

## Introduction to ENERGY STAR

*Katy Hatcher, Leslie Cook*  
**ENERGY STAR Commercial Buildings**  
*U.S. Environmental Protection Agency*

May, 2008

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### Why improve the energy efficiency of your community's buildings?

- Because many of you are paying 30-40% more than necessary for your utilities.
- Because you have a chance to improve the quality of life for the citizens of your city.
- To work towards meeting the goals of the Mayor's Climate Protection Agreement.
- To demonstrate to the nation that commercial real estate operators in your community are leaders in energy efficiency.

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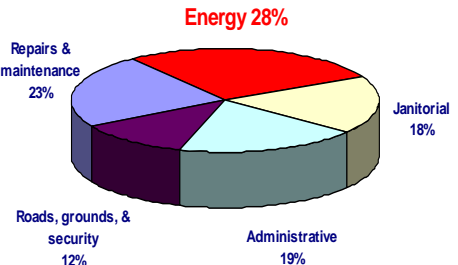
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### Energy – The Largest Piece of Office Building Operating Expenses



Category	Percentage
Energy	28%
Repairs & maintenance	23%
Janitorial	18%
Administrative	19%
Roads, grounds, & security	12%

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

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## Environmental Benefits of ENERGY STAR



- If the energy efficiency of commercial and industrial buildings improved by just 10 percent, Americans would save about \$20 billion and reduce greenhouse gas emissions equal to the emissions from about 30 million vehicles.
- Commercial buildings and industrial facilities generate nearly 50% of U.S. carbon dioxide emissions.
- 30% of energy consumed in commercial buildings is used unnecessarily or inefficiently.
- 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.
- **IMMEDIATE, COST-EFFECTIVE** emission reduction opportunities = EXISTING buildings.

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## A Win-Win-Win Proposition



- Public-private partnership to promote energy efficiency in buildings benefits everyone:
  - Private Organizations – Save \$, recognition as good corporate citizen, develop positive relationship with city government.
  - City Government – Save \$, makes progress toward meeting GHG emission goals.
  - Residents – Improved environmental quality, healthier learning, work, and play environment.

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## ENERGY STAR



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**Also ENERGY STAR**





AEGON Center  
Louisville, KY



Shriners' Hospital for Children  
Houston, TX



Bank Of America Fifth Avenue Plaza  
Seattle, WA



Westin San Francisco Airport  
Millbrae, CA



Twin Peaks Charter Academy  
Longmont, CO



Ted Weiss Federal Building  
New York, New York

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**What is ENERGY STAR for 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.
- Offerings for new construction and existing buildings.
- Works in markets with a focus on:
  - Public sector (government, K-12, higher ed)
  - Commercial property (offices, retail, hotels)
  - Healthcare
  - Small business and congregations

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**What is ENERGY STAR for Buildings?**



- Technical Tools and Guidance
  - Portfolio Manager for existing buildings
  - Target Finder for new construction
  - Energy Management Guidelines
  - Creating an Energy Management Team
  - Building Upgrade Manual
  - Calculator tools to track return on investment of projects
  - Assistance for architects in designing energy efficient buildings
- On-Line Training
  - Designing Top Energy Performing Buildings
  - Portfolio Manager and Target Finder
  - Best Practices and Networking Meetings
  - ENERGY STAR Challenge: Getting Started
- Campaigns to Involve Employees, Customers, and Others
  - ENERGY STAR Challenge
  - Change the World, Start with ENERGY STAR

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## Who is ENERGY STAR for Buildings?



- Over 1,700 Partners operating more than 11 billion square feet of space (nearly 20% of space in the U.S.).
- Over 3,000 small business and congregation network participants.
- Nearly 100 utility and energy efficiency program sponsors.
- Over 1,400 service/product providers.
- Over 65,000 buildings, representing more than 9 billion square feet of space, measure and track their energy performance with ENERGY STAR.

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## What is ENERGY STAR for Buildings?



### ➤ Recognition

- ENERGY STAR Partner



- Designed to Earn the ENERGY STAR



- ENERGY STAR Label



- ENERGY STAR Partner of the Year



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## The ENERGY STAR for Buildings



- ENERGY STAR labeled buildings use 40 percent less energy than average buildings.
- Over 4,000 buildings have earned the ENERGY STAR label for energy efficiency.



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## Benchmarking with Portfolio Manager

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### Track All Buildings' Energy Use and Associated Carbon Emissions

- **Any building type**
  - Energy intensity (kbtu/sf/yr) normalized for weather and square footage for any building type
  - 1-100 rating for certain building types
- **Any campus configuration**
  - Central office loops
  - Multi-facility complexes
  - Universities
- **Any combination of meters**
  - One building one meter
  - One building many meters
  - Many buildings one meter
  - Many buildings many meters

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### Benchmarking – The First Step to Energy Savings in Buildings

- Benchmarking through ENERGY STAR allows you to:
  - ✓ Assess actual building energy performance.
  - ✓ Compare one building against a national sample of similar buildings.
  - ✓ Compare all of your buildings of a similar type to each other.
  - ✓ Set priorities for use of limited staff time and/or investment capital.

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## Portfolio Manager – Tracking Energy Performance in Existing Buildings



- Free online tool for existing buildings:
  - All receive an EUI (energy use intensity)
  - Some receive ratings on a 1-100 scale.
  - Track changes in energy use over time in single buildings, groups of buildings, or entire portfolios.
  - Track cost savings and CO<sub>2</sub> reductions.
  - Apply for ENERGY STAR recognition.
  - Track water usage.
- Free on-line trainings offered monthly

[www.energystar.gov/benchmark](http://www.energystar.gov/benchmark)

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## Is Your Building Performing Well?



Fuel Efficiency  
MPG

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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## Ratable Space Types



**K-12 Schools**



**Offices**



**Hospitals**



**Supermarkets**



**Hotels**



**Retail Stores**



Others include: Warehouse, Residence Halls, Courthouses, Medical Offices, Financial Centers/Banks, and **Wastewater Treatment Plants**

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## ENERGY STAR Label Eligibility Requirements



Facilities are eligible to receive the ENERGY STAR label if they meet the following requirements:

- The facility receives a rating of 75 or higher.
- At least 11 full consecutive calendar months of energy data for all fuel types are provided during the year rated (benchmarked).
- A Professional Engineer (PE) verifies that the building data are accurate, indoor air pollutants are controlled, thermal conditions are met, and ventilation and illumination are adequate. A list of PEs in your region may be found on the ENERGY STAR Web site at: [www.energystar.gov/buildings](http://www.energystar.gov/buildings).
- EPA receives the original Letter of Agreement (LOA) and verified Statement of Energy Performance (SEP) within 120 days of the period covered by the SEP.

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## Energy Performance Rating

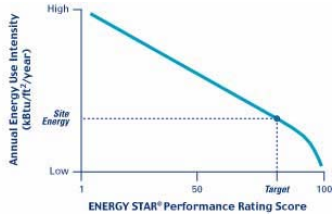


– Based on actual "whole – building" energy performance data

- DOE-Commercial Building Energy Consumption Survey (CBECS)

– Normalizes for factors that affect energy use intensity

- Climate/weather
- Size
- Occupancy




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## Data Required to Benchmark Office Spaces



<u>Building Characteristics:</u>	<u>Energy Use Data:</u>
✓ Building Name	✓ Building Name
✓ Gross Floor Area	✓ Energy Meter ID
✓ Occupants	✓ Energy Type/Unit
✓ Number of PCs	✓ Monthly Start/End Date
✓ Operating Hours/Week	✓ Energy Consumption
	✓ Energy Cost (optional)

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**Set Investment Priorities** 

- Delta Score Estimator
  - Embedded in Portfolio Manager
  - Estimates a new performance rating for a potential project
  - Estimates the percentage of energy use reduction required to hit a rating target
  - Estimates annual energy cost savings at target rating

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**Tracking Campaigns: Master Accounts** 

- Allows users to measure and track progress of campaigns and customize PM account structure, for example:
  - Coalition of organizations linking up to track the progress of an energy efficiency campaign
  - City government tracking buildings within individual departments and agencies while measuring aggregate results
- **Process:**
  - Institution creates a Master Account
  - Master Account appears in a public registry
  - Individual users can share facilities with Master Account
  - Master Account holder can view progress for all facilities that have been shared

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**Statement of Energy Performance** 

- Can be generated for purposes other than applying for the ENERGY STAR
  - LEED-EB application
  - Real estate transactions
  - Maintaining a Facility Summary Report
- **Process:**
  - User selects time period of performance
  - Tool generates 1 page summary with energy use, cost, and emissions figures
  - Summary also included as second page when full SEP is generated to apply for the ENERGY STAR

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**Cost-free Online ENERGY STAR Training Sessions**



- **ENERGY STAR and the LEED Rating System**
  - Tuesday, May 6, 2008, 1:00-2:30 pm, EDT
- **Rating Energy Performance with EPA's Portfolio Manager for Commercial Real Estate**
  - Tuesday, May 13, 2008, 12:00-2:00 pm, EDT
  - Wednesday, June 18, 2008, 11:45 am-1:45 pm, EDT
- **Rating Energy Performance with EPA's Portfolio Manager for Healthcare Facilities**
  - Wednesday, May 14, 2008, 12:00-1:30 pm, EDT
  - Thursday, June 19, 2008, 11:00 am - 12:30 pm, EDT
- **Designing Top Energy Performing Buildings for Your Clients (Target Finder)**
  - Thursday, May 15, 2008, 2:00-3:00 pm, EDT
  - Thursday, June 19, 2008, 2:00-3:00 pm, EDT
- **Best Practices to Improve Energy Performance: Commercial Real Estate**
  - Tuesday, May 20, 2008, 12:00-2:00 pm, EDT
- **ENERGY STAR PC Power Management**
  - Tuesday, May 20, 2008, 1:30-2:30 pm, EDT
  - Tuesday, June 24, 2008, 1:30-2:30 pm, EDT
- **Purchasing and Procuring Efficient Equipment**
  - Thursday, May 22, 2008, 2:00-3:00 pm, EDT

Register at <https://energystar.webex.com>

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**Benchmarking in Action**

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**Rent and Occupancy in ENERGY STAR Buildings**



- Study conducted by real estate professor at University of San Diego and CoStar Research Director
- Based on analysis of 223 ENERGY STAR office buildings (111 million sq. ft.) compared with 2,077 non-ENERGY STAR buildings (889 million sq. ft.).
- Class A properties over 200,000 sq. ft.
- Findings over a period of 3 years:
  - ENERGY STAR buildings had nearly 2% higher occupancy than their non-ENERGY STAR counterparts.
  - ENERGY STAR buildings had rents that were 7% higher than their non-ENERGY STAR counterparts.
  - ENERGY STAR buildings had higher valuations, selling for 30% more per sq. ft. than their non-ENERGY STAR counterparts.

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**Operations and Maintenance:  
Hines**

- > 1900 K Street, Washington DC-1996 construction
  - 1999 scored 32
  - 2002 scored 70
  - By 2003 earned ENERGY STAR
- > Found quality construction with energy efficiency in mind, but oversized, and without sufficient attention to operations.
  - VFDs on chillers to match measured demand
  - Improved operating standards- static pressure, set points
  - Tracked and managed energy use continuously
  - Improved lighting controls
- > Savings based largely on management practices

"Did not really cost us anything to implement—just a change in the way things get done."

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**Whole Building Strategy:  
St. Francis Hospital**



- > 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:
    - ❖ Score: 91
    - ❖ Gas bill cut in half
    - ❖ Electricity reduced 17%

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




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**Leveraging Recognition:  
Food Lion**

- > North Carolina-based mid-Atlantic regional supermarket chain.
- > ENERGY STAR labels: 600 out of 1,200 stores.
- > Energy use reduced 37% since 2000
  - Savings = more than 2 trillion Btu
  - Emissions reductions = more than 1 billion lbs CO<sub>2</sub>
- > Energy savings equivalent to 437 stores using no energy.
- > Cost savings in 2006 over \$2.5 million = Profit on sales of \$78 million of grocery products.
- > ENERGY STAR Partner of the Year: 2002-2007.

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**Louisville Kilowatt Crackdown**

- Modeled after the Seattle Kilowatt Crackdown and Portland Office Energy Showdown
- The first joint campaign led by major commercial real estate leadership organizations in Louisville.
  - BOMA (Building Owners and Managers Assoc.)
  - CCIM (Certified Commercial Investment Member)
  - CREW (Commercial Real Estate Women)
  - ICSC (International Council of Shopping Centers)
  - IFMA (International Facility Management Assoc.)
  - IREM (Institute for Real Estate Management)

Now together as the "Louisville Energy Alliance"

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**Louisville Kilowatt Crackdown**

- An energy management contest among ALL Louisville commercial buildings (including commercial real estate, health care, K-12, hospitality, etc.)
- A leadership challenge for building owners, managers and engineers to take the next step
- An opportunity to gain competitive insight into how building compares to similar structures

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**Louisville Kilowatt Crackdown** 

**Awards based on Portfolio Manager benchmarking results from July 2008 - July 2009**

- Greatest Improvement in Efficiency
  - For buildings making the greatest leap in efficiency in 2008
- Most Efficient Building
  - For properties with the highest overall efficiency ratings
- The Kilowatt Cup
  - Jury awarded trophy recognizing superior achievements in energy management

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**Energy Efficiency Partnership of Greater Washington** 

- Core Partners
  -  HANNON ARMSTRONG
  -  VirginiaTech  
National Capital Region
  -  pepco  
Energy Services
- Associate Partners
  -  ARLINGTON  
VERMONT
  -  LEO A DALY
  -  Meridian  
INTERNATIONAL CENTER  
Bringing the World Together
  -  THE JBG COMPANIES
  -  Chesapeake  
Crescent
  -  GVA Advantis
  - 

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**Energy Efficiency Partnership of Greater Washington** 

- Goal = Reduce greenhouse gas emissions 20 to 50% from existing buildings within the greater DC area
- Businesses, banks, state and local governments, energy services companies committing resources through Energy Performance Contracting
- Virginia Governor Timothy Kaine, Maryland Governor Martin O'Malley Washington, D.C. Mayor Adrian Fenty, director of the U.S. General Services Administration (GSA) made commitments at the April 23, 2008 "20 Now" Action Forum
- More than 400 federal, state, and local commercial buildings have been identified for energy saving retrofits
- Benchmarking to track and measure results

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Become an ENERGY STAR Partner:

[www.energystar.gov/joinbuildings](http://www.energystar.gov/joinbuildings)

Benchmark your buildings in Portfolio Manager:

[www.energystar.gov/benchmark](http://www.energystar.gov/benchmark)

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Katy Hatcher

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