



# Benchmarking New York

what the results are showing us

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# Benchmarking: What is it and why should we do it?

## What?

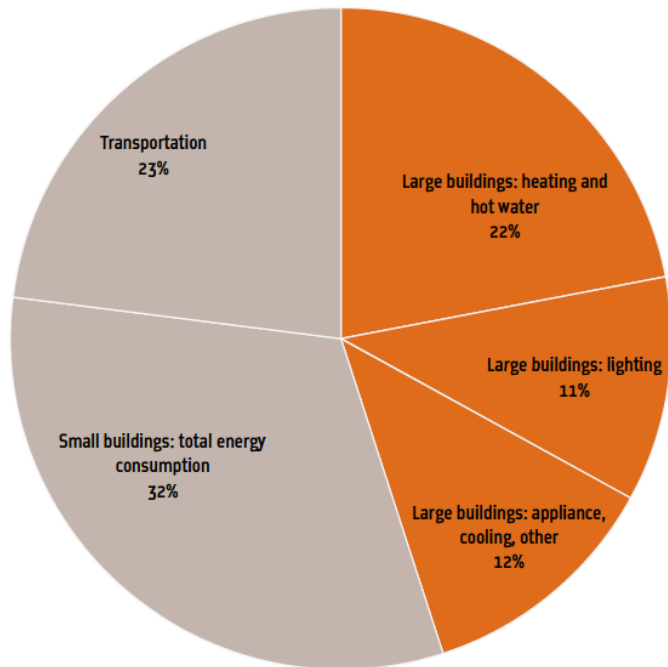
- A way of measuring how efficiently a building uses energy (and water)
- EPA's Portfolio Manager – an online tool
- Input information: Monthly energy use, building attributes, information about use
- Output metrics: Energy use per square foot, a rating, CO2

## Why?

- Pervasive lack of information on how well our buildings are performing
- Even building owners and managers don't know
- The market needs to value energy efficiency
- "Right to Know" for tenants, prospective purchasers, etc.

# New York's benchmarking ordinance impacts 2% of the buildings that represent 50% of the built area

Large buildings account for 45% of New York City's energy use.



Source: NYC Mayor's Office

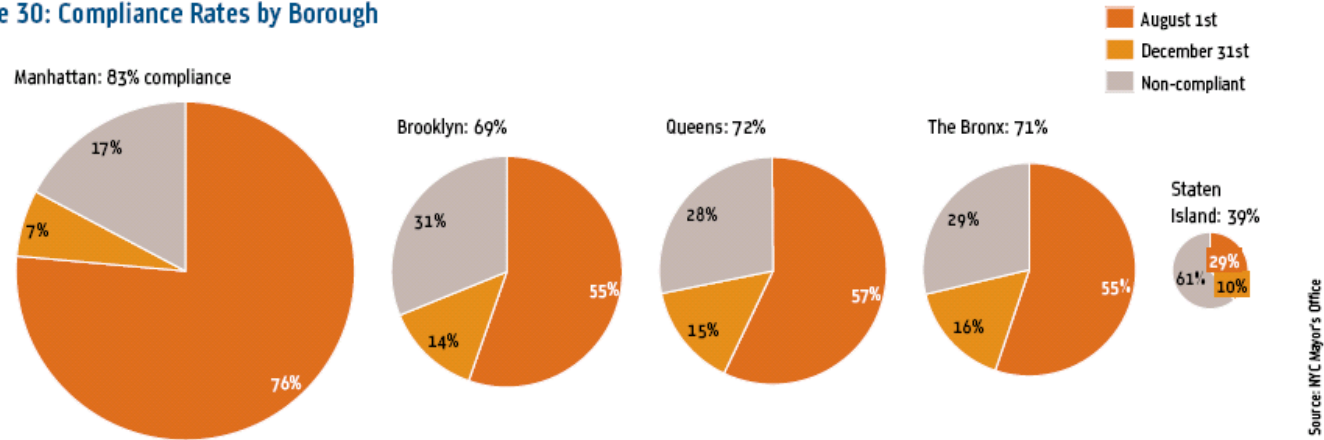
## KEY FEATURES OF ORDINANCE:

- Applies to all types of properties > 50,000 sq. ft.
- Captures 15,300\* properties and 2.6 billion sq. ft.
- Part of the Greener, Greater Buildings Plan, which includes mandatory audits, RCx, commercial tenant metering, & lighting upgrades
- Annual requirement
- Public disclosure
- Requires both energy and water use

\* Includes 12,600 private sector & 2,700 public sector buildings

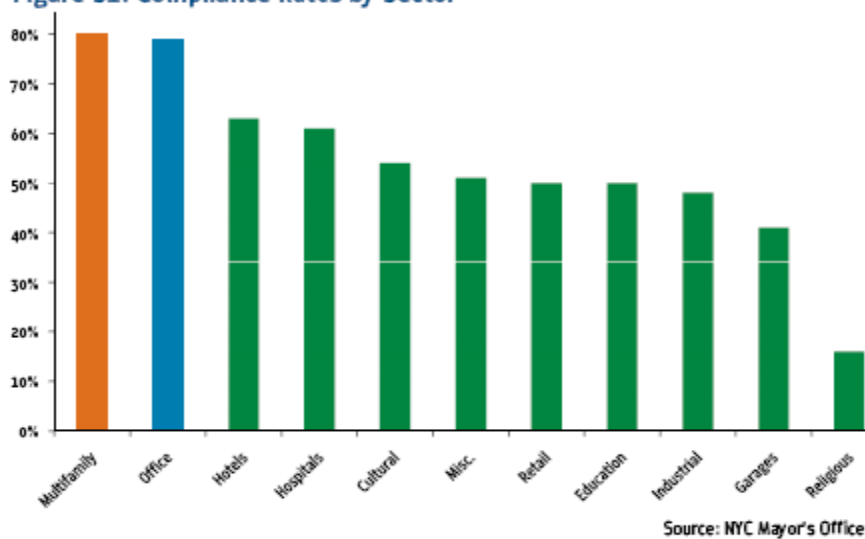
# The first year's compliance rates were very high – 75%

Figure 30: Compliance Rates by Borough



Percentages of compliant properties in each borough; size of each pie chart is proportional to the total number of covered properties in each borough.

Figure 31: Compliance Rates by Sector

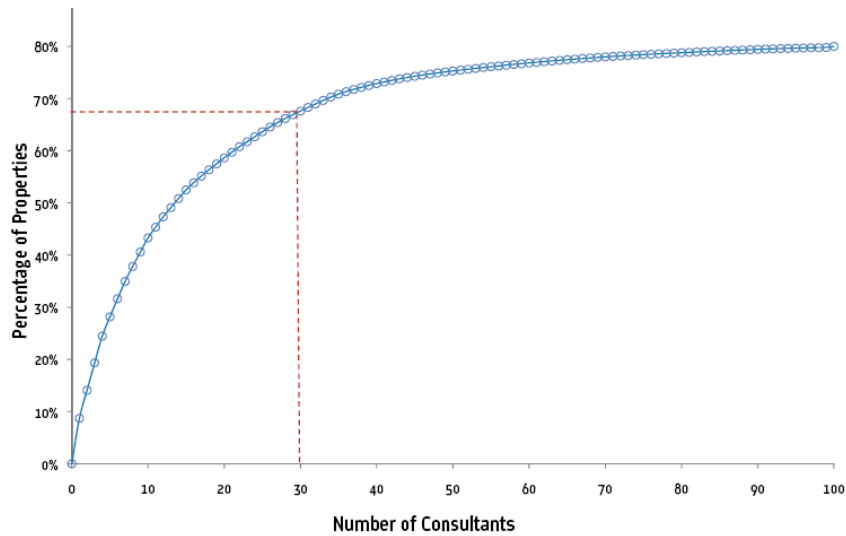


New York now has data on  
**12,000** large properties  
 equaling over **2 Billion** sq ft.

# Consultants played a major role in the benchmarking, which represented dozens of new jobs

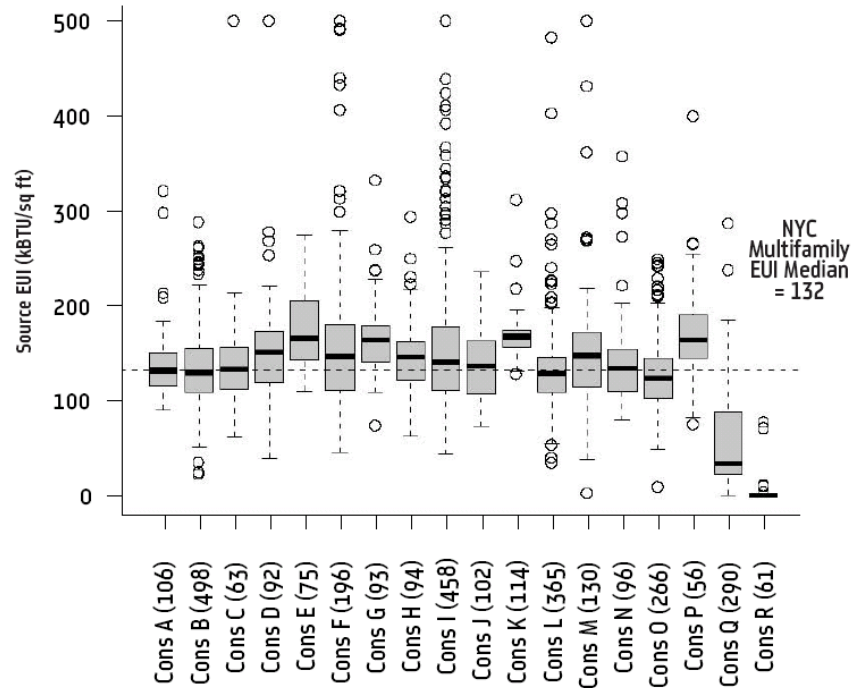
**Figure 36: Percentage of Properties Benchmarked by Consultants**

The circles represent the cumulative percent of properties benchmarked by an increasing number of consultants, arranged such that the consultant with the largest percentage comes first, followed by the next largest, and so on.



Source: NYC Mayor's Office

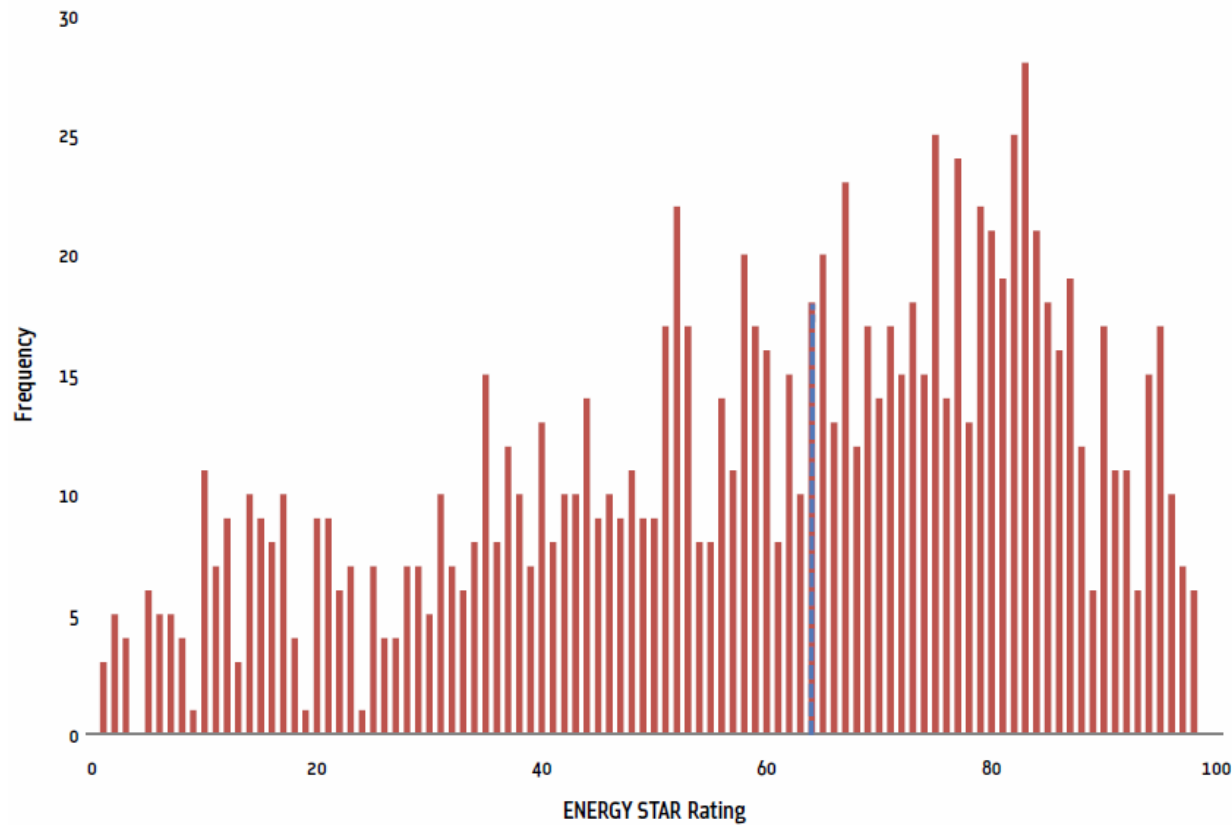
**Figure 37: Distribution of Multifamily EUIs Obtained by 18 Consultants**



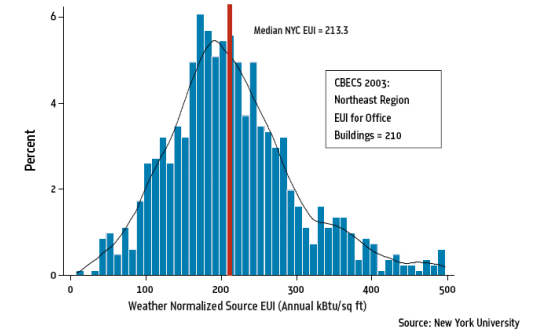
Source: University of Pennsylvania

# New York cities buildings perform significantly above the national average, but are in line with the Northeast

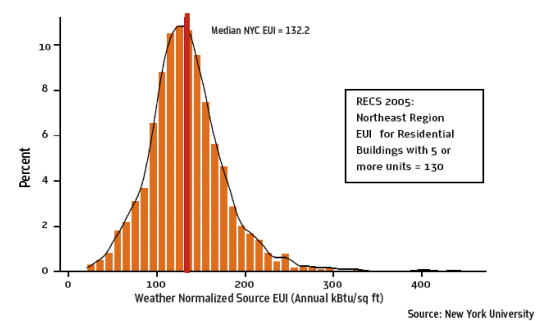
### ENERGY STAR Ratings for Eligible Buildings



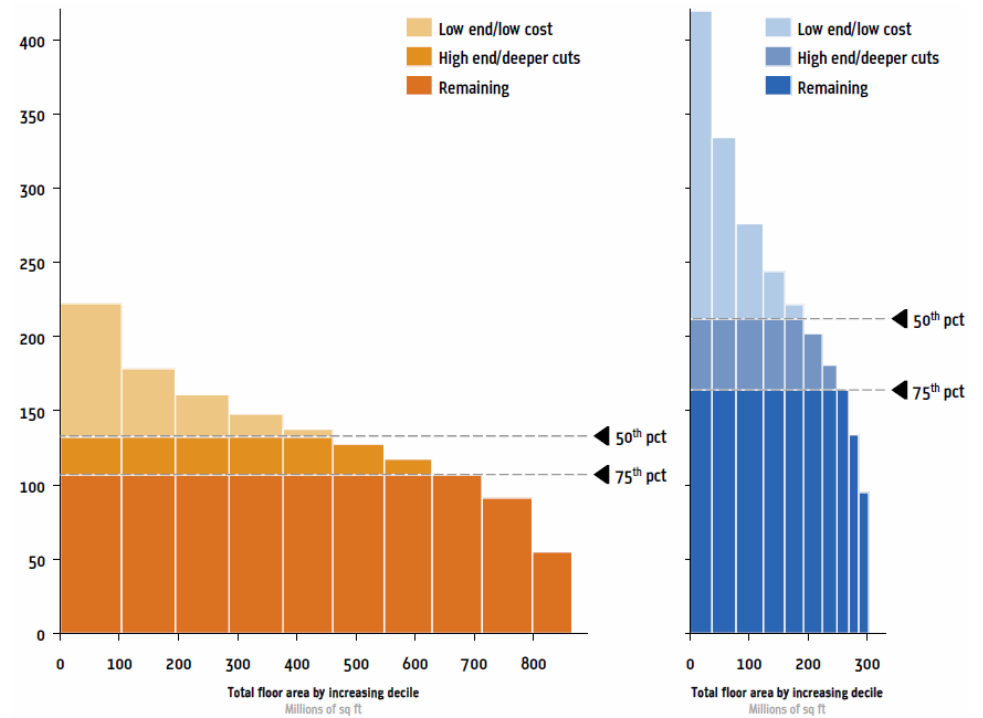
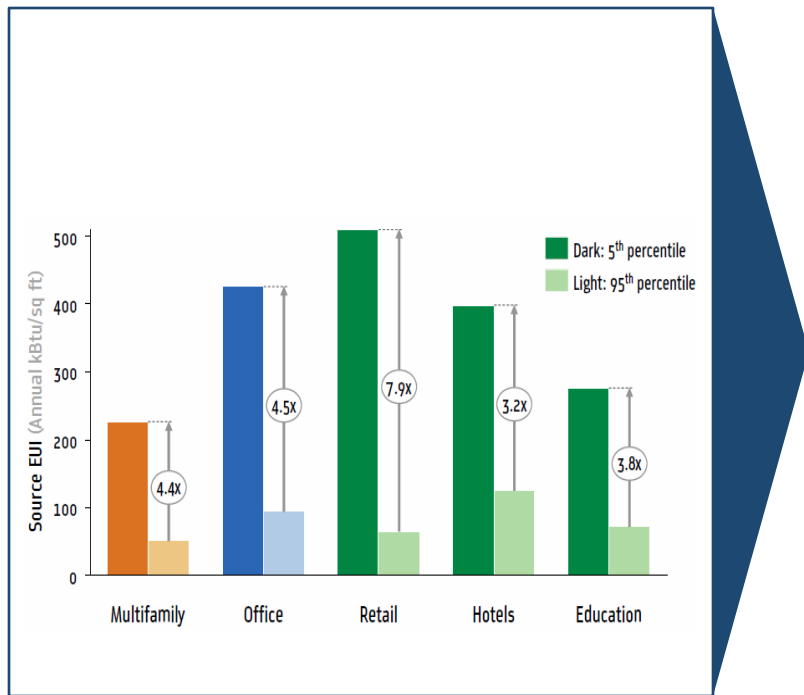
### Figure 18: Histogram of Office Building EUIs



### Figure 17: Histogram of Multifamily EUIs

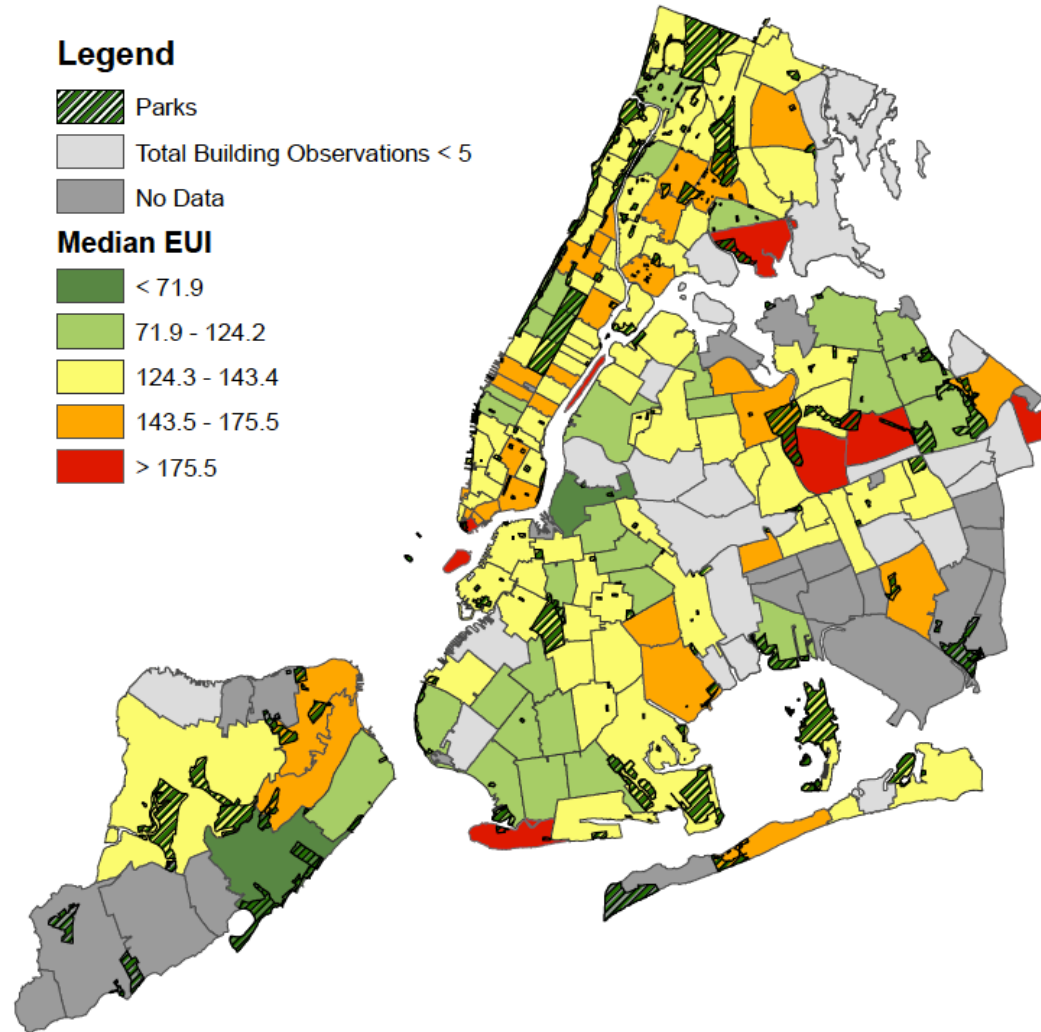


The very wide range of energy use indicates that significant citywide savings will be very cost effective.



We can target the worst performing neighborhoods, which use more than twice the energy per square foot as the best

Figure 20: Median EUI by Zip Code, Multifamily (min. 5 properties per zip code)



Source: New York University



We can see other patterns -- how age impacts energy use, water usage, etc.

Figure 24: Median Energy Use Per Sq Ft by Building Type and Age Group

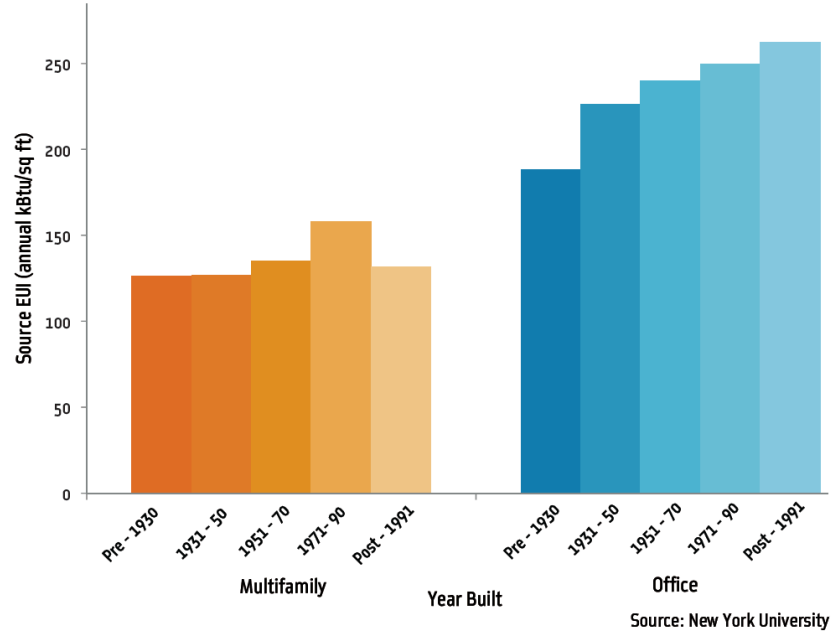
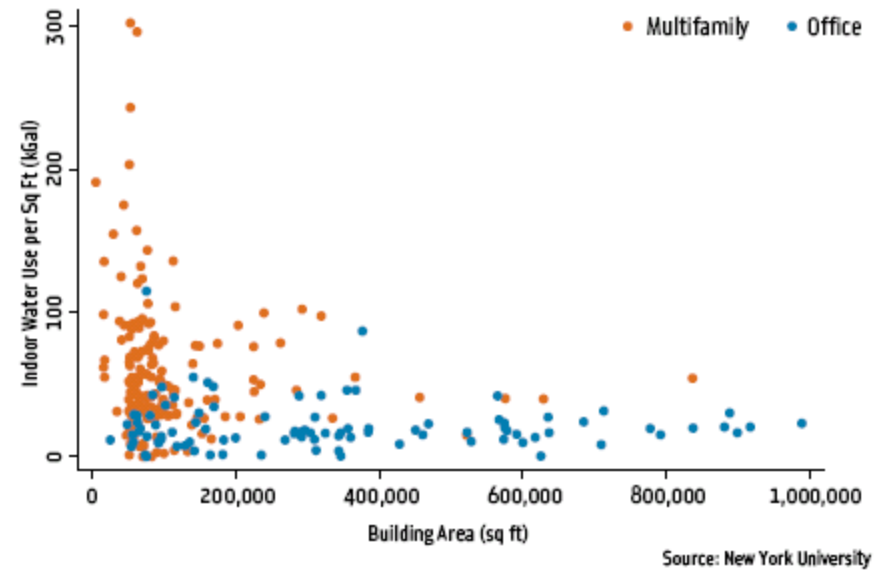


Figure 29: Scatter Plot of Water Usage for Multifamily and Office Buildings



We are at the beginning of a knowledge revolution that is going to happen very quickly ... next steps

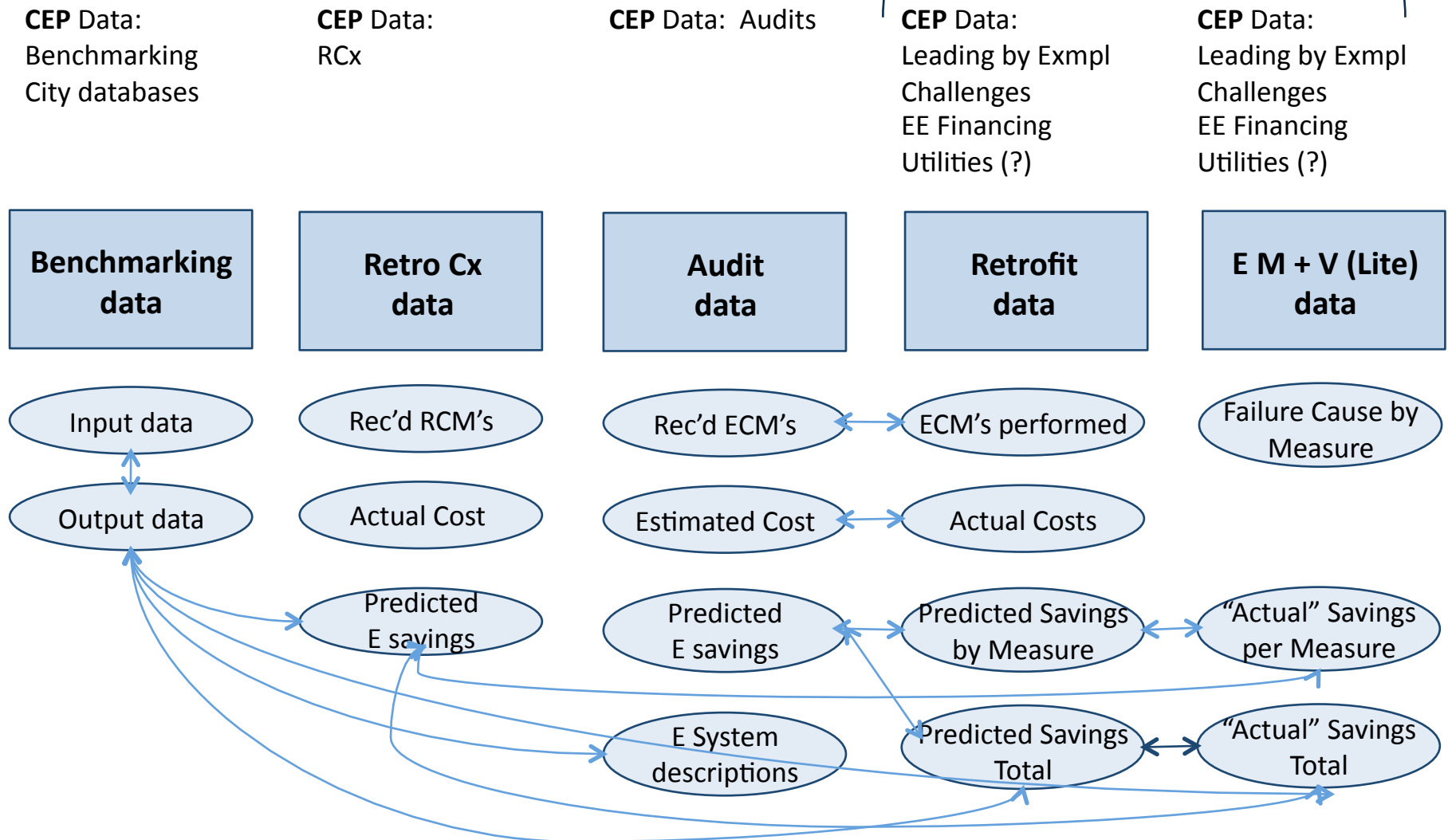
Local Law 87 – Audits and Retro-commissioning Data Collection			
<b>Building Location</b>			
Borough:	Block:	Lot:	
Building Identification Number(s) (BINs):	Address:	Zip Code:	
Number of buildings on the lot:			
If there is more than one building on the lot, identify it:			
<input type="checkbox"/> Entire lot audited and retro-commissioned as one building? <input type="checkbox"/> Each building audited and retro-commissioned individually?			
<b>Building Characteristics</b>			
Gross Floor Area: (ft <sup>2</sup> )	Total Conditioned Area: (ft <sup>2</sup> )	Conditioned Area heated only: (ft <sup>2</sup> )	Conditioned Area cooled only: (ft <sup>2</sup> )
Conditioned Area, heated and cooled: (ft <sup>2</sup> )	Number of conditioned floors:	Conditioned floors Above grade:	Conditioned floors Below grade:
Year of construction:		Year of last major renovation:	
<b>Building Type</b>			
Occupancy class as identified on the Certificate of Occupancy	Multi-family:(%)	Industrial: (%)	Commercial:(%)
Retail: (%)	Multi-tenant? Y / N	Other: (%)	
<b>Metering Configuration</b>			
Check all that apply:	<input type="checkbox"/> Tenants directly metered (Direct metering only) <input type="checkbox"/> Tenants not directly metered or sub-metered (Master meter without sub-metering) <input type="checkbox"/> Tenants sub-metered by building owner (Master meter with sub-metering)		
Other:			
<b>Energy Systems Configuration</b>			
Check is situation applies	<input type="checkbox"/> Shared Energy Systems for Multiple Buildings on a single lot <input type="checkbox"/> Shared Energy Systems for Multiple Buildings on multiple lots		
Check all that apply:	<input type="checkbox"/> Shared electric <input type="checkbox"/> Shared heat <input type="checkbox"/> Shared gas / oil <input type="checkbox"/> Shared chilled water		
<b>Benchmarking</b> (Must be completed by auditor)			
Portfolio Manager Building ID:	Year:	Facility type:	Current rating:
Source Energy Intensity: (kBtu/Sq. Ft.) (EUI)	Greenhouse Gas Emissions: (MtCO <sub>2</sub> e)	Indoor and outdoor water use: (kGal/Sq. Ft.)	

DATA COLLECTION FOR LOCAL LAW 87 COMPLIANCE	
Inventory of Major Energy Consuming and Generating Equipment	
HEATING	
<b>Boilers</b>	
Type: (Check all that apply)	Total: _____
<input type="checkbox"/> Steam Boiler	Total: _____
<input type="checkbox"/> Hot Water Boiler	<input type="checkbox"/> Condensing
<input type="checkbox"/> Other	<input type="checkbox"/> Non-condensing
	Total: _____
Burner Type:	Total: _____
<input type="checkbox"/> Atmospheric Burner	Total: _____
<input type="checkbox"/> Power Burner	Total: _____
<input type="checkbox"/> Sealed Combustion	Total: _____
<input type="checkbox"/> Sealed Combustion Condensing	Total: _____
<input type="checkbox"/> Rotary Cup	Total: _____
Fuel/Energy Source: (Check all that apply)	
<input type="checkbox"/> #2 Oil	
<input type="checkbox"/> #4 Oil	
<input type="checkbox"/> #6 Oil	
<input type="checkbox"/> Interruptible Gas	
<input type="checkbox"/> Firm Gas	
<input type="checkbox"/> Electric	
<input type="checkbox"/> Other	
Size/Capacity (input): _____ thousand Btu/hour	
Size/Capacity (output): _____ horsepower	
Year of manufacture:	Boiler: _____
	Burner: _____

This information on building systems will enable us to make much more sense of the bench-marking scores

# We are at the beginning of a knowledge revolution that is going to happen very quickly ... next steps

Could be required by CEP programs



Note that arrows show types of questions that can start to be asked – such as the relationship of predicted costs or savings to actual. The arrows show some of the main questions that can be answered by the data, but they are not exhaustive.