

Technology Discussions: Government



Using Software to Track Building Energy Data

Jim Morris, Virginia Beach City Public Schools

John Heinz, EnergyCAP

Julia Reynolds, Chesterfield County (moderator)

Sponsored by **EnergyCAP**[®]



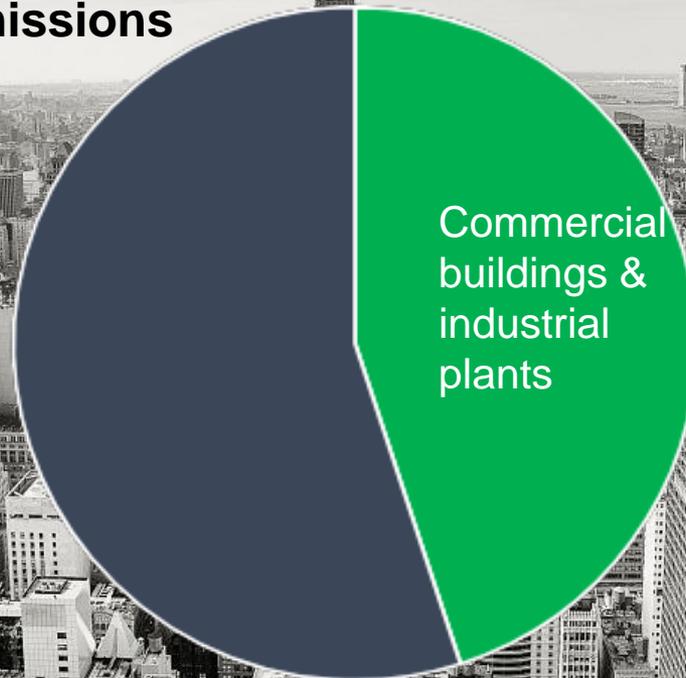
ENERGY STAR for Virginia Energy Efficiency Council (VAEEEC)

Presented by Jim Morris, Virginia Beach City Public Schools, VA
on Behalf of the EPA's ENERGY STAR program

November 2, 2017

Why focus on buildings and plants?

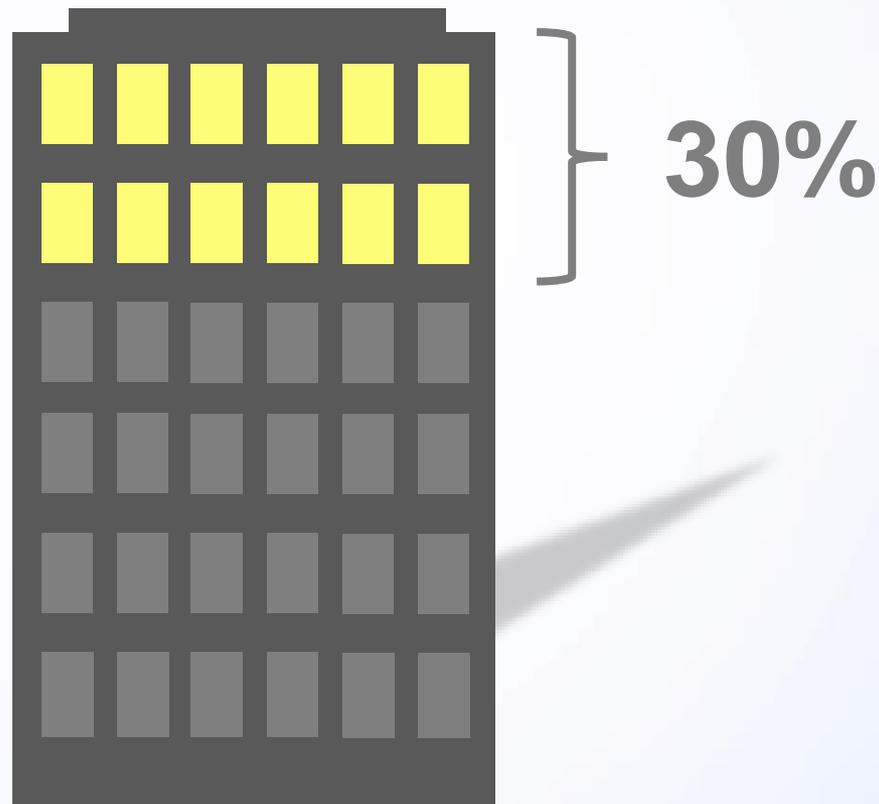
U.S. CO2 Emissions



Commercial buildings & industrial plants

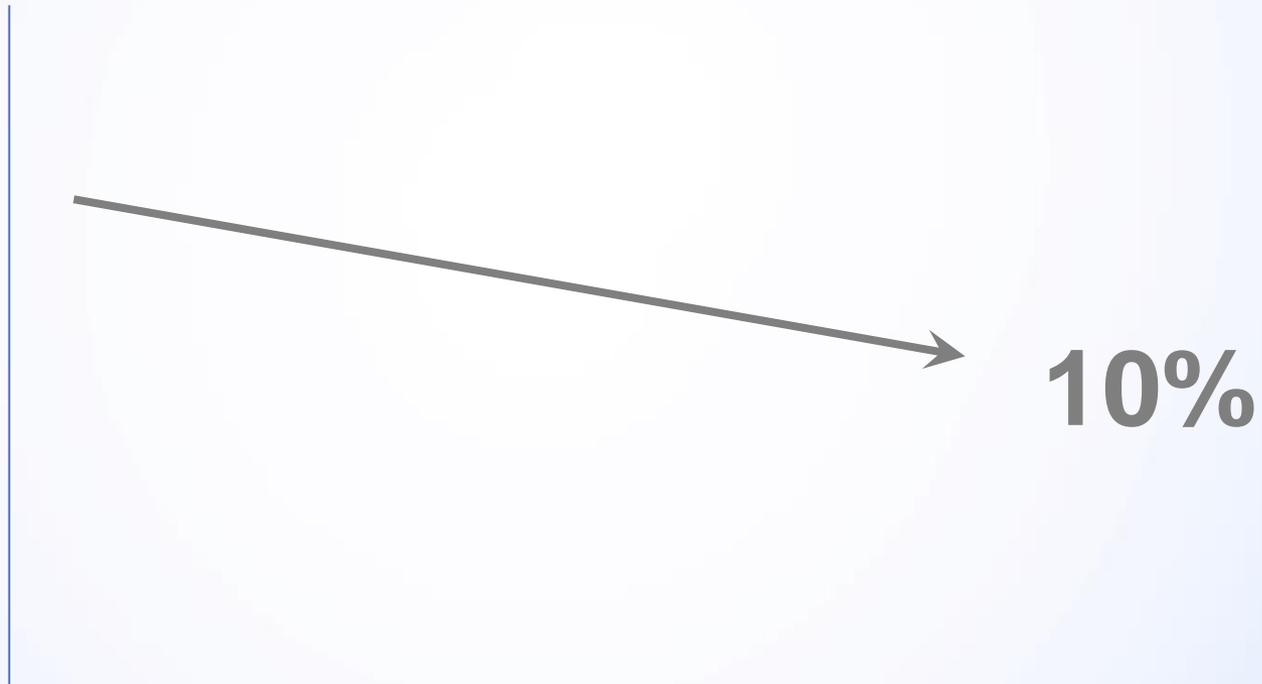
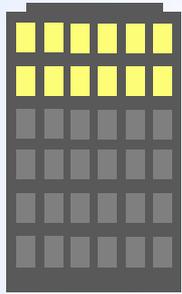
Why focus on buildings and plants?

Energy waste in commercial buildings



Why focus on buildings and plants?

Low- to no-cost reduction potential



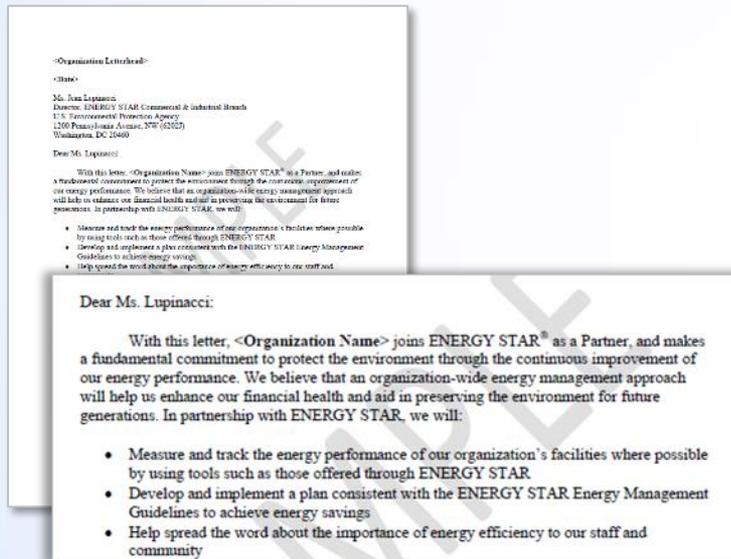


About ENERGY STAR

Why Partner with ENERGY STAR?

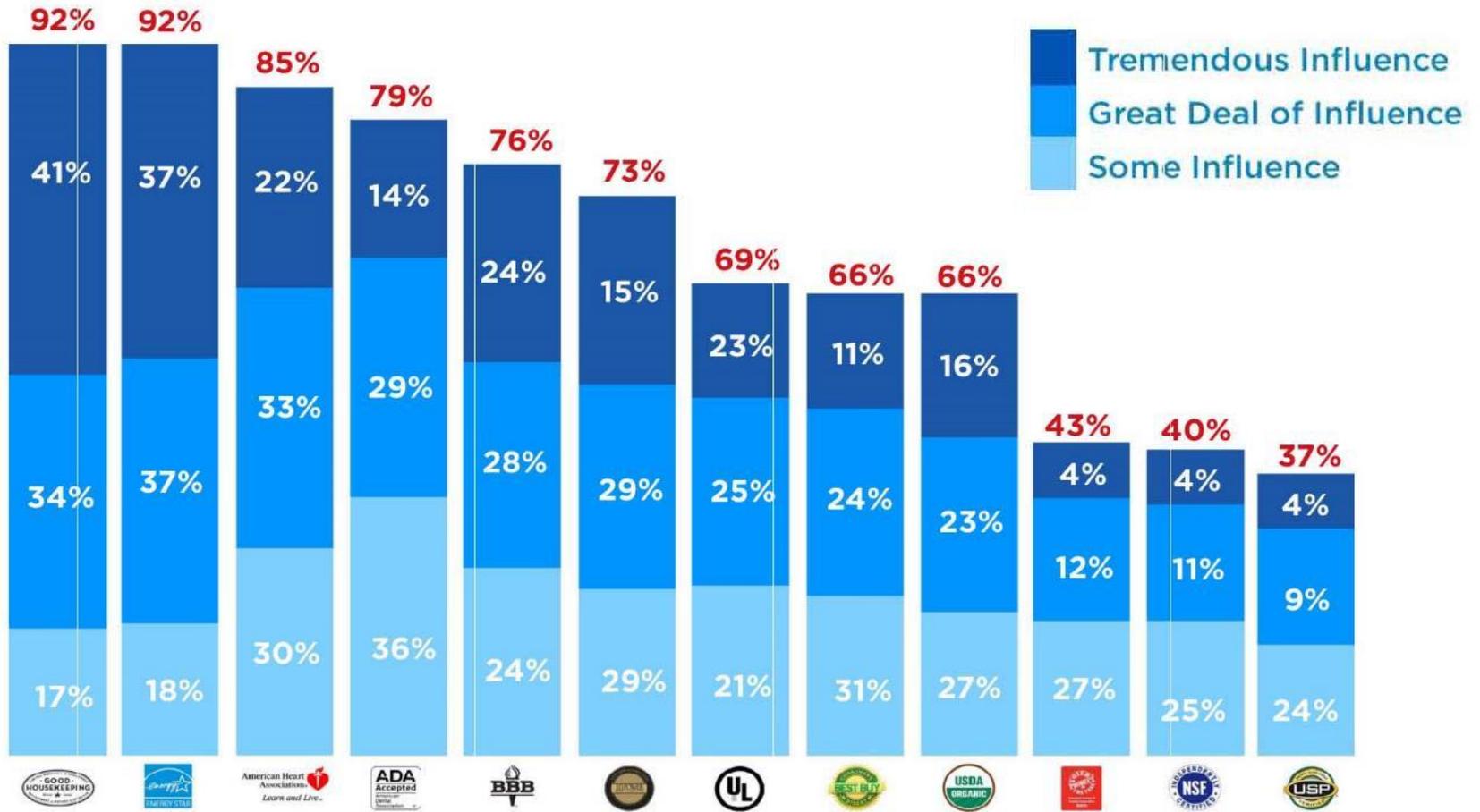
Get management buy-in

Align your organization with a leading brand



energystar.gov/joinbuildings

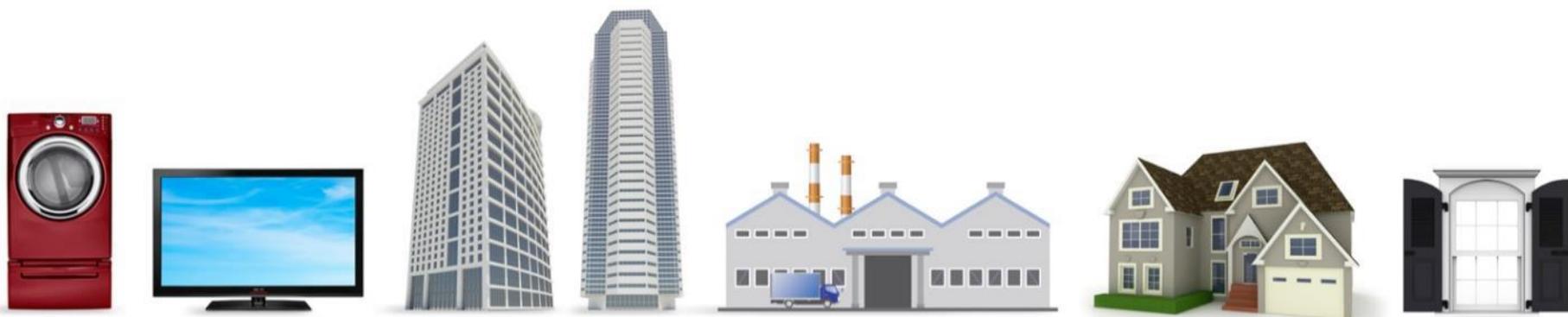
Brand trust among consumers



Source: Fairfield Research, July 2011 Survey of Good Housekeeping readers



The biggest little label in energy efficiency



5.5 billion
products

28,500
buildings

130
industrial
plants

1.6 million
homes



And it's more than just a label...

ENERGY STAR **KIDS!** WE ARE ENERGY STAR!
WHAT'S THE WORD? GREENHOUSE GASES!
FACTS! Almost 50% of the energy in the U.S. comes from coal.

YOUR PLANET NEEDS YOU! FIND OUT WHY!
YOU CAN MAKE BIG CHANGES! FIND OUT HOW!

Join the **LORAX**

OFFICE EQUIPMENT ENERGY-SAVING TIPS

- Cancel sleep modes
- Power down when not in use
- Use a Multi-Function Device (MFD)
- Switch to a laptop

BATTLE OF THE BUILDINGS BOOTCAMP 2016



ENERGY STAR® Portfolio Manager®

The most-used energy measurement and tracking tool for commercial buildings.

WE EARNED IT!

We received U.S. EPA's ENERGY STAR® signifying superior energy performance!

CHANGE THE WORLD. Start with ENERGY STAR.

Make a change today to save energy and protect the climate. 3,287,350 individuals already have.

SAVE THE PLEDGE | JOIN TEAM ENERGY STAR | BECOME A PLEDGE DRIVER | SHARE YOUR STORY



WHO SAYS SAVING ENERGY CAN'T BE FUN?

- Unblock air vents
- Report temperature imbalances
- Skip the space heater
- Report energy waste
- Don't leave PCs running

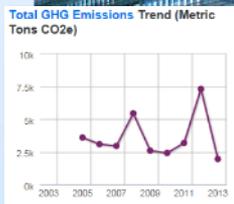
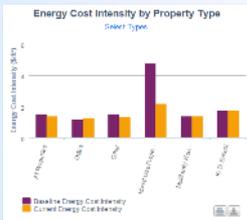
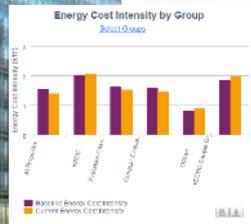
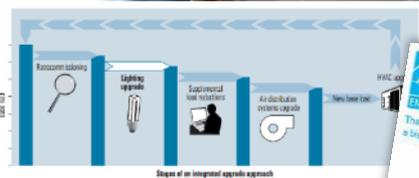
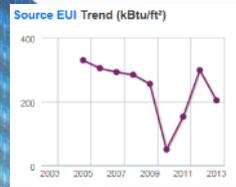
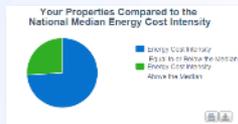


ENERGY STAR for Buildings and Plants



ENERGY STAR for Buildings and Plants

Voluntary EPA program that delivers environmental benefits and financial value through superior energy efficiency.

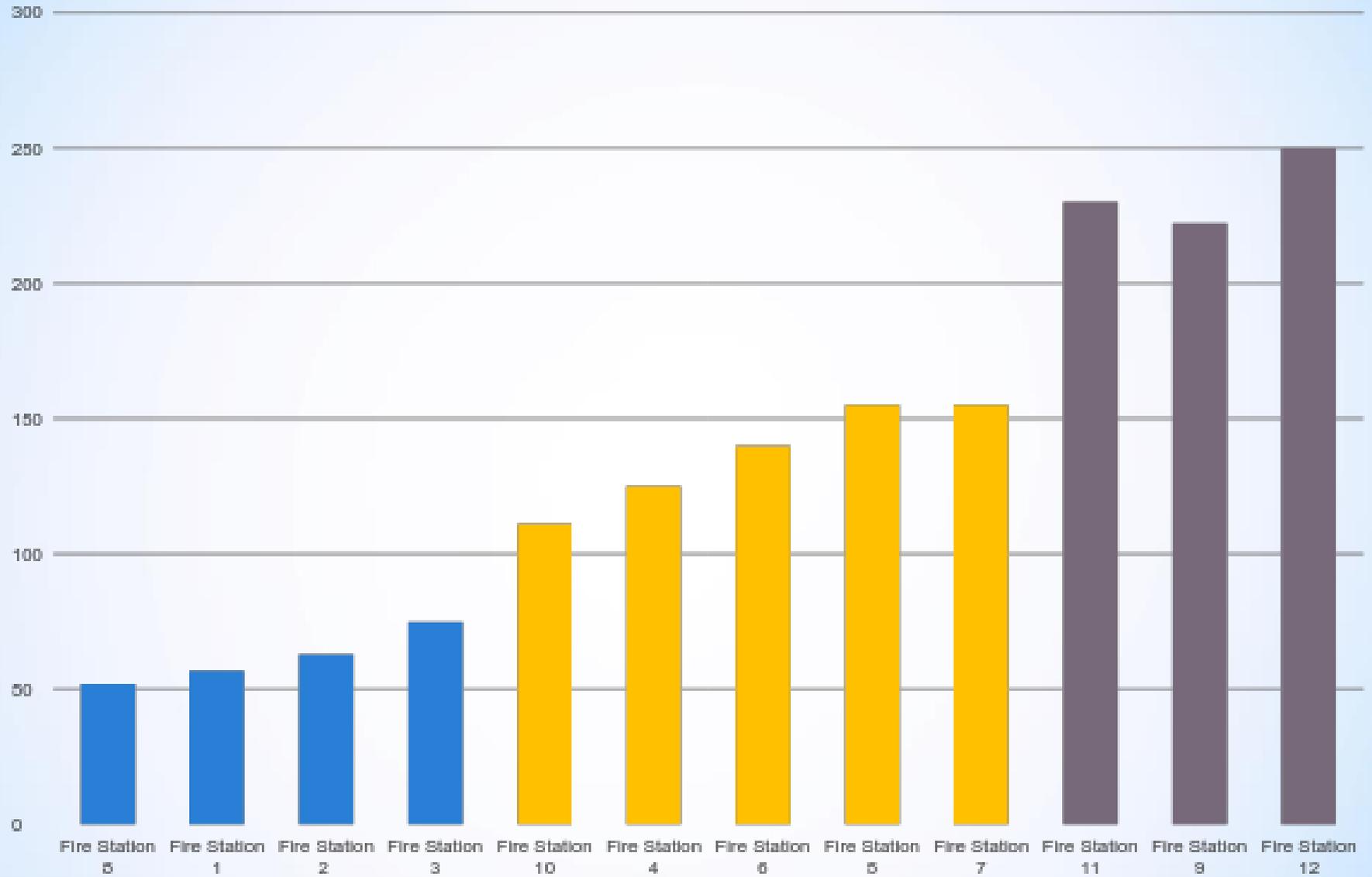




Benchmarking in Portfolio Manager and the 1-100 ENERGY STAR score



Site Energy Intensity (KBtu/Ft2)



Benchmarking allows you to:



Compare your building to a **national sample** of similar buildings



Compare your buildings of a similar type to **each other**



Identify underperformers in your portfolio and set priorities for the use of limited staff time and/or investment capital

ANY building can be benchmarked.

Benchmarking allows you to:

- Evaluate portfolio-wide performance
- Understand individual building performance
- Compare energy performance to national median
- Identify and address potential problems by looking at monthly trends
- Track the impact of energy, water, waste management strategies

Property types with 1-100 ENERGY STAR scores



Bank Branch



Barracks*



Courthouses



Data Centers



Distribution Centers



Financial Offices



Hospitals



Hotels



K-12 Schools



Office Buildings



Medical Offices*



Multifamily Housing



Residence Hall/Dormitory*



Retail Stores



Senior Care Communities



Supermarkets



Warehouses



Wastewater Treatment Plants*



Wholesale club/ Supercenters



Worship Facilities

Property types with 1-100 ENERGY STAR scores

**Multifamily Housing
1-100 ENERGY STAR Score
is now available!**



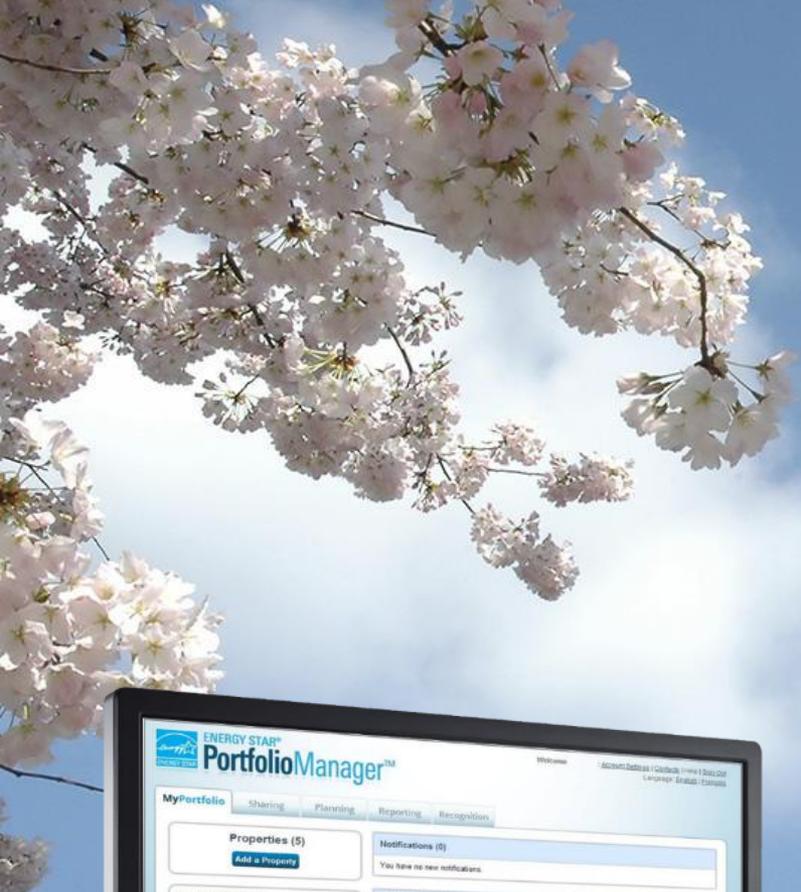
Multifamily Housing

https://www.energystar.gov/buildings/owners_and_managers/existing_buildings/us_e_portfolio_manager/understand_metrics/epa_1_100_water_score



ENERGY STAR® PortfolioManager®

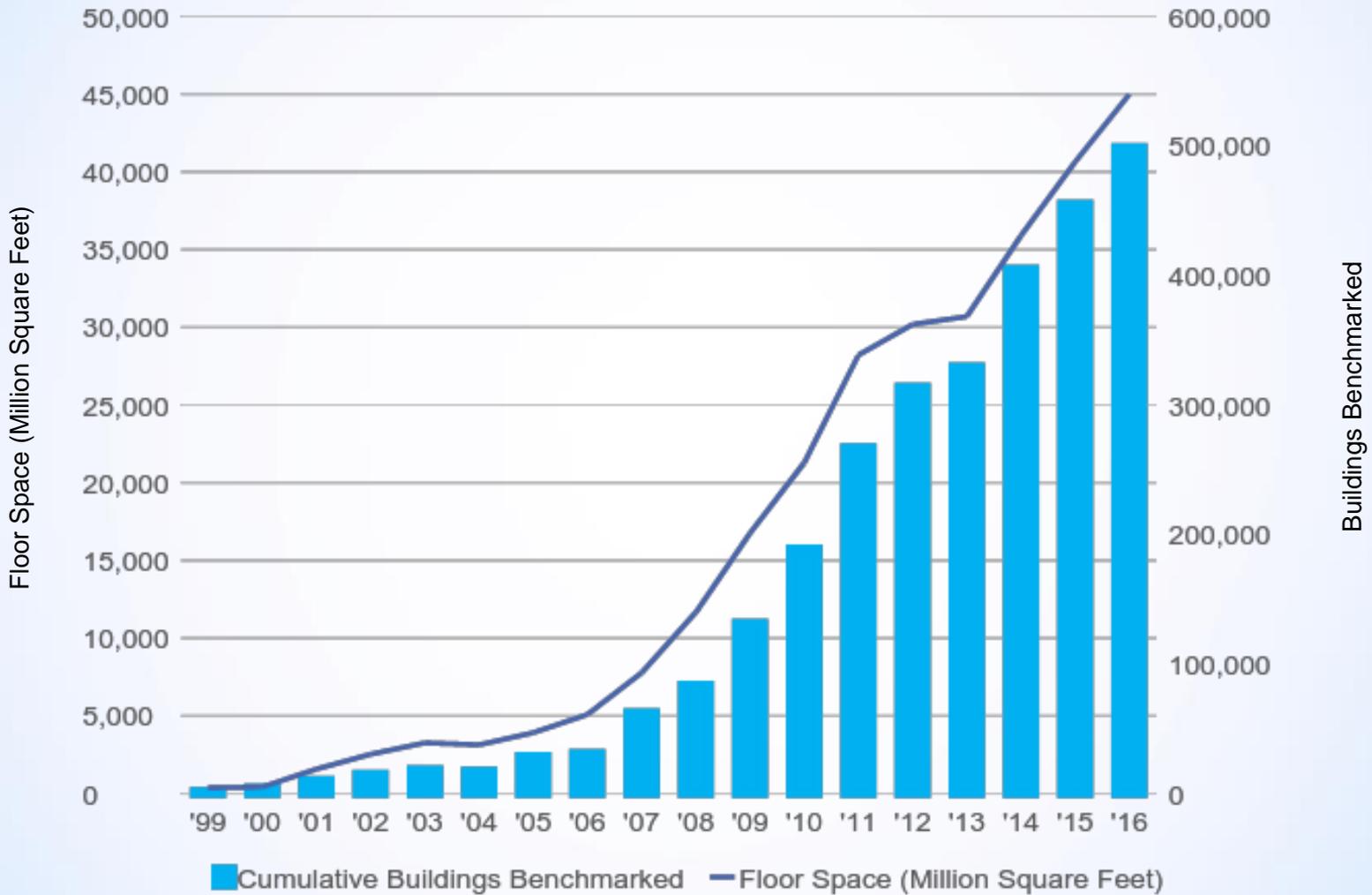




- More than 40% of the U.S. commercial building market
- 450,000+ buildings
- 40 billion+ square feet



ENERGY STAR® PortfolioManager®





ENERGY STAR® PortfolioManager®

Management Tool



Assess whole building energy and water consumption



Track changes in energy, water, greenhouse gas emissions, and cost over time



Track green power purchase



Create custom reports



Share/report data with others



Apply for ENERGY STAR certification





ENERGY STAR® PortfolioManager®

Metrics Calculator



Energy consumption
(source, site, weather
normalized)



Greenhouse gas
emissions (indirect, direct,
total, avoided)



Water consumption
(municipally supplied
potable and reclaimed,
alternative)



ENERGY STAR 1-to-100
score (available for many
building types)

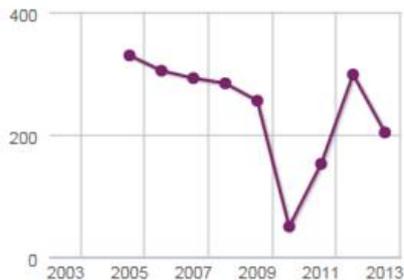


MyPortfolio Sharing Planning Reporting Recognition Admin Processing

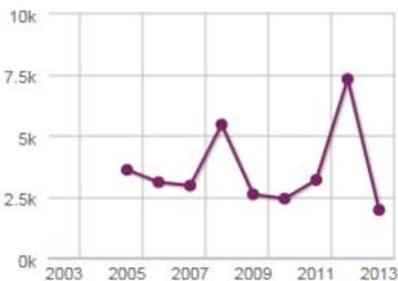
Properties (21)

[Add a Property](#)

Source EUI Trend (kBtu/ft²)



Total GHG Emissions Trend (Metric Tons CO₂e)



Notifications (0)

You have accepted a connection request from Karen Schneider. The connection has been made and will now show in your [Contacts list](#). If needed, you may now share property information with this contact.

You have no new notifications.

Properties (21)

[Add a Property](#)

Filter by:

[Search](#)

[Create Group](#) | [Manage Groups](#)

Name ↕	Action
AES - Federal Office (Test)	<input type="text" value="I want to..."/>
Federal Test DOH Office 25	<input type="text" value="I want to..."/>
Mike Sample Hospital	<input type="text" value="I want to..."/>
Mike's London Property	<input type="text" value="I want to..."/>
Mike's Sample Bldg.	<input type="text" value="I want to..."/>
Mike's Test DEES Project	<input type="text" value="I want to..."/>
Mike's Test Design	<input type="text" value="I want to..."/>
Mike's Test HOW	<input type="text" value="I want to..."/>
Mike's Test International Property	<input type="text" value="I want to..."/>



ENERGY STAR® PortfolioManager®





500,000 properties benchmarking energy use

50% of U.S. commercial building space

110,000+ properties benchmark water use

200,000+ properties benchmark energy/water using web services

30,000 ENERGY STAR certified properties

Understand energy cost trends

Portfolio Average Energy Cost Intensity

-0.15 ▶ Change in Average Energy Cost Intensity

1.39 ▶ Current Average Energy Cost Intensity

1.54 ▶ Baseline Average Energy Cost Intensity

Properties Included: 27

Your Properties Compared to the National Median Energy Cost Intensity

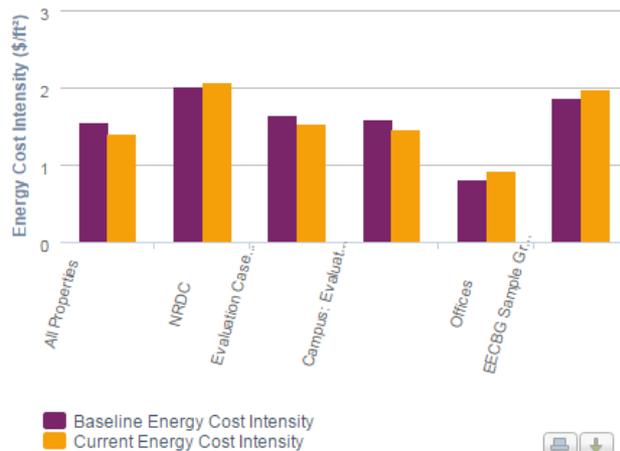


■ Energy Cost Intensity Equal to or Below the Median
■ Energy Cost Intensity Above the Median



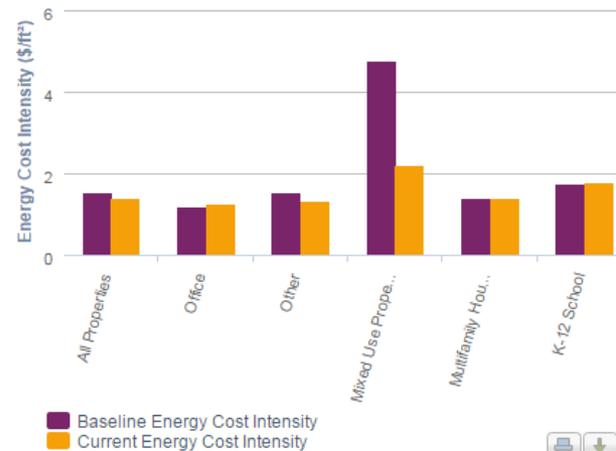
Energy Cost Intensity by Group

[Select Groups](#)



Energy Cost Intensity by Property Type

[Select Types](#)



Translate simple information into dozens of performance indicators

Energy Metrics (Site and Source)

- Total Energy Use (kBtu)
- Energy Use Intensity (EUI) (kBtu/Sq. Ft.)
- Weather Normalized EUI (kBtu/Sq. Ft.)
- National Median EUI (kBtu/Sq. Ft.)
- % Difference from National Median EUI (%)

Comparisons

- Total Energy Use (kBtu)
- Energy Use Intensity (kBtu/Sq. Ft.)
- Adjusted Energy Use (%)
- GHG Emissions (MtCO₂e)
- Available against baseline or between any two periods.

Financial

- Annual Energy Cost
- Total Energy Cost per Sq. Ft.
- Cumulative Investment in Facility Upgrades
- Cumulative Investment per Sq. Ft.

Renewable Energy

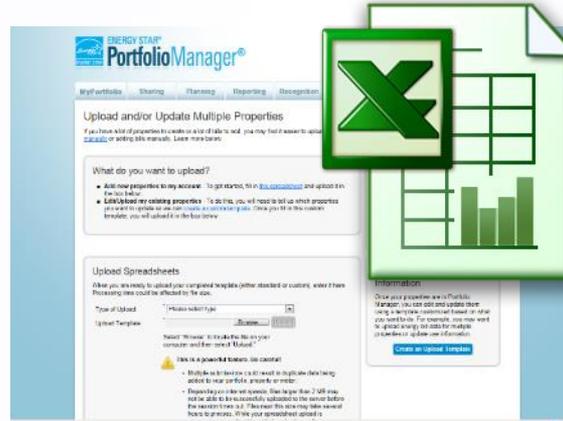
- Total On-Site Electric Generation (kWh)
- Percent of Electricity from On-Site Renewable (%)
- Total Renewable Energy Certificates Purchased and Sold
- Total Avoided Greenhouse Gas Emissions from RECs (MtCO₂e)

Choose the best data management method

Manual entry



Spreadsheet upload



Web services



Find Utilities that Provide Energy Data for Benchmarking: www.energystar.gov/utilitydata
200+ Providers Exchange Data with Portfolio Manager

Portfolio Manager Training

YouTube

Search

ENERGY STAR Portfolio Manager®

MyPortfolio Sharing Planning Reporting Benchmarking

Charts & Graphs

ENERGY STAR Performance Documents

Statement of Energy Performance (SEP)

Statement of Energy Design Index

Data Software Checklist

Program & Goals Report

ENERGY STAR Score Card

Templates & Reports (9)

How to Respond to a Data Request in Portfolio Manager®

ENERGY STAR

Subscribe 1,516

Add to Share More

- Weekly live webinars
- 3-7 minute training videos on YouTube
- Step-by-step training guides, FAQs, and technical reference documents

ENERGY STAR Portfolio Manager®

How to Benchmark

How to Share Performance

Portfolio Manager® Quick Start Guide

"How To" Series

Getting Started

Step 1: Add a Property

Step 2: Enter Energy & Water Data

Step 3: View Results & Progress

Property Types

Properties with Multiple Use Types

Free. Online. Secure.

energystar.gov/benchmark

ENERGY STAR Help Desk

ENERGY STAR Portfolio Manager™

Help | Login
Language: English | Français

MyPortfolio | Sharing | Planning | Reporting | Recognition

Portfolio Manager Help

Learn More about Portfolio Manager.
Get fact sheets, quick reference guides and other information about how the tools works.

Search the Knowledge Base
Browse or search our Frequently Asked Questions.

Check the Glossary
Look up terms used throughout Portfolio Manager.

Take or View a Training.
Sign up for a session or view a recording on a wide variety of topics.

Ask a Question.
Send a question or comment to our staff.

Web Service Documentation.
If you exchange data via web services, check out the documentation or get email updates.

Don't forget, we're out there with you! Network with us and other folks who are using Portfolio Manager.

[Like us on Facebook](#) | [Follow Us on Twitter](#) | [View Our YouTube Channel](#)

Technical References

Are you into the math of it all? Learn more about how Portfolio Manager calculates metrics.

- [Source Energy](#)
- [Greenhouse Gas Emissions](#)
- [ENERGY STAR Scale](#)
- For more information on specific property types, like office and school, visit the [ENERGY STAR website](#). These are available in English only.
- [National Median Values](#)
- [Accounting for Climate & Weather](#)
- [Thermal Conversion Factors](#)

[Get more documentation on the ENERGY STAR website.](#)

Follow Us [f](#) [t](#) [v](#) [i](#)

[Contact Us](#) | [Privacy Policy](#) | [Browser Requirements](#) | [ENERGY STAR Buildings & Plants Website](#)

On-demand user support at energystar.gov/buildingshelp



Recognition Opportunities

ENERGY STAR Recognition



Thank you



Contacts

Jim Morris
Virginia Beach City Public Schools
Jim.Morris@VBSchools.com

Katy Hatcher
U.S. EPA
Hatcher.Caterina@epa.gov

Kudret Utebay
The Cadmus Group, LLC
Kudret.Utebay@cadmusgroup.com



Making Utility Bill & Energy Management for Government...

Easier. Smarter. Friendlier.

A recognized industry leader since 1980.
Certified Veteran Owned Small Business.
No external investors. No external control.



Partial Client List

State



Cities



City of Phoenix



Counties



EnergyCAP's Mission

Help clients derive value from energy information through technology-based solutions.

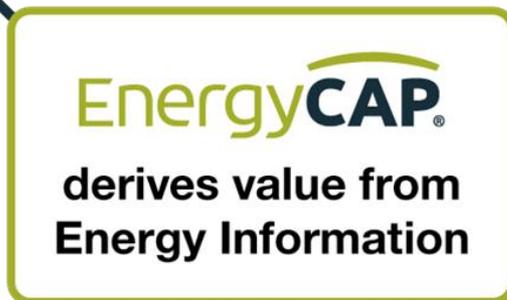




Utility Bill Accounting



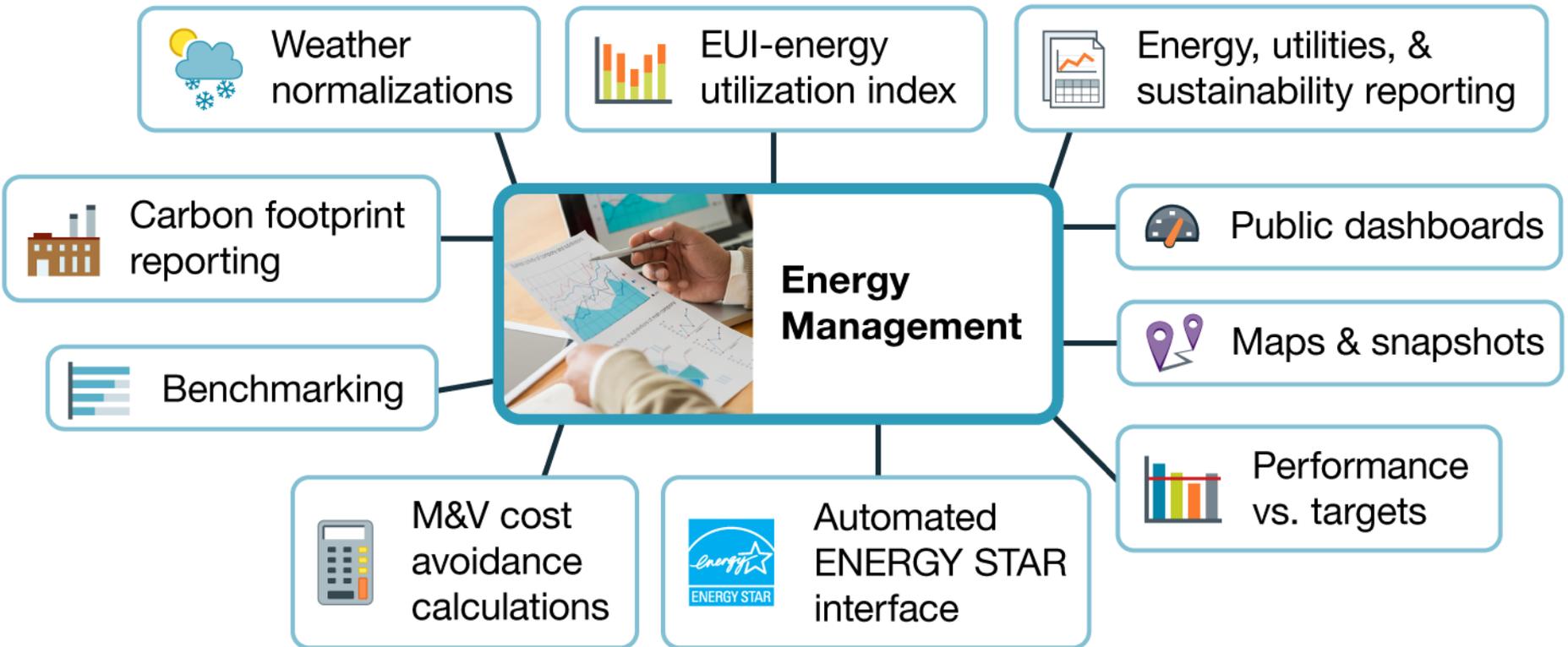
Energy Management



EnergyCAP
derives value from
Energy Information



Building Operations

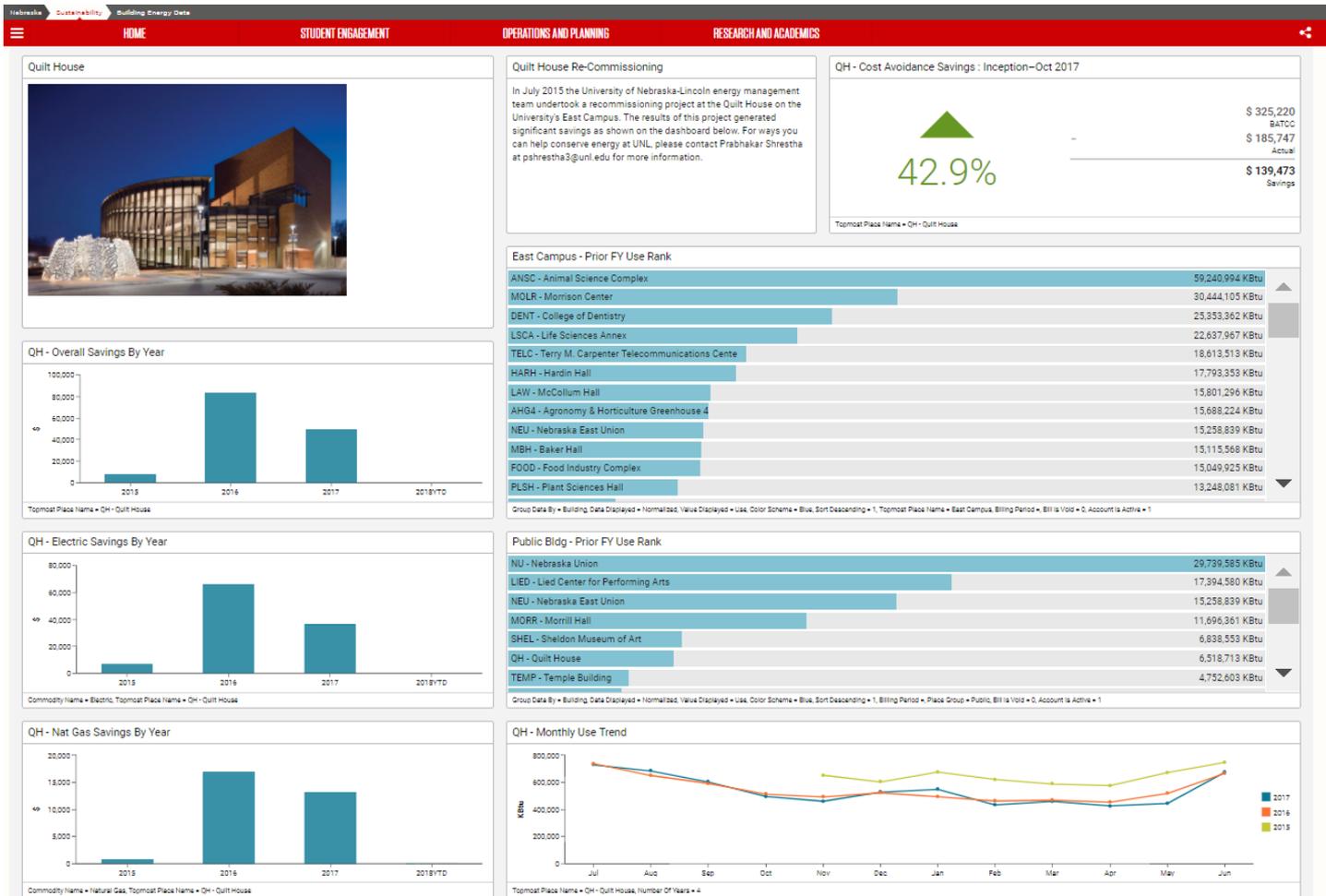


Track any commodity and any unit of measure.

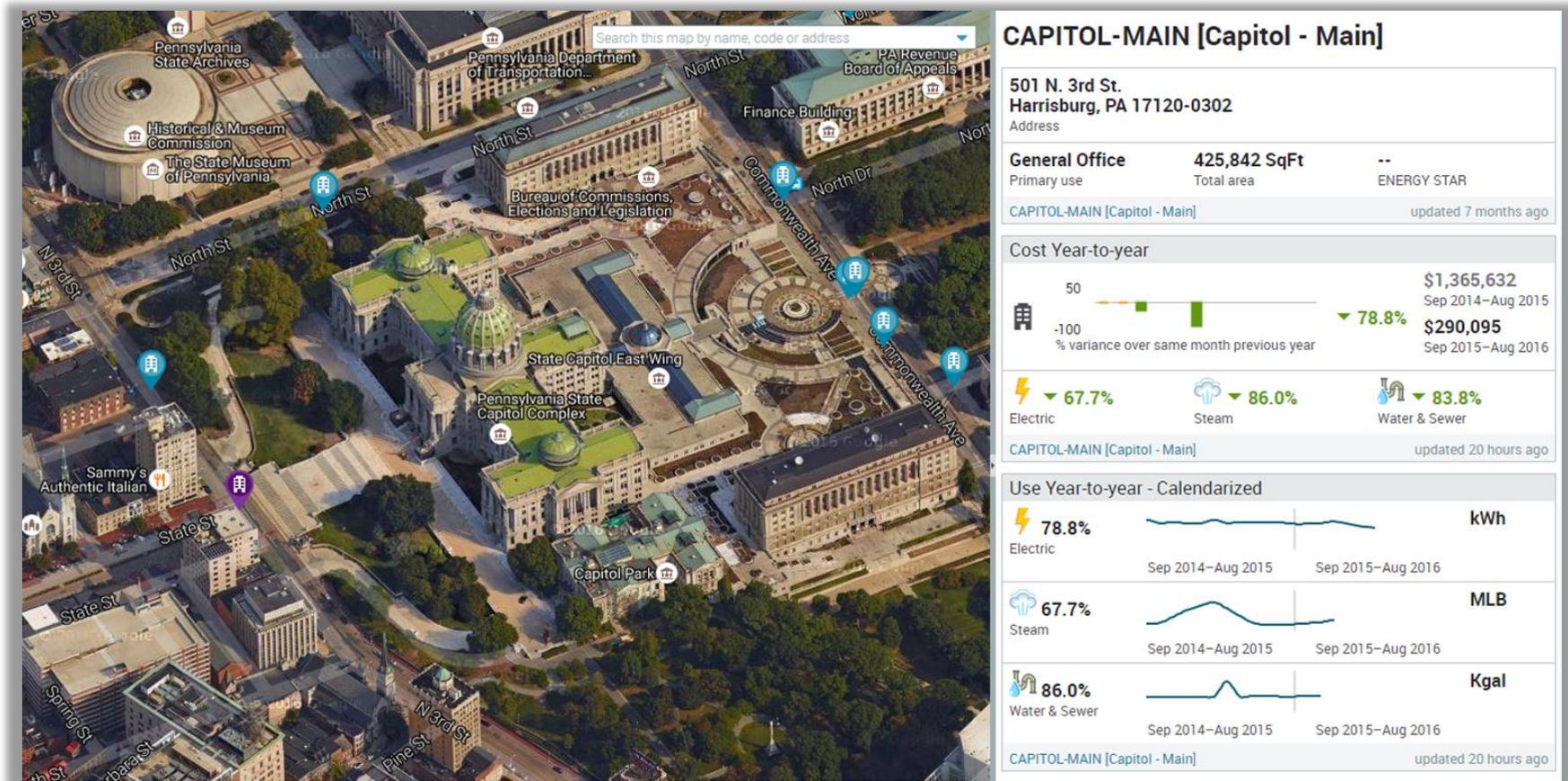


Communicate and manage via user-configurable dashboards.

<https://sustainability.unl.edu/building-energy-data>



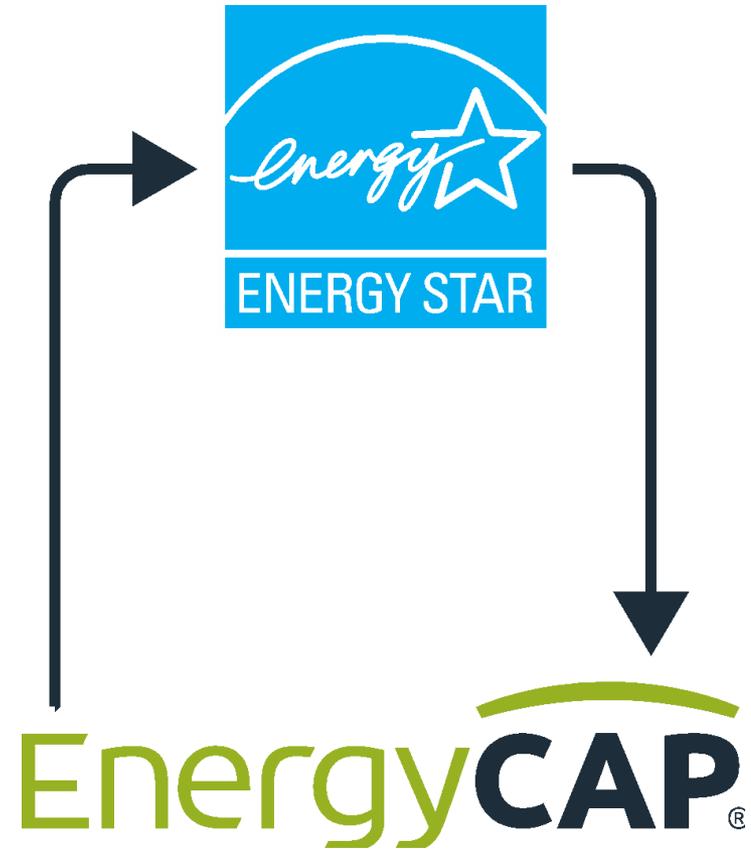
Public engagement via map dashboards and KPIs



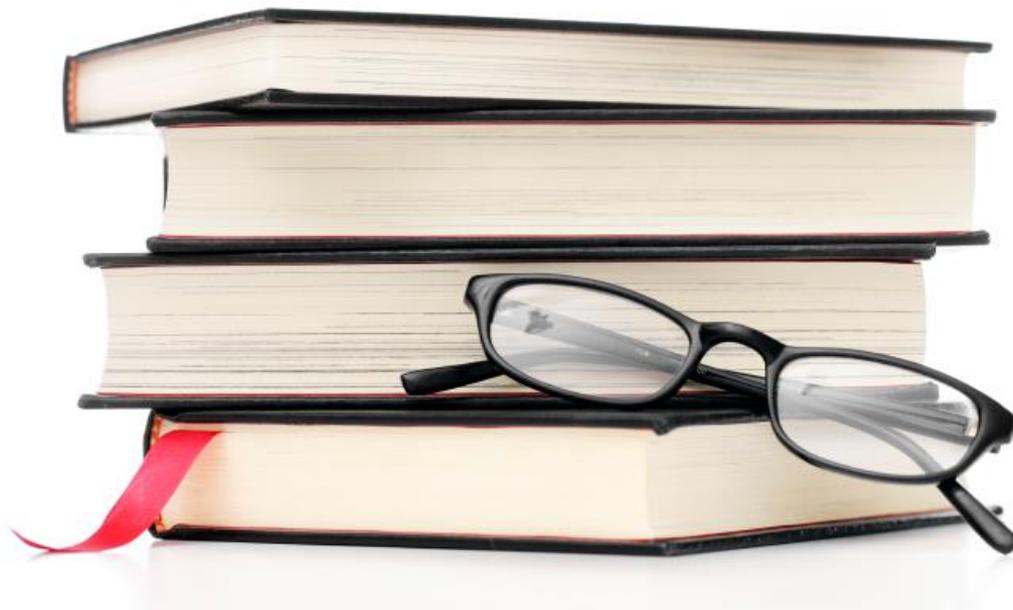
Compare buildings and meters within your portfolio using extended benchmarking charts.



Automatically submit
your building data to
Portfolio Manager.



View and analyze data from a library of over 300 reports, charts, and graphs.



Customize energy data with Report Designer—an Excel plugin for easy ad-hoc reporting.

File Home Insert Draw Page Layout Formulas Data Review View REPORT DESIGNER Tell me what you want to do

Get Started Analysis Billing Year-to-Year Custom Update Data Clear Data Connection Connection Info

Tutorial Report Templates

B17

1	Last Updated Date :	8/9/16 9:15 AM																
2	Bill Data Table :	Bill Rollup by Place																
3	Data View :	Calendarized																
4	First Billing Period :	Sep-2014																
5	Last Billing Period :	Aug-2016																
6	Datasource :	catalyst2016																
7	Report Designer version :	1.0.0.0																

Place Code

- DGS-101NCOURT
- DGS-16FRANCIS
- DGS-170EMAIN
- DGS-200WBALTIMO...
- DGS-201STPAUL
- DGS-201WPRESTON
- DGS-222NORTHHO...
- DGS-2NLIBERTY

Energy

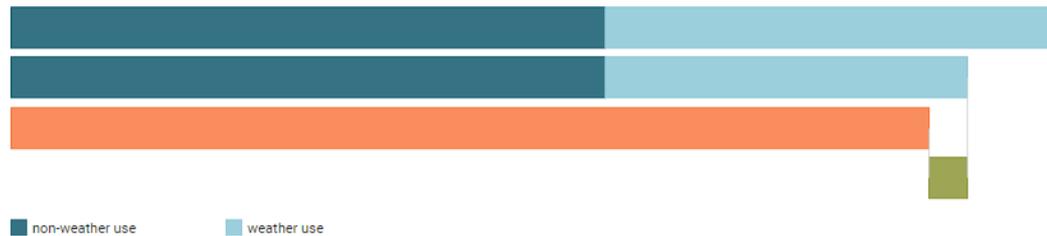
Cost

Row Label	Total Use - Common Unit	Total Use - Global Unit	Jse - Global / Area	Total Cost	Cost / Common Unit	Cost / Global Unit	Cost / Area
Electric	5,284,818.58 kWh	18,037.09 MMBtu	0.0722 MMBtu / SqFt	\$643,112.05	\$0.1217 / kWh	\$35.6550 / MMBtu	\$2.5755 / SqFt
Natural Gas	7,149.34 THERM	714.93 MMBtu	0.0029 MMBtu / SqFt	\$5,112.46	\$0.7151 / THERM	\$7.1510 / MMBtu	\$0.0205 / SqFt
Sewer	326.92 Kgal	0.00 MMBtu	0.0000 MMBtu / SqFt	\$2,398.27	\$7.3360 / Kgal		\$0.0096 / SqFt
Steam	5,552.00 MLB	6,384.80 MMBtu	0.0256 MMBtu / SqFt	\$143,709.24	\$25.8842 / MLB	\$22.5080 / MMBtu	\$0.5755 / SqFt
Water	1,781.16 Kgal	0.00 MMBtu	0.0000 MMBtu / SqFt	\$31,958.65	\$17.9426 / Kgal		\$0.1280 / SqFt
Grand Total		25,136.82 MMBtu	0.1007 MMBtu / SqF	\$826,290.67		\$32.8717 / MMBtu	\$3.3091 / SqFt

Perform IPMVP-compliant measurement and verification of savings and cost avoidance. Normalize data.

Savings for Jul 2014

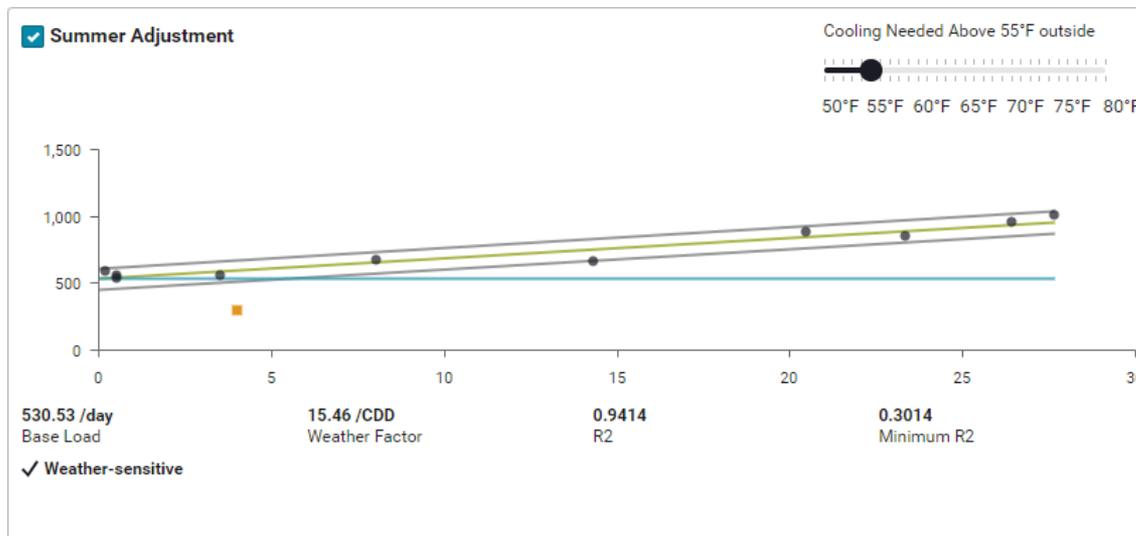
Adjust Savings Manually

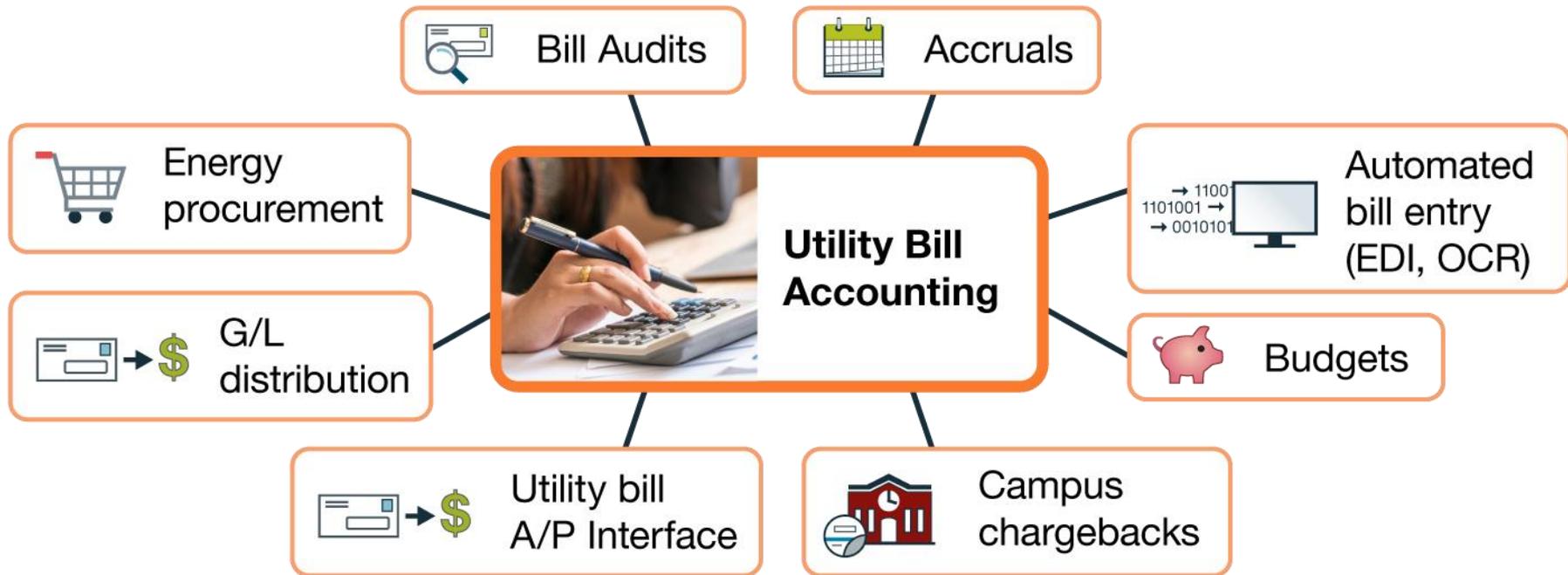


27,600 KWH	Actual baseline use	\$ 3,148	BATCC cost
25,343 KWH	BATCC use	\$ 3,021	Actual current cost
24,320 KWH	Actual current use		
1,023 KWH	Use avoidance	\$ 127	Cost avoidance

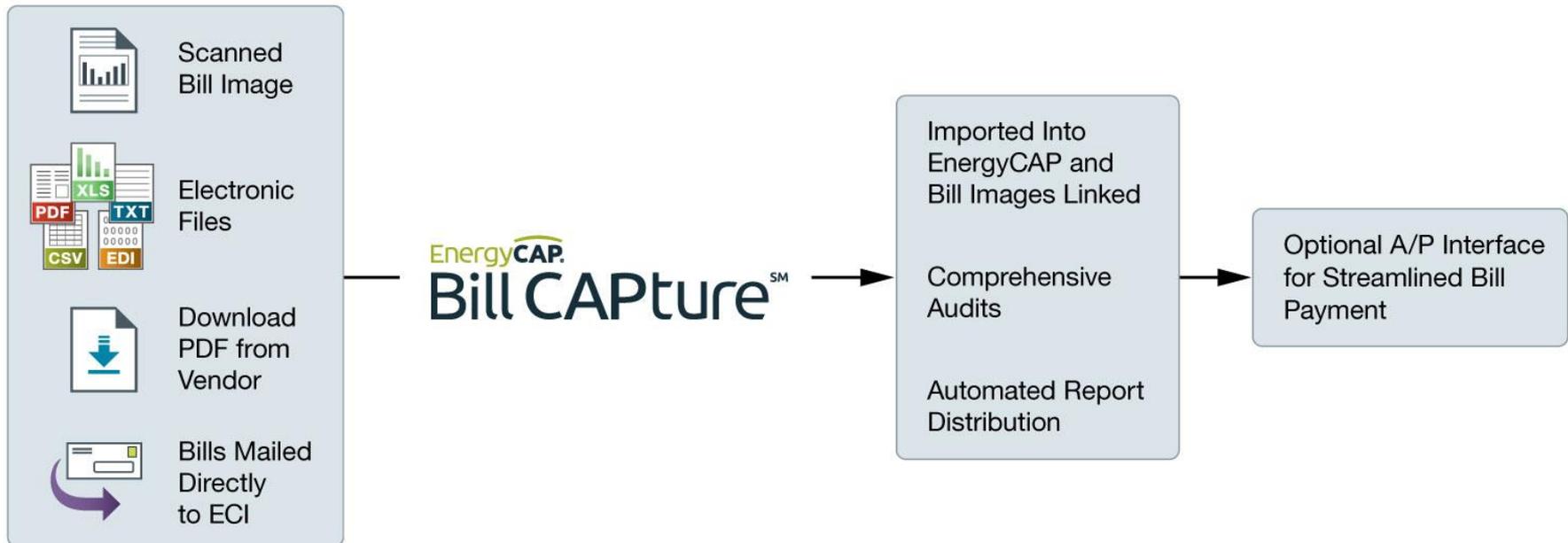
15.46 KWH/CDD | 0.941 R2
Summer

N/A KWH/HDD | N/A R2
Winter





Let Bill CAPture do your data entry.
Eliminates manual keying of utility bills.



www.comed.com

Customer Service / Power Outage
English

Español
1-800-95-LUCES (1-800-955-8237)

Hearing/Speech Impaired
1-800-572-5789 (TTY)

For Electric Supply Choices visit
www.pluginillinois.org

Account Number

Name
Service Location

Phone Number

Issue Date May 22, 2015

Bill Summary	
Previous Balance	\$26,163.75
Total Payments	\$0.00
Amount Due on July 27, 2015	\$32,559.20

Meter Information									
Read Date	Meter Number	Load Type	Reading Type	Previous	Meter Reading	Difference	Multiplier X	Usage	
4/30	145045952	I/O w/ Flow Thru	On Pk kW	Estimate	Actual			570.24	
4/30	145045952	I/O w/ Flow Thru	Total kWh	Estimate	Actual			248981	
4/30	145045952	I/O w/ Flow Thru	Off Pk kWh	Estimate	Actual			189018	
4/30	145045954	I/O w/ Flow Thru	On Pk kW	Estimate	Actual			570.24	
4/30	145045954	I/O w/ Flow Thru	Total kWh	Estimate	Actual			248981	
4/30	145045954	I/O w/ Flow Thru	Off Pk kWh	Estimate	Actual			189018	

Service from 3/31/2015 to 4/30/2015 - 30 Days

Retail Delivery Service - Railroad

Delivery Services - ComEd	\$5,543.93
Customer Charge	1,043.46
Standard Metering Charge	24.78
Distribution Facilities Charge	3,809.20
IL Electricity Distribution Charge	497.98
Meter Lease	

Taxes and Other

Environmental Cost Recovery Adj	497.98
Energy Efficiency Programs	497.98
Franchise Cost	\$5

Total Current Charges

Miscellaneous

Charges from previous bill

Bill Entry

Enter Bills | Notes/Alerts | History | Properties

Account:

Start Date: 03/31/2015 | End Date: 04/30/2015 | Days: 30

Due Date: 07/20/2015 | Statement Date: 05/22/2015

Invoice Number: | Control Code: METRA_3915135020_201501

Pay Amount: \$6,395.45 | Estimated: | Billing Period: Apr 2015

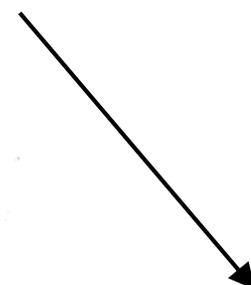
Status: On Hold, Approved

Meter: 1142802007 | Meter Name: Matteson - Electric | Serial Number:

Place Code: MMEDSUBMAT... | Rate: COMMERCIAL DEMAND...

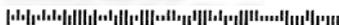
Customer Charge:		1,043.46 \$
Standard Metering Charge:		24.78 \$
Distribution Facilities Charge:	1,140.48 kW	3,809.20 \$
IL Electricity Distribution Char:	497.982 kWh	592.57 \$
Meter Lease:		73.92 \$
Environmental Cost Recovery Adj:	497.982 kWh	149.39 \$
Energy Efficiency Programs:	497.982 kWh	512.90 \$
Franchise Cost:		189.23 \$
Balance Forward-Past Due:		26,163.75 \$
Current Charges (ECBC):		6,395.45 \$
Amount Due (ECBC):		32,559.20 \$

ACCOUNTS PAYABLE
 2015 MAY 26 P 1:40



Return only this portion with your check made payable to ComEd. Please write your ac

57 1 SP 0.480 006400057000148 001 01 GXH59 1 05082015



Matteson - Electric

Average Daily Use

Average Cost Per Day

Average Unit Cost

Demand

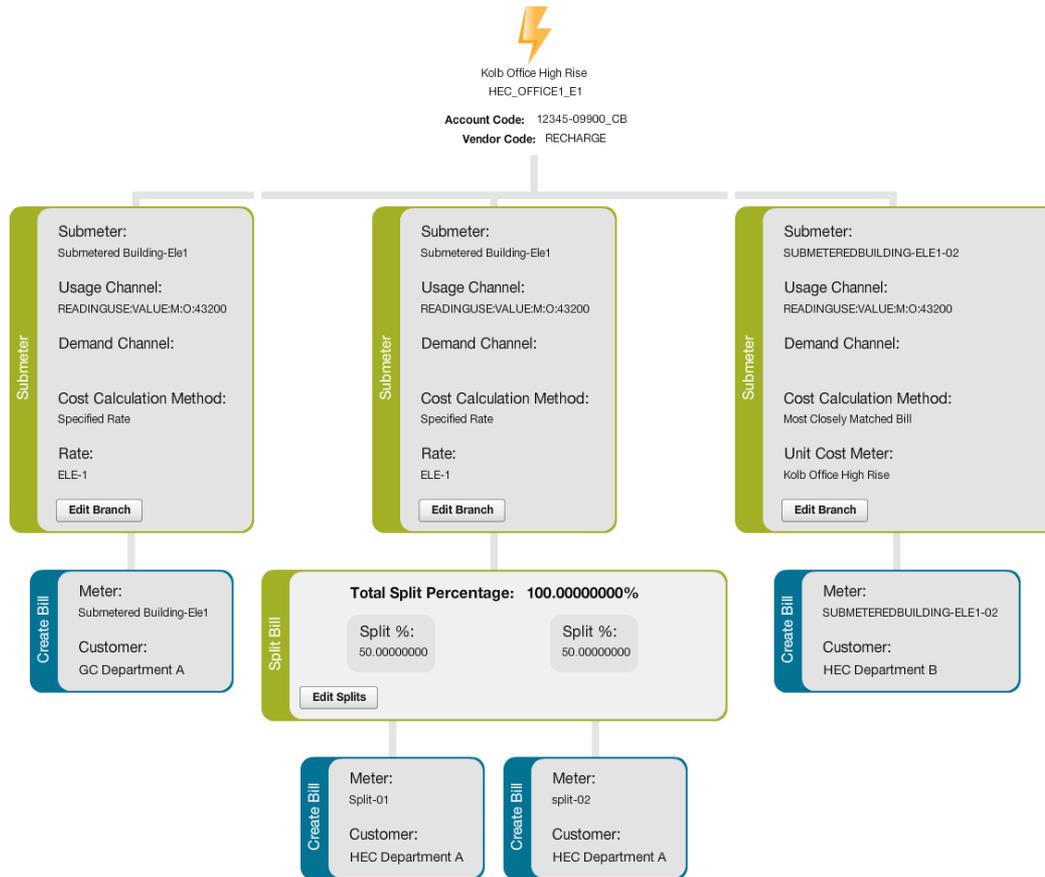
Verify utility bill accuracy and spot problems using more than 50 audits.

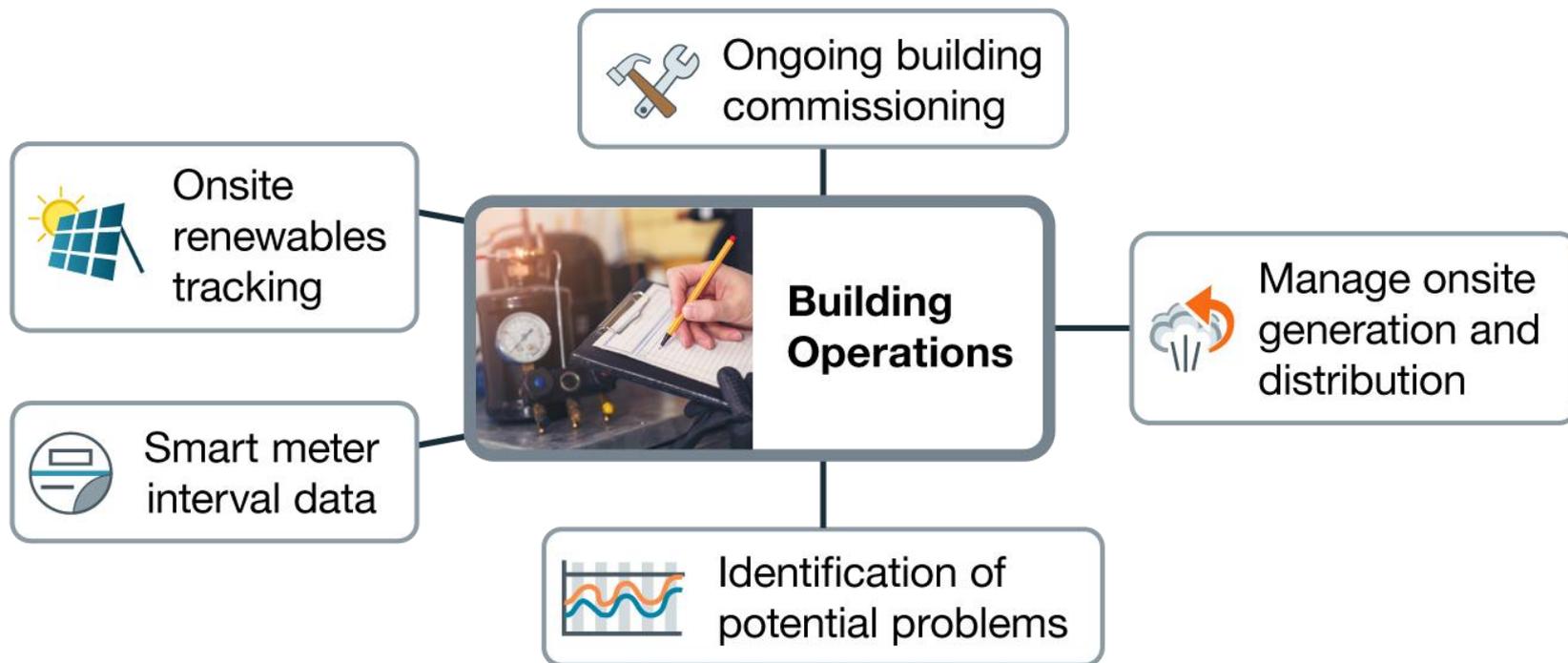




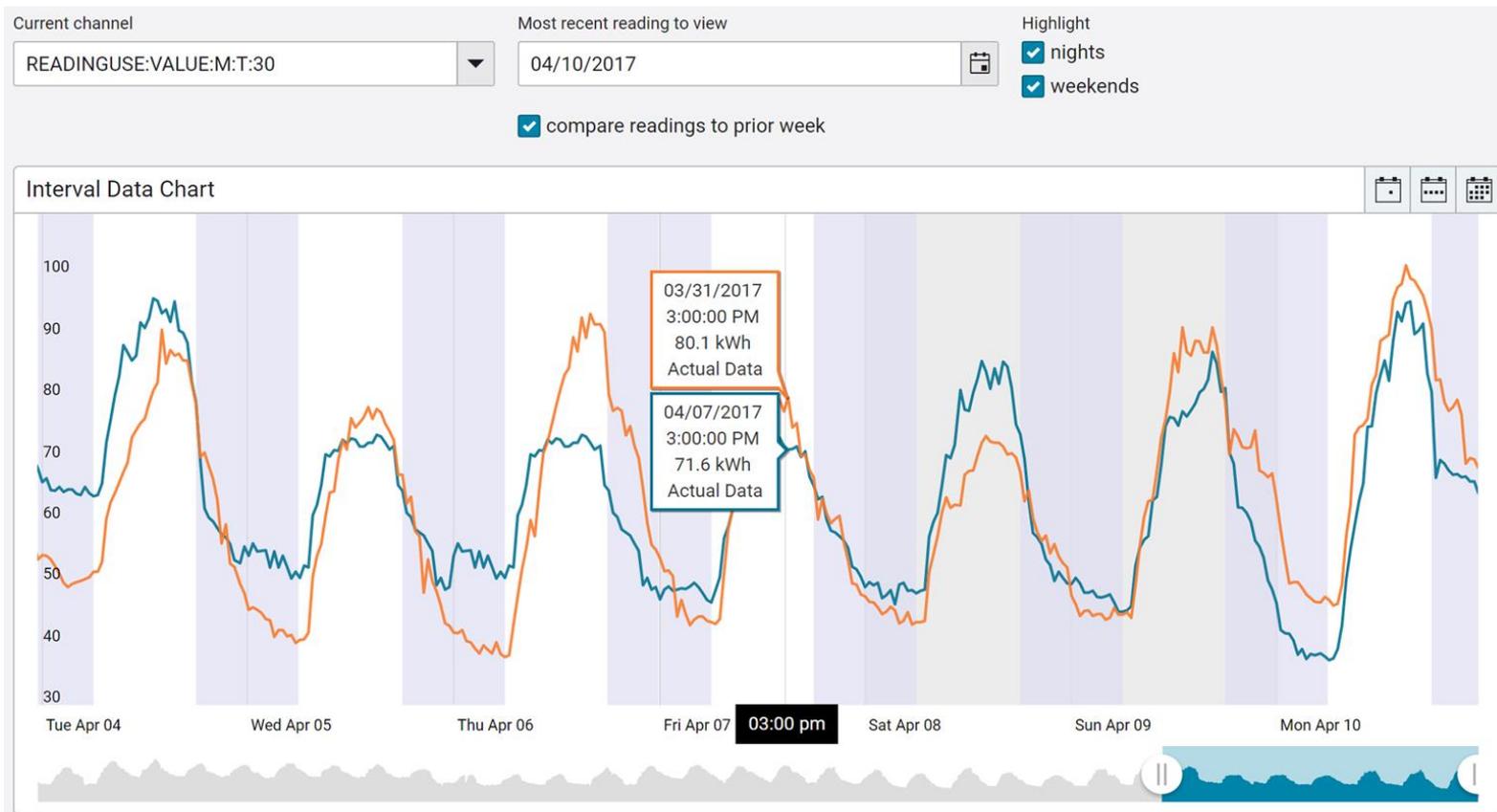
Create detailed budgets,
accruals, and usage forecasts.

From submeters and % splits, create chargeback and/or cost allocation bills for reimbursable activities.





Import and analyze meter interval data for detailed energy consumption analysis.



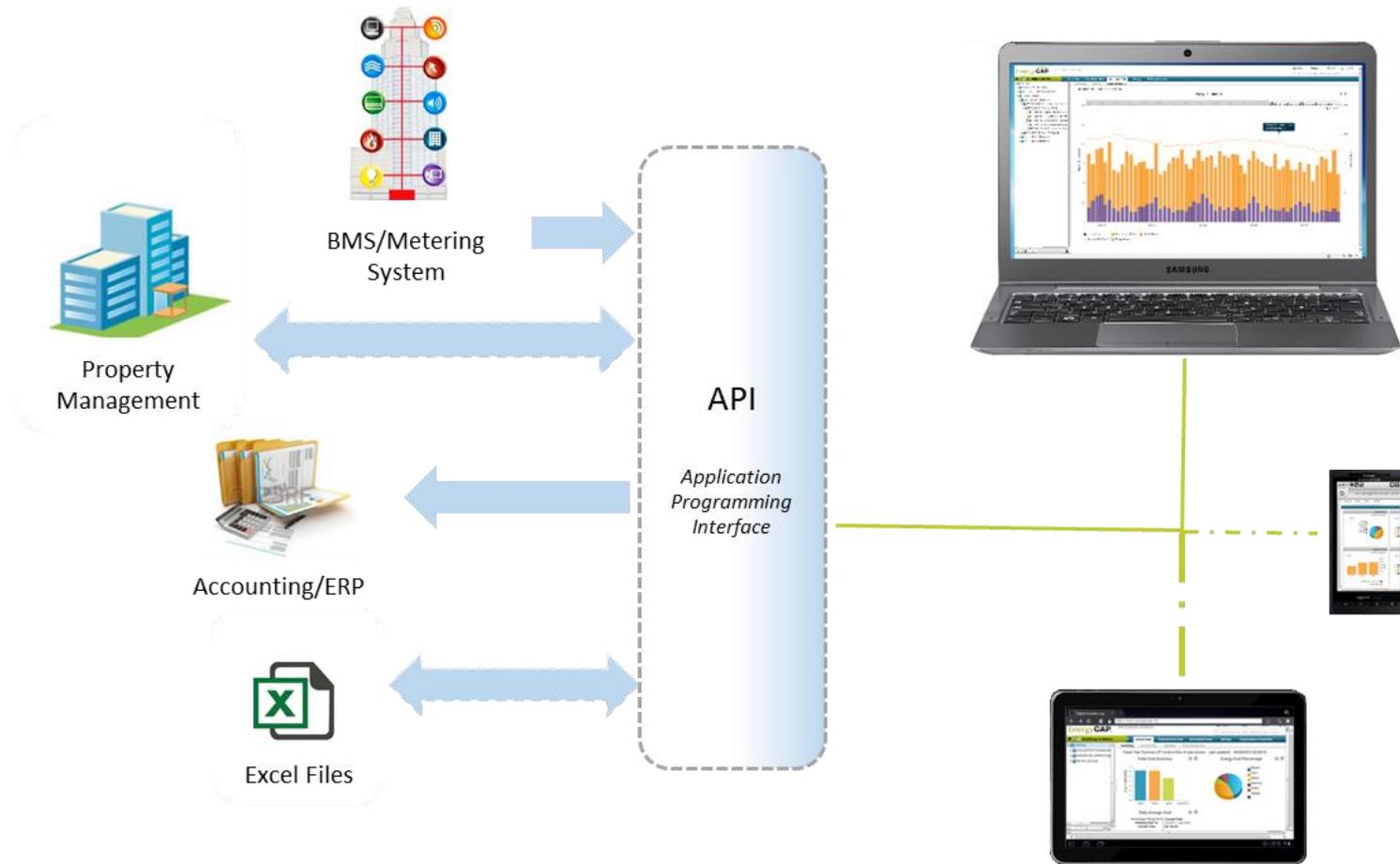
Automate meter data collection with Smart CAPtureSM

We load your smart meter data for you using various methods:

- Data available from utility vendors
- Interface with your existing equipment via file transfer, API, gateway.
- Install new metering equipment with CTs or connect to existing smart meter.



Integrate systems through REST API and electronic files.



A Smart Investment

EnergyCAP often pays for itself in under 12 months

Guide to Payback

Monitoring Consumption and Costs
Save 1 to 4%

Payment of invoices
Save 0.5 to 2%

Automated data collection
Save \$0.50 to \$5 per bill

Rate Optimization
Save 2 to 3%

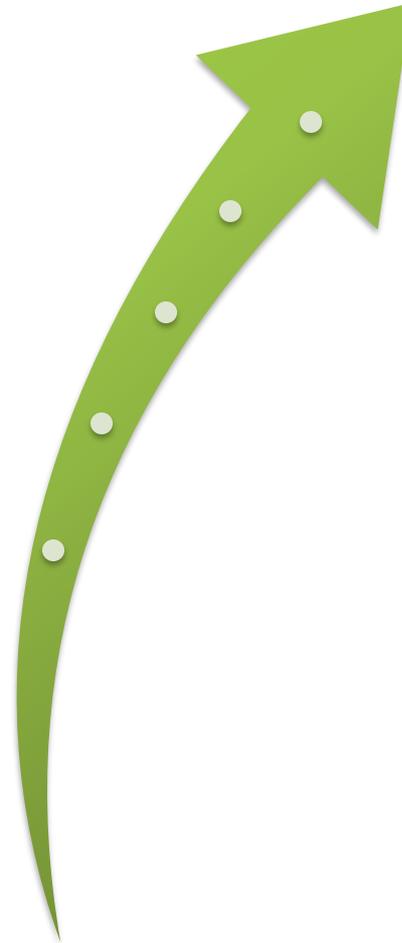
Energy Efficiency Projects
Save 1 to 10%

•Measure, improve, verify savings

Communication
Save 1 to 5%

Benchmark
Save 1 to 3%

Invoice control
Save 1 to 3%



Examples

Consolidate Systems and Improve Workflow

City of Virginia Beach

received the Louisville Award
for Innovation in Government
from the Government
Finance Officers Association
(GFOA)

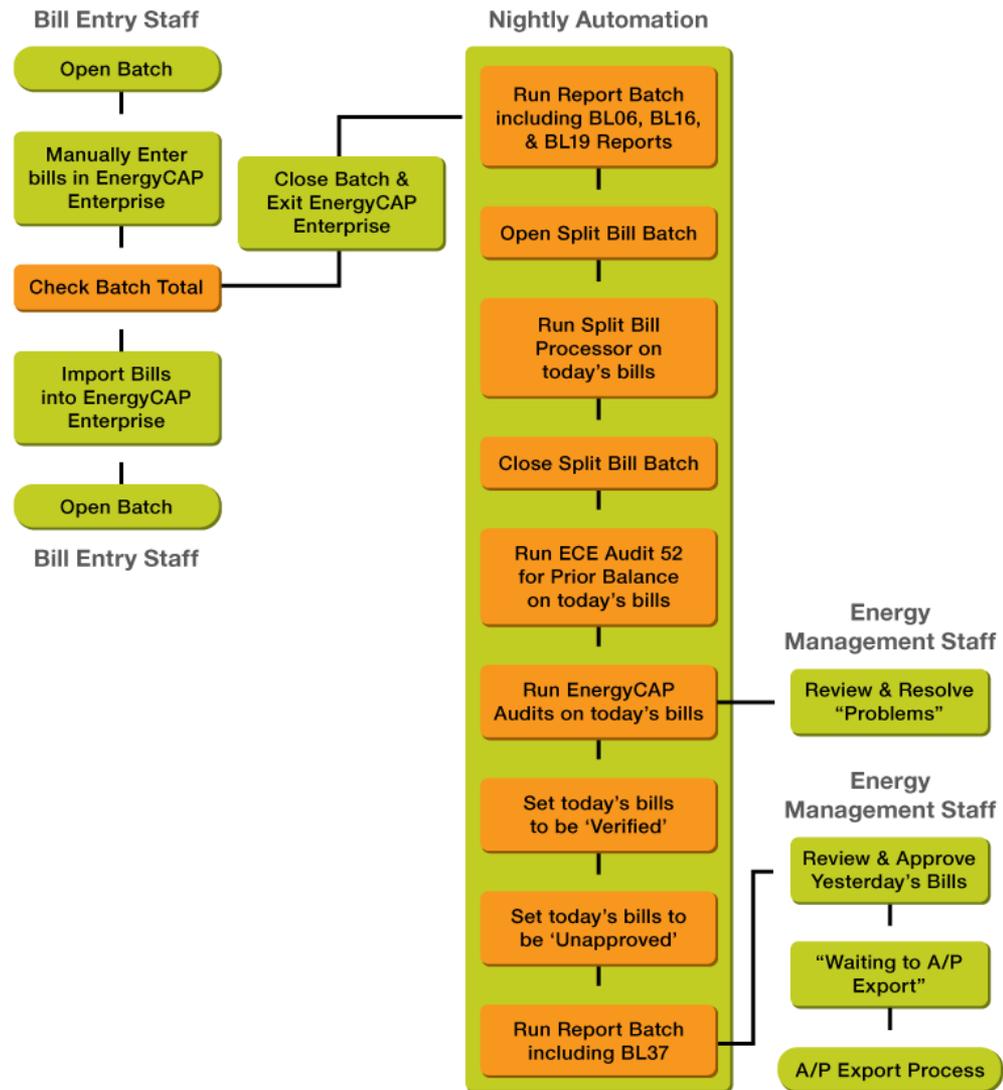


Workflow

Enter, audit, verify, approve, and export bills to accounting

Reductions in data errors, late or incorrect payments, paper records

Increase in managerial focus, efficiency, analysis, reporting



Communicate

White Paper

Press Releases

Awards

Infographic



Solve Billing Issues, Identify Incentives

In just seven months after implementing EnergyCAP, Riverside County, CA saved **\$96,000**.

\$48,000 after identifying and correcting problem utility bills

\$48,000 in incentives from Southern California Edison and Southern California Gas Company

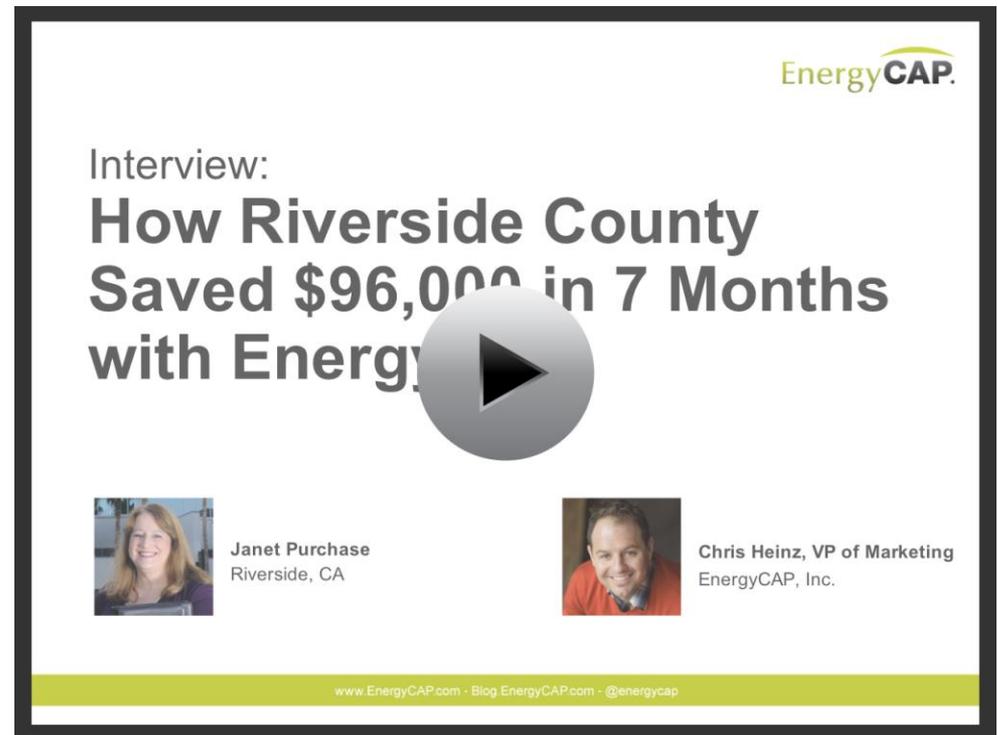
Communicate

Blog

Press Releases

Video Interview

Community Meetings



EnergyCAP®

Interview:
**How Riverside County
Saved \$96,000 in 7 Months
with EnergyCAP**



 **Janet Purchase**
Riverside, CA

 **Chris Heinz, VP of Marketing**
EnergyCAP, Inc.

www.EnergyCAP.com · Blog.EnergyCAP.com · [@energycap](https://twitter.com/energycap)

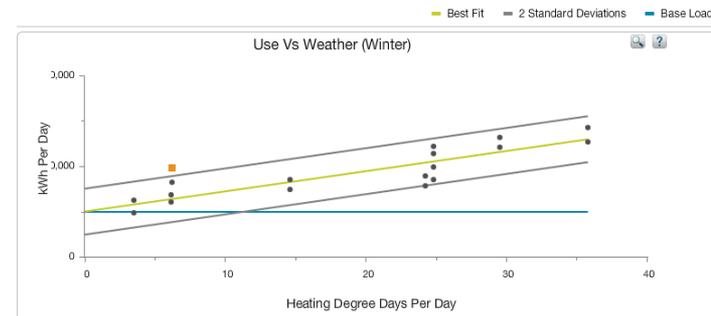
Savings from a Project

One office building—
re-lamped and
CO2 monitors
were added to air
handling equipment

Total Cost: \$78,000

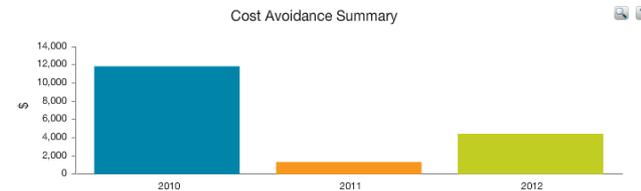
**One Year Cost
Avoided: \$98,000** in
steam and electricity

**One Year Net
Savings: \$20,000**



Winter				
Weather Sensitive	R2	Min R2	Base Load (kWh/day)	Weather Factor (kWh/HDD)
✓	0.783	0.1697	5046.78	221.93

Cost Avoidance Baseline Start: 01/01/2008 Savings Start: 01/01/2009 Meter Included in Cost Avoidance



Total Program to Date Cost Savings



Communicate

White Paper

Press Releases

Infographic



Seeking Sustainability

Minneapolis Adopts EnergyCAP to Achieve Efficiency Goals

2008: Minneapolis implemented EnergyCAP, but had not yet fully integrated it into their business practices.

The City of Minneapolis required each department to pay for its own utilities:

- 1 Of the 19 Fire stations in Minneapolis, each sent paper invoices to a central department.
- 2 A fire department clerk had written important account info on each invoice.
- 3 The fire department mailed the invoices to accounts payable.
- 4 An accounts payable clerk had entered information into the system.

Invoices periodically got lost. (With the least invoices came late fees.)

Invoices were often miscoded. (Charges would be assessed to the wrong department.)

Minneapolis has realized utility bill processing efficiencies through centralized processing and EDI invoicing.

Minneapolis found that a \$79K retrofit project actually avoided \$98K IN STEAM and ELECTRICITY USE

MINNAPOLIS CURRENTLY TRACKS 4 COMMODITIES:

- ELECTRICITY (7 meters)
- NATURAL GAS (101 meters)
- CHILLED WATER (7 meters)
- STEAM (7 meters)

All 175 electric meters in the City's portfolio are being tracked with EnergyCAP.

Data for 90% of these meters is being automatically uploaded into EnergyCAP from EDI-format invoices.

It is estimated that the streamlined system saves the City at least **2 hours a week** of clerk time and around **\$4,000 a year** in clerical labor.

With determined leadership of the City government, and the hard work of the accounting staff and energy manager, the City of Minneapolis is leading the way in energy management and conservation.

They're gonna make it after all!

©2013 EnergyCAP, Inc. www.EnergyCAP.com

Other Ways to Communicate

Auto email reports

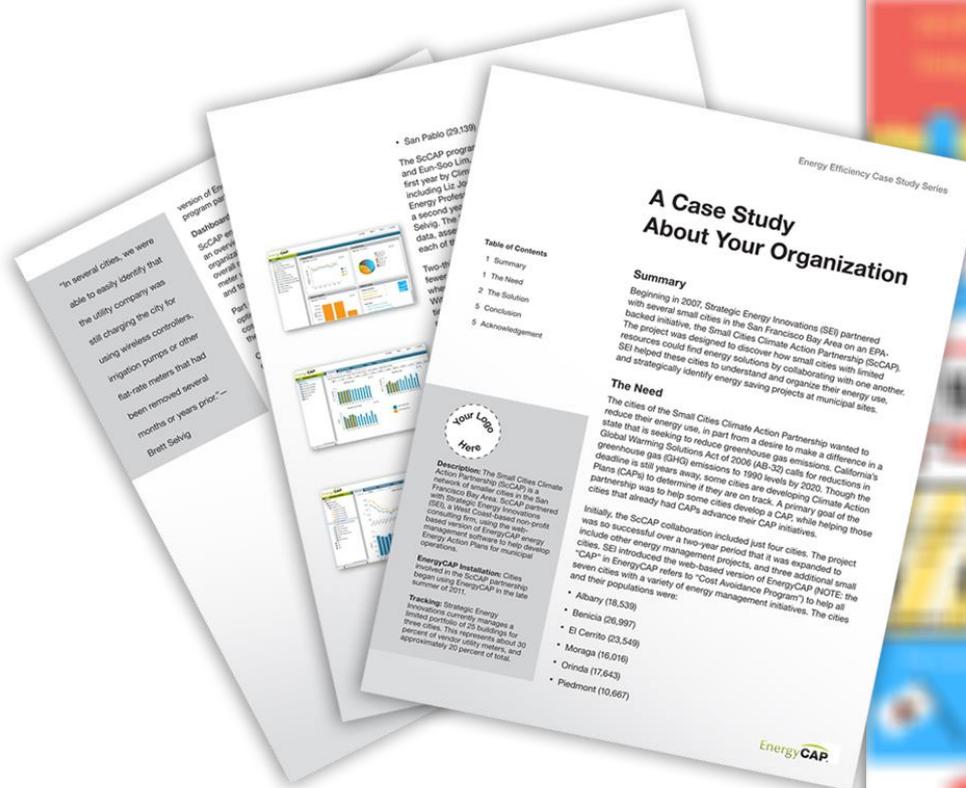
Online access to EnergyCAP

Embeddable Dashboards

API

Social Media

Your Success Story Could Be Next...



GSA

You may be able to avoid costly and time-consuming RFP processes by piggybacking on other public procurements or purchasing from our GSA contract.



Questions?



Using Software to Track Building Energy Data

Jim Morris, Virginia Beach City Public Schools

John Heinz, EnergyCAP

Julia Reynolds, Chesterfield County (moderator)

Sponsored by  EnergyCAP[®]

The EnergyCAP logo consists of the word "Energy" in a light green font, "CAP" in a dark blue font, and a green arc above the "CAP" portion.