DOE Technical Assistance Program

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Energy Management For the Portfolio Manager Initiative

December , 2011

Rob Van Der Like, The Cadmus Group, Inc. in support of EPA's ENERGY STAR Program

What is TAP?

DOE's Technical Assistance Program (TAP) supports the Energy Efficiency and Conservation Block Grant Program (EECBG) and the State Energy Program (SEP) by providing state, local, and tribal officials the tools and resources needed to implement successful and sustainable clean energy programs.

How Can TAP Help You?

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

TAP offers:

- One-on-one assistance
- Extensive online resource library, including:
  - Webcasts
  - Events calendar
  - TAP Blog
  - Best practices and project resources
- Facilitation of peer exchange

On topics including:

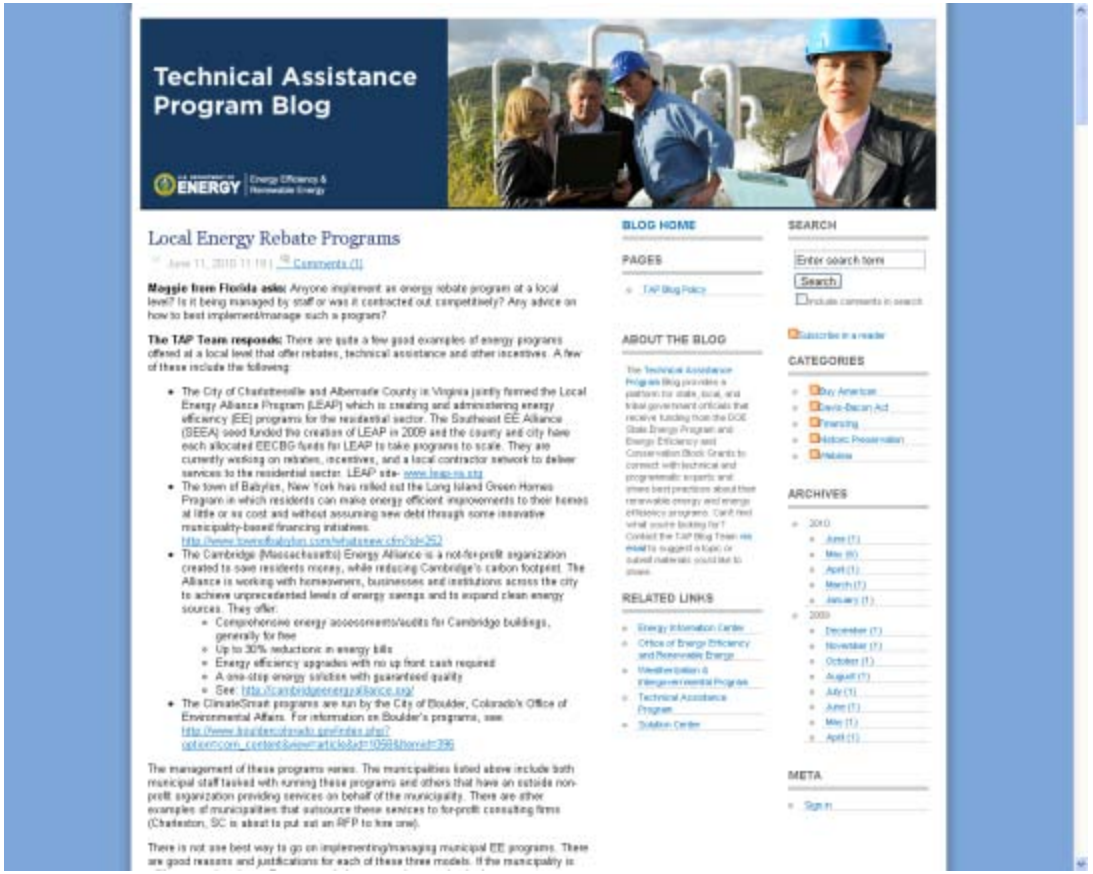
- Energy efficiency and renewable energy technologies
- Program design and implementation
- Financing
- Performance contracting
- State and local capacity building

The TAP Blog

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Access the TAP Blog!
http://www.eereblogs.energy.gov/tap/

Provides a platform for state, local, and tribal government officials and DOE's network of technical and programmatic experts to connect and share best practices on a variety of topics.



Accessing TAP Resources

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

We encourage you to:

1) Explore our online resources via the Solution Center

2) Submit a request via the Technical Assistance Center

3) Ask questions via our call center at 1-877-337-3827 or email us at solutioncenter@ee.doe.gov

Agenda

- Guidelines for Energy Management
- Assessment Methods
- The Action Plan
- ENERGY STAR Resources

Opportunities in Buildings

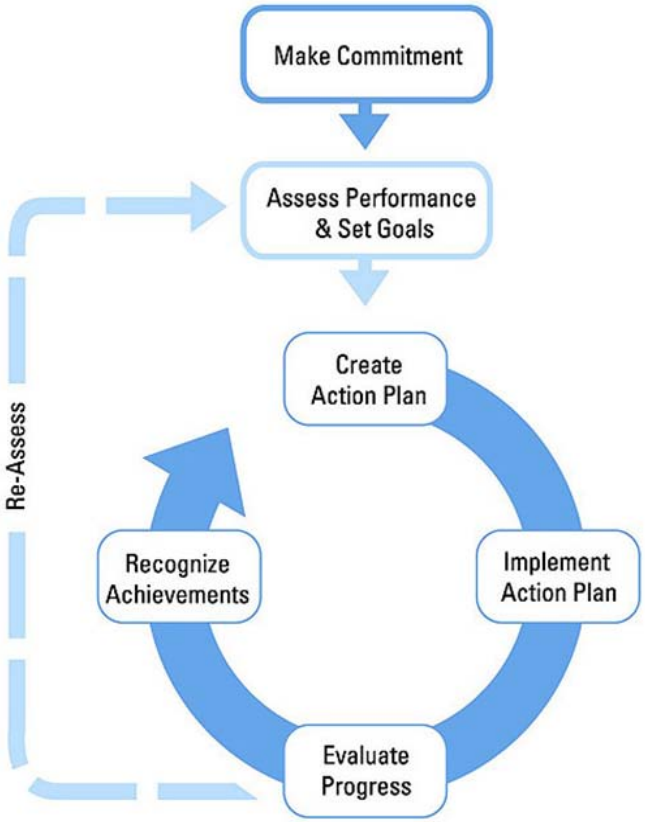
- Commercial buildings and industrial facilities generate about **50 percent** of U.S. carbon dioxide emissions
- **30 percent** of energy consumed in commercial and industrial buildings is wasted
- Reductions of **10 percent** in energy use can be possible with little or no cost

SEP/EECBG and ENERGY STAR

DOE Goal	ENERGY STAR Offering
EECS Development	Energy Management Guidelines
Progress Reporting • Energy saved • Cost saved • Water saved • GHG saved	Portfolio Manager
Community Outreach	Partner Resources ENERGY STAR Challenge Recognition Programs Change the World, Start with ENERGY STAR
Energy Use Reduction	Portfolio Manager (existing buildings) Target Finder (new buildings) ENERGY STAR Products Building Upgrade Manual Service and Product Provider Directory
Financial Efficiency	Cash Flow Opportunity (CFO) Calculator

Guidelines for Energy Management

1. Make Commitment
2. Assess Performance
3. Set Goals
4. Create Action Plan
5. Implement Action Plan
6. Evaluate Progress
7. Recognize Achievements



Step 1: Commitment

- Establish a team focused on energy management policy and planning
- Appoint an energy coordinator or sustainability coordinator
- Make a policy statement on energy efficiency as a key business strategy

Step 2: Assess Performance

- Assess your performance to:
  - Identify opportunities for improvement
  - Provide a basis for goal-setting
  - Evaluate progress (Step 6 of Energy Management Guidelines)
- Benchmark your buildings' energy performance using Portfolio Manager
  - Other methods include energy auditing, load profiling, data logging, and BAS trending

Step 3: Set Goals

Set energy management goals that:

- Are reasonable (based on pre-assessment)
- Are measureable/observable
- Connect to existing business plans
- Are specific
  - Numerical reduction goal (reduce by % or an amount)
  - Action goal (create Portfolio Manager account, establish policy, appoint energy coordinator, train staff members, conduct awareness program, complete retrofit project, install monitoring devices, etc.)

Step 4: Create Action Plan

- May include:
  - Policy development
  - Awareness campaigns
  - Training
  - Continuous monitoring
  - Use of control systems technology
  - Operational changes
  - Best practices
  - Maintenance tasks
  - Retrofits

Step 5: Implement Plan

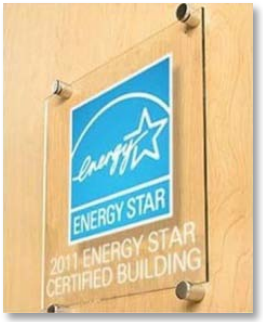
- Develop a communications plan, including:
  - Newsletters, reports, and/or a website
  - Employee/tenant policies and programs
  - Progress updates
  - Recognition opportunities
- Identify unique roles and responsibilities
- Arrange interdepartmental coordination
- Delegate supervision and monitoring responsibilities

Step 6: Evaluate Progress

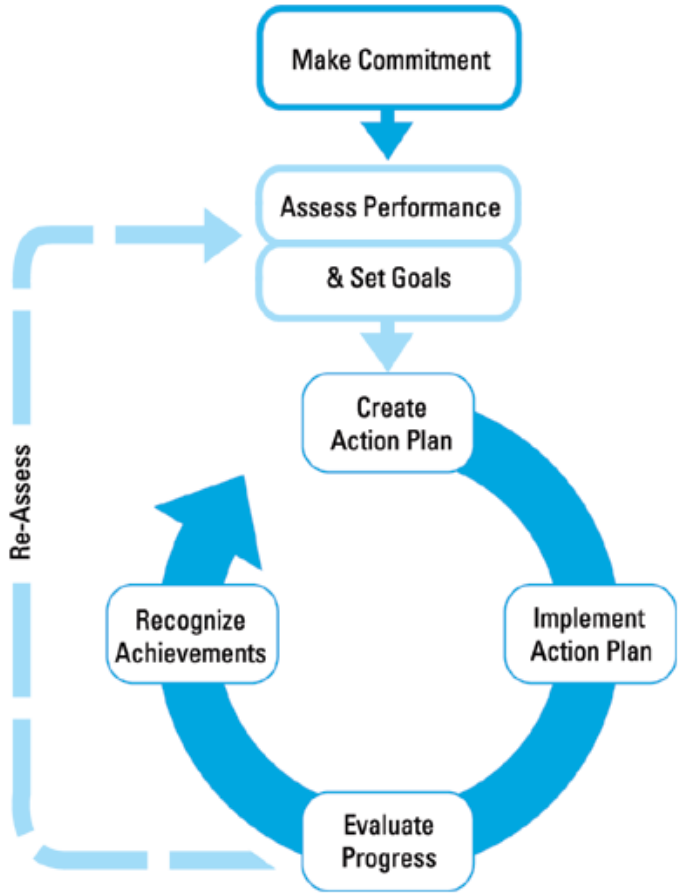
- Use Portfolio Manager to measure progress
  - Compare energy performance to baselines
  - Compare performance against goals for environmental performance and financial savings
  - Compare energy performance to peer building types using the ENERGY STAR energy performance score (1-100) or Energy Use Intensity index
  - Verify energy savings from optimized system settings, upgraded energy-efficient equipment, and increased occupant awareness

Step 7: Recognize Achievements

- Regional and State-Level
  - Mayor Abramson and the Kentucky Office of Energy Policy personally recognize all buildings in Louisville/Jefferson County, KY that earn the ENERGY STAR.
- ENERGY STAR Recognition
  - Apply for eligible buildings that have achieved a score of 75 or higher in Portfolio Manager to earn the ENERGY STAR. Apply for ENERGY STAR Leaders recognition for portfolio-wide improvements.
- National Organizations
  - National organizations such as NACo, ICLEI, ACEE, USCM, and others provide awards for achievement in energy efficiency.
- Green Building Rating Systems
  - Consider applying for LEED certification, Green Globes, or CHPS.

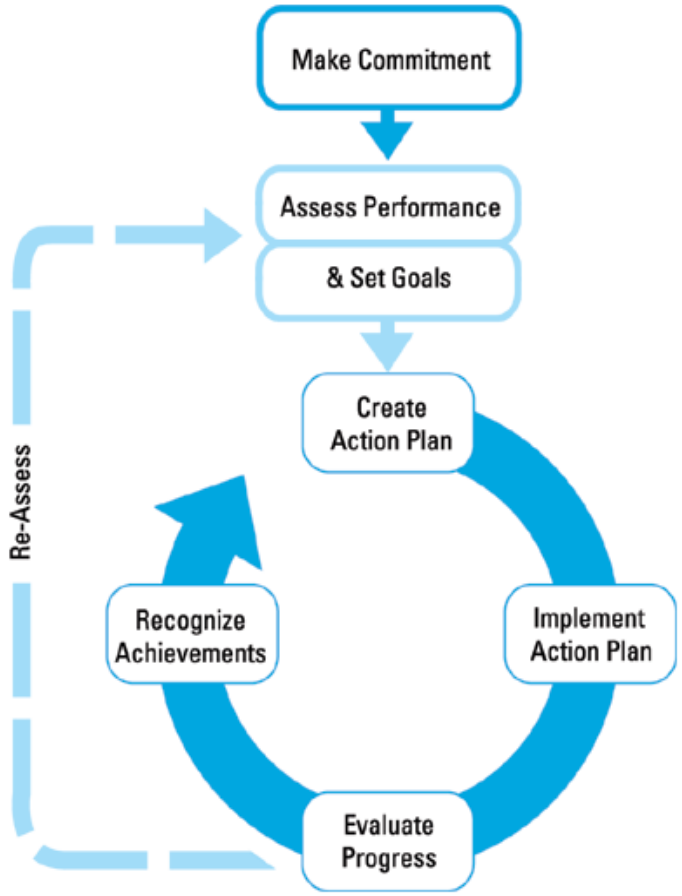


The Continuous Improvement Process for Energy Management



- ✓ STEP 1: Make Commitment
- ✓ STEP 2: Assess Performance
- ✓ STEP 3: Set Goals
- ✓ STEP 4: Create Action Plan
- ✓ STEP 5: Implement Action Plan
- ✓ STEP 6: Evaluate Progress
- ✓ STEP 7: Recognize Achievements

The Continuous Improvement Process for Energy Management



- ✓ STEP 1: Make Commitment
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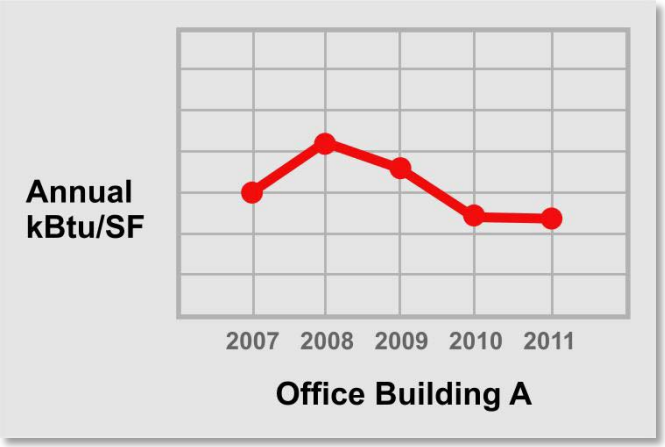
- ✓ STEP 7: Recognize Achievements

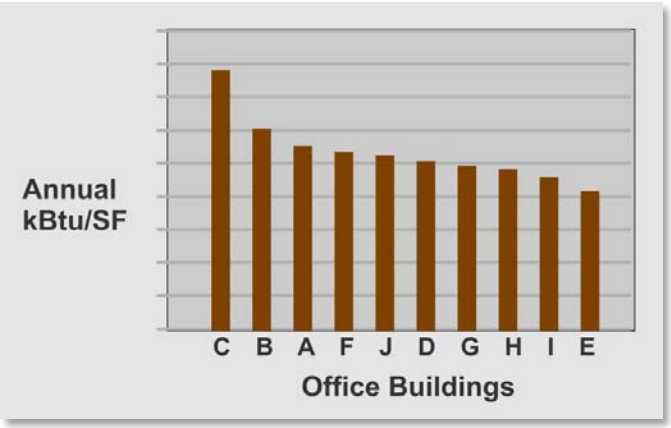
Assessment Methods

- Benchmarking
- Load profiling
- Data logging
- BAS trend logging

Benchmarking

- Benchmark and measure the effectiveness of projects and programs
  - Track a building's performance over time
  - Compare similar space types

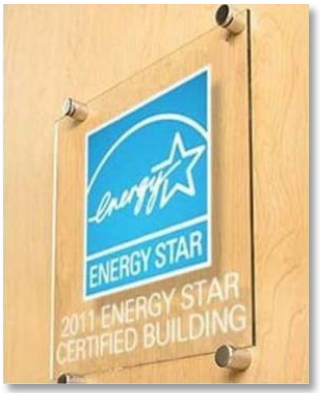




Benchmarking

- Using Portfolio Manager, you can:
  - Benchmark all of your buildings
  - Track the energy use intensity (EUI) for each building
  - Obtain an energy performance score for eligible buildings
  - Track changes in energy and water use over time
  - Track and report cost savings and CO2 emissions
  - Apply for the ENERGY STAR

www.energystar.gov/benchmark



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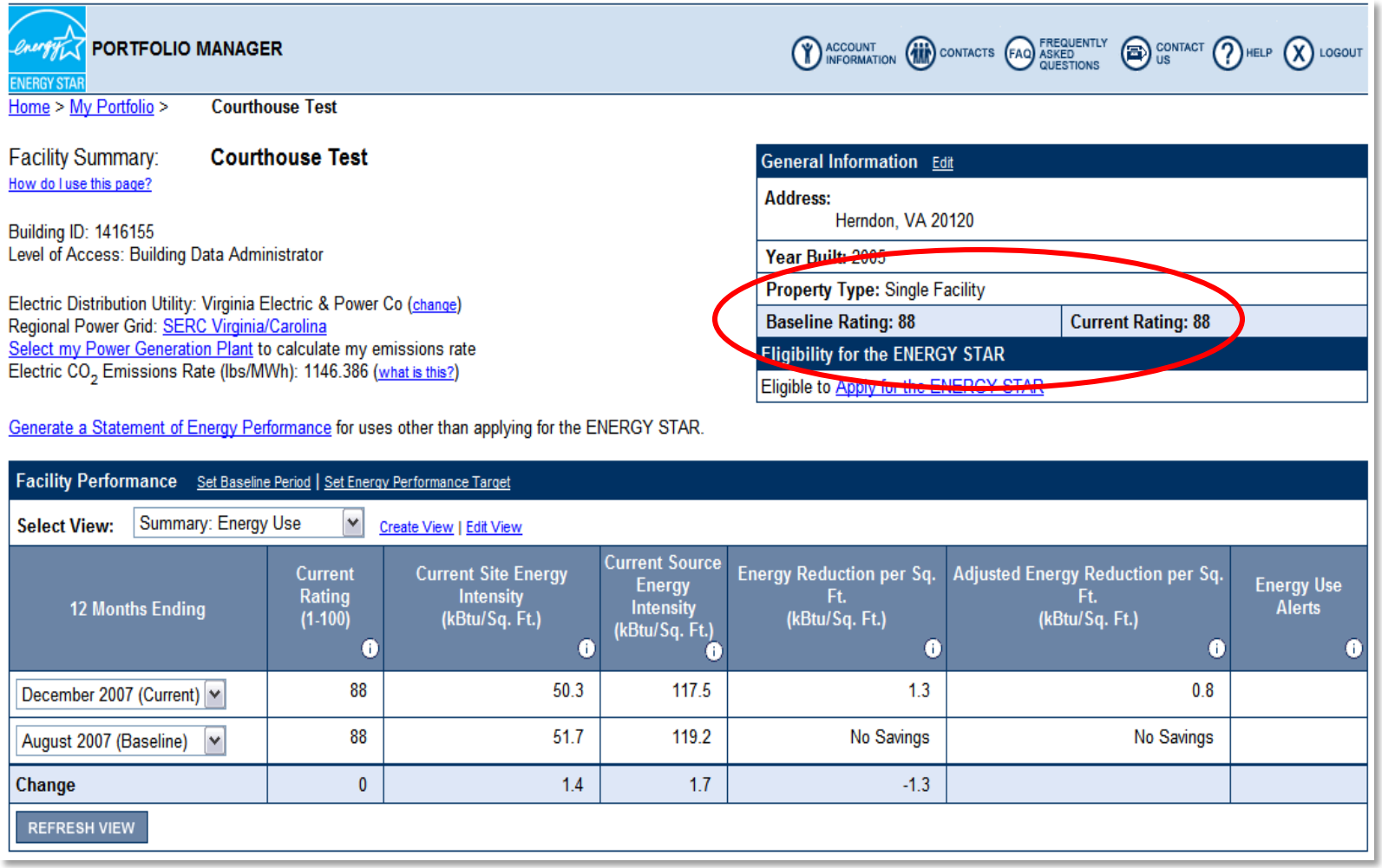
Benchmarking



PORTFOLIO MANAGER

ACCOUNT INFORMATION | CONTACTS | FREQUENTLY ASKED QUESTIONS | CONTACT US | HELP | LOGOUT

Home > My Portfolio > Courthouse Test

Facility Summary: **Courthouse Test**

How do I use this page?

Building ID: 1416155
Level of Access: Building Data Administrator

Electric Distribution Utility: Virginia Electric & Power Co (change)
Regional Power Grid: SERC Virginia/Carolina
Select my Power Generation Plant to calculate my emissions rate
Electric CO_2 Emissions Rate (lbs/MWh): 1146.386 (what is this?)

General Information Edit

Address:
Herndon, VA 20120

Year Built: 2005

Property Type: Single Facility

Baseline Rating: 88 | **Current Rating: 88**

Eligibility for the ENERGY STAR

Eligible to Apply for the ENERGY STAR

Generate a Statement of Energy Performance for uses other than applying for the ENERGY STAR.

Facility Performance Set Baseline Period | Set Energy Performance Target

Select View: Summary: Energy Use — Create View | Edit View

12 Months Ending	Current Rating (1-100)	Current Site Energy Intensity (kBtu/Sq. Ft.)	Current Source Energy Intensity (kBtu/Sq. Ft.)	Energy Reduction per Sq. Ft. (kBtu/Sq. Ft.)	Adjusted Energy Reduction per Sq. Ft. (kBtu/Sq. Ft.)	Energy Use Alerts
December 2007 (Current)	88	50.3	117.5	1.3	0.8	
August 2007 (Baseline)	88	51.7	119.2	No Savings	No Savings	
Change	0	1.4	1.7	-1.3		

REFRESH VIEW

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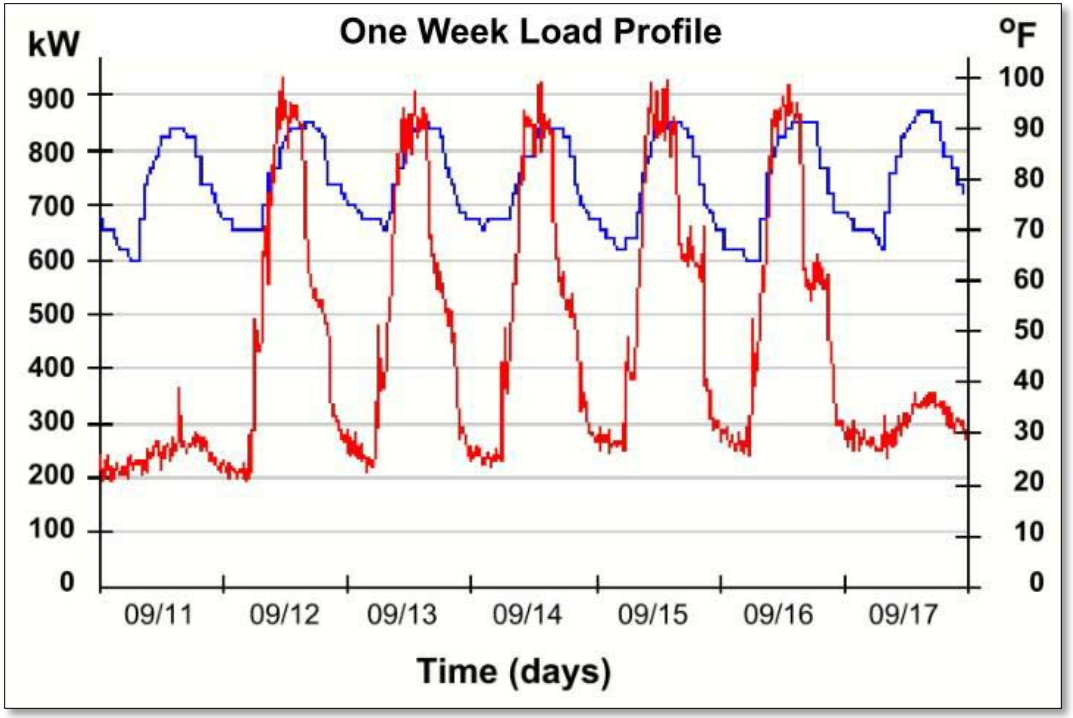
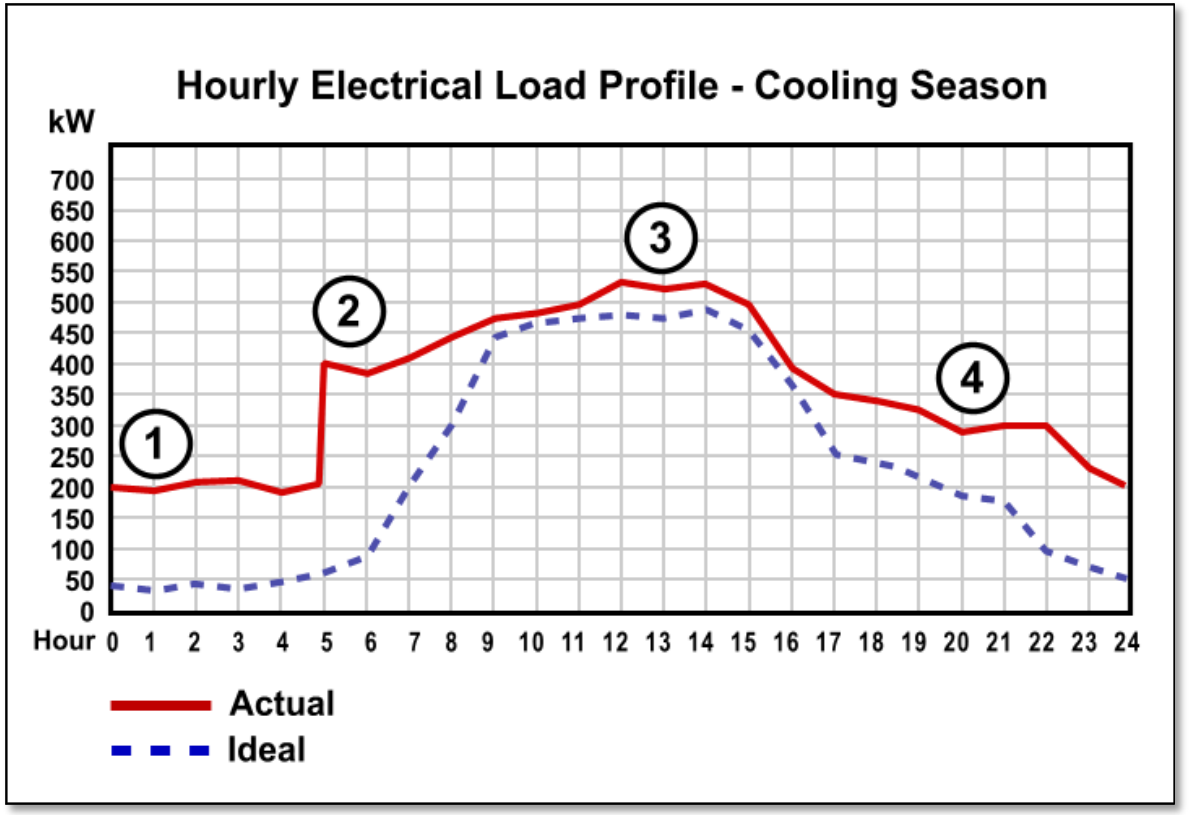
Load Profiling

A load profile displays the amount of electricity used by an electric meter over a given time period



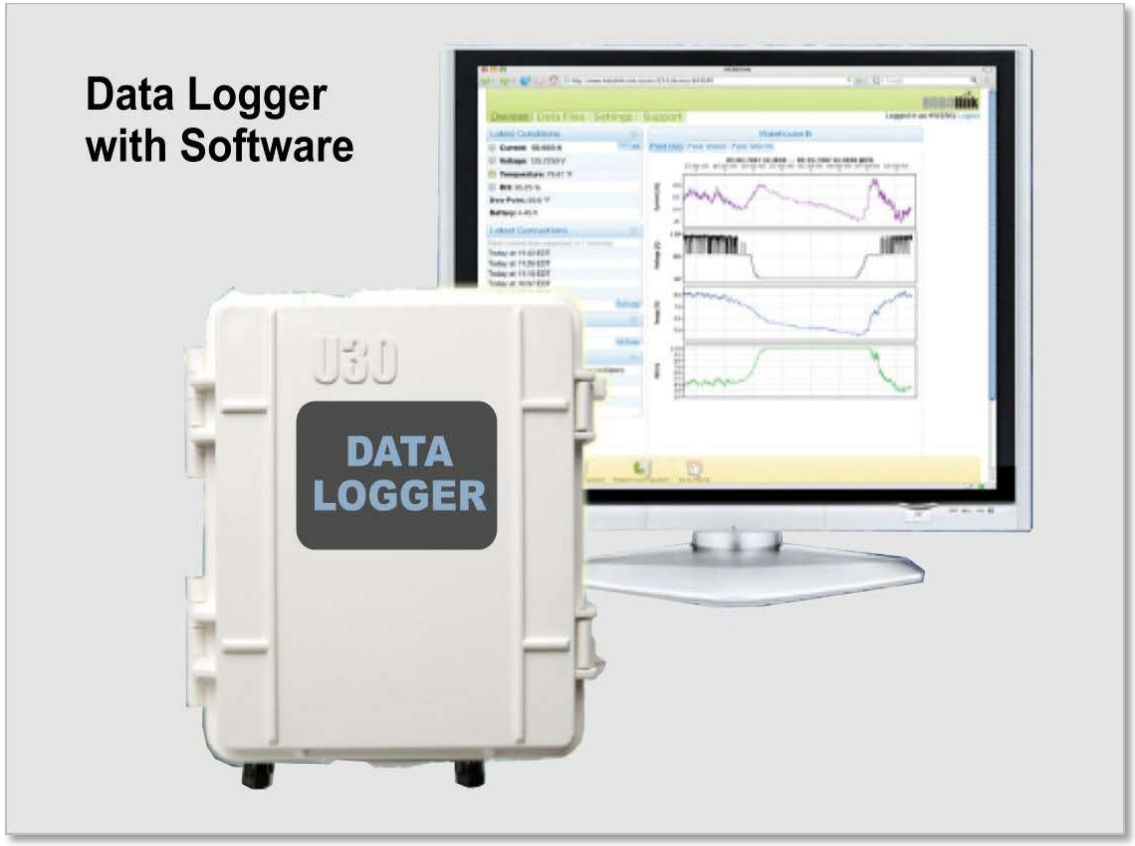
Load Profiling

1. Energy use in the middle of the night?
2. Is equipment starting up too early?
3. Reductions for both demand and consumption?
4. Is power demand reducing quickly enough?



Data Logging

- Data logging can measure:
  - Temperature
  - Humidity
  - Light Intensity
  - Current (Amps)

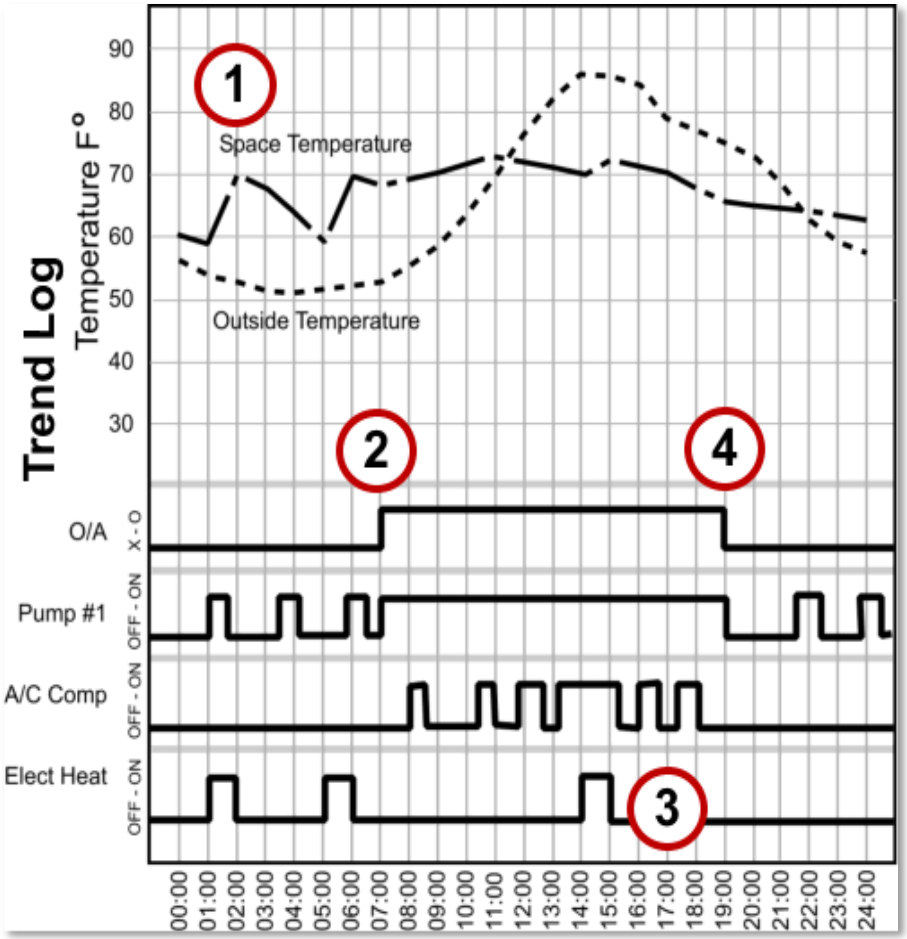


BAS Trend Logging

- The building automation system (BAS) may provide trend logs which indicate:
  - When an item of equipment was in operation
  - System settings
  - Optimization opportunities

Example Questions

1. Why is the space temperature maintained at 70°F during unoccupied hours?
2. Why do outside air dampers open at 7a.m. when occupants don't start arriving until 8:30a.m.?
3. Why is the heating strip on during the time that the space is being cooled?
4. Why do outside air dampers stay open until 7p.m. when all occupants have left by 6p.m.?



The Action Plan

- People-oriented strategies
- System optimization
- Building retrofits and upgrades
- Action plan phasing

People-Oriented Strategies

- Communication plan
- Awareness campaign
- Staff training
- Energy management roles
- Multi-disciplinary teams
- Occupant surveys
  - See DOE's Peer Exchange Hub on the Solution Center for resources

ENERGY STAR at Your Desk

Communication Plan

- Involve the individuals/teams who will have the greatest impact on your success
  - Communicate with them
  - Train them
  - Motivate them
  - Recognize their accomplishments
- Relay your policies, goals, and plans for action with staff members
- Tailor your communication strategy to fit your organization's specific needs and goals

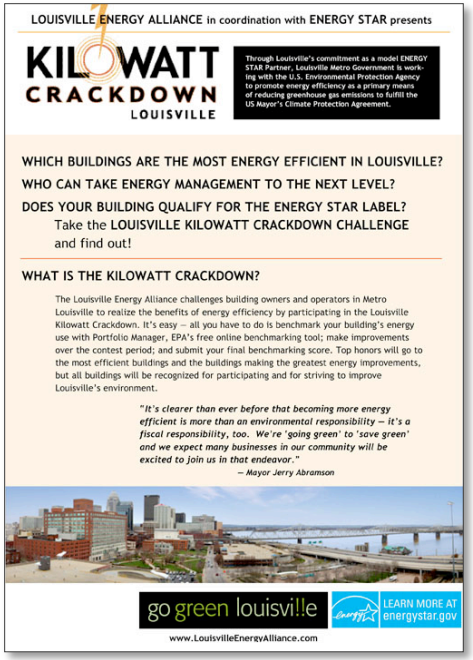
Awareness Campaign

- Inform, Remind, Encourage, Recognize
  - Use when control of major building systems is in the hands of the occupants
- Monitor, Control, Adjust
  - More aggressive programs include specified tasks that are monitored and tracked

Awareness Campaign

Examples:

- ENERGY STAR Bring Your Green to Work
- GreeNYC “Be Cool & Smart” ad campaign
- Louisville Kilowatt Crackdown



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Employee Training

- Identify key job performance skills
- Assess knowledge and proficiency in specific energy efficiency tasks
- Improve skills directly related to job performance
- Target building operations, building services, and food service staff members

Energy Management Roles

- Identify key positions in the organization and assign specific duties
  - Example: Energy Management Coordinator
  - Can be assigned to people at all levels to facilitate communication
  - Tasks could include forwarding information and monitoring building performance

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Multi-Disciplinary Teams

- Use the expertise of various staff members in the organization
- Focus on creating approaches tailored to the organization and its buildings
- Teams may include personnel from:
  - Energy and water
  - Facilities management
  - Transportation
  - Safety and health
  - Finance
  - Etc.

HanesBrands Energy Policy Kick-Off Event

Occupant Surveys

- Engage building occupants
- Create an effective follow-up procedure to respond to their input
- Alert building operators to performance issues that may also effect energy efficiency

System Optimization

- Lighting
- Heating and cooling
- Ventilation
- Other

Lighting

- Assign responsibility for lighting control
- Evaluate potential for:
  - Daylight harvesting
  - Task lighting
- Conduct a lighting survey to determine how lights are used
  - A 20 percent reduction in lighting energy could be possible

Heating and Cooling

- Keep outside doors and windows closed
- Keep window blinds closed when daylighting isn't needed
- Set back temperature when space is unoccupied
- Check for simultaneous heating and cooling
- Conduct physical condition survey to ensure good repair
- Heating
  - Flue gas analysis
- Cooling
  - Turn system off if doing

  so does not affect IAQ

Ventilation

- Ensure return-air registers are not blocked
- Check that exhaust fans are not running unnecessarily
- Repair weather-stripping on windows and doors
- Conduct a leak survey
- Ensure air dampeners are functioning properly

Other

- Turn off office appliances when not in use
- Use power strips for electronic equipment to avoid phantom loads
- Purchase ENERGY STAR qualified equipment
- Reduce need for high-energy portable appliances (space heaters, coffee makers, mini refrigerators, etc.)
- Use patch management software to avoid need for leaving computers on overnight
- Conduct a water-heater control survey
- Create a building operating plan

Retrofits and Upgrades

- Lighting
- Heating
- Cooling
- Ventilation
- Other

Building Retrofits and Upgrades

- Lighting
  - Install higher-efficiency lights
  - Install occupancy sensors
  - Utilize programmable time clocks for outside systems
- Heating
  - Consider adding a water-side economizer
  - Repair steam traps as needed
  - Consider modular condensing boiler system and heat pump systems

Building Retrofits and Upgrades

- Cooling
  - Conduct a motor survey to determine retrofit opportunities
  - Install programmable thermostats
  - Install variable frequency drives (fans, pumps, etc.)
- Ventilation
  - Evaluate building automation system controls
  - Consider Demand Control Ventilation System

Action Plan Phases

- Phase 1: No cost
- Phase 2: Low cost
- Phase 3: Capital Investment

Action Plan: Phase 1

- Measures which can significantly improve the efficiency of building performance
  - Facility managers can accomplish them quickly with little or no funding
- Operational changes include adjustments to:
  - Temperature settings
  - Setbacks
  - Start and stop times

Action Plan: Phase 2

- Low-cost services that evaluate, analyze, and adjust large energy-consuming systems
  - May require some budgetary programming
- Service providers can provide detailed information on savings impacts of follow-on projects
  - Energy audits
  - System inspection and evaluation

Action Plan: Phase 3

- Efforts with great potential to improve building energy performance
  - May require design, engineering, and construction
- Requires capital project planning and programming
  - It may be possible to pay for most or all of the improvement project with the savings it generates (e.g. energy performance contract)

Building Upgrade Manual

- Plan and implement profitable energy saving building upgrades utilizing five stages:
  - Retro-commissioning
  - Air distribution systems upgrade
  - Lighting upgrade
  - Load reductions
  - HVAC upgrade

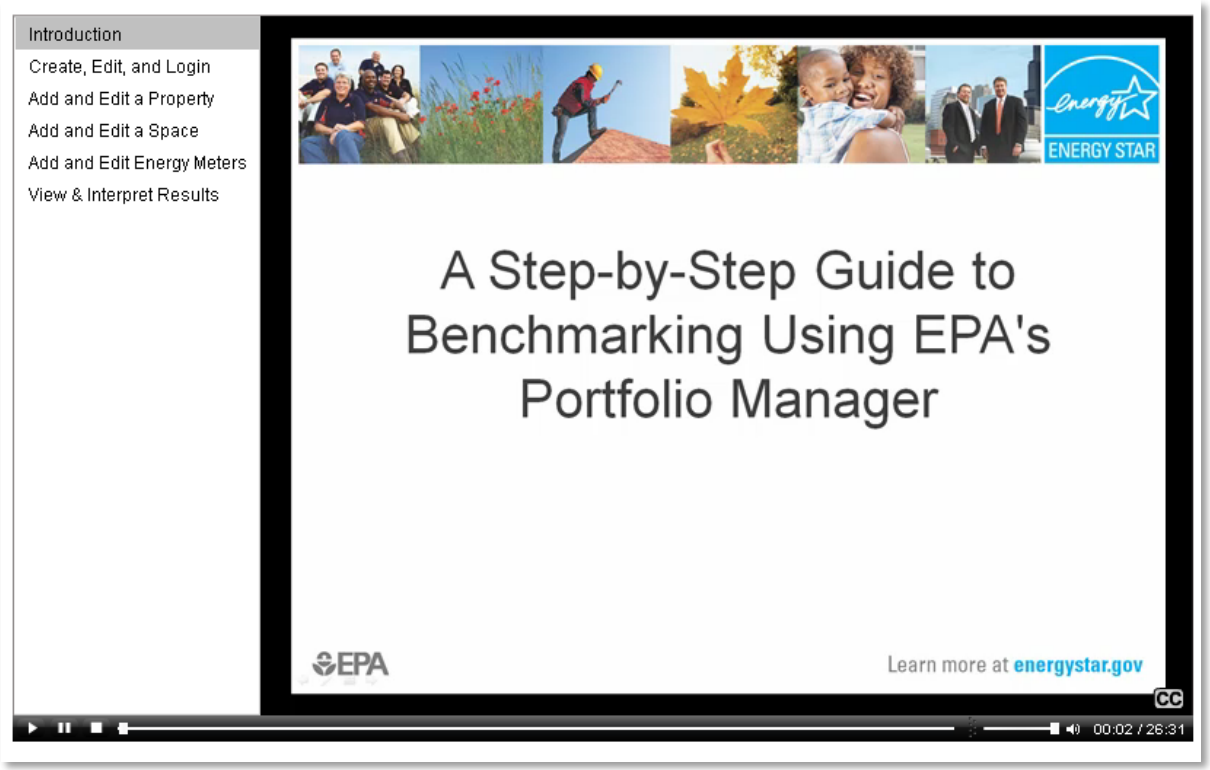
http://www.energystar.gov/buildings

CFO Calculator

- Helps answer three critical questions about efficiency projects:
  - How much new equipment paid for using savings?
  - Should we finance now or wait for a future budget?
  - What is the cost of delay?

ENERGY STAR Training Sessions

- Training sessions
- Webinars
- Recorded presentations



energystar.gov/businesstraining

For More Information:

Visit: www.energystar.gov/benchmark
E-mail: buildings@energystar.gov

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Facility Name	Baseline Rating (1-100)	Current Rating (1-100)	Change from Baseline: Adjusted Energy Use (%)	Current Site Energy Intensity (kBtu/Sq. Ft.)	Baseline Energy Period Ending Date
Bakersville School	60	82	-22.1	58.4	12/31/2009
Beech Street School	35	58	-18.6	83.1	12/31/2009
Central High School Complex	77	90	-20.3	64.4	12/31/2009
Gossler Park Elementary School	22	46	-20.3	83.2	12/31/2009
Green Acres School	25	46	-18.3	83.6	12/31/2009
Hallsville Elementary School	43	64	-17.9	67.1	12/31/2009
Highland Goffe's Falls Elementary School	52	78	-22.9	42.3	12/31/2009
Hillside Middle School	40	71	-25.4	52.5	12/31/2009
Jewett Elementary School	35	53	-14.8	65.7	12/31/2009
Mcdonough Elementary School	59	85	-26.2	50.8	12/31/2009
Mclaughlin Middle School	24	31	-6.5	70.2	12/31/2009
Memorial High School	77	89	-16.9	55.8	12/31/2009
MST	59	72	-12.5	64.3	12/31/2009
Northwest Elementary School	50	46	3.7	54.5	12/31/2009
Parker Varney Elementary School	46	54	-7.1	51.8	12/31/2009
Parkside Middle School	46	72	-21.8	52.8	12/31/2009
Smyth Road School	51	59	-8.7	59.6	12/31/2009
Southside Middle School	46	72	-22.1	49.7	12/31/2009
Webster Elementary School	36	43	-5.5	66.4	12/31/2009
West High School	80	91	-18.9	59.6	12/31/2009
Weston Elementary School	46	70	-20.5	41.6	12/31/2009
Wilson Elementary School	45	45	-0.1	61.5	12/31/2009

PORTFOLIO MANAGER

ACCOUNT INFORMATION | CONTACTS | FREQUENTLY ASKED QUESTIONS | CONTACT US | HELP | LOGOUT

Home > My Portfolio

Group Averages	
Baseline Rating: 56 Facilities Included: 22	Current Rating: 72 Facilities Included: 22
Change from Baseline: Group Adjusted Percent Energy Use (%): -17% Facilities Included: 22	

Averages are weighted by Total Floor Space.

More about Baselines

More about Change from Baseline: Adjusted Energy Use

Add a Property

Import Facility Data Using Templates

Work with Facilities

Update Multiple Meters

Reporting and Analysis

New! Generate Reports and Graphs

Request Energy Performance Report

Apply for Recognition

Apply for the ENERGY STAR

ENERGY STAR Leaders

Automated Benchmarking

Get Started Now

You have been granted access to Shared Facilities!

Facility Name	Baseline Rating (1-100)	Current Rating (1-100)	Baseline Energy Period Ending Date	Baseline Site Energy Intensity (kBtu/Sq. Ft.)	Current Site Energy Intensity (kBtu/Sq. Ft.)	% Difference from National Median Source EUI
Bakersville School	60	82	12/31/2009	72.2	56.4	-29.5
Beech Street School	35	58	12/31/2009	104.6	83.1	-7.2
Central High School Complex	77	90	12/31/2009	78.2	64.4	-39.3
Gossler Park Elementary School	22	46	12/31/2009	74.7	63.2	3.3
Green Acres School	25	46	12/31/2009	71.4	63.6	2.8
Hallsville Elementary School	43	64	12/31/2009	80.8	67.1	-12.8
Highland Goffe's Falls Elementary School	52	78	12/31/2009	57.0	42.3	-24.9
Hillside Middle School	40	71	12/31/2009	71.4	52.5	-18.8
Jewett Elementary School	35	53	12/31/2009	75.5	65.7	-2.6
Modonough Elementary School	59	85	12/31/2009	65.1	50.8	-32.3
Mclaughlin Middle School	24	31	12/31/2009	73.1	70.2	17.9
Memorial High School	77	89	12/31/2009	69.0	55.8	-36.9
MST	59	72	12/31/2009	74.8	64.3	-19.7
Northwest Elementary School	50	46	12/31/2009	52.7	54.5	3.1
Parker Varney Elementary School	46	54	12/31/2009	55.0	51.8	-4.3
Parkside Middle School	46	72	12/31/2009	69.3	52.8	-19.5
Smyth Road School	51	59	12/31/2009	62.9	59.6	-7.9
Southside Middle School	46	72	12/31/2009	67.6	49.7	-19.6
Webster Elementary School	36	43	12/31/2009	65.6	66.4	6.2
West High School	80	91	12/31/2009	73.4	59.6	-40.7
Weston Elementary School	46	70	12/31/2009	51.6	41.6	-17.8
Wilson Elementary School	45	45	12/31/2009	58.2	61.5	4.3

Facility Name	Baseline Rating (1-100)	Baseline Energy Period Ending Date	Current Rating (1-100)	Baseline Site Energy Intensity (kBtu/Sq. Ft.)	Baseline Source Energy Intensity (kBtu/Sq. Ft.)	Current Source Energy Intensity (kBtu/Sq. Ft.)
Bakersville School	60	12/31/2009	82	72.2	110.9	86.4
Beech Street School	35	12/31/2009	58	104.6	181.1	147.5
Central High School Complex	77	12/31/2009	90	78.2	131.4	104.7
Gossler Park Elementary School	22	12/31/2009	46	74.7	141.0	112.5
Green Acres School	25	12/31/2009	46	71.4	121.6	99.6
Hallsville Elementary School	43	12/31/2009	64	80.8	126.6	103.9
Highland Goffe's Falls Elementary School	52	12/31/2009	78	57.0	88.6	68.3
Hillside Middle School	40	12/31/2009	71	71.4	116.7	87.2
Jewett Elementary School	35	12/31/2009	53	75.5	125.6	107.0
Mcdonough Elementary School	59	12/31/2009	85	65.1	111.0	82.0
Mclaughlin Middle School	24	12/31/2009	31	73.1	128.9	120.6
Memorial High School	77	12/31/2009	89	69.0	121.5	101.0
MST	59	12/31/2009	72	74.8	134.4	118.9
Northwest Elementary School	50	12/31/2009	46	52.7	90.7	93.7
Parker Varney Elementary School	46	12/31/2009	54	55.0	94.6	87.7
Parkside Middle School	46	12/31/2009	72	69.3	114.4	89.3
Smyth Road School	51	12/31/2009	59	62.9	95.0	88.4
Southside Middle School	46	12/31/2009	72	67.6	104.6	81.2
Webster Elementary School	36	12/31/2009	43	65.6	102.3	96.3
West High School	80	12/31/2009	91	73.4	123.6	100.2
Weston Elementary School	46	12/31/2009	70	51.6	88.3	70.0
Wilson Elementary School	45	12/31/2009	45	58.2	94.6	94.2

US DOE Technical Assistance Program:

- Joel Blaine, Portfolio Manager Initiative
  - 202-287-1816 or joel.blaine@ee.doe.gov
- Pam Bloch Mendelson, TAP Lead
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- For tools and resources see the Solution Center at: http://wip.energy.gov/solutioncenter
- To place a request for TA, see either the Technical Assistance Center website: https://tac.eecleanenergy.org/ or call 1-877-EERE-TAP (1-877-337-3827)

THANK YOU!

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Thanks to our audience and our participants:

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