

## 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](mailto: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

**August 30, 2012**

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

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- 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?

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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](http://www.seeaction.energy.gov)**



*[www.seeaction.energy.gov](http://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](http://www1.eere.energy.gov/seeaction/existing_commercial.html).
- Tell us your story.
  - E-mail [cody.taylor@ee.doe.gov](mailto: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](mailto:cody.taylor@ee.doe.gov) to participate in the SEED platform or asset rating pilots.
- Request assistance.
  - E-mail [cody.taylor@ee.doe.gov](mailto:cody.taylor@ee.doe.gov) and let us know which policy/program you are interested in learning more about.





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# 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!

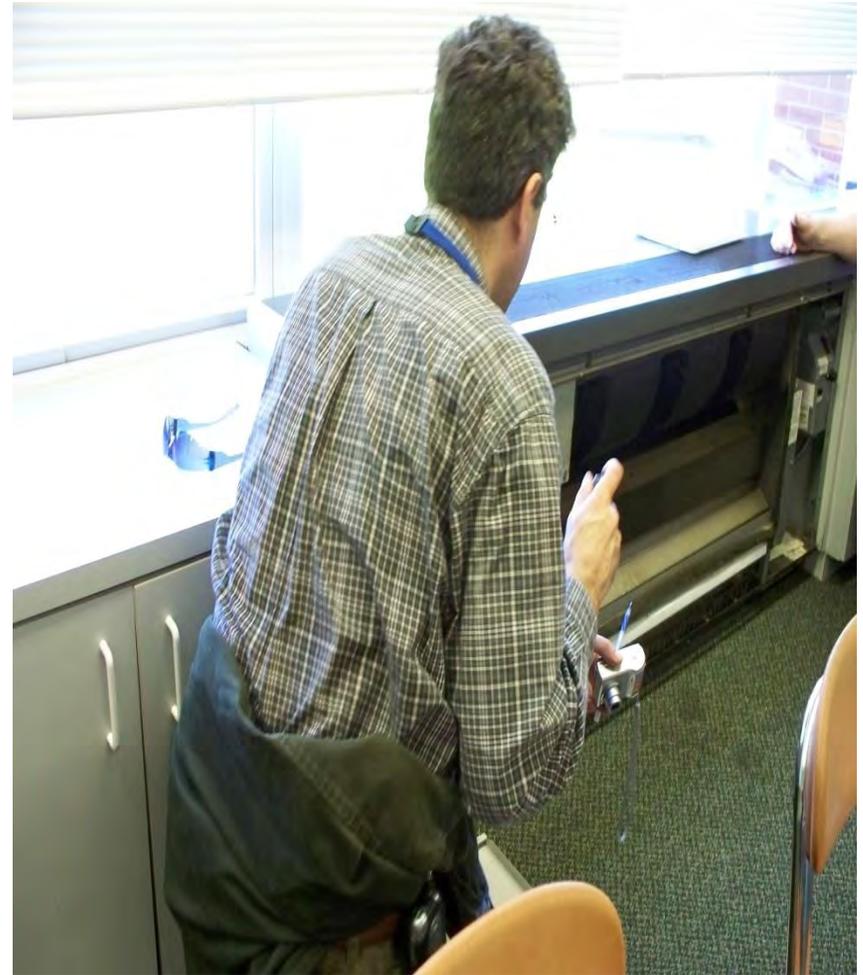
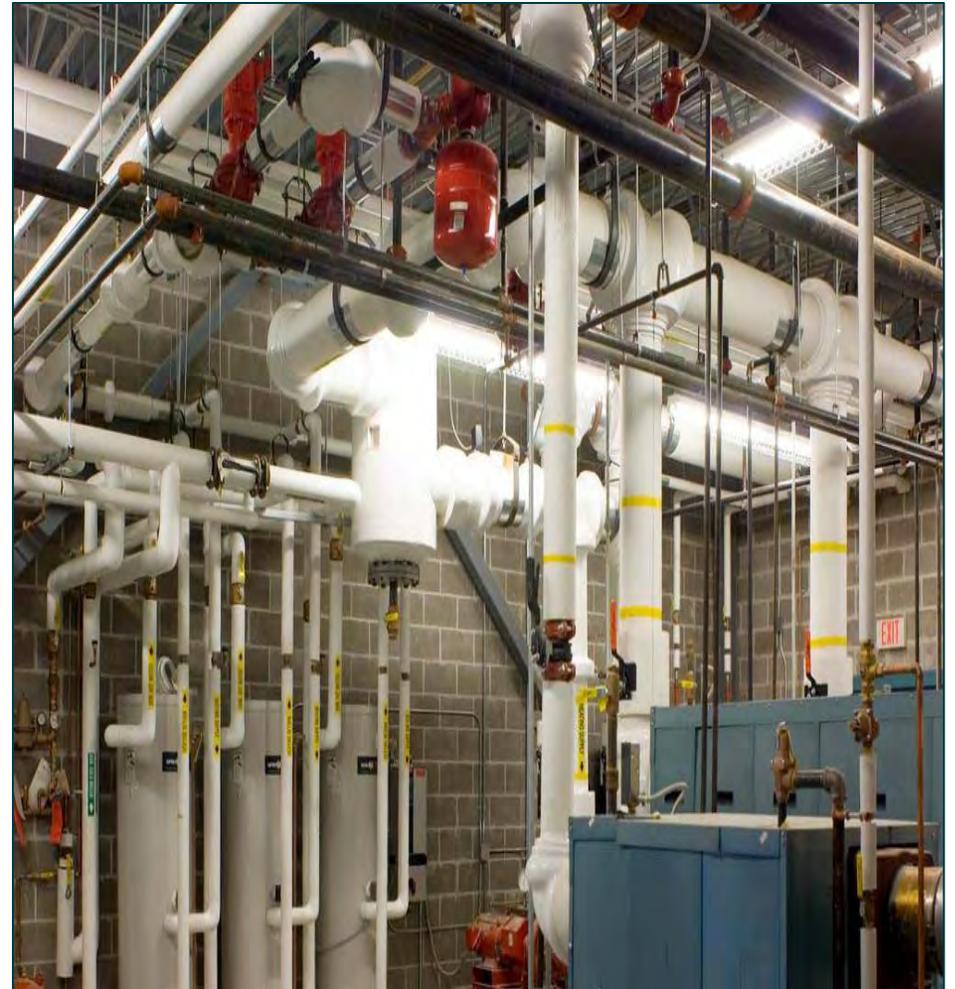


Image courtesy of NEEP

# 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](mailto:scott.jarman@austinenergy.com)

# Austin Energy and the Austin Climate Protection Plan



- City of Austin's municipal utility
- 2<sup>nd</sup> 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.



# 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



## Contact Information:

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Energy Efficiency Services  
(512) 482-5307  
[scott.jarman@austinenergy.com](mailto:scott.jarman@austinenergy.com)

# Thank You!

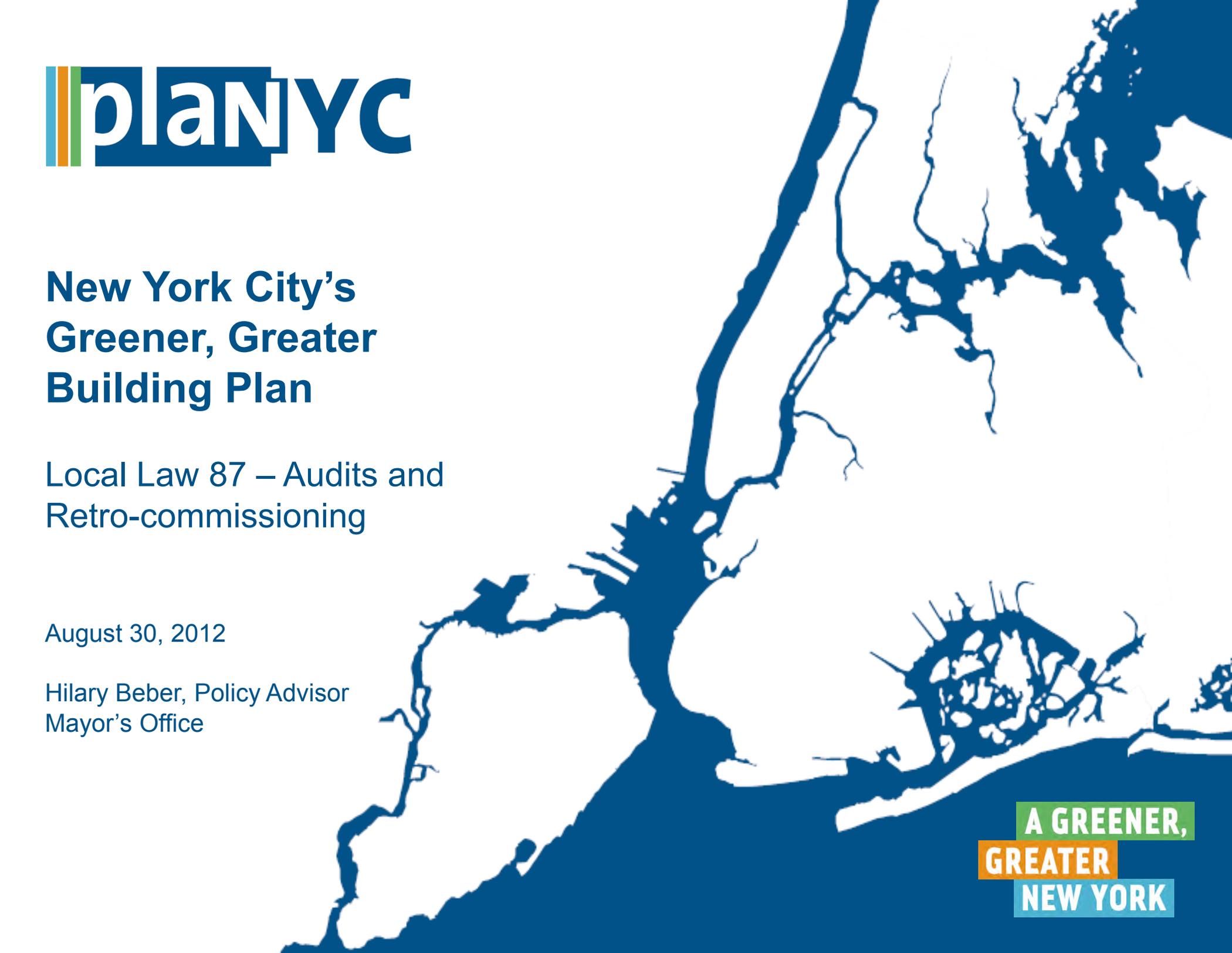


# New York City's Greener, Greater Building Plan

Local Law 87 – Audits and  
Retro-commissioning

August 30, 2012

Hilary Beber, Policy Advisor  
Mayor's Office



**A 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

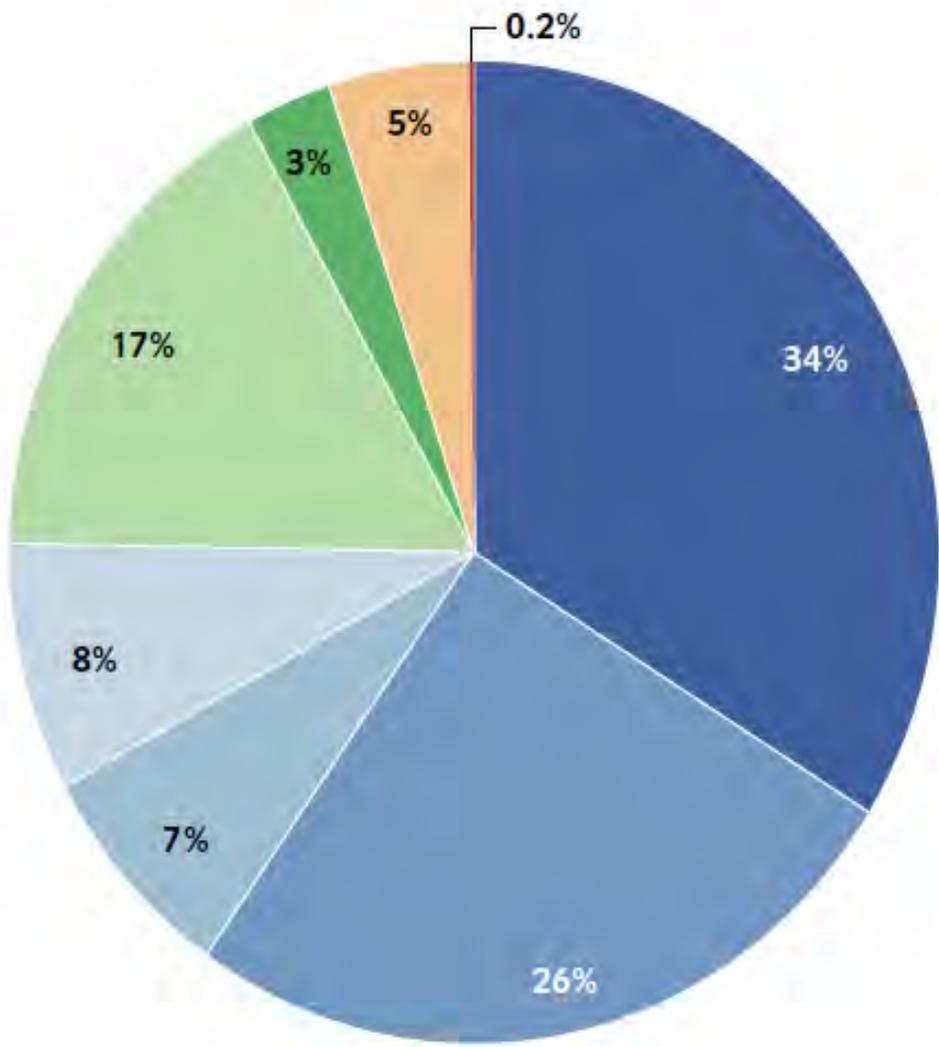


**Solid Waste** - Divert 75 of our solid waste from landfills



**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 MMTCO<sub>2</sub>e

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...



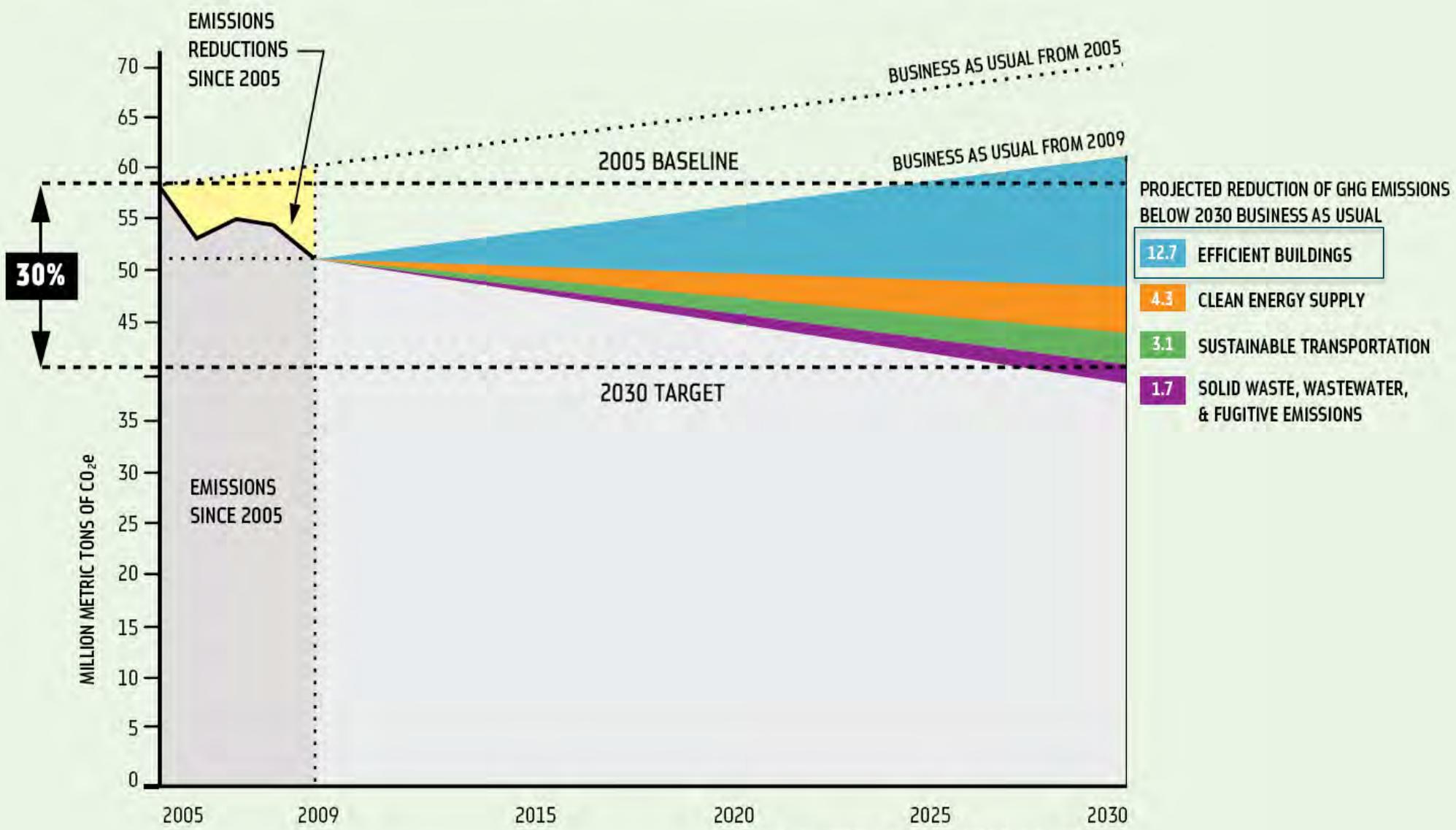
In 2030, over 85% of our buildings will be buildings that exist today

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



Source: NYC Mayor's Office and M.J. Beck Consulting, LLC

THE NEW YORK CITY

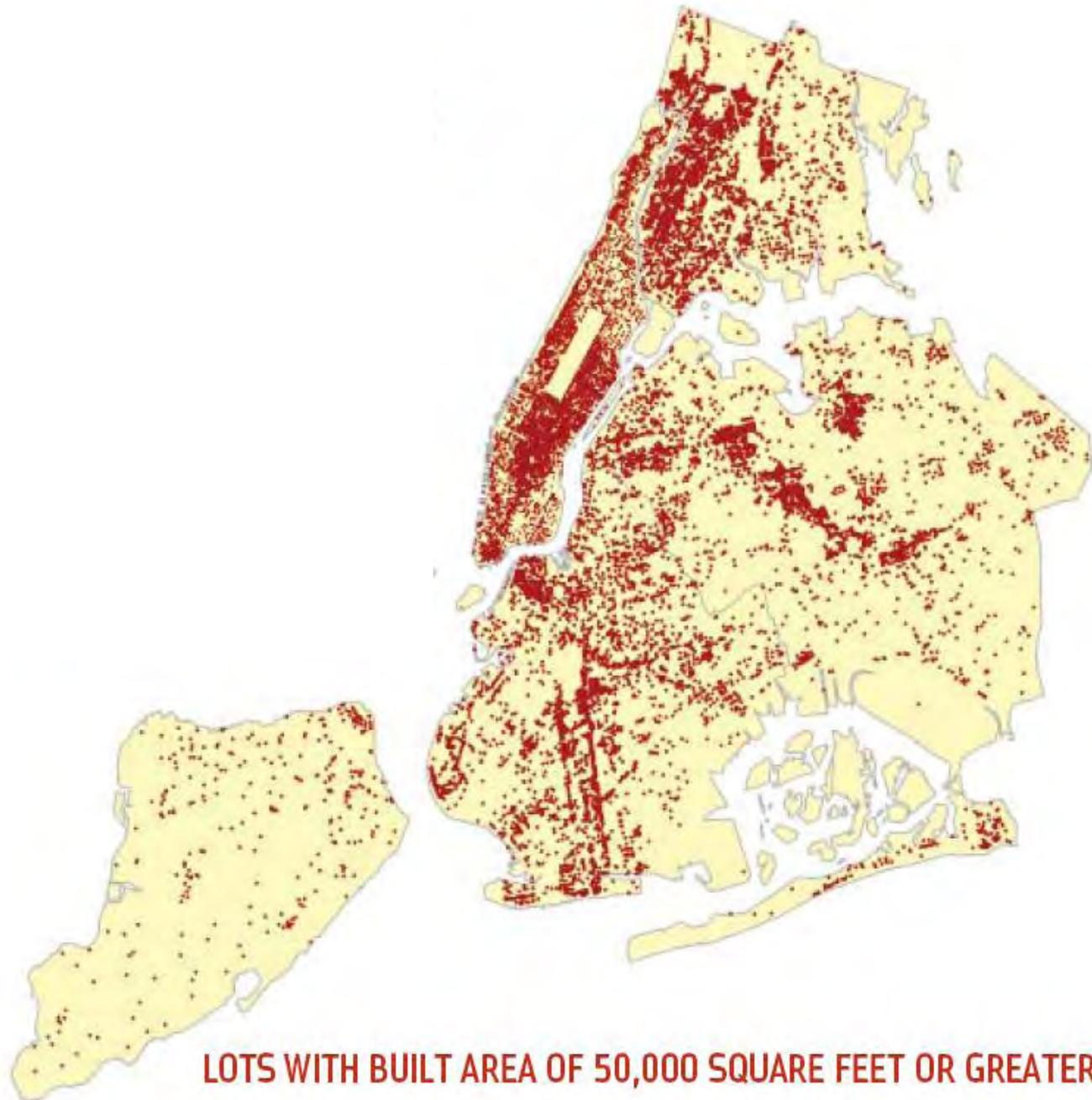
# GREENER, GREATER BUILDINGS PLAN

**1** New York City  
Energy Code

**2** Lighting Upgrades and  
Sub-Metering

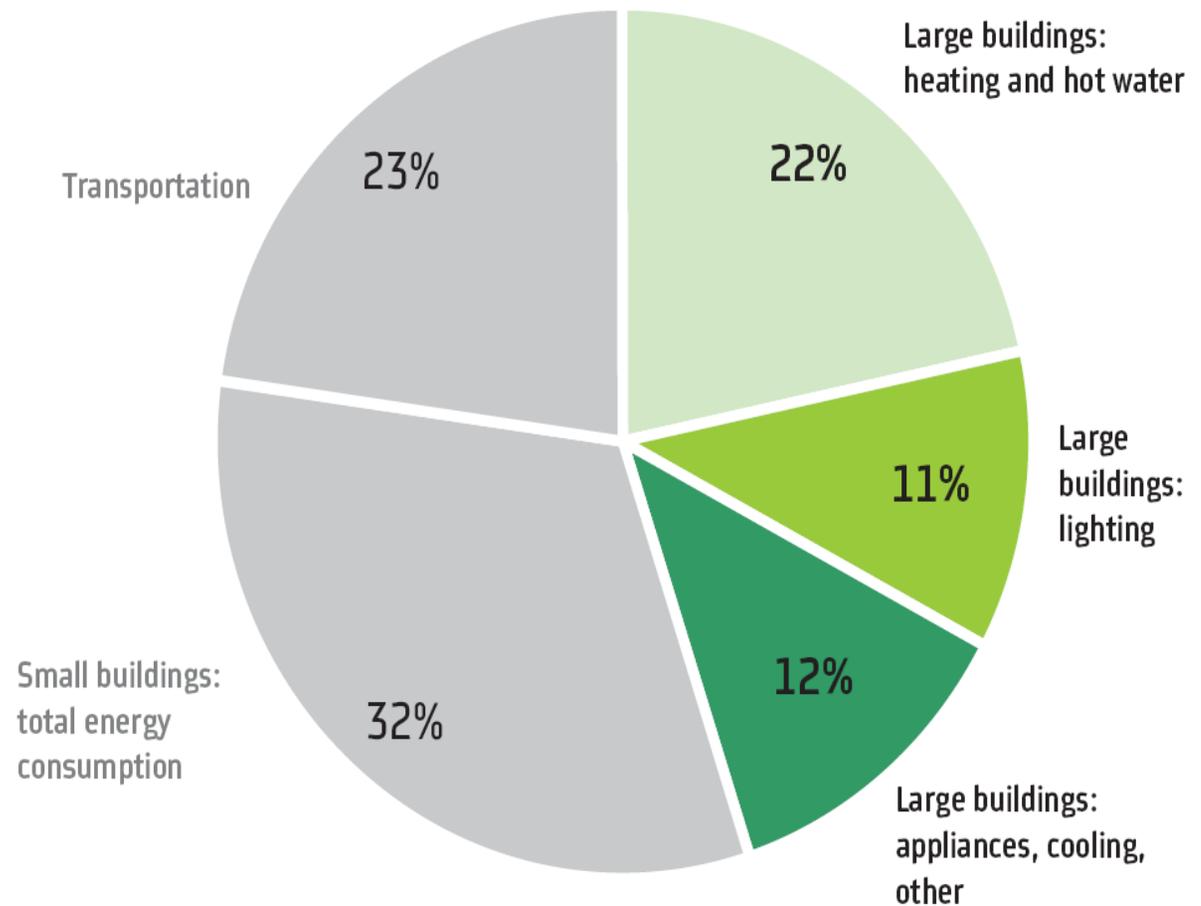
**3** Benchmarking

**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/ggbp](http://www.nyc.gov/ggbp)

A GREENER,  
GREATER  
NEW YORK



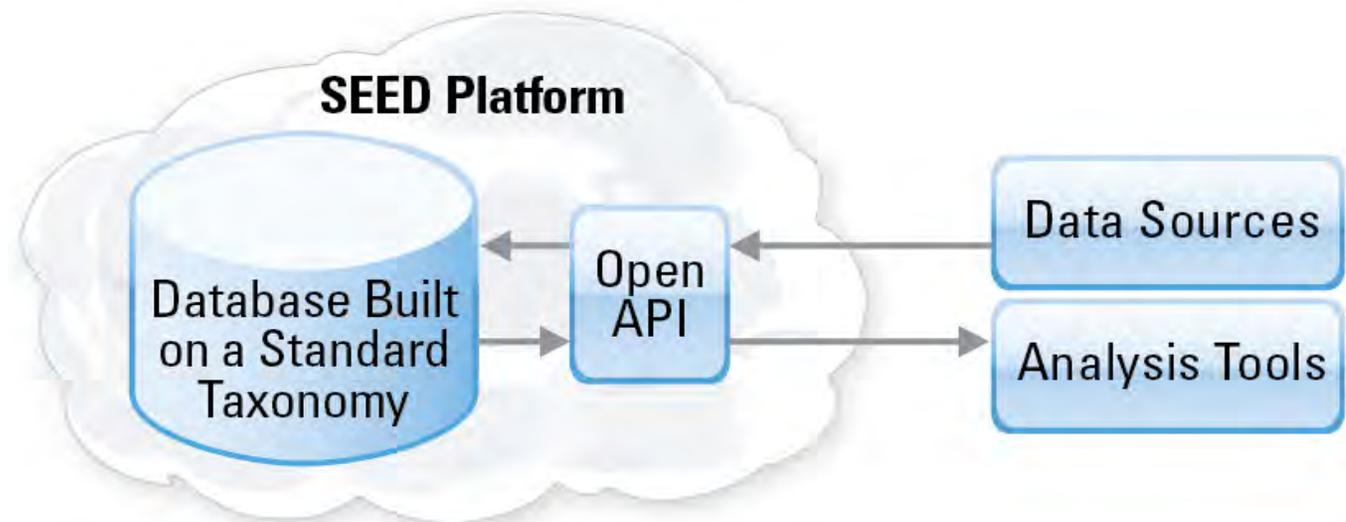
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## Related DOE Initiatives

# 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](http://en.openei.org/wiki/Utility_Access_Map)

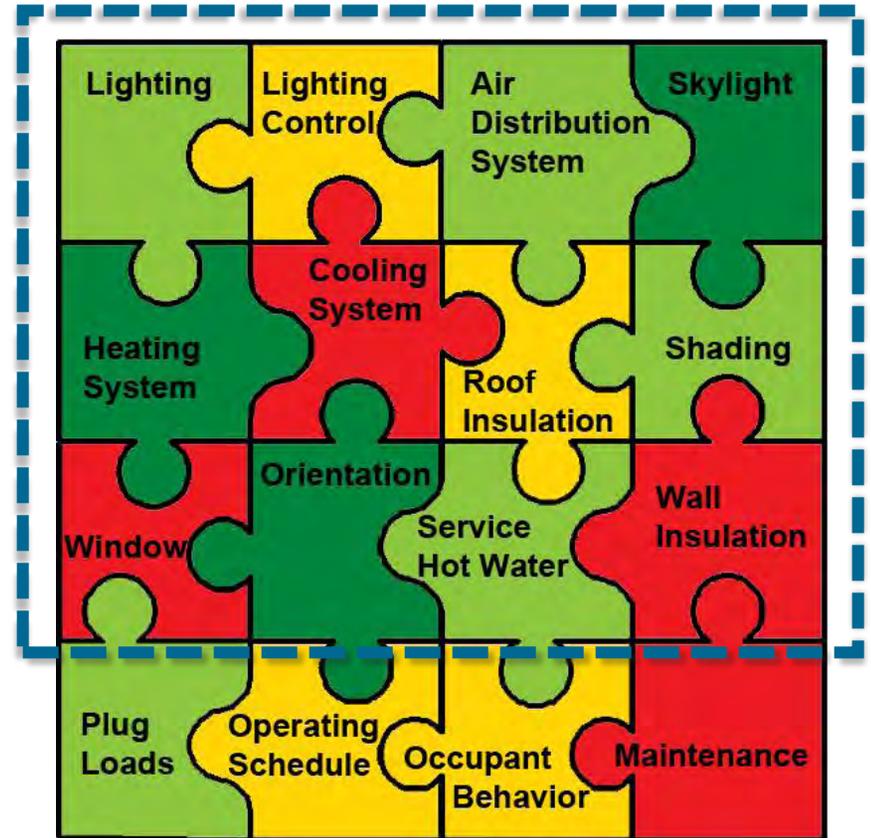


[www.seeaction.energy.gov](http://www.seeaction.energy.gov)

# 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

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Topics to be covered include:

- Strategic Energy Management Programs
- High Performance Leasing Strategies

Dates and times TBD...stay tuned!





# SEE Action

STATE & LOCAL ENERGY EFFICIENCY ACTION NETWORK

## Questions?

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