

Energy Benchmarking for Better Building Performance

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BetterBricks

May 13, 2010 Energy & Facilities Connections, Leavenworth, WA

Who is BetterBricks?



www.BetterBricks.com

A program of the Northwest Energy Efficiency Alliance A source for tools, training, and technical advisors A strategic roadmap for energy management











Roadmap for Energy Management





Today's Topics



What is Energy Benchmarking?

Why is it a best practice in facility management?

What activities does Energy Benchmarking involve?

What tools and resources are available?

Case Studies

Energy Performance Rating for Cars



- Miles per gallon (mpg)
- •Is 10 MPG high or low for an automobile?





Energy Performance Rating for a Building



80 kBtu/sf/year



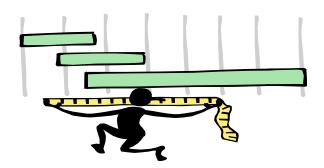
Electricity + Gas / Square Feet = kBtu/sf/year

"You can't manage what you can't measure."



Energy benchmarking is a system for measuring energy use by recording energy consumption and costs for your building. Output is an Energy Use Index (EUI).

- EUI for a car is MPG miles per gallon
- EUI for a building is Btu/sf/year British thermal unit per square foot per year
 - EUI can also be stated in \$/sf/yr terms.

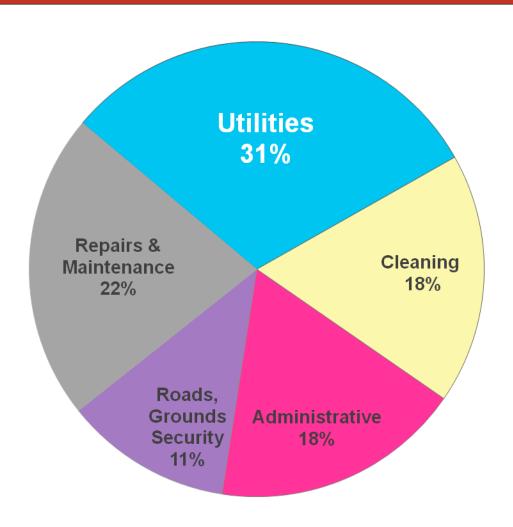




Why is Energy Benchmarking a facility management best practice?

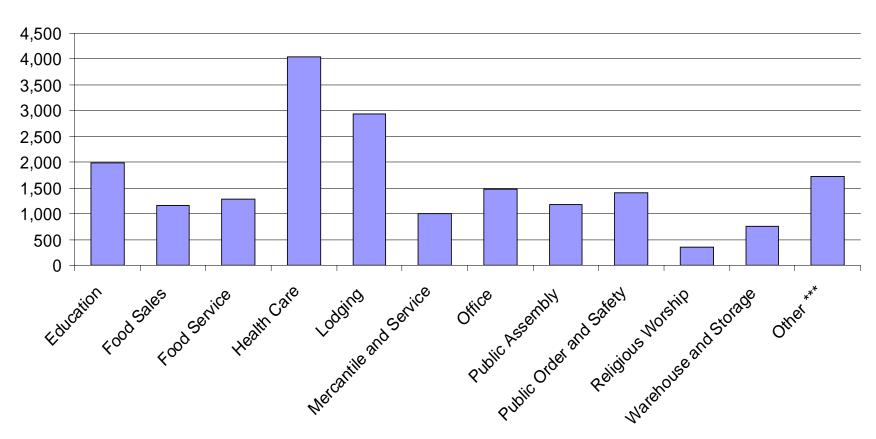
Energy is the Largest Operating Expense





Energy Intensity by Sector (Million Btu/building)



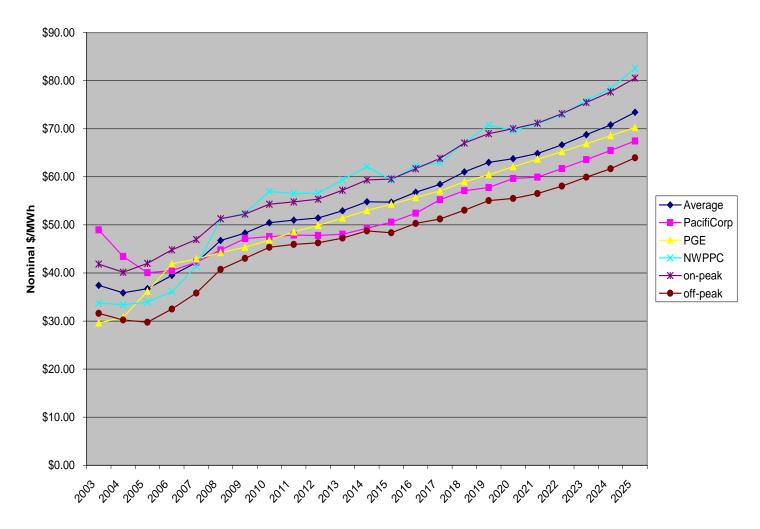


Sources: Energy Information Administration, Commercial Buildings Energy Consumption Surveys, 1992, 1995, 1999.

Energy Prices Will Rise







Leaders Have Adopted Energy Benchmarking Initiatives





16,500 members with 9 billion sf of commercial office space Building Energy Efficiency Program & BOMA Green



18,500 owner-occupied facilities
Sustainability Partnership to provide education

4,700 members in higher ed facilities

ENERGY STAR® Challenge





Green Guide to Health Care™

New Legislation focuses on energy performance in buildings



Energy Performance Disclosure Requirements

- Requires owners of commercial and institutional properties to energy benchmark their buildings and report ratings
- 5 states (California, Hawaii, Michigan, Ohio, Washington)
- 6 Cities (Austin, Denver, DC, New York, Seattle, Westchester, PA)

New Legislation Focuses on Performance





Energy Performance Disclosure Requirement

- State of Washington signed by Governor Gregoire in 2009
- City of Seattle proposed by Mayor Nickels

Requires owners of commercial and institutional properties and large multi family to energy benchmark their buildings and report score

Energy Performance Disclosure Requirements - State of Washington



Utility requirement (all electric and natural gas utilities > 25,000 customers)

➤ Jan. 1, 2010 – Utilities must maintain energy use data for all nonres buildings in a format compatible with ENERGY STAR Portfolio Manager. Upon authorization, a utility shall upload data to Portfolio Manager

Owner requirement for State Facilities

➤After Jan. 1, 2011, non-res buildings > 50,000 sf must disclose Portfolio Manager benchmarking data and rating to "any prospective buyer, lessee, or lender" for the previous 12 months ➤After Jan. 1, 2012, same requirement for buildings > 10,000 sf

http://www.ga.wa.gov/energy/EnergyStar.htm

Energy Performance Disclosure Requirements - State of Washington

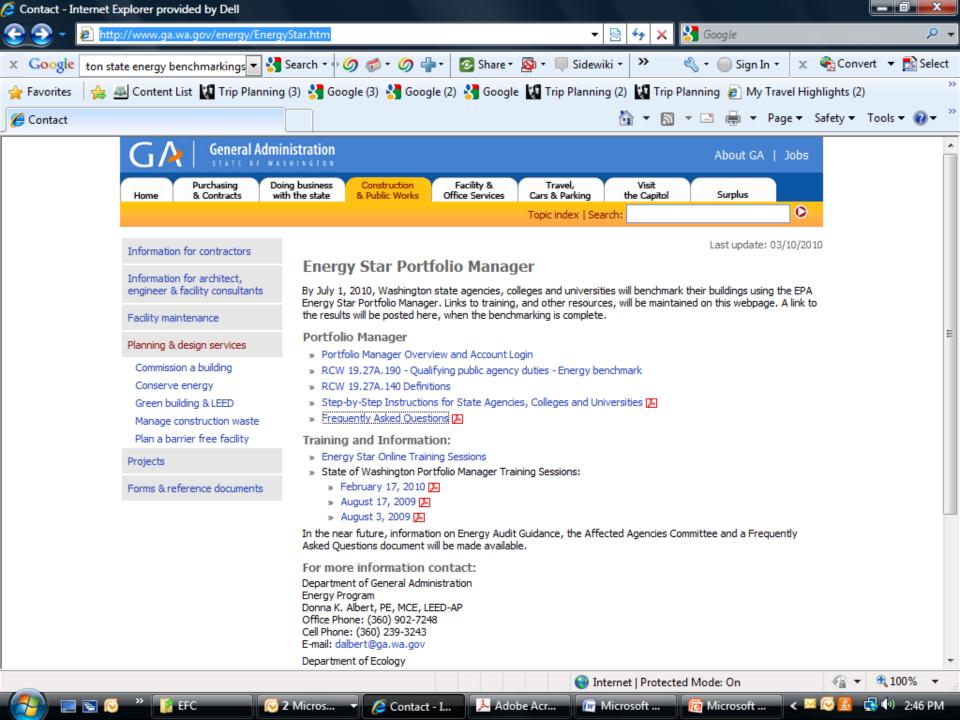


State Facility Requirement

By July 1, 2010

- Create an energy benchmark
- Report to General Administration
- Link to the Washington State "master account"

http://www.ga.wa.gov/energy/EnergyStar.htm



Energy Performance Disclosure Requirements – City of Seattle

Resolution by Seattle City Council, 2010

Commercial and Institutional Properties

- Mandatory benchmarking using ENERGY STAR® Portfolio Manager
- Report benchmarking data annually to City of Seattle
- ➤ Disclose (upon request) to buyer, tenant, and lender
- ➤ Phased in 2 tiers
 - ➤ Properties > 50,000 sf by April 2011 and annually thereafter
 - ➤ Properties > 10,000 sf by April 2012 and annually thereafter

Large Multifamily Properties

➤ Similar requirements on same 2 tier implementation schedule

More information www.seattle.gov/dpd/greenbuilding



LEED Rating System

LEED for Existing Buildings: Operation & Maintenance

Energy & Atmosphere CREDIT 1

➤ Buildings eligible to receive an ENERGY STAR rating using ENERGY STAR's Portfolio Manager tool, must achieve an energy performance rating of at least 69.

LEED 2009

- ➤ New, stronger emphasis on energy efficiency
- ➤Old version 10 point maximum for optimizing energy performance
- ➤ New version 19 point maximum





What Activities Does Energy Benchmarking Involve?

Energy Benchmarking Uses these Common Inputs



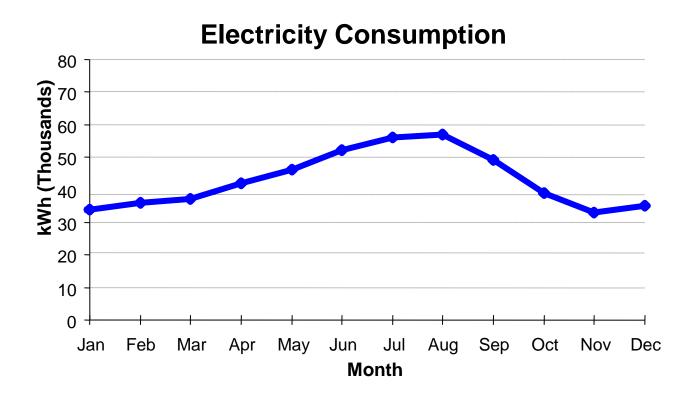
- 12-months or more of utility bills
- Fuel types: electricity, natural gas, steam, other
- Fuel consumption: kWh, therms, gallons
- Fuel costs: \$/kWh, \$/therm, \$/gallon
- Building characteristics:

Square footage and function
Occupied hours
Plug loads (PC's/person)
Data center
Specialized uses

Energy Benchmarking Provides Valuable Data



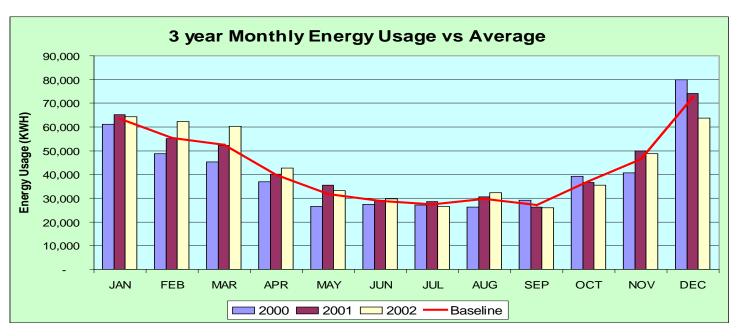
What does this tell us?



Energy Benchmarking ProvidesMulti-Year Comparisons



What does this tell us?



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2000	61,287	48,672	45,146	36,834	26,569	27,507	27,040	26,343	29,271	39,324	40,586	80,039
2001	65,061	55,168	52,281	40,158	35,580	29,225	28,546	30,556	26,189	36,642	50,047	74,104
2002	64,373	62,378	60,180	42,761	33,156	29,631	26,426	32,245	25,921	35,593	48,609	63,817
Baseline	63,574	55,406	52,536	39,918	31,768	28,788	27,337	29,715	27,127	37,186	46,414	72,653

Other Energy Benchmarking Benefits



Detect billing errors

Monitor consumption changes
Identify savings opportunities
Justify capital expenditures
Gain management support
Show results of conservation
Track utility costs



What Energy Benchmarking tools are available?

Available Benchmarking Tools



Building Energy Software Tools Directory

http://www.eere.energy.gov/buildings/tools_directory/subjects_sub.cfm

o Benchmarking Tools (35+)

Electric & Gas Utility Providers

O Check with your local utility

Energy Service Providers

- Northwest Energy Efficiency Council www.neec.net
- Automated Benchmarking Service providers

http://www.energystar.gov/index.cfm?c=spp_res.pt_spps_automated_benc hmarking

A Free Tool through ENERGY STAR®



EPA introduced the Energy Performance Rating System ENERGY STAR Portfolio Manager

A standardized, comparable metric of whole building energy and water performance www.energystar.gov

Eligible Space Types



Hospitals



Medical Office Buildings



Warehouses



Retail



Waste Water Treatment Plants



Dormitories



Office Buildings



Courthouses



Supermarkets



Hotels



Financial Centers



Schools



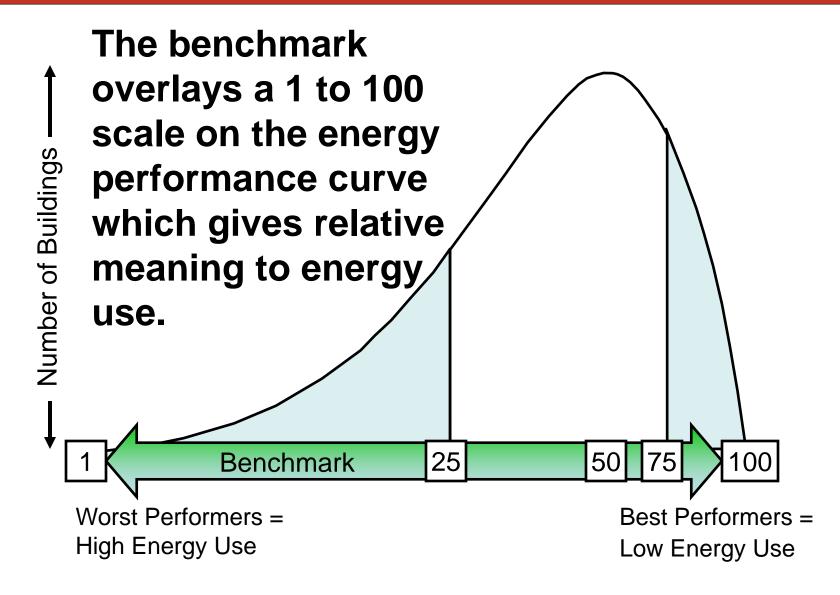
What's behind Portfolio Manager?



- Uses 2003 Commercial Building Energy Consumption Survey (CBECS) data
- Compares subject building to peer buildings
- Calculates energy use intensity on an annual kBtu per square foot basis
- Provides a statistically normalized score from 1 to 100
- Normalizes data for weather (160 U.S. weather stations) and climate (heating and cooling degree days)
- Securely hosts user's database of building data

Portfolio Manager Converts EUI (Btu/sf/yr) into a "Score"





Energy Performance Rating for a Building



Tracking Number SEPSOON ISSUED FOR YOU



ENERGY STAR®Portfolio Manager
Benchmarking Tool



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Statement of Energy Performance



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Normalized Benchmark Data	ENERGY STAR	Your Bldg.				
Energy Performance Rating:	75	60				
Energy Consumption: (kBtu/ft2-yr):	95	123				
Energy Costs/SF/YR:	\$1.75	\$2.50				
Emissions:						
CO2 (1000 lbs/yr):	5,465	7,100				

Data You'll Need to Collect



Address

Zip code for weather normalization

Energy Consumption

12 consecutive months for each source

Space Type Data

Hours of operation Number of PCs Occupancy

Set Energy Performance Improvement Goals





Portfolio

Benchmarking

Statement of Energy Performance

Apply for Label

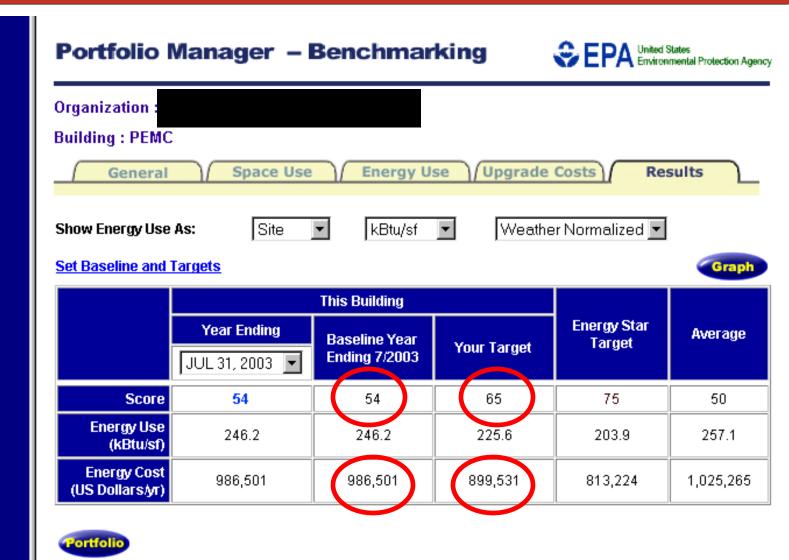
Administration

Import

Help

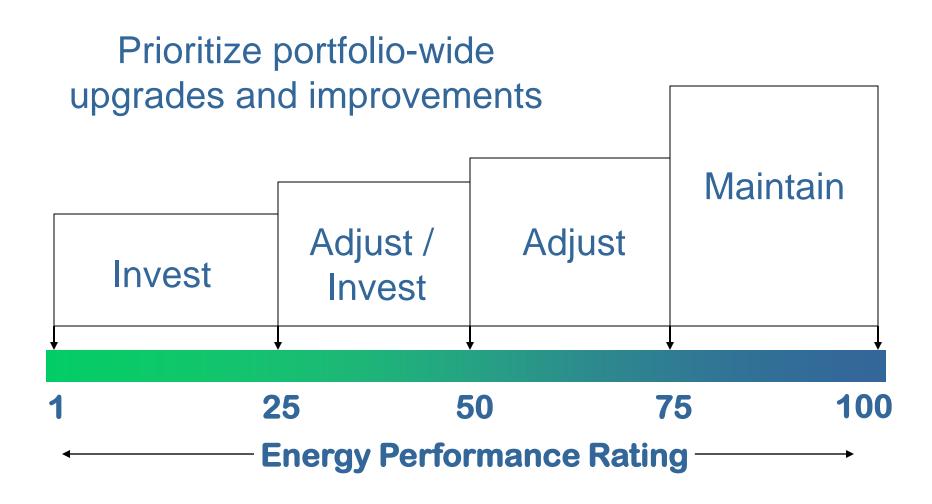
Print

Logout



Plan Energy Conservation Projects





Reward Improvements











ENERGYSTAR Partner of the Year

Recognition for High Performance





138 labeled buildings in Washington State

Recognizes top performing buildings

Top 25% qualify for ENERGY STAR

Recognizes portfolio improvement

Baseline improvements of 10, 20 and 30 points

U.S. Bank City Centre Seattle, WA







BOMA Seattle KILOWATT CRACKDOWN





Kilowatt Cup Winner – Unico Properties, LLC



Washington Mutual Tower – Wright Runstad

CASE STUDY: PeaceHealth







Ron Tolleson, Facility Director Scott Dorough, Resource Conservation Manager Benchmarked buildings at 5 sites

Identified \$850K annual energy cost savings

Developed 3-year energy management plan to reduce energy costs 10%

Plan adopted by corporate Executive Team

RESULTS

Resource Conservation Mgr to oversee budget and track Performance

ENERGY STAR® Label in 2007

Energy efficient purchases policy

3% reduction in 2007 (\$200K)



Capistrano Unified School District

Desktop computers in "sleep" mode

Saves \$20/computer for 14,000 computers - \$280K per year

Created an energy manager position





Gilbert Public Schools

140 South Gilbert Road • Gilbert, Arizona 85296

Goal: "Find things with least effect on our people but save energy."

Created energy management task force – M&O, technology services, community education, utility provider

"Saving Energy" Card - M&O staff use to report things left on after hours

Middle school is "guinea pig" for energy savings:

- -Remove personal appliances
- -Reduce light levels in hallways
- -Change T settings during unoccupied times of 85 F during cooling season
- -Better T control with EMS system

Saved 41% - \$7,500 per year



Getting Started



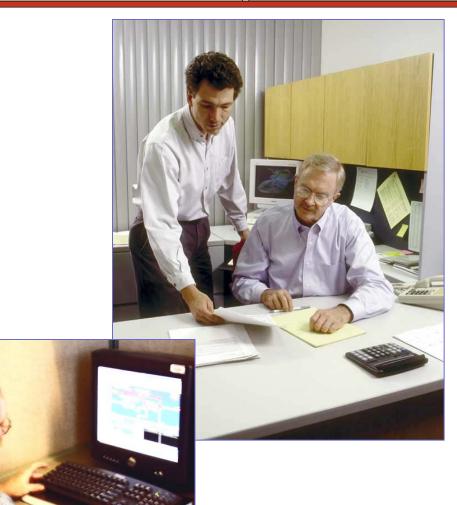
What's your next step?

Assign a Staff Lead



Skill sets – computers, software, data entry, reports

Provide training and professional development



What is Building Operator Certification (BOC)?



- Technical training
- Exam
- In-facility project
- BOC credential



Benefits

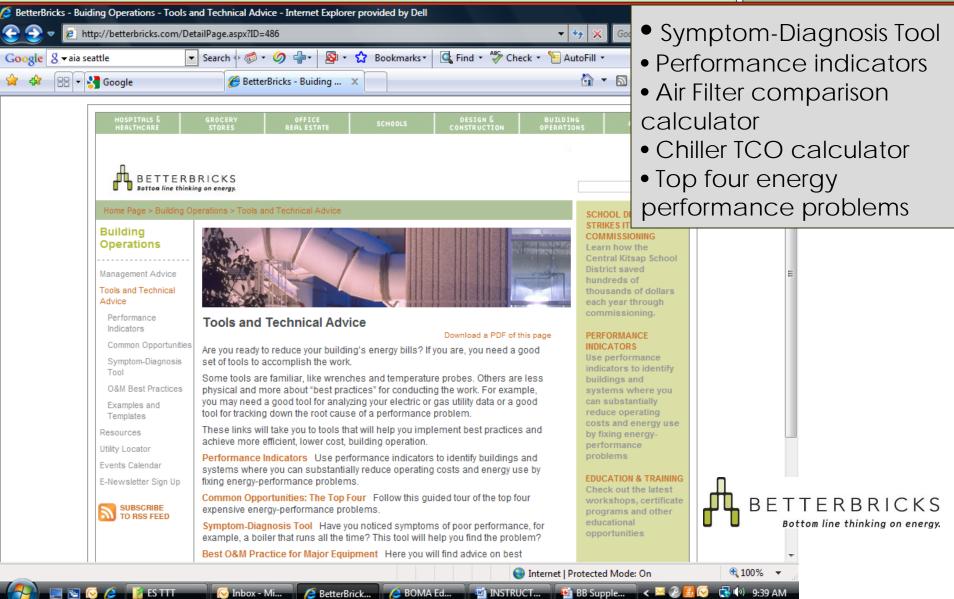
- Recognized by Washington State GA
- Discounts for WAMOA member schools
- \$12,000 annual energy savings
- Safety, comfort and air quality





Resources for Better Building Operation





BetterBricks Roadmap for Energy Management



Know your starting point

Accounting & benchmarking

Know your destination

 Establish an energy performance goal

Figure out your route

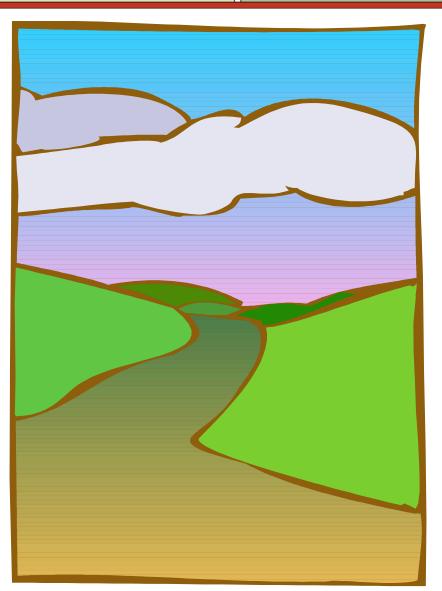
- Tune up your building systems
- Invest in capital upgrades
- Enhanced O&M

Carpool

Bring the C-suite along

Look at your map frequently

Measure and report progress



Resources



ENERGY STAR® Buildings

www.energystar.gov

BetterBricks

www.betterbricks.com

WSU Energy Program & Plant Ops Consortium

http://www.energy.wsu.edu

Electric & Gas Utilities

Database of Incentives for Energy Efficiency http://www.dsireusa.org/

Building Operator Certification - BOC®

www.theBOC.info

