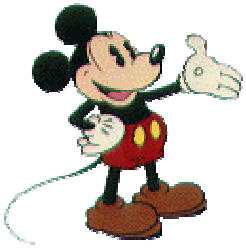
# Electric Sub-Meters





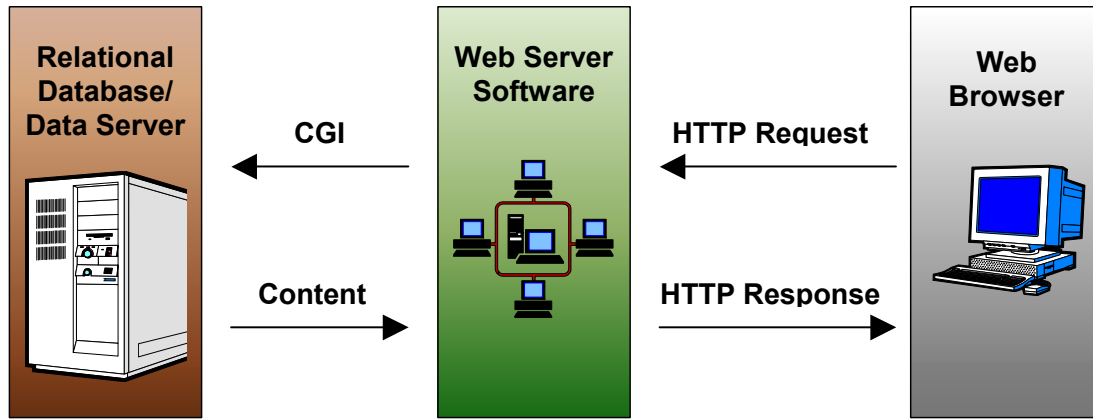
# Water Meters





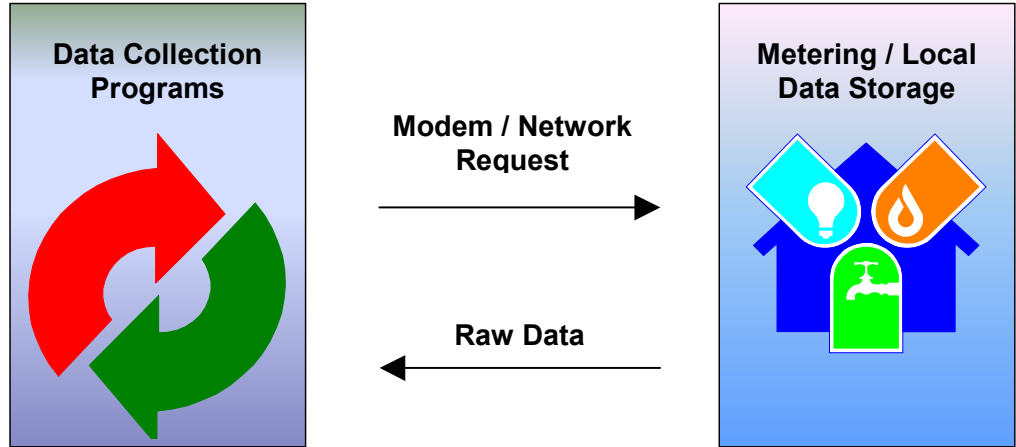
# Portable Flow/BTU Meters



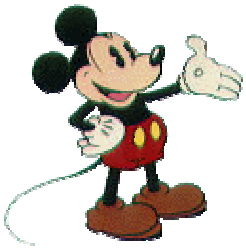


**Web Publishing Process**

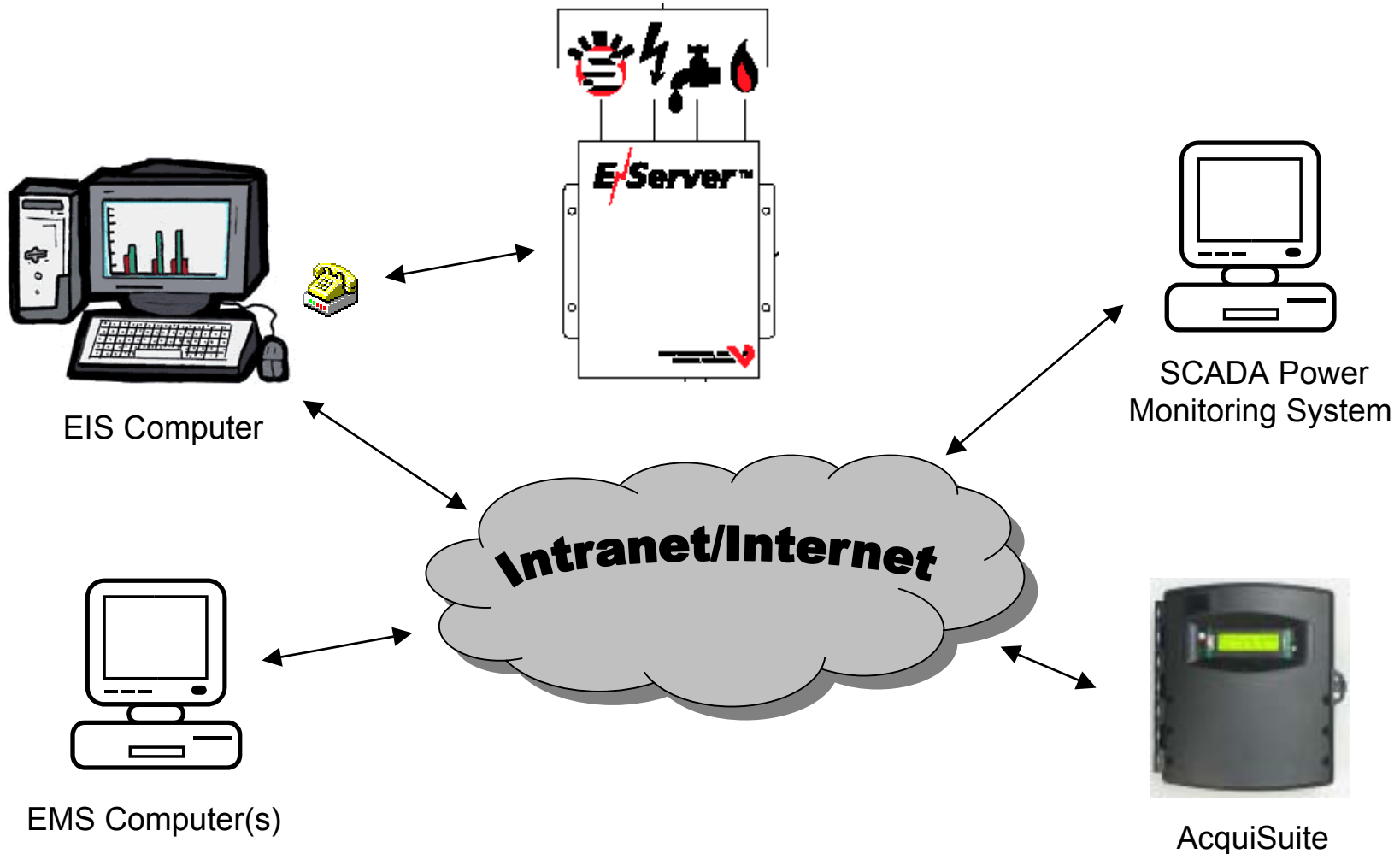
Processed Data

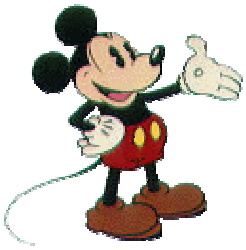


**Data Collection Process**



# Data Collection Devices





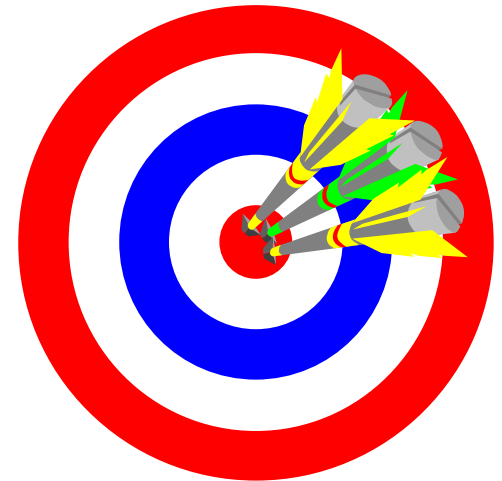
# Web Programming Tools

- **Server Programs**

- Windows 2000 Server
- Internet Information Server (IIS)
- Microsoft Visual Foxpro
- Foxweb ([www.foxweb.com](http://www.foxweb.com))
- KavaCharts ([www.ve.com](http://www.ve.com))
- Autotask 2000 ([www.cypressnet.com](http://www.cypressnet.com))

- **Client Programs**

- Netscape
- Internet Explorer

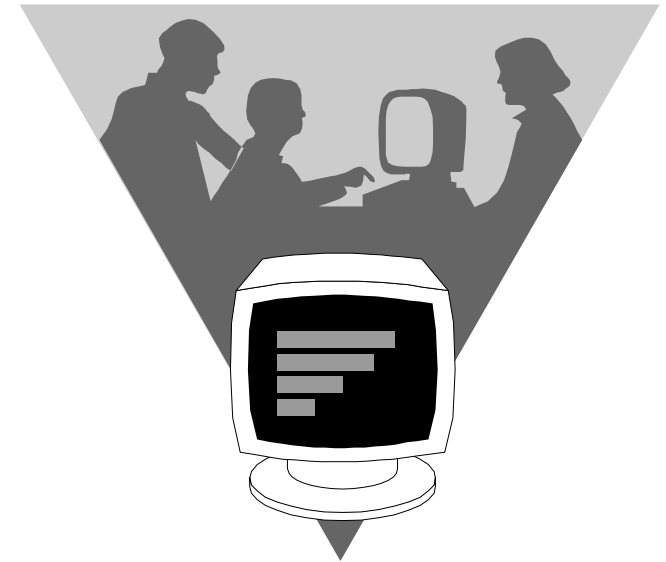


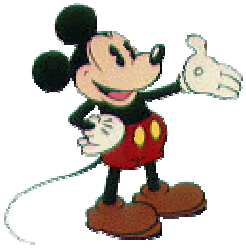




# Utility Reporting System (URS)

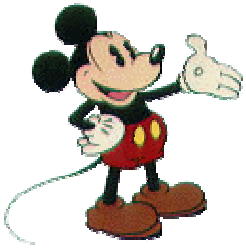
- **Intranet Database Program**
  - Use web browser to graph and report utility usage
- **Monthly Billing Data**
  - Utility bill data downloaded monthly from utility
- **Hourly Interval Data**
  - Power monitoring systems
  - Energy management systems
  - Other submetering systems
- **Demo to Follow**





# Energy Information System Results

- **Energy Project Savings**
  - Quantified with Monthly Billing Data
- **Utility Cost Reimbursement**
  - Quantify Operating Participant Usage
- **Utility Billing Errors**
  - Comparison reports are emailed to individuals each month - lot's of visibility to data
- **Utility Awards Report**
  - Awards based on analysis of monthly billing data.
  - Winners have largest percent reduction from prior year



# Energy Information System Results

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- **Redundant Utility Metering**
  - Provides daily checks on meter accuracy
- **Chiller and Boiler Plant Efficiency**
  - Helps identify poor performing plant operation
- **Inefficient Chilled Water Usage**
  - Pinpoints facilities with low chilled water differential temperatures
- **New Facility Design and Utility Budgets**
  - Generated from meter data from comparable facilities

# *Utility Reporting System*



Visit <http://www.utilityreporting.com>



# Selected Resources

- **Building Upgrade Manual**  
[www.energystar.gov](http://www.energystar.gov) > business improvement > tools & resources page
- **Portfolio Manager**
- **Purchasing & Procurement Guidelines**  
[www.energystar.gov](http://www.energystar.gov) > business improvement > purchasing & procurement link
- **Quick Scope (for commercial real estate)**



# Upcoming Web Conferences

**October 22, 2003**

**Increasing Energy  
Performance Across  
the Organization**

**November 19, 2003**

**Communicating To  
Financial Officers**



**Save The Date!**

**December 3, 2003**

**ENERGY STAR Networking Meeting  
Washington, DC**



Thank you for participating!