



Utility Benchmarking in Multifamily Housing 201: Let Performance Data Drive Your Decisions

Tuesday

2:00-3:15pm



Panelists

- Speakers

- Scott Ledford, ICF
- Colleen Woodson, BrightPower Inc.
- Julie Klump, Preservation of Affordable Housing

- Moderators

- David Ruggiero, ICF



2017 Better Buildings Summit

Utility Benchmarking in Multifamily Housing 201: Let Performance Data Drive Your Decisions

May 16, 2017



Scott Ledford

ICF



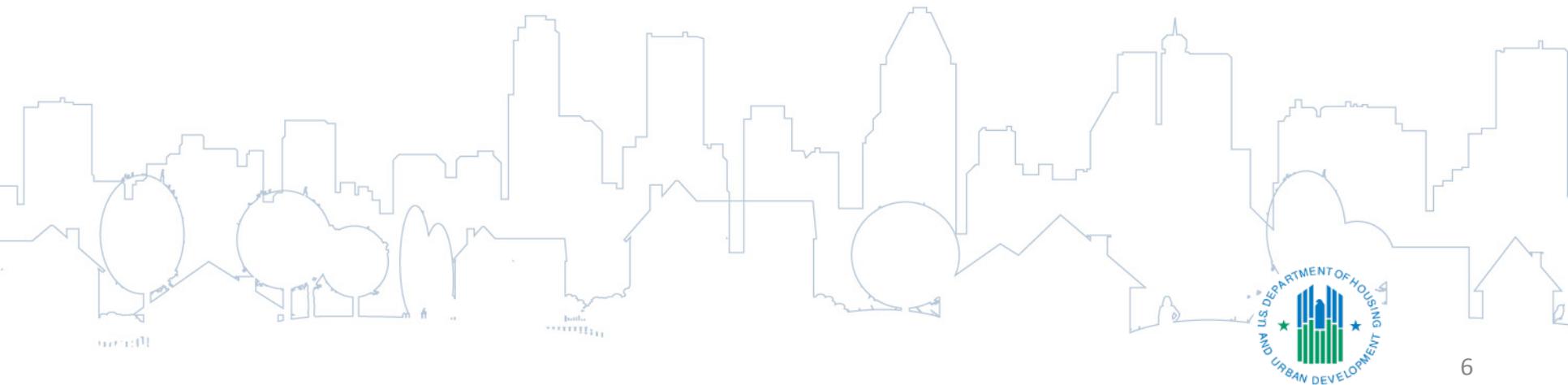
U.S. DEPARTMENT OF
ENERGY

Learning Objectives

- In this session, you will:
 - Identify strategies and resources for translating benchmarking results into concrete next steps toward improving property performance
 - Hear from someone who advises multifamily housing providers on utility benchmarking
 - Hear from a multifamily housing provider that has undertaken utility benchmarking



Using Your Benchmarking Results to Make Informed Decisions



Benefitting Your Organization

- There are real, actionable ways to use the information gained from utility benchmarking to benefit your organization:
 - Identify Anomalies
 - Improve Poor Performers.
 - Recognize and Document Best Practices from Top Performers
 - Set Portfolio-Wide Savings Goals



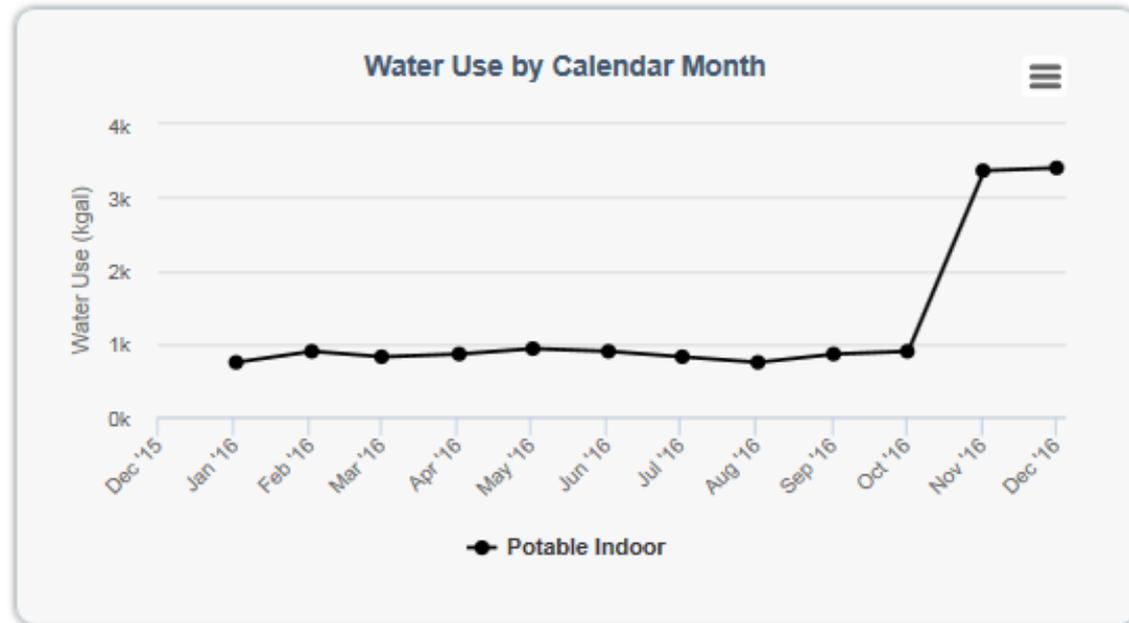
Identify Anomalies

- The results of utility benchmarking are only as good as the data entered into Portfolio Manager
- Review your organization's utility data regularly to look for errors and anomalies
- Portfolio Manager has a number of built-in features that can help you with data quality, including:
 - Metrics "Not Available" messages
 - Alert icons
 - Data Quality Checker
 - Inclusion of selected alerts in custom reports



Identify Excess Consumption

- Portfolio Manager graphs consumption by utility type
- Spikes in consumption can be examined to see if they reflect leaks, billing errors, or equipment malfunctions



 [Export Data by Calendar Month](#)

Water Meters - Used to Compute Metrics (1)

[Add A Meter](#)

[Change Meter Selections](#)

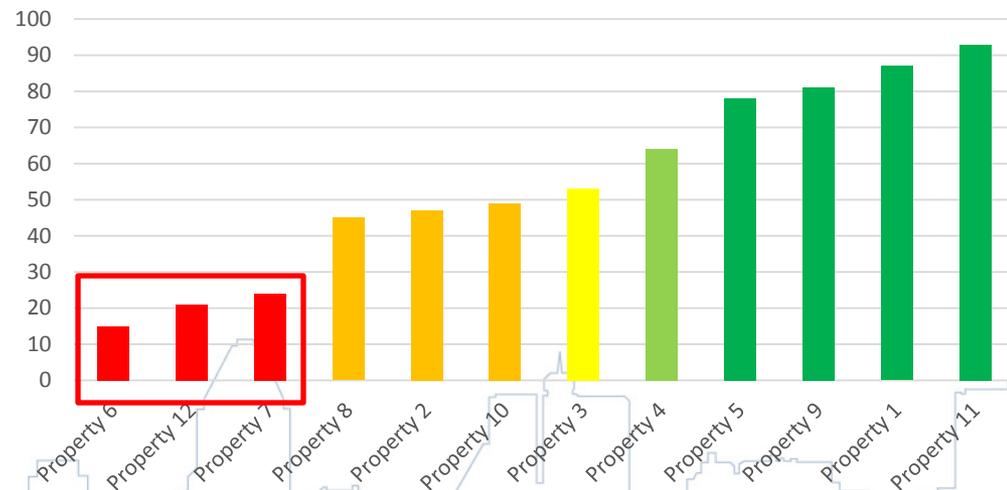
 [View as a Diagram](#)

Name Meter ID	Water Meter Type	Most Recent Bill Date	In Use? (Inactive Date)
Potable Indoor Meter 28338628	Potable Indoor	12/31/2016	Yes

Identify and Prioritize Poor Performers

- Housing providers can analyze benchmarking metrics across properties and identify the lowest performers
- These properties may represent the best place to start with improvements/upgrades

ENERGY STAR Score



Improve Poor Performers

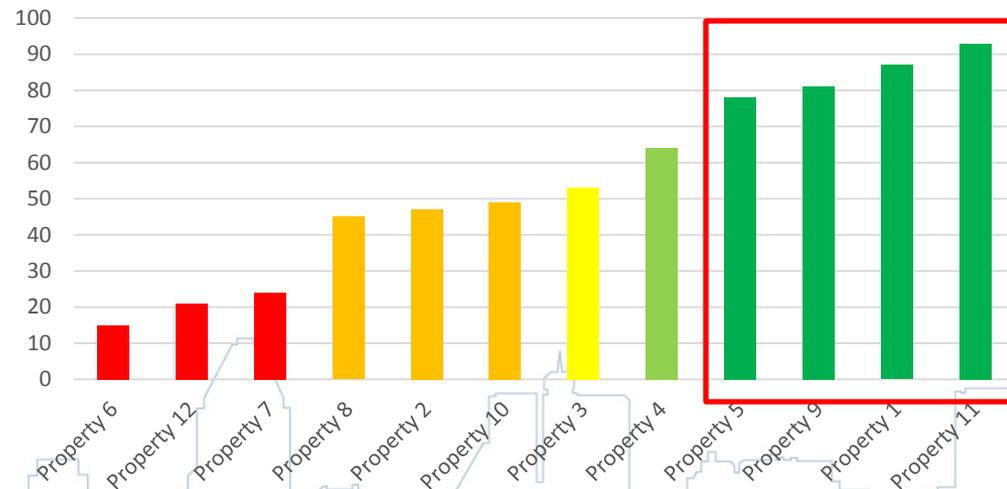
- Review your utility benchmarking reports to look for properties that are performing poorly
- Investigate reasons for high energy or water consumption and identify measures that can be taken to improve performance
 - Identify operations and maintenance measures that can generate savings with limited up-front costs
 - Have a building audit conducted, and if warranted, make capital investments to improve performance.



Identify and Recognize Top Performers

- Top performers may be eligible for recognition
- Best practices of top performers can be identified and communicated across the portfolio

ENERGY STAR Score



Set Portfolio-Wide Savings Goals

- Portfolio Manager includes baseline and target-setting functionality at the property level
- Target metrics can be selected for inclusion in custom reporting templates – allowing you to look at goals across properties

The screenshot displays the 'MyPortfolio' interface for 'Sample Multifamily Building 2'. It includes a navigation bar with 'Sharing', 'Reporting', and 'Recognition' tabs. The main content area shows property details, an ENERGY STAR score of 53 (Current) and 71 (Baseline), and a 'Goals' tab. The 'Goals' tab contains a bar chart of Energy Performance (kBtu/ft²) comparing Baseline (Dec 2014) and Current (Dec 2016) Source and Site EUI. Below the chart are links to generate performance documents. To the right, a 'Metrics Comparison' table compares the property's performance against a target and median property performance. At the bottom right, a 'Current Baselines & Targets' table shows the target score of 75 for Energy.

MyPortfolio | Sharing | Reporting | Recognition

Sample Multifamily Building 2
123 Main Street, Durham, NC 27701 | [Map It](#)
Portfolio Manager Property ID: 5819176
Year Built: 2000 | Parent Property: [Parent Property for 3 Building Campus](#)
[Edit](#)

Not eligible to apply for ENERGY STAR Certification

ENERGY STAR Score (1-100)
Current Score: 53
Baseline Score: 71

Summary | Details | Energy | Water | Waste & Materials | **Goals** | Design

Energy Performance (kBtu/ft²)

Energy Use Intensity

200
0

Baseline (Dec 2014) | Current (Dec 2016)

■ Source EUI
■ Site EUI

Generate & Download Performance Documents for this Property

- [Statement of Energy Performance \(SEP\)](#)
- [Score Card](#)
- [Progress & Goals Report](#)
- [Data Verification Checklist](#)

Metrics Comparison for Your Property & Your Target [Change Time Period](#)

Metric	Dec 2014 (Energy Baseline)	Dec 2016 (Energy Current)	Target*	Median Property*
ENERGY STAR score (1-100)	71	53	75	50
Source EUI (kBtu/ft²)	95.8	108.7	93.6	111.3
Site EUI (kBtu/ft²)	36.6	40.7	35.0	41.6
Source Energy Use (kBtu)	9,580,012.5	10,895,653.9	9,361,628.1	11,127,543.1
Site Energy Use (kBtu)	3,656,690.0	4,068,099.9	3,503,270.1	4,164,103.6
Energy Cost (\$)	Not Available	Not Available	Not Available	Not Available
Total GHG Emissions (Metric Tons CO2e)	390.8	441.8	380.7	452.5

* To compute the metrics at the target and median levels of performance, we will use the fuel mix associated with your property's current energy use.

Current Baselines & Targets

	Baselines	Target
Energy	12/31/2014	75
Water	Not Available	Not Available
Waste/Materials	Not Available	Not Available

[Set Baselines or Target](#)

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Set Portfolio-Wide Performance Goals

- Looking at your organization's portfolio as a whole.
 - How is it possible to achieve at least a 20% reduction in energy and water use in a cost-effective manner?
 - What would that mean for your organization's overall utility costs?
 - What is the average ENERGY STAR 1-100 Score for your organization's properties?
 - What would happen if your organization were to bring up all under-performing properties to a score of 50 or better? To 75?



Key Concepts for Pursuing Efficiency Improvements

- Consider starting with low- and no-cost energy and water efficiency improvements (and quick fixes)
 - Establish the financial and environmental benefits of utility management
 - Demonstrate the value of these efforts to leadership, staff, and residents
 - Realize significant and rapid savings from operational and behavioral approaches
- Consider how to leverage low- and no-cost savings to help fund more intensive retrofits
 - Capital investment needs may be lower when utility waste is reduced through low- and no-cost measures



Resources on Improving Portfolio Performance

No-and Low-Cost Energy Saving Tips for Multifamily Housing Common Areas: Need an easy win? These tips from successful ENERGY STAR partners will help your organization start saving energy in common areas and vacant units with little-to-no upfront investment.



No- and Low-Cost Energy-Saving Tips for Multifamily Housing Common Areas

Utility costs are typically the largest controllable operating expense in multifamily housing communities. Strategic energy management practices can greatly reduce these costs, increasing net operating income. ENERGY STAR partners have found the following no- and low-cost measures to be effective in reducing energy consumption and operating expenses.



Replace all incandescent bulbs, flood lights, and decorative spot lights with ENERGY STAR qualified compact fluorescents. Replacing one 60 watt incandescent bulb with a 13-watt CFL will save \$56 in energy costs over the CFL's lifetime (at \$0.12/kWh). In addition, CFLs reduce future costs of purchasing new lamps – and the labor costs associated with changing light bulbs – because they last 10 times longer.



Resources on Improving Portfolio Performance (cont.)

No- and Low-Cost Checklist for Saving Energy and Water in Multifamily Housing: For those who are ready to dive in, this checklist provides a more in-depth review of the no- and low-cost energy and water savings opportunities to look for across your organization's multifamily properties.



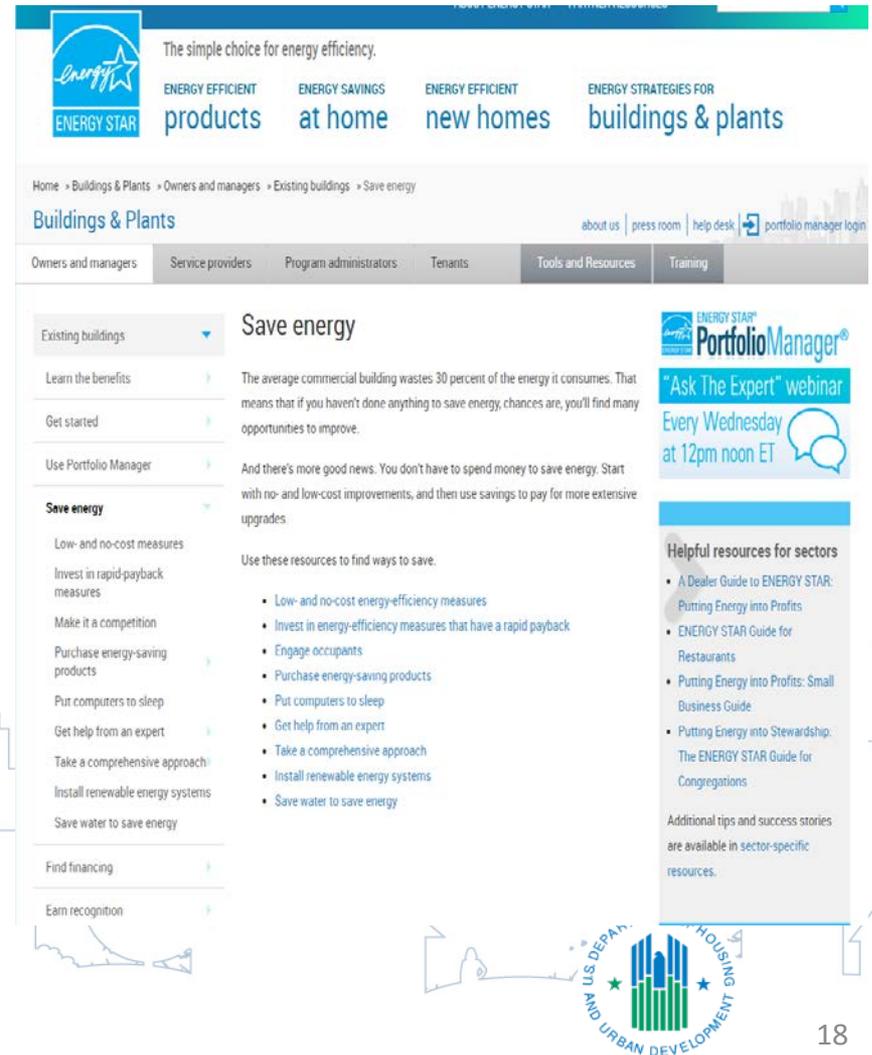
Use the checklist below to help identify and implement no- and low-cost changes to improve energy and water efficiency in multifamily assets. By employing these measures and strategies at your property, you can better manage utility costs — the largest source of controllable expenses in an apartment community — increase resident attraction and retention, and enhance asset value. Before you start any improvement projects, don't forget to research any utility and energy efficiency rebates and incentives that may be available in your area.

Category	Measure / Strategy	Status	Comments
General ENERGY STAR	Benchmark energy and water performance using EPA's ENERGY STAR Portfolio Manager. Update energy and water meters regularly, and review consumption trends with management.		
General Digi Envelope	Take steps to minimize heating and cooling load. Install weather stripping on doors and windows to eliminate drafts and air leakage; use window shades, tinting, films, or blinds to reduce heat gain in the summer (and heat loss in the winter); and install shades or blinds in common area windows where applicable. When weather is temperate, open windows rather than using mechanical heating or cooling equipment.		
General Digi Envelope	Regularly inspect the building envelope. Whenever applicable, re-install weather stripping, sealing, and caulking; inspect thermal break gaskets; ensure that automatic door closers function properly.		
General Digi Envelope	Perform a thermal scan to identify thermal transmission and air leakage; address any opportunities found.		
General Communications	When meeting with residents, include discussions on unit-level actions they can take to help them save money and the property meet its energy reduction goals.		
General Communications	Build a competition around turning off unnecessary equipment and lighting, properly utilizing window blinds, taking the stairs instead of elevators, and other simple actions. Different floors, wings, or residents (or different buildings in a multi-building complex) can compete against each other in this competition.		
General Communications	Instruct staff to be diligent about: turning off unnecessary lights; minimizing use of heating and cooling when possible; turning off appliances that are not in use; making sure model and vacant units are operated efficiently; and generally looking out for energy waste, such as a broken photosensor. Instruct nighttime security staff and/or courtesy patrols to turn off unnecessary lights. At least monthly, conduct a nighttime audit to identify lights that are on when they do not need to be.		
Lighting General	Clean light fixtures whenever a light is changed or replaced.		
Lighting General	Retrofit T12 and 32W T8 fluorescent fixtures and lamps with 25W or 28W T8 lamps/fixtures.		
Lighting General	Replace all incandescent bulbs, flood lights, and decorative spotlights with ENERGY STAR qualified compact fluorescent lamps (CFLs).		
Lighting General	Replace incandescent exit sign lamps with LED exit sign lamps.		
Lighting General	Make bulk purchases of common CFLs; offer residents the ability to purchase these bulbs at cost or offer to install a new CFL for their burned-out lamp free of charge. Maintain a receptacle in the leasing office where residents can bring burned-out CFLs for proper recycling.		



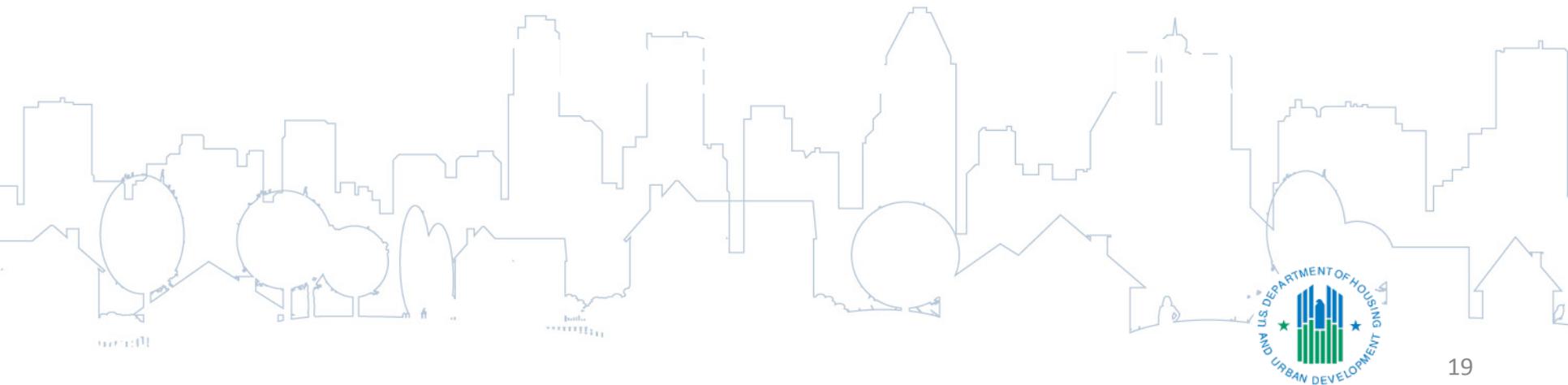
Resources on Improving Portfolio Performance (cont.)

Save Energy: Visit this comprehensive section on saving energy in existing buildings, which details best practices for saving energy, engaging occupants, and calculating potential energy savings. Consider the full range of ENERGY STAR and WaterSense qualified products, as well as the ENERGY STAR Service and Product Provider partners who can help to identify, plan, and implement energy-efficiency improvements.



The screenshot shows the ENERGY STAR website interface. At the top, the ENERGY STAR logo is on the left, and the tagline "The simple choice for energy efficiency." is on the right. Below the tagline are four navigation buttons: "ENERGY EFFICIENT products", "ENERGY SAVINGS at home", "ENERGY EFFICIENT new homes", and "ENERGY STRATEGIES FOR buildings & plants". The main content area is titled "Buildings & Plants" and includes a breadcrumb trail: "Home > Buildings & Plants > Owners and managers > Existing buildings > Save energy". A navigation bar below the breadcrumb trail includes "Owners and managers", "Service providers", "Program administrators", "Tenants", "Tools and Resources", and "Training". The "Save energy" section is highlighted, and a dropdown menu shows "Existing buildings" selected. The main content area for "Save energy" includes a sub-section "Existing buildings" with a dropdown arrow, and a list of links: "Learn the benefits", "Get started", "Use Portfolio Manager", "Save energy", "Low- and no-cost measures", "Invest in rapid-payback measures", "Make it a competition", "Purchase energy-saving products", "Put computers to sleep", "Get help from an expert", "Take a comprehensive approach", "Install renewable energy systems", "Save water to save energy", "Find financing", and "Earn recognition". The "Save energy" section contains the following text: "The average commercial building wastes 30 percent of the energy it consumes. That means that if you haven't done anything to save energy, chances are, you'll find many opportunities to improve." and "And there's more good news. You don't have to spend money to save energy. Start with no- and low-cost improvements, and then use savings to pay for more extensive upgrades." Below this text is a list of resources to find ways to save, including: "Low- and no-cost energy-efficiency measures", "Invest in energy-efficiency measures that have a rapid payback", "Engage occupants", "Purchase energy-saving products", "Put computers to sleep", "Get help from an expert", "Take a comprehensive approach", "Install renewable energy systems", and "Save water to save energy". On the right side of the page, there is a "Portfolio Manager" logo and a "Ask The Expert" webinar announcement: "Ask The Expert" webinar Every Wednesday at 12pm noon ET. Below this is a "Helpful resources for sectors" section with a list of resources: "A Dealer Guide to ENERGY STAR: Putting Energy into Profits", "ENERGY STAR Guide for Restaurants", "Putting Energy into Profits: Small Business Guide", and "Putting Energy into Stewardship: The ENERGY STAR Guide for Congregations". At the bottom right, there is a logo for the U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT.

Experiences in Multifamily Utility Benchmarking



Colleen Woodson

BrightPower



U.S. DEPARTMENT OF
ENERGY

Let Performance Data Drive your Decisions

Bright Power
Colleen Woodson, Director of
Energy Analysis

About Bright Power

Energy experts pinpoint high-value opportunities via in-depth analysis of every building in your portfolio.



An Intelligence-Driven Framework



Practical solutions attack the root causes of wasted energy spend and improve portfolio returns.

Bright Power tracks every building and the results of every energy project to ensure maximum savings.



Benchmarking Challenges

- Data access
 - Utility data
 - Property information
 - Past project information
 - System information

- Turning Data into Insight

Your Electric Usage Profile

Service to:
CUSTOMER
123 MAIN ST
ANYTOWN, PA 18062

Meter: 0000-0000
Your next meter reading is on or about May 18, 2015.

This section helps you understand your year-to-year electric use by month. Meter readings are actual unless otherwise noted.



Monthly Comparison	Days Billed	kWh	Average kWh/Day	Average Temp.
Apr 2015	30	698	23	43F
Apr 2014	30	734	24	44F

Billing Period	Type	Reading
Apr 17	Actual	19207
Mar 18	Actual	18509
30 Days	kWh Billed	698

Year	May 2015	May 2014
Yearly		

Billing Summary

(Billing details on back)

Balance as of Apr 21, 2015	\$0.00
Charges:	
Total Generation & Transmission Charges	\$64.66
Total Distribution Charges	\$41.96
Total Current Charges	\$106.62
Amount Due By May 12, 2015	\$106.62
Account Balance	\$106.62

How To Shop For Electricity

You can choose the company that supplies your electricity. Visit papowerswitch.com or www.oa.state.pa.us for supplier offers. If you are already shopping, know your contract expiration date.

Here's the information you need to shop:
Bill Account Number: 0000-0000 Rate Schedule: RS (Residential)
Current Supplier: Supplier ABC

PPL Electric Utilities price to compare for your rate is \$0.09559 per kWh. This changes the 1st of June and December.

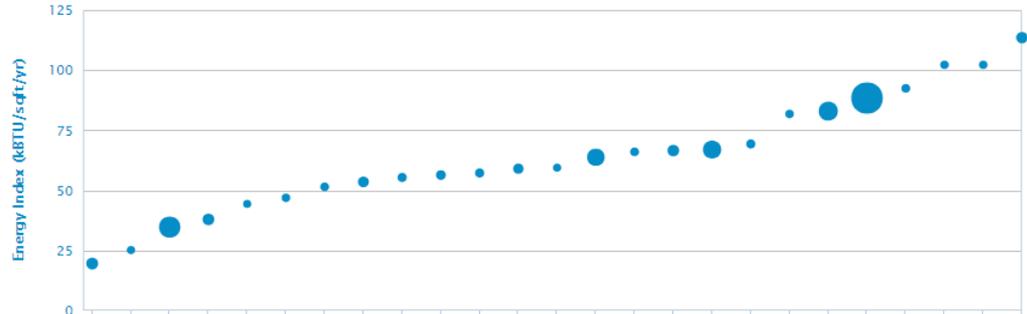
Manage Your Account

Pay Your Bill	Online Options (pplectric.com)
Online: Visit pplectric.com	- Report an outage/check outage status
Phone: Call 1-800-342-5775	- Make a payment, view your bill and usage history.
Mail: Use envelope provided	- Sign up for alerts.
ABP: Automatic Bill Pay (see back of stub to enroll)	- Enroll in paperless billing, automatic bill pay, budget billing.
Card: MasterCard, Discover, Visa or debit, call 1-800-673-2413	- View your rate schedule at: pplectric.com/rates



Identifying Opportunities

- Efficiency + Spending
- Trends over time
- Recent projects
- Funding, incentives, or financing



	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Total usec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
2	2007											68,218	131,959	200,177
3	2008	133,123	125,679	134,049	140,121	167,872	181,024	198,429	200,148	177,255	156,765	137,289	142,351	1,894,103
4	2009	144,117	128,758	138,425	139,724	164,133	169,624	187,682	189,658	165,000	144,750	125,560	130,120	1,827,549
5	2010	136,913	126,161	141,976	147,436	167,487	184,522	208,875	206,121	173,485	152,294	137,550	149,603	1,932,424
6	2011	151,910	135,579	149,760	154,139	178,332	185,668	199,417	194,705	168,794	150,860	139,488	149,004	1,957,655
7	2012	151,503	142,944	151,051	148,643	171,411	186,280	203,441	200,319	174,231	161,338	150,025	149,465	1,990,652
8	2013	150,734	136,618	149,884	149,340	169,480	182,721	197,534	193,627	175,091	156,997	140,794	146,632	1,949,453
9	2014	151,582	140,043	149,121	139,939	161,726	177,152	187,793	186,295	177,762	168,758	155,020	149,519	1,944,711
10	2015	100,181												100,181
11														



BP West - 2

123 ABC St, Portland, OR, 97215

 Tools



Owner Energy
Whole Building

D

82 kBtu/ft²/yr



Most Recent Year - Owner

May 2014 - Jun 2015

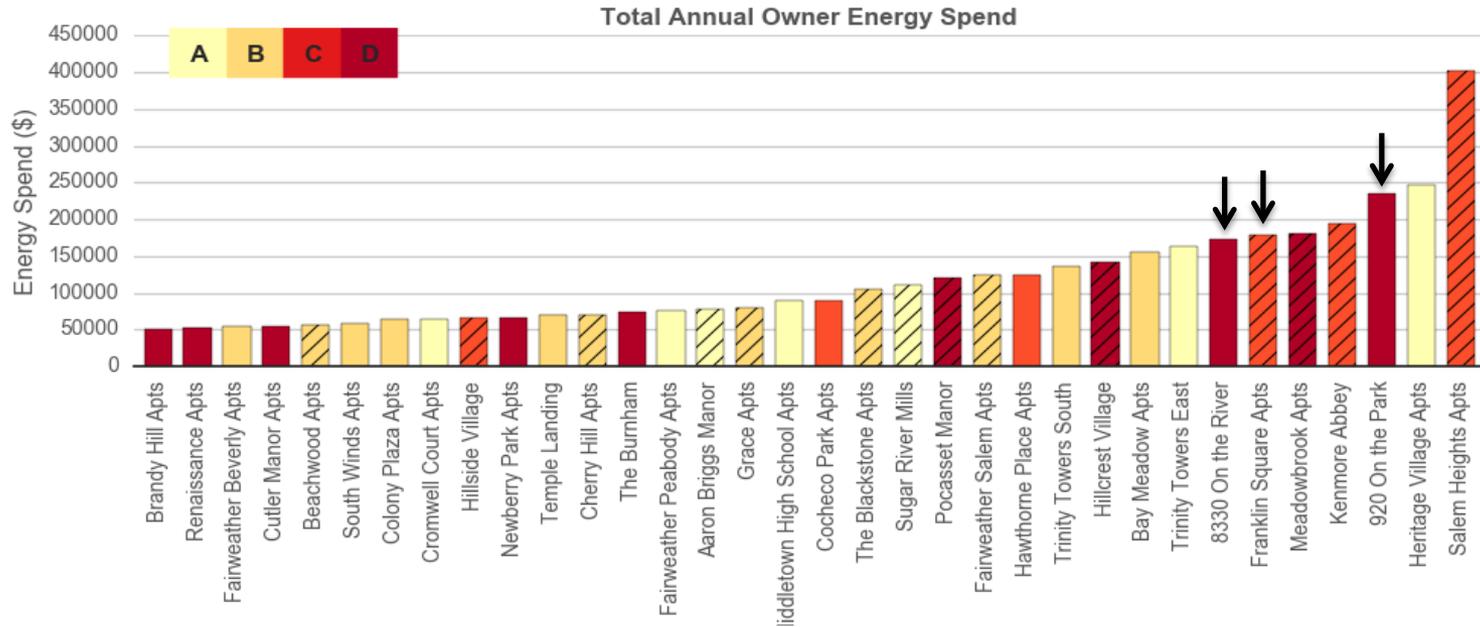
Energy Spending Carbon

	Cooling Whole Building	A	2.2 BTU/ft ² /CDD		\$ 402
	Heating Whole Building	D	13.0 BTU/ft ² /HDD		\$ 13,251
	Electric Baseload Whole Building	B	2,451 kWh/unit/yr		\$ 8,431
	Fossil Fuel Baseload Whole Building	B	6.94 mmBTU/bdmm/yr		\$ 2,558
	Water	B	65.2 gal/bdmm/day		\$ 16,007

Electric	Gas	Water
\$10,060	\$14,585	\$16,008

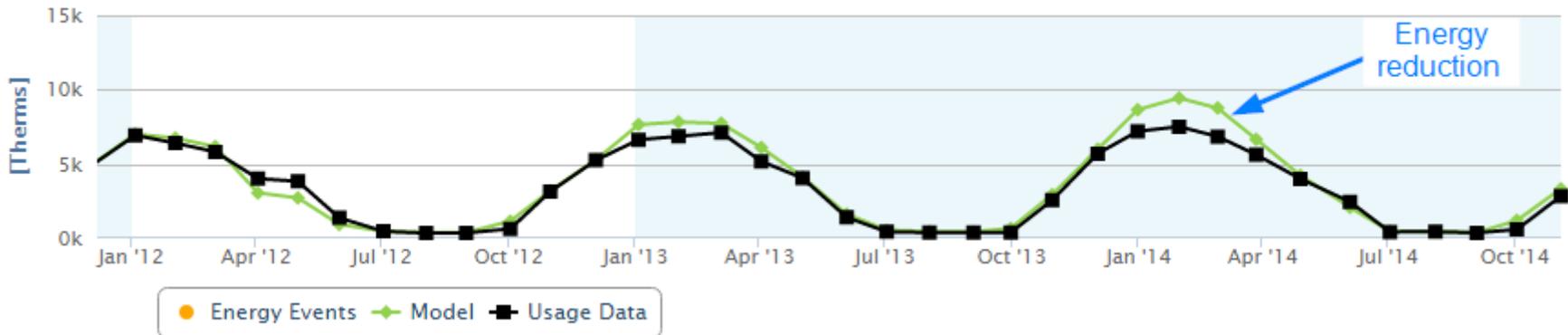
Total Spend
\$40,652

www.brightpower.com



Gas Account

(28 Jan 2009 - 03 Nov 2014)



EnergyScoreCards.com



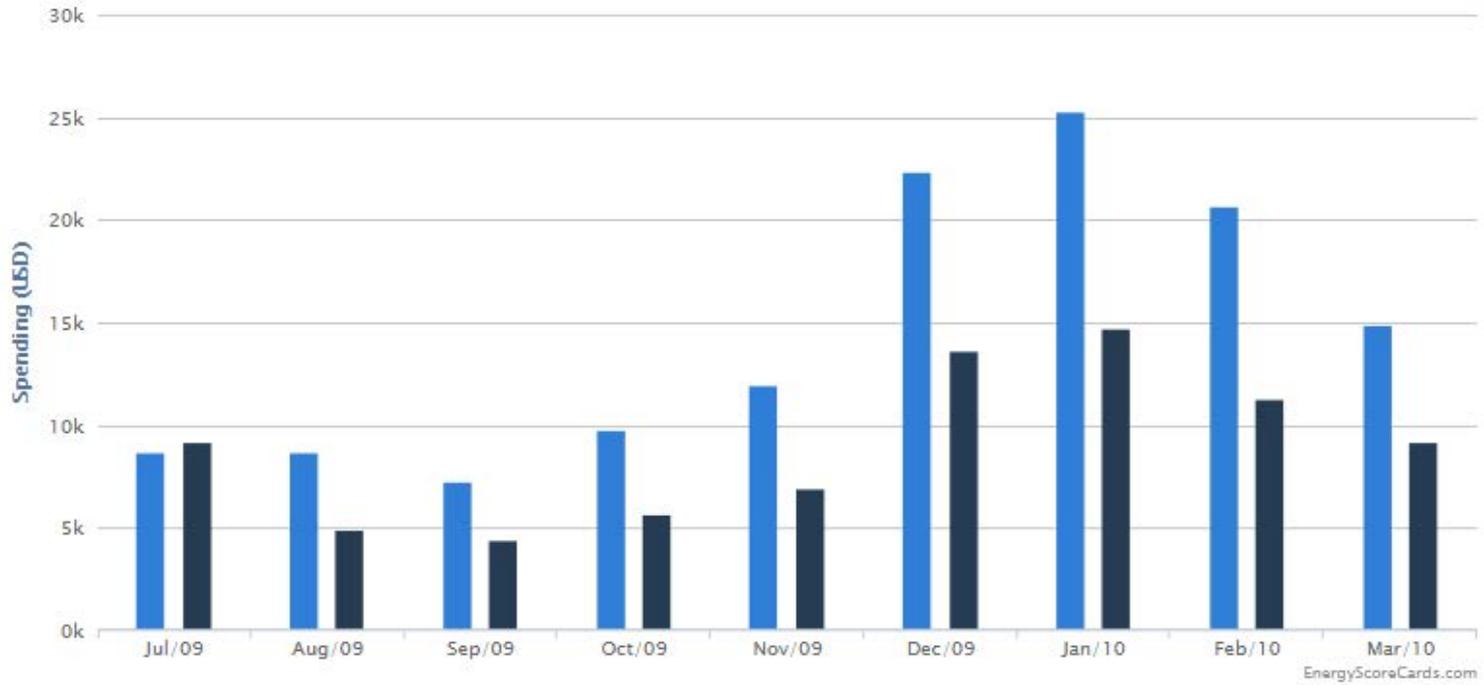
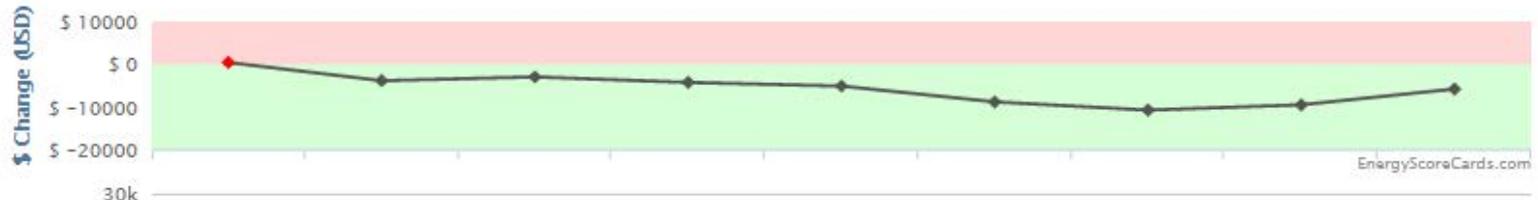
Package: **Energy Audit**

Status: **Exceeding Projections!**

Savings to Date: **\$49,629**

Energy Savings: **35.1%**

Water Savings: **22.28%**



Baseline Period for Report

Pre-Retrofit - Owner
Jan 2006 - Dec 2006



All Energy + Water

Display

Spending Usage

Display Series

Baseline vs Actual

Accounts

Assumptions



Future

- Data access standards
 - Owner data
 - Whole-building data
 - Individual resident data
- Interval and real-time data
 - California smart meter data
- Software: more than just benchmarking



Julie Klump

Preservation of Affordable Housing



U.S. DEPARTMENT OF
ENERGY

Utility Benchmarking in Multifamily Housing: Let Performance Data Drive Your Decisions

Preservation of Affordable Housing

Julie Klump

Vice President, Design and Building
Performance

WHO WE ARE

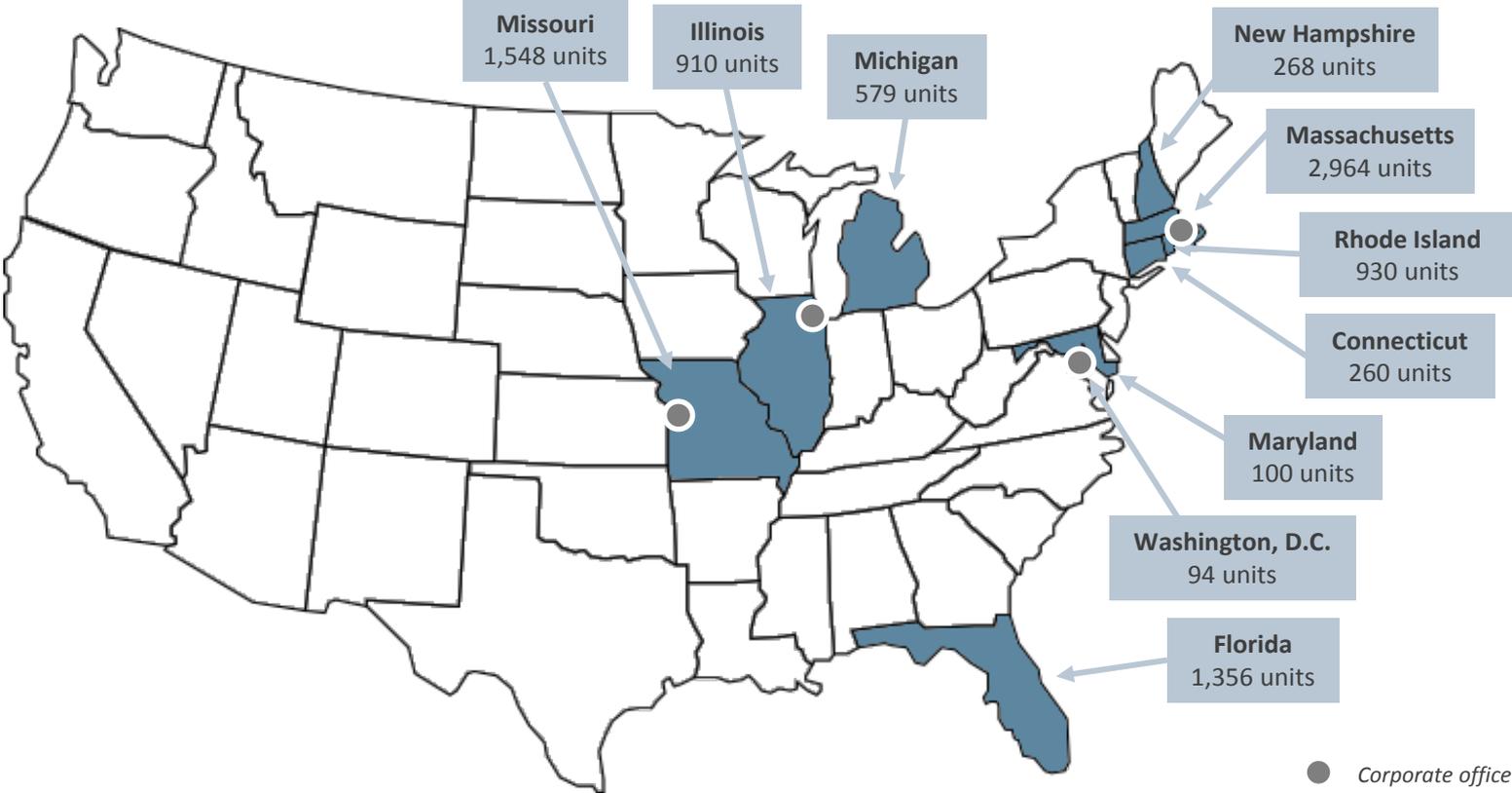


Preservation of Affordable Housing

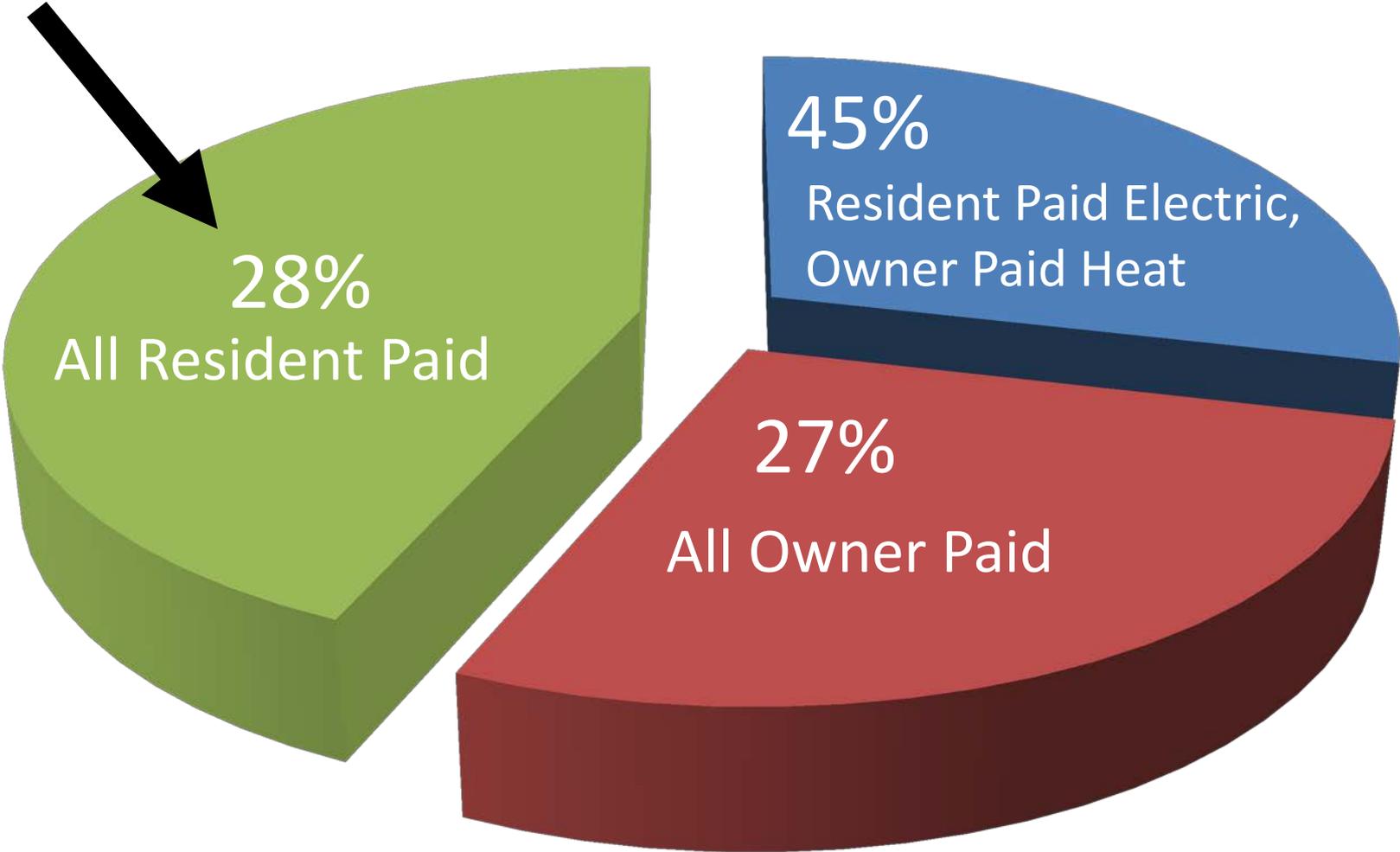
POAH is a nonprofit organization whose mission is to preserve, create, and sustain affordable, healthy homes that support economic security and access to opportunity for all.



WHERE WE ARE



Biggest Challenge in Benchmarking A Property or Portfolio



Get The Data You Can

+ All Circuits

- Heating & Cooling

- AC 1
- AC 4
- AC 5
- AC 6
- AC Computer room
- Boiler 1
- Boiler 2
- Boiler 3
- Boiler 4
- Chiller 1
- Chiller 2
- Electric heat panel
- fan coil 6 computer room
- Fan coil 6 rehab room
- Fan coil 8 mechanical room
- Fan coil boiler room 12
- Fan coil boiler room 14
- Fan coil conference room
- Fan coil conference room heater
- Fire pump heater
- Heat - security guard
- Temp heat

+ Ventilation

+ Lighting

+ Food Prep

+ Laundry

+ Process Equipment

+ Safety

+ Water & Irrigation

Chiller 1

Circuit Details

[Edit Channel Settings](#)



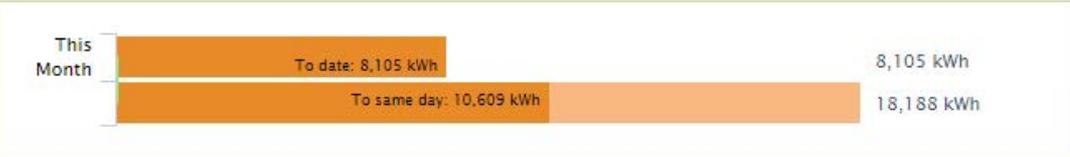
Now	
Usage	3,361 w
Power Factor	0.67
% Breaker Capacity	7%

Past 30 Days	
Energy	15,288 kWh
Power Factor	0.64
Cost	\$1,566
CO2	lbs

Runtime Information [Show Detail](#)

90 Day Alert History *Beta* (0 - 0) [Show Detail](#)

Projected Usage in kWh vs Previous Period kWh Cost



Chiller 1



[Help](#) | [Sign Out](#)

property

Search

Now What?

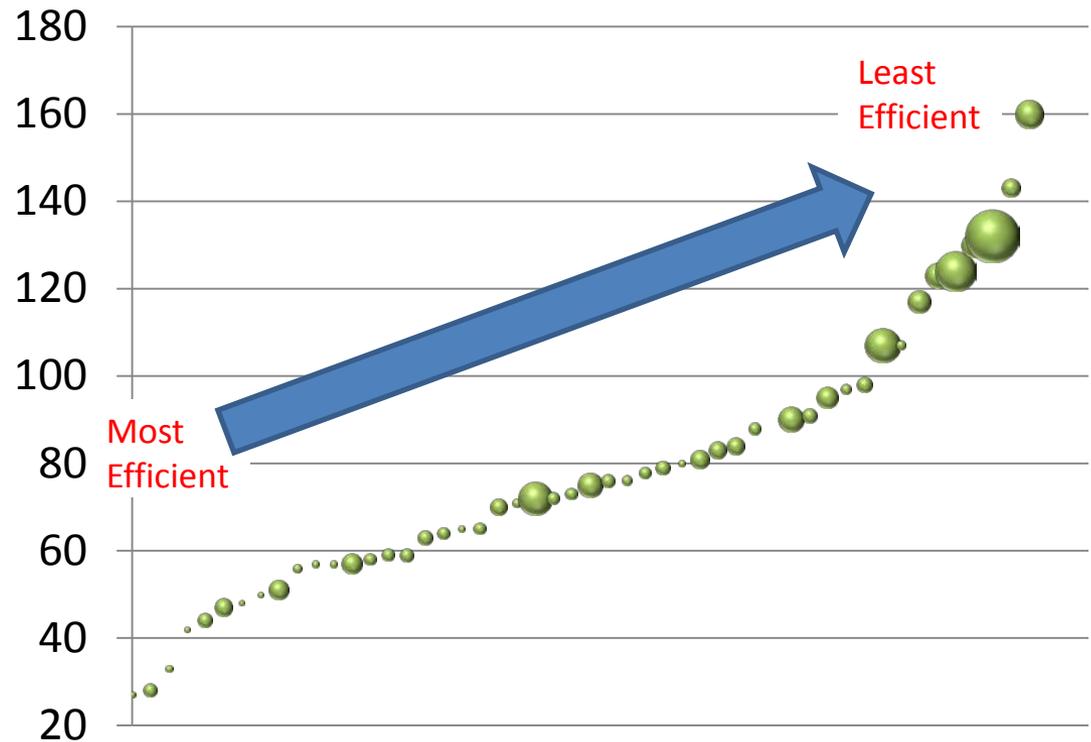
Monitor Monthly Anomalies

Prioritize Sites that Need Attention (quarterly or every 6 months)

Use Incentives or Capital Planning to Implement

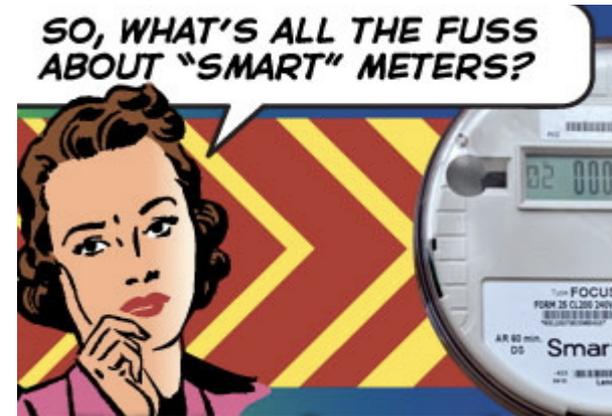
Measure Effectiveness

Repeat



Property Name	Payment Code	Fossil Fuel Spending (\$/yr)	Heating Index (BTU/ft2/HD)
Salem Heights Apartments	(O)000	\$180,877	8.4
Meadowbrook Apartments	(T)TOO	\$136,770	7.2
Franklin Square Apartments	(T)TOO	\$133,582	10.3
Bay Meadow Apartments	(T)TOO	\$124,960	6.0
8330 On the River	(T)TOO	\$114,999	8.3
920 On the Park	(O)000	\$107,086	11.3
Hillcrest Village	(O)000	\$85,143	2.5
Sugar River Mills	(T)TOO	\$77,939	2.8
Kenmore Abbey	(T)000	\$75,685	7.9

Future



All Blocks ▼

508

Heat 77°F 82°F

308

Heat 77°F 75°F

509

Heat 77°F 74°F

309

Heat 77°F 73°F

3F ▼

310	311	312	305	308
307	308	309		

Thank you.

Julie Klump

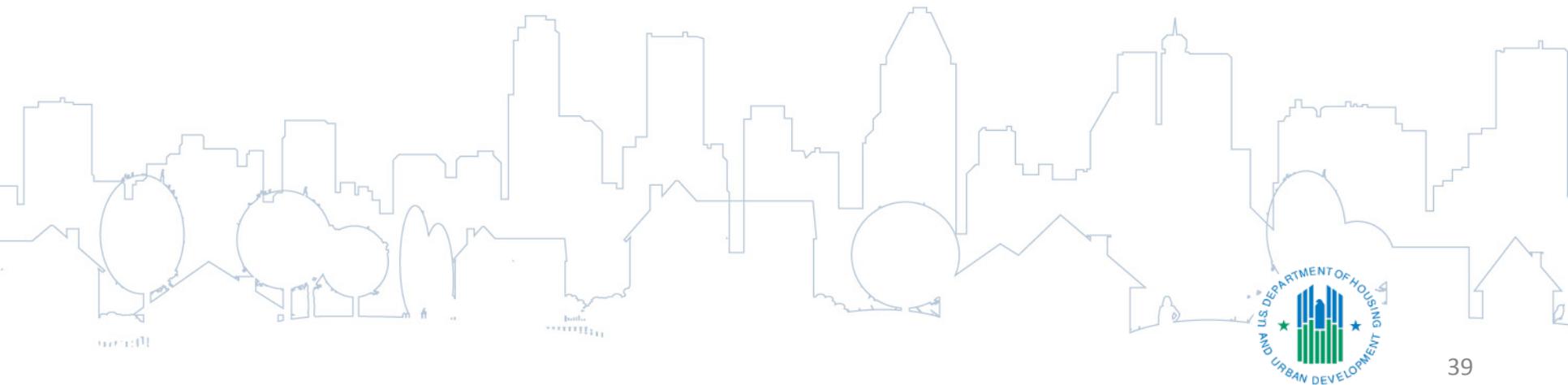
jklump@poah.org

Today's Themes

- 1. From an organizational perspective, what is the number one challenge you face when benchmarking a property/portfolio?**
- 2. How do you use data to identify energy saving opportunities at the property level? What systems or loads do you attack first?**
- 3. Where is the industry in one year, two years and five years? How do we get there?**



Questions?



Related Resources

- [HUD Multifamily Utility Benchmarking Toolkit](#)
- [HUD Multifamily Utility Benchmarking Webinar Series](#)
- ENERGY STAR Frequently Asked Questions:
 - [How Can I Find and Fix Errors in My Data?](#)
 - [What Are Alert Icons?](#)
- Best Practices Guidance from ENERGY STAR
 - [Low- and No-Cost Energy Efficiency Measures](#)
 - [No- and Low-Cost Energy-Saving Tips for Multifamily Housing Common Areas](#)
 - [No- and Low-Cost Checklist for Saving Energy and Water in Multifamily Housing](#)



Contact Information

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Thank You

Provide feedback on this session in the new Summit App!

Download the app to your mobile device or go to bbsummit.pathable.com

