

US EPA ENERGY STAR: Benchmarking Energy Use in Commercial Buildings

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Making Headlines....



- St Paul Public Schools, second largest school district in Minnesota, avoided energy costs amounting to over \$1 million in the last 4 yrs.
- Transwestern Commercial Services increased their asset value by \$750 million from 2002 to 2004 through energy conservation.
- Food Lion, committed to a company-wide strategy for energy efficiency, has seen savings amounting to nearly \$105 million.
- Marriott International has achieved \$4.5 million in annual savings through a strategic Energy Conservation Program.

The Value of Energy Efficiency in Commercial Buildings



- In 2006, American consumers and businesses, with the help of ENERGY STAR:
 - Prevented the release of greenhouse gas emissions equivalent to those from 25 million automobiles.
 - Saved more than \$14 billion on energy bills.
- The buildings in which we work, shop, play, and educate our children use \$200 billion of electricity and natural gas each year.
- According to the U.S. Green Building Council, GHG emissions from commercial buildings are projected to grow faster than any other sector over the next 25 years – about 1.8 percent per year.
- Commercial buildings and industrial facilities generate 45% of our national emissions of greenhouse gases.
- 30% of energy consumed in commercial buildings is used unnecessarily or inefficiently.

Energy as a Percentage of Total Office Building Operating Expenses



Data based on 2007 BOMA Experience Exchange Report (Average of Urban & Suburban Non-Government Buildings)

ENERGY STAR for Commercial Buildings

- U.S. Environmental Protection Agency energy management program.
- Provides proven solutions to help public and private sector building owners and managers reduce their energy consumption.
- Works in markets with a focus on:
 - Public sector (government, K-12, higher ed)
 - Commercial property (offices, retail, hotels)
 - Healthcare
 - Small business and congregations





ENERGY STAR for Commercial Buildings

- ENERGY STAR buildings' utility bills are over 50 cents per square foot less than average buildings'.
- On average, ENERGY STAR buildings use 35 percent less energy than average buildings.
- Nearly 30 percent of Fortune 500 companies are ENERGY STAR partners.
- ENERGY STAR office properties gross higher rents and higher occupancy rates than their non-ENERGY STAR counterparts.
- Over 60,000 buildings, representing about 8 billion square feet of space, have measured their energy performance with ENERGY STAR.





ENERGY STAR for Commercial Buildings



- Offer a variety of free technical resources:
 - Tools to benchmark and track energy performance in buildings
 - Energy Management Guidelines
 - Assistance for architects on designing energy efficient buildings
 - Case studies and best practices from leaders
 - Calculators to track returns on energy efficiency investments
 - Training
 - Materials to communicate with citizens, employees, stakeholders, and the media about energy efficiency efforts.
- Opportunities for national recognition:
 - ENERGY STAR Label
 - ENERGY STAR Leader
 - ENERGY STAR Partner of the Year

Successful Benchmarking Can Help to:



- Plan and prioritize upgrade efforts and retrofits
- Make energy costs visible
- Identify best (and worst) building management practices within a building or across a portfolio of buildings
- Assess performance relative to peers in the same sector or across other sectors
- Identify areas of improvement and make informed management and investment decisions
- Communicate good results to the public

Benchmarking has helped Food Lion to reduce its utility cost per store per week by 5.5%

Myth #1: Age Matters



My building is new, so I know it's energy efficient.

New Doesn't Always Equal Efficient





Myth #2: Technology Matters



I installed energy efficient technologies, so I know my building is energy efficient.

Technology Doesn't Always Equal Performance





If you're still not convinced that benchmarking energy use is a good idea...

Fort Wayne Fire Stations 20 Similar Buildings – Different Energy Use

Current Site and Weather Normalized Source Energy Intensity (kBtu/SF) 500 450 400 350 300 Site Intensity 250 Source Intensity 200 150 100 50 Fort Warne Fie Dopartq Electration 5 Fire Station F FIRSTATION file Shion P File Station 15 File Station . File Academy File Station FileStation File Station 10 File Station 19 FII8 Station 14 File Station ? File Shion PE File Station 13 File Station 1 FIRE Station 1

Fire Stations- Site and Source Energy Use Intensity











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PORTFOLIO MANAGER EPA's system for helping you track and improve energy efficiency across your entire portfolio of buildings.	FAQ FREQUENTLY ASKED QUESTIONS CONTACT OF HELP
WHAT'S NEW IN PORTFOLIO MANAGER	
New! Water Treatment and Distribution Facilities The EPA is pleased to announce the addition of Water Treatment and Distribution Facilities to Portfolio Manager. Water Utilities will now be able to track and improve energy consumption and emissions by entering and managing data in Portfolio Manager. Learn More New! Portfolio Manager Enhancements (Spaces Not Eligible to Receive a Rating) Portfolio Manager now provides users the ability to manage buildings that are eligible to receive a rating as well as those that are not – all within the same online platform. Learn More	Username: <u>Forgot your username?</u> Password: <u>Forgot Your Password?</u> New User? <u>Register</u> Login
About Portfolio Manager	ENERGY STAR Labeled Buildings
 Learn what Portfolio Manager can do for your organization Take the Portfolio Manager Tour Explore some Frequently Asked Questions about our October 1, 2007 Updates Train on how to use Portfolio Manager Review eligibility requirements to benchmark your facility Import facility data 	
Success through ENERGY STAR	
 Learn about ENERGY STAR Leaders that have improved organization-wide Take the ENERGY STAR Challenge – improve your buildings' energy efficiency by 10% Find buildings that have earned the ENERGY STAR 	Coleman A. Young Municipal Center 2 Woodward Avenue Detroit, MI 48226 <u>Read Profile</u>



Inside Portfolio Manager

Portfolio Averages Add a Property								
Baseline Rating: 89 Facilities Included: 8 Portfolio Adjusted Percent Energy Reduction: 1.9% Facilities Included: 11				Work with Facilities I <u>mport</u> Facility Data Using Templates <u>Update</u> Multiple Meters <u>Share</u> Facilities <u>Request</u> Energy Performance Report				
Averages are weighted by Total Floor Space. Apply for Recognition More about Baselines Apply for the ENERGY STAR More about Adjusted Percent Energy Reduction ENERGY STAR Leaders					on ' STAR <u>rs</u>			
GROUP: All Facilities 🔽 Create Group View All VIEW: Nonratable View 💟 Create View Edit View View All								
Download in Excel Search Facility Name: Search								
Results 1 - 13 of 13	Results 1 - 13 of 13 AII # A B C D E F G H I J K L M N O P Q R S T U V W X Y Z							
Facility Name 🗖	Current Source Energy Intensity (kBtu/Sq. Ft.)	National Average Source EUI (kBtu/Sq. Ft.) i	% Difference from Avg Source EUI î)	<u>Current Site Energy</u> Intensity (kBtu/Sq. <u>Ft.)</u> î	National Average Site EUI (kBtu/Sq. Ft.) î	Adjusted Percent Energy Reduction i	<u>Current</u> <u>Rating</u> (<u>1-100)</u>	
A Portion	26.8	227.3	88.2% Below National Average	8.0	68.1	0.0%	100	
AES - Test	111.0	223.9	50.4% Below National Average	33.2	67.0	12.6%	93**	
Done								



- Track multiple energy and water meters for each facility
- Customize meter names and key information
- Benchmark your facilities relative to past performance
-) View percent improvement in weather-normalized source energy
-) Monitor energy and water costs
-) Share your building data with others inside or outside of your organization
- Enter operating characteristics, tailored to each space use category within your building.
- Rate energy performance on a scale of 1-100 relative to similar buildings nation wide

Portfolio Manager Statement of Energy Performance



ENERGY S

Is Your Building Performing Well?



in this and



Is 18 MPG high or low for an automobile?

Is 80 kBtu/SF/YR high or low for a building?

Energy Performance *EPA Benchmarking*

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STATEMENT OF ENERGY PERFORMANCE Margrave High School

EPA's Energy Performance Rating System for Commercial Buildings



- Housed within Portfolio Manager
- Based on actual billed energy data
- Creates a whole building indicator
 - Capture the interactions of building systems not individual equipment efficiency
 - Track energy use accounting for weather and operational changes over time
- Gives a peer group comparison
 - Compare a building's energy performance to its national peer group
 - Track how changes at a building level alter the building's standing relative to its peer group
- Uses a simple 1-100 "score" where 50 is an average building
- Normalizes for factors such as weather, occupancy, operating hours, and other building-specific characteristics

EPA Rating – Technical Foundation



- Analyze national survey data
 - Energy Information Administration's Commercial Building Energy Consumption Survey (CBECS)
- Develop regression models to predict energy use for specific building types based on operations
- Create scoring lookup table
 - Ratings are based on the distribution of energy use for a given building type
 - Ratings are expressed on a 1-to-100 scale such that one point represents one percentile of buildings
 - A rating of 50 indicates that your building is better than 50% of buildings in the population
- Buildings that earn a 75 or higher can earn the ENERGY STAR label

EPA's Energy Performance Rating System – Available Space Types



Offices



Supermarkets



Hospitals



Hotels

K-12 Schools



Medical Office Buildings





EPA's Energy Performance Rating System – Available Space Types



Warehouses

fice DB



Courthouses

ENERGY STAR



Wastewater Treatment Plants

Residence Halls Financial Centers







Improving Management Strategies: 1900 K Street, Washington DC

- New Construction (1996) with energy efficiency in mind but oversized equipment
- EPA Rating
 - ♣ In 1999 ◊ 32
 - ♣ In 2006 (\) 78
- Harnessed building automation systems to improve efficiency
 - VFDs on chillers to match measure demand
 - Improved operating standards static pressure set points
 - Continuous tracking of energy use
 - Improvements to lighting systems
- Savings reflect synergy between building technology and energy management practices





Whole Building Strategy: St. Francis Hospital, Missouri



- ♣ 150,000 sq. ft hospital- Maryville, Missouri
 - Initial rating 51
 - Methodological review
 - Commissioning, lighting and ENERGY STAR procurement policy
 - Used \$ saved from right-sizing water pump to buy new boilers
 - Used \$ saved from new boilers to fund new DDC controls
 - In one year:
 - ϖ Score: 91
 - ϖ Gas bill cut in half
 - ϖ Electricity reduced 17%

"Benefits to patient comfort.... savings put into patient services"



First Step to Green: Citigroup



Portfolio = 90 million sq. ft.

Comprehensive tracking of + 13,000 properties
Set ghg reduction goal: 10% by 2011
Use EPA energy performance rating
Enhance internal tracking
Identify facilities to improve
First step in plans for LEED-EB

"We believe that by participating in ENERGY STAR and LEED certification programs, we can better prioritize our emissionreduction activities in the next 5 years and have a better method of measuring our progress"

Summary



- ENERGY STAR provides proven resources to help building owners and managers reduce energy consumption
- Portfolio Manager is a premier tool to help you benchmark (You cannot manage what you do not measure!)
- The ENERGY STAR Rating presents a useful benchmark of whole building energy performance
 Easy to communicate 1-to-100 peer group comparison
- The ENERGY STAR Rating has been extremely valuable for ENERGY STAR Partners
 Benchmark energy performance
 Prioritize investments
 Improve energy efficiency
 Track cost and emissions savings
- Get started today at <u>www.energystar.gov</u> !



Questions?

www.energystar.gov