



SEE Action Series: Energy Audit and Retro-Commissioning Policies for Public and Commercial Buildings

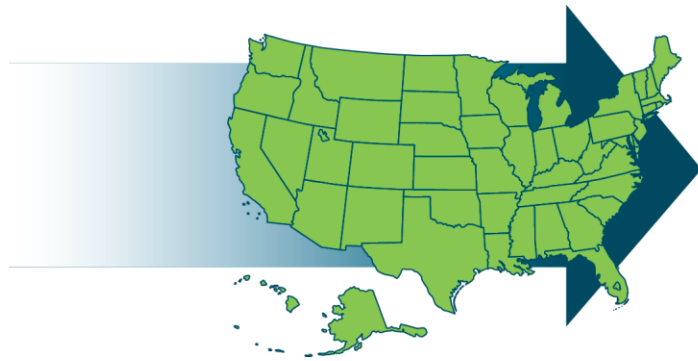
August 30, 2012

DOE's Technical Assistance Program (TAP) supports state, local, and tribal officials, by providing them with tools and resources needed to implement successful and sustainable clean energy programs



- Last fall, DOE announced that TAP would be transitioning to a new, post-ARRA framework
- Over last several months, TAP has conducted an assessment of the services we offer and needs of our constituencies
- DOE has continued to facilitate peer exchange, and we encourage you to get involved now:
<http://www1.eere.energy.gov/wip/solutioncenter/peerexchangehub.html>

- Stay tuned for announcements over the next several weeks regarding:
 - Additional upcoming webcasts
 - Availability of direct technical assistance
 - Other new and exciting resources
- Today's webcast will be available online:
<http://www1.eere.energy.gov/wip/solutioncenter/webcasts/default.html>
- Don't hesitate to contact us at:
TechnicalAssistanceProgram@ee.doe.gov



SEE Action

STATE & LOCAL ENERGY EFFICIENCY ACTION NETWORK

SEE Action Existing Commercial Buildings Working Group

Energy Audit and Retro- Commissioning Policies for Public and Commercial Buildings

Carolyn Sarno, Northeast Energy Efficiency Partnerships

Scott Jarman, Austin Energy

Hilary Beber, New York City Mayor's Office

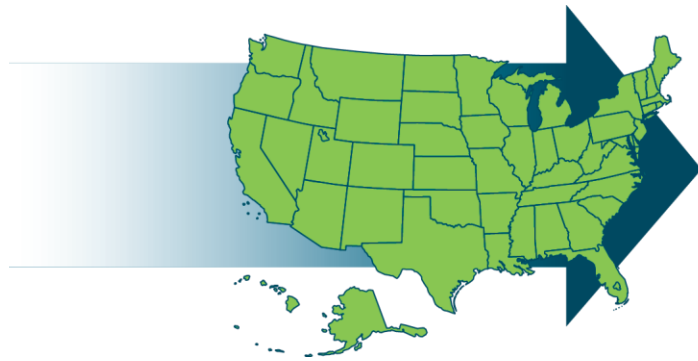
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This information was developed as a product of the State and Local Energy Efficiency Action Network (SEE Action), facilitated by the U.S. Department of Energy/U.S. Environmental Protection Agency. Content does not imply an endorsement by individuals or organizations that are part of SEE Action working groups, or reflect the views, policies, or otherwise of the federal government.

Agenda

- SEE Action Overview
- Introduction to Retro-Commissioning and Audit Policies
- Local Government Example: Austin, TX
- Local Government Example: New York City
- Related DOE Initiatives
- Discussion





SEE Action

STATE & LOCAL ENERGY EFFICIENCY ACTION NETWORK

SEE Action Overview

What is SEE Action?

A state and local effort facilitated by the federal government that helps states, utilities, and other local stakeholders take energy efficiency to scale and achieve all cost-effective energy efficiency by 2020.

For more information, visit:

www.seeaction.energy.gov



www.seeaction.energy.gov

SEE Action Leadership

- **Executive Group** of more than 30 stakeholders including state and local governments, associations, business leaders, non-governmental organizations, and others.
- **Eight Working Groups** help SEE Action achieve its goal of capturing all cost-effective energy efficiency by 2020.



Commercial Working Group: Motivation

- The majority of office space that will be used in next decade has been built.
- Commercial buildings use:
 - ~50% of U.S. building energy use.
 - ~20% of total U.S. energy use and GHG emissions.
- Public buildings are ~25% more energy-intensive than private buildings.
- Commercial building owners/managers spend more than \$2 per sq. ft. on energy.
- ~5 to 15 jobs created per \$1M invested in energy efficiency.
- Energy-efficient buildings have higher occupancy levels, lease rates, and sales prices.



Commercial Energy Efficiency Policies and Programs

- Drive Demand for Energy Efficiency
 - **Benchmarking, Rating, and Disclosure**
 - **Retro-commissioning**
 - Ratepayer-funded Programs
 - Public-Private Partnerships (Energy Challenges)
- Enable Efficiency Operations and Investment
 - **Strategic Energy Management**
 - **High-Performance Leasing**
 - Financing Innovation
- Build the Workforce
 - Education & Training
 - Materials
 - Certification
- Move the Market
 - High-Performance Procurement
 - Emerging Technology Demonstration



Commercial Working Group: Resources

- Fact sheets: benchmarking, rating, and disclosure; retro-commissioning; high-performance leasing; strategic energy management programs
- Model policy design guides: benchmarking, rating, and disclosure; retro-commissioning (under development)
- Expert / peer support: guidance on adopting and enhancing policy and program solutions

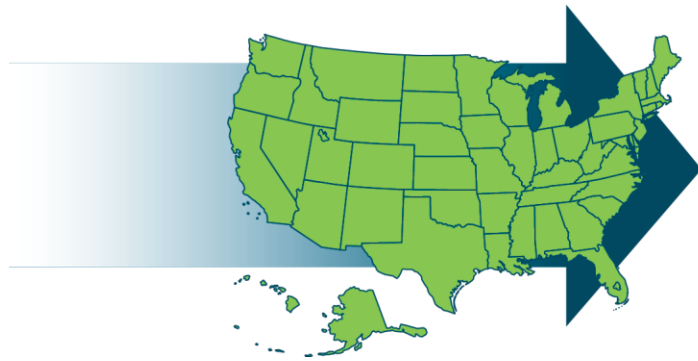
**Have other ideas?
Please let us know.**



How State Governments Can Get Involved

- Download and share SEE Action resources.
 - Visit http://www1.eere.energy.gov/seeaction/existing_commercial.html.
- Tell us your story.
 - E-mail cody.taylor@ee.doe.gov and let us know what you're doing to promote energy efficiency in existing commercial buildings.
- Share your data.
 - E-mail cody.taylor@ee.doe.gov to participate in the SEED platform or asset rating pilots.
- Request assistance.
 - E-mail cody.taylor@ee.doe.gov and let us know which policy/program you are interested in learning more about.





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STATE & LOCAL ENERGY EFFICIENCY ACTION NETWORK

Introduction to Retro-Commissioning and Audit Policies

Carolyn Sarno

Northeast Energy Efficiency Partnerships

TODAY'S TOPICS

Energy Audits



Retro- commissioning



Images courtesy of NEEP

ENERGY AUDITS

- Foundation for energy policy
 - Benchmarking
- Types
 - ASHRAE (I, II, III)
- Involve stakeholders
 - Utility Administrator
 - Facilities staff
 - Occupants!

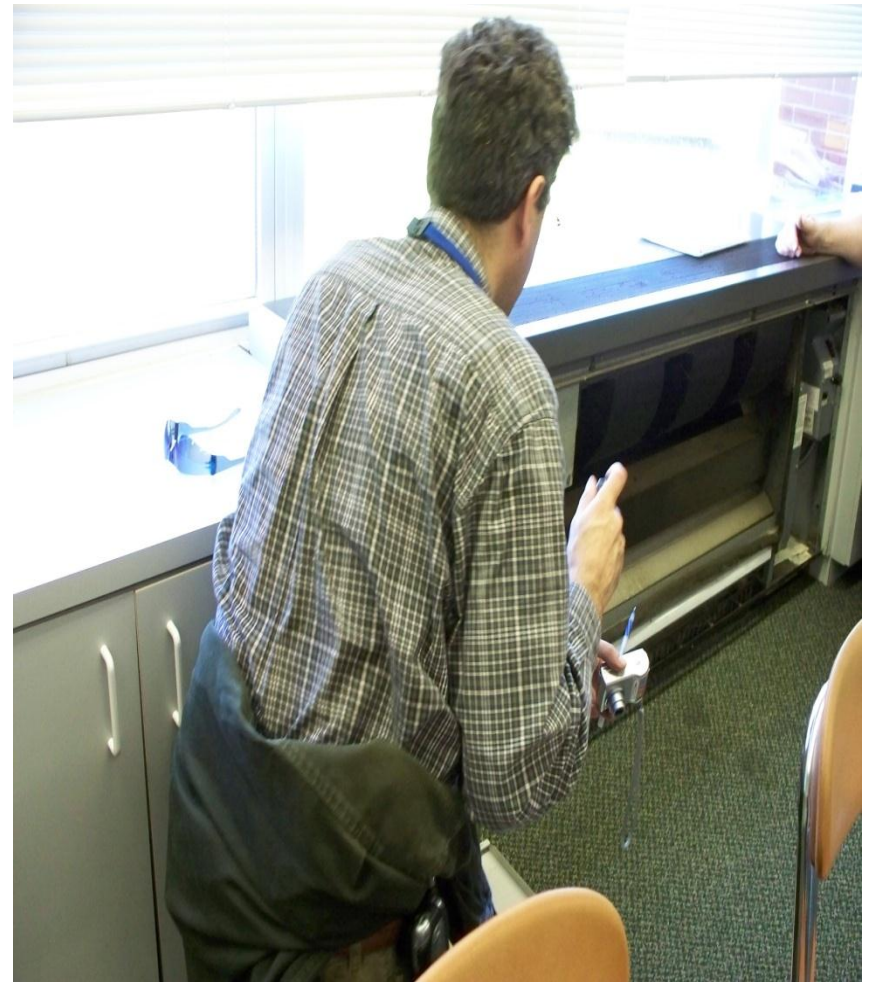
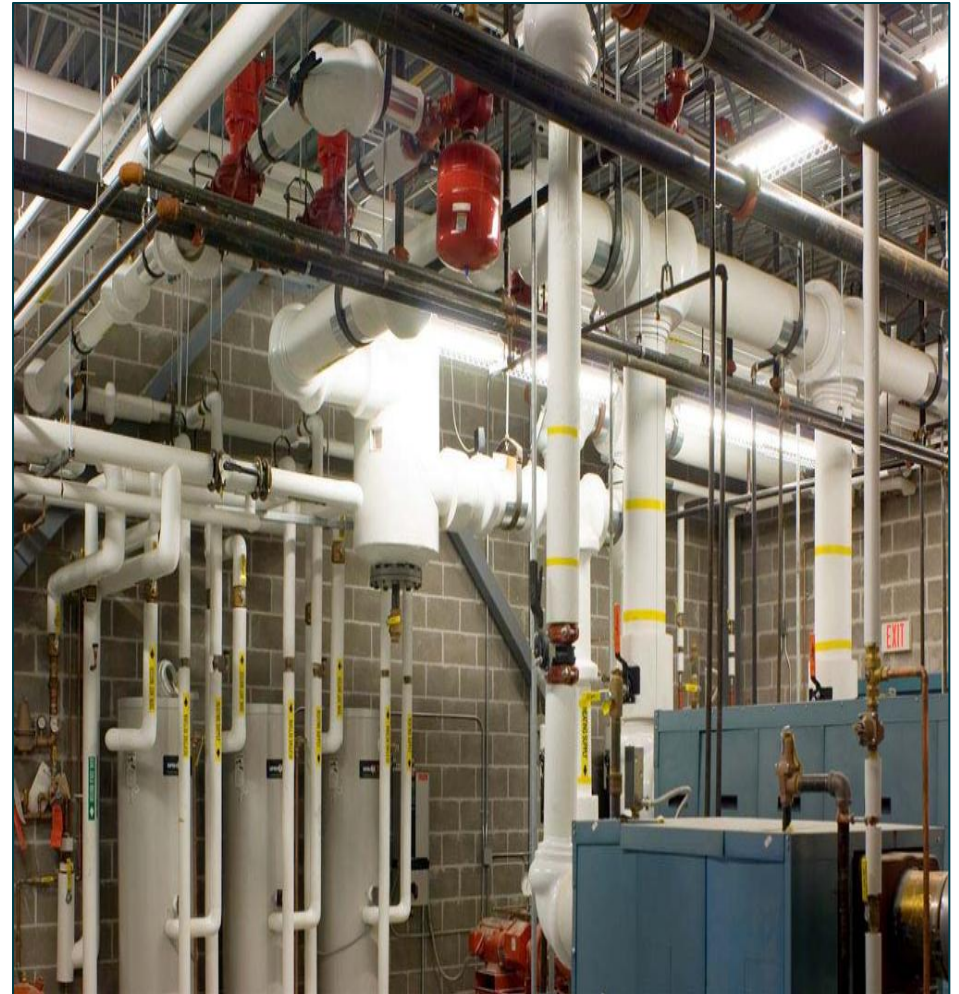


Image courtesy of NEEP

RETRO-COMMISSIONING

- “Tune up”
- Low cost way to reduce energy cost
 - 10-20% savings
- Part of comprehensive energy policy
- Involve staff





State and Local Energy Efficiency Action Network

City of Austin Energy Audit and Disclosure Ordinance

Scott Jarman, PE, CEM, PMP

Interim Director Energy Efficiency Services

Austin Energy

scott.jarman@austinenergy.com

Austin Energy and the Austin Climate Protection Plan



- City of Austin's municipal utility
- 2nd Largest municipal Texas utility
- City council approved
 - 2003 Generation Resource Plan
 - 2007 Austin Climate Protection Plan
 - Sets goals for Austin Energy
 - Sets goals for City of Austin



Austin Climate Protection Plan



- GHG Reduction Plan
- Five components:
 - Municipal
 - Utility
 - Community
 - “Go Neutral”
 - **Homes and Buildings**



Climate Protection Plan



Homes and Buildings

- All new homes zero net energy capable by 2015
- All new non-residential construction 75% more efficient by 2015
- **Disclosure of historic energy use and facilitate energy improvements in existing homes and buildings**
- Enhanced incentives for Green Building and Carbon Neutral rating systems

Existing Building Disclosure Development



- Stakeholder taskforce formed
- Split into three sub-committees
 - Residential, Multifamily, Commercial
- Developed recommendations
- Council approved resolution
- Council approved ordinance

Energy Conservation Audit and Disclosure (ECAD) Ordinance



- Became effective June 1, 2009
- Impacts three market segments
 - Residential single family homes
 - Multifamily properties
 - Commercial buildings
- Revised in May 2011

Residential Single Family



- Effective June 1, 2009
- Time of sale audit and disclosure requirement
- Age and energy upgrade based exemptions
- Qualified auditors required (BPI/RESNET)
- Worked to develop audit companies
- Goal for audit to cost about \$200
- Marketed/promoted through realtors
- Goal to have 25% of homes sold upgraded

Residential Single Family



Through October 2011:

- 8,871 homes audited
- 66% of non-exempt homes audited
 - 79% of homes needed weatherization
 - ~20% average duct leakage
- 1,186 upgraded homes (20%)
- 6% of total homes sold made upgrades

Residential Multi-family



- Audit requirement (due June 1, 2011)
- Tenant disclosure requirement
- Qualified auditors (RESNET/BPI)
- Exemptions for age and prior energy upgrades
- Mandatory upgrade requirement for high energy use properties (150% of the median)
- Dwellings grouped by fuel type and age range

Residential Multi-Family



Through October 2011

- 1,347 total properties covered by ordinance
- 270 exempted from audit
- 574 apartment communities audited (53% of non-exempt properties)
 - 4,309 individual apartment buildings audited
 - ~40% average duct leakage

Residential Multi-Family



- EUIs developed for 6 apartment types (types based on age and heating type)
- Most communities are pre-1985
- Exemption certifications developed
- “Notice of High Energy Use” developed



CERTIFICATE OF ENERGY IMPROVEMENT

ENERGY AUDIT EXEMPTION

Certificate Number: 0013497

12345 APARTMENT AVENUE, AUSTIN, TX 78700

STREET ADDRESS

This property has made voluntary energy-saving improvements and has met the requirements of the City of Austin's Energy Conservation and Disclosure Ordinance (Austin City Code, Chapter 6-7). This property is exempt from further requirements under the Code for a period of 10 years from the date the improvements were made. Owners who voluntarily installed energy-saving measures are not required to conduct an energy audit during the exemption period. Residents are encouraged to discuss the energy performance of this property with the property manager.

| Energy Efficiency Improvements Made* | Completion Date | Work Performed by |
|---|-----------------|---------------------------|
| Air Ducts Sealed to Leak Less than 15% | September 2011 | A Qualified Auditor |
| Replaced All Air Conditioning Units with ENERGY STAR® Equipment | September 2011 | Another Qualified Auditor |

**This property may have made other improvements to save energy.*

This property has made these additional improvements through the Power Saver Program of Austin Energy:

Solar Screens

Programmable Thermostats

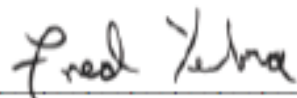
Solar Photovoltaic Panels

Additional Attic Insulation

Water Heater Timers

Solar Water Heating

Reviewed by:


Fred Yebra, Director of Energy Efficiency Services

For more information about the Environmental Conservation Audit and Disclosure Ordinance, please call 974-7827.



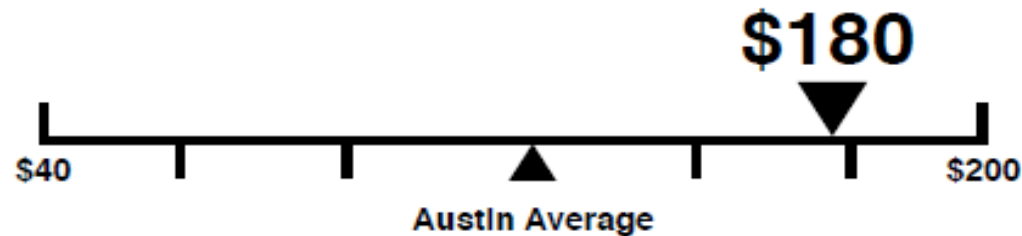
Austin City Code Chapter 6-7, Energy Conservation

2011

NOTICE OF HIGH ENERGY USE PROPERTY

1234 APARTMENT AVENUE, AUSTIN, TX 78700

ESTIMATED MONTHLY ELECTRIC COST



THIS PROPERTY

This graph above represents the range of electric costs for Austin properties of a similar type to this one.

This property is:

- all electric
- built in 1986
- 800 sq. ft. average apartment size

Cost information:

- is based on this facility's average size apartment,
- based on a cost of \$0.10 per kWh, and
- is updated annually.

1,800 kWh
ESTIMATED MONTHLY
ELECTRIC USE

YOUR BILL

Your actual bill will depend on many factors:

- Weather (bills are higher in extreme heat and cold – especially if electric heat is used),
- Thermostat settings,
- Number of occupants,
- Lifestyle habits,
- Size and location of unit (upper floors and south and west facing units are generally warmer),
- Energy efficiency measures in place, and
- Age and type of heating/cooling equipment.

This property uses 15 % more energy per square foot than an average multi-family property in the Austin area. This may result in a higher electric bill than would be incurred in a similar unit in an average energy use property.

For details about energy use per square foot for Austin multi-family properties, visit austinenergy.com/go/ECAD, call 482-5278, or see QR code:



Commercial Buildings



- Uses EPA's Portfolio Manager tool
- Does not require "certified" raters
- Annual reporting and time-of-sale disclosure
- No audit or RCx requirement
- Three year phase-in by building size
 - 75,000 + sq. ft. – by June 1, 2012
 - 75,000 to 30,000 sq. ft. – by June 1, 2013
 - 30,000 to 10,000 sq. ft. – by June 1, 2014

Commercial Buildings



- Reporting through Portfolio Manager
- Reporting period January through June
- Developed internal database to track
- Sent letters to owners November 2011
- Developed building ID numbers
- Requested owner report with ID's
- Aggregated energy use data

Commercial Buildings



- Held hands-on workshops
- Developed energy use worksheet
- Developed guide on “How to benchmark your building/facility”
- EPA hosted Austin-specific webcast
- Promoted through key account team
- Mixed owner feedback

Commercial Buildings (Preliminary Statistics)



- Workshops = 12
 - 108 Participants
- Percent of population reported = 67%
- Offices and schools were over 60% of reported facilities
- Average overall Portfolio Manager score (all categories) = 62
- Percent using enhanced reporting = 60%
- Percent of using minimum compliance reporting = 40%
- Percent of building scores receiving “N/A” = 38%
- Submitted without building ID = 49%
- Aggregated data reports sent to customers = 59

Implementation Considerations



- Develop clear ordinance definitions
- Multi-channel marketing
 - Local organizations
 - Local contractors or service providers
 - Web site development
 - Rating and reporting training and assistance
- Database development and management
 - Track reporting and reported data
 - Correspondence management



Thank You!

Contact Information:

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Energy Efficiency Services
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New York City's Greener, Greater Building Plan

Local Law 87 – Audits and
Retro-commissioning

August 30, 2012

Hilary Beber, Policy Advisor
Mayor's Office

A stylized map of New York City in white, showing the five boroughs and major water bodies, set against a dark blue background. The map is positioned on the right side of the slide, partially overlapping the text.

**A GREENER,
GREATER
NEW YORK**



Housing and Neighborhoods – Create homes for almost a million more New Yorkers while making housing and neighborhoods more affordable and sustainable



Parks and Public Space – Ensure all New Yorkers live within a 10-minute walk of a park



Brownfields – Clean up all contaminated land in New York City



Waterways – Improve the quality of our waterways to increase opportunities for recreation and restore coastal ecosystems



Water Supply – Ensure the high quality and reliability of our water supply system



Transportation – Expand sustainable transportation choices and ensure the reliability and high quality of our transportation network



Energy – Reduce energy consumption and make our energy systems cleaner and more reliable



Air Quality – Achieve the cleanest air quality of any big U.S. city

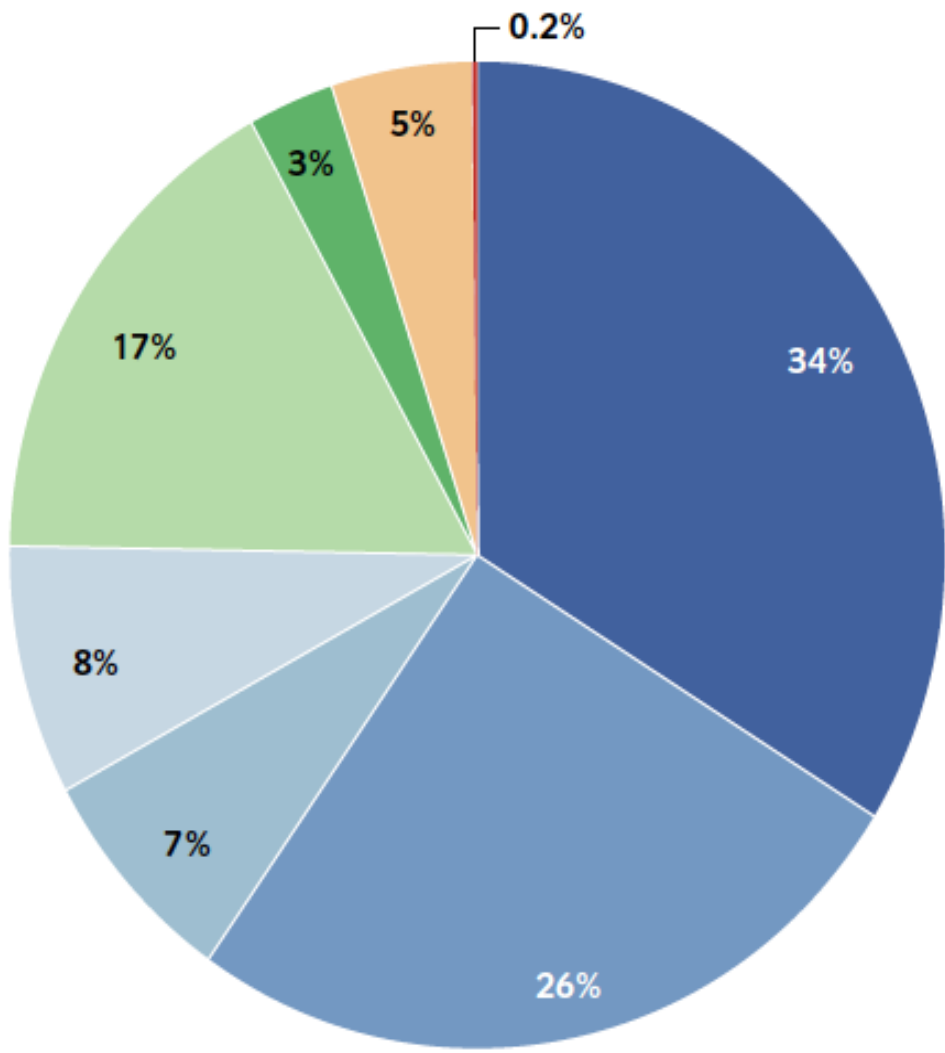


Solid Waste - Divert 75 of our solid waste from landfills



Climate Change – Reduce greenhouse gas emissions by more than 30% and increase the resilience of our communities, natural systems, and infrastructure to climate risk

2009 Citywide GHG Emissions by Sector



TOTAL = 50.8 MMTCO₂e

Buildings = 75%

- Residential
- Commercial
- Industrial
- Institutional

Transportation = 20%

- On-road transportation
- Transit

Solid waste, wastewater, and fugitive = 5%

- Solid waste, wastewater, and fugitive

Streetlights and traffic signals = 0.2%

- Streetlights and traffic signals

This is twice the national average, proportionally

In particular, it's the existing buildings...

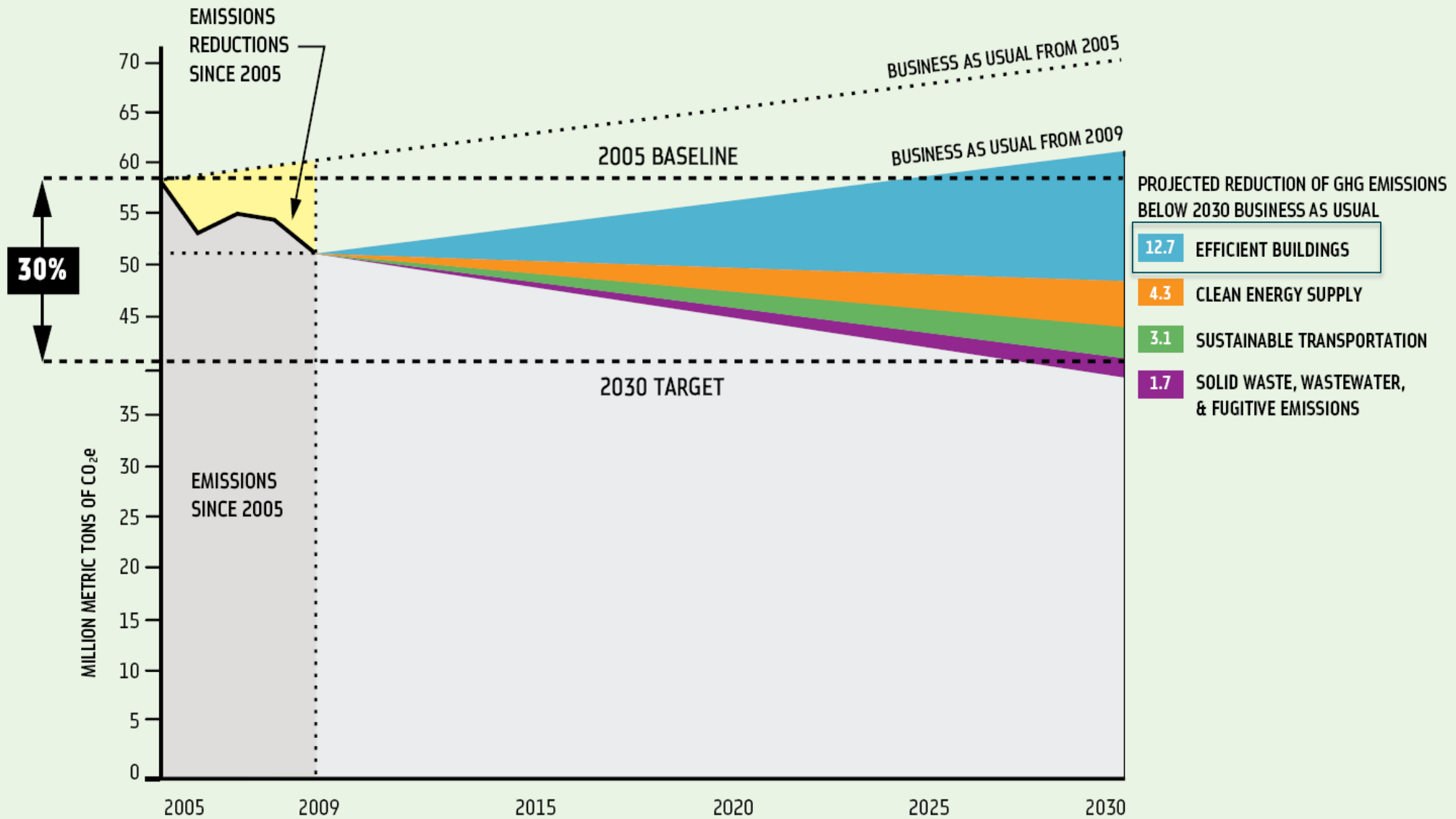


In 2030, over 85% of our buildings will be buildings that exist today

1
2

Over half of our emissions reductions will have to come from making our buildings more efficient.

Projected Impacts of Our Greenhouse Gas Reduction Strategies



THE NEW YORK CITY

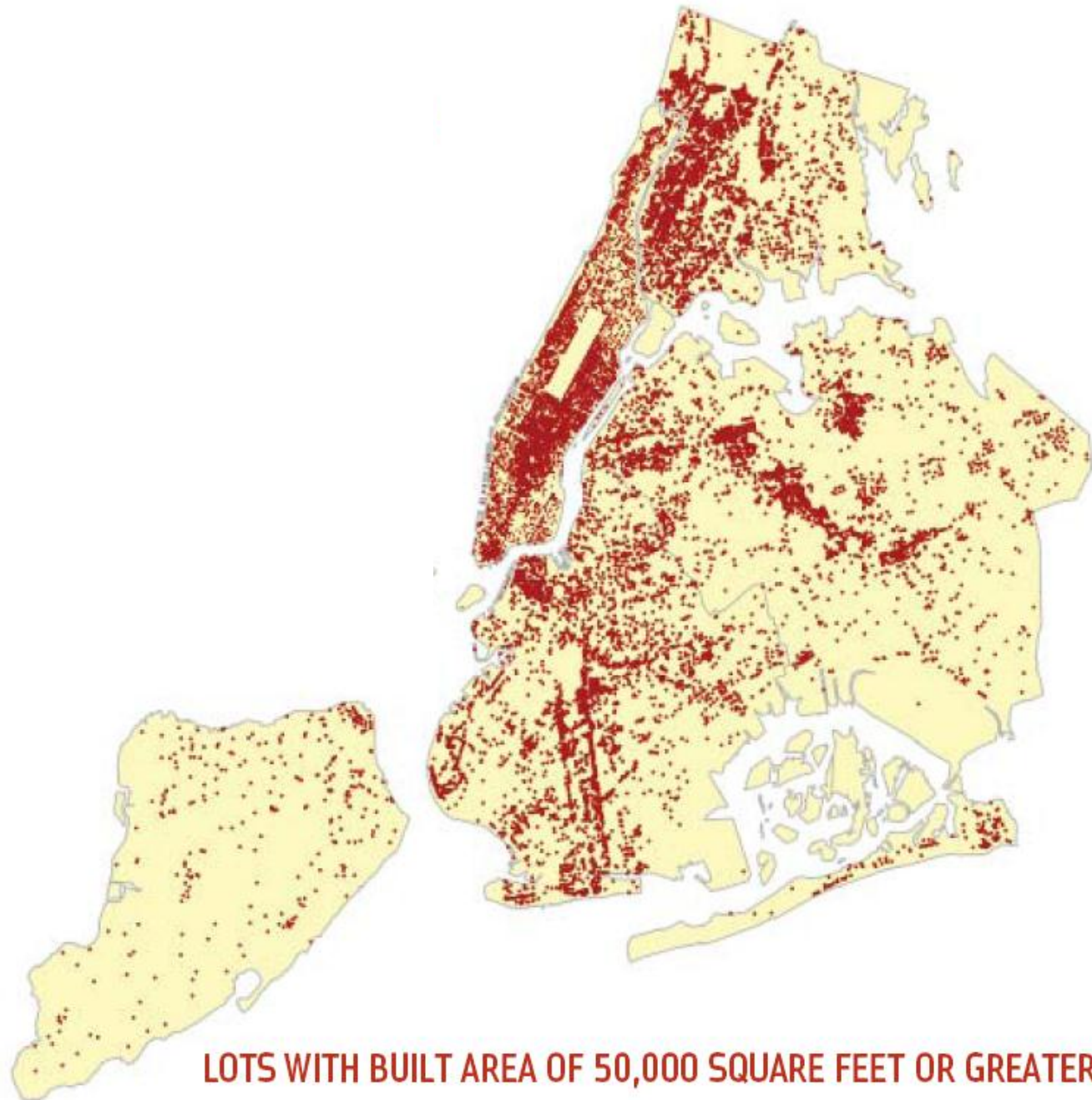
GREENER, GREATER BUILDINGS PLAN

1 New York City
Energy Code

2 Lighting Upgrades and
Sub-Metering

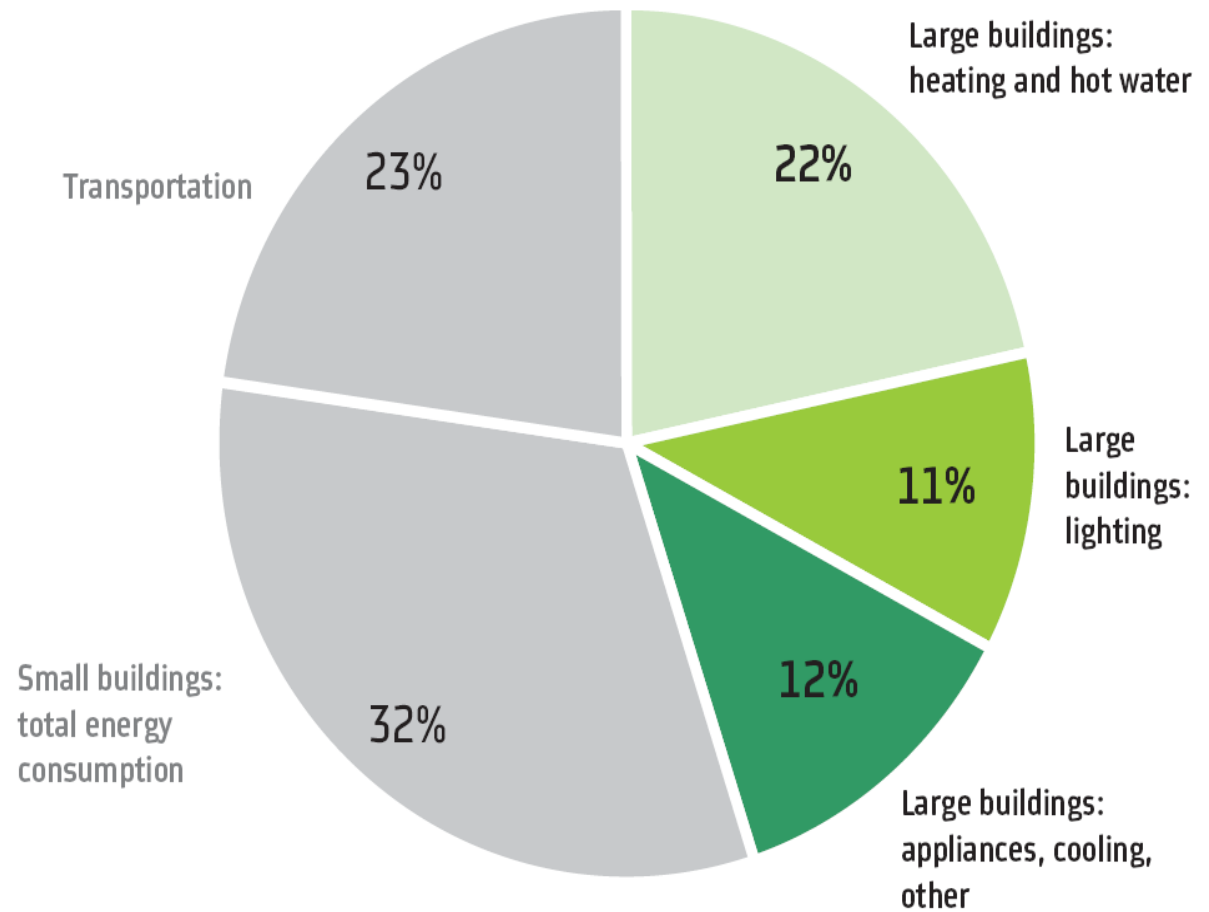
3 Benchmarking

4 Audits and
Retro-Commissioning



New York has **1 million** buildings,

But the largest 15,000 properties (less than 2%) account for almost half of the city's overall emissions



Energy Audits

- Analysis of a building's energy equipment, systems, envelope, and operations
- Identifies cost effective options to save energy
- Provides recommended strategies and cost estimates

Retro-commissioning

- Re-tuning systems in an existing building to improve efficiency

Examples:

- Checking HVAC controls
- Calibrating lighting sensors
- Ensuring pipe insulation

**LOCAL LAWS
OF
THE CITY OF NEW YORK
FOR THE YEAR 2009**

No. 87

Introduced by Council Member Gennaro, the Speaker (Council Member Quinn), Brewer, Comrie, Dickens, Garodnick, Gioia, James, Koppell, Lappin, Mitchell, Palma, Recchia Jr., Reyna, Rivera, Stewart, Liu, Yassky, Sears, White Jr., Mendez, de Blasio, Mark-Viverito, Vann, Avella, Vacca, Gerson, Jackson, Gonzalez, Ferreras, Vallone Jr., Barron, Arroyo, Crowley and Mealy

A LOCAL LAW

To amend the New York city charter and the administrative code of the city of New York, in relation to requiring energy audits and retro-commissioning of base building systems of certain buildings and retro-fitting of certain city-owned buildings.

Be it enacted by the Council as follows:

Section 1. Chapter 3 of title 28 of the administrative code of the city of New York is amended by adding a new article 308 to read as follows:

**ARTICLE 308
ENERGY AUDITS AND RETRO-COMMISSIONING OF BASE BUILDING
SYSTEMS**

§28-308.1 Definitions. *As used in this article, the following terms shall have the following meanings:*

BASE BUILDING SYSTEMS. *The systems or subsystems of a building that use energy and/or impact energy consumption including:*

1. *The building envelope.*
2. *The HVAC (heating ventilating and air conditioning) systems.*
3. *Conveying systems.*

Energy Efficiency Report (EER),
submit forms for:

- ASHRAE Level 2 Energy Audit
- Retro-commissioning Report

All “base building” energy systems
covered:

- HVAC (Heating, Ventilation and Air Conditioning)
- Electrical and Lighting
- Domestic Hot Water
- Building Envelope
- Conveying Systems



- NYC Department of Buildings (DOB) is responsible for enforcement
- Failure to comply with LL 87 subjects properties to fines of \$3,000 the first year and \$5,000 for each additional year
- DOB intends to conduct random reviews of documentation



Finalizing requirements

- Rule
- Data collection forms



First buildings come due in 2013

- Outreach
- Training





www.nyc.gov/ggbbp

A GREENER,
GREATER
NEW YORK



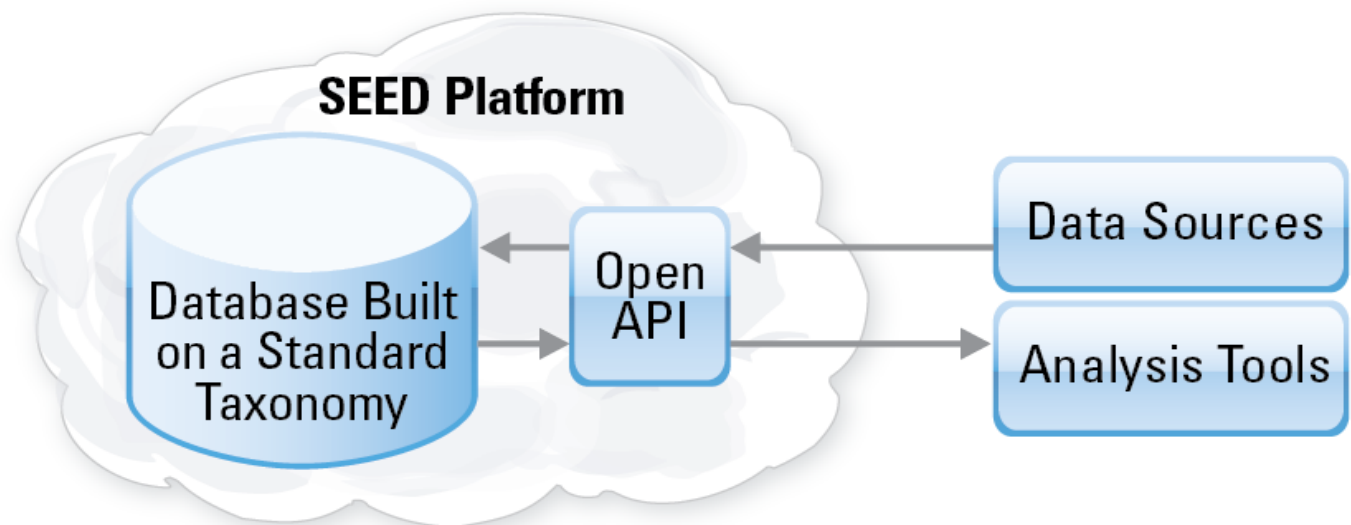
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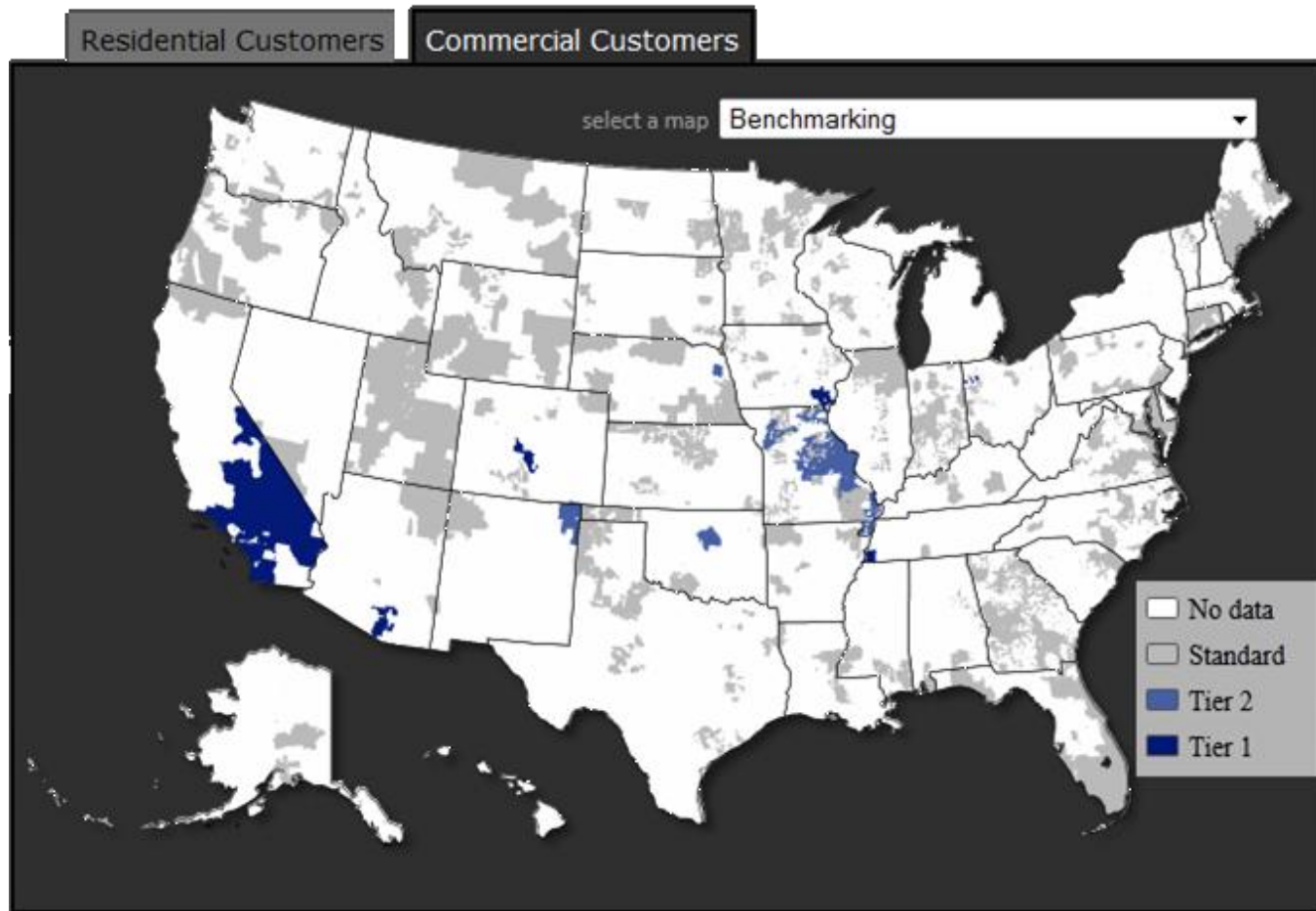
Related DOE Initiatives

Standard Energy Efficiency Data (SEED) Platform

The Standard Energy Efficiency Data Platform (SEED) is a software tool that allows state and local governments to quickly and easily create their own database using a standard building energy performance taxonomy, and easily share selected data with other parties as needed.



Access to Utility Data



21% of utilities have completed the questionnaire

http://en.openei.org/wiki/Utility_Access_Map

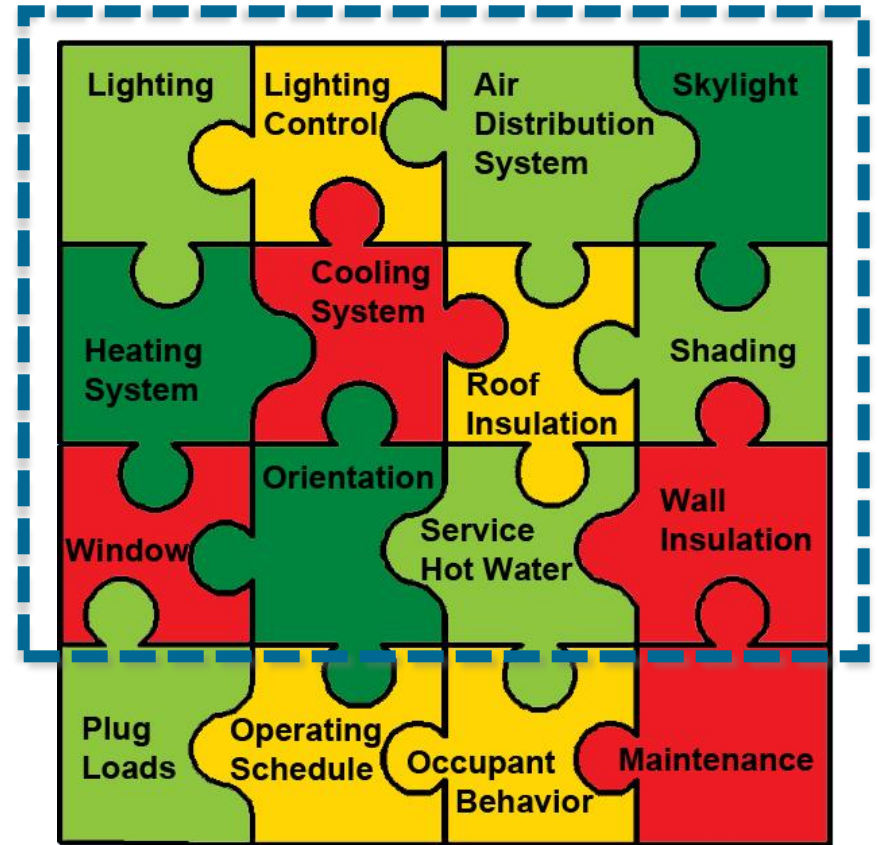


www.seeaction.energy.gov

Commercial Building Asset Rating Program

- Complements Portfolio Manager providing a common platform for:
 - Evaluating the inherent energy performance of buildings' physical characteristics while controlling for building operation and tenant behavior
 - Identifying energy efficiency improvements
- Looking for pilot participants to test tool for select building types (office, school unrefrigerated warehouse, public assembly)

Energy Asset Rating



Building energy use is affected by many factors.

For more information, visit:

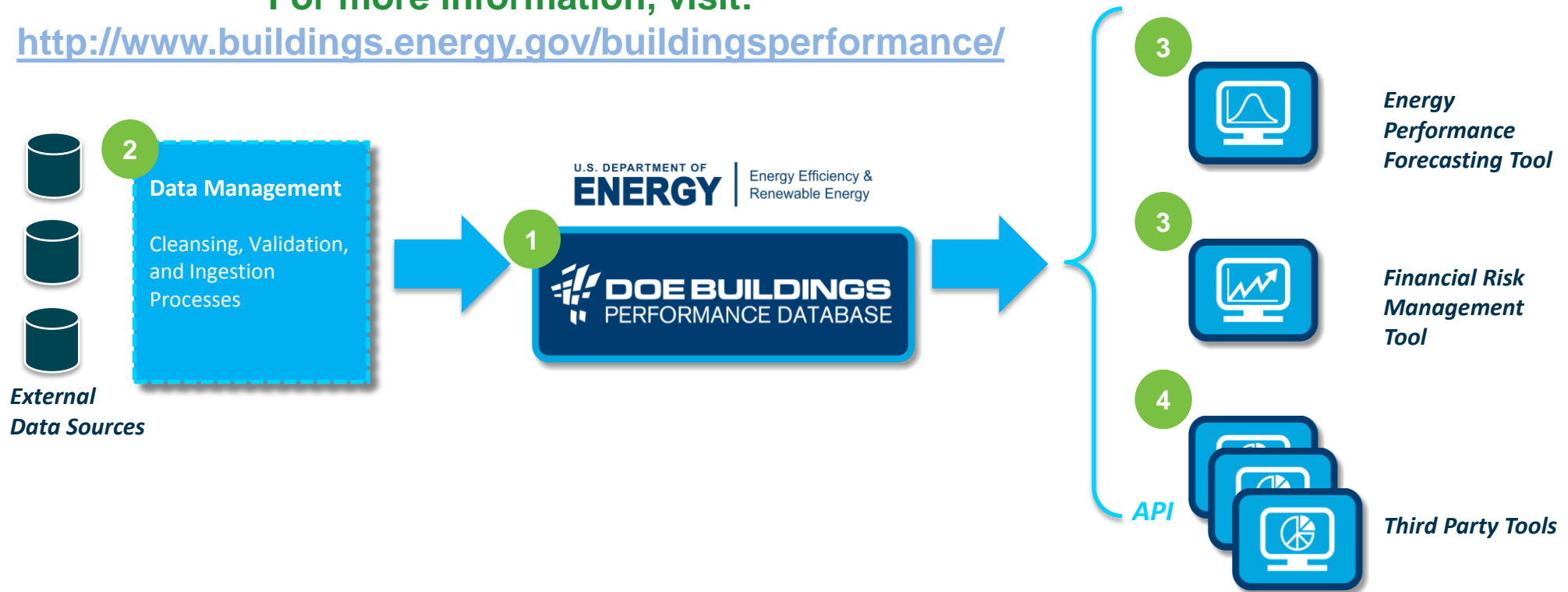
<http://www.commercialbuildings.energy.gov/assetrating.html>



Buildings Performance Database

For more information, visit:

<http://www.buildings.energy.gov/buildingsperformance/>



- 1** Common taxonomy: a standardized “data model” to organize energy use and building characteristic data
- 2** Data management: processes and tools to support the on-boarding and validation of data from multiple sources
- 3** Applications: web-enabled tools to forecast energy savings and related cash flows.
- 4** 3rd party tool support: API allows 3rd parties to create new applications to use the data in the database

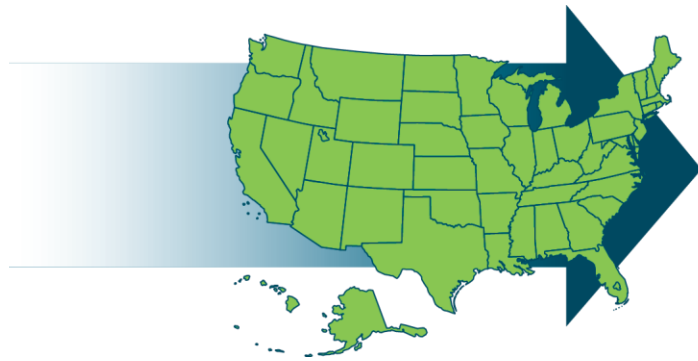
Join Us For Additional SEE Action Webcasts This Fall

Topics to be covered include:

- Strategic Energy Management Programs
- High Performance Leasing Strategies

Dates and times TBD...stay tuned!





SEE Action

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Questions?

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www.seeaction.energy.gov/existing_commercial.html