



**The Daylight  
Savings Company**

## ***NYC LL84 and LL87 Purpose, Requirements, and Experiences***



**THE COOPER UNION**

Retraining  
Program for  
Immigrant  
Engineers

April 3<sup>rd</sup>, 2016

(800) 337-2192 [www.daylightsavings.us](http://www.daylightsavings.us)



# The Daylight Savings Company

## Agenda

- Overview of The Daylight Savings Company
- Background of LL87 and LL84 Compliance.
- The LL87 process
  - Overview of the required ASHRAE Level II Audit and Retro-commissioning (RCx)
  - How the audit and RCx are beneficial to the facility
  - How to complete the LL87 compliance
- Resources for assistance and funding
  - NYSERDA
  - Con Edison's C & I Program
- Q & A



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## Our Company

- The Daylight Savings Company  
Award winning energy efficiency engineering, **since 1991.**
- We provide services for **compliance needs**  
NYC LL87, NYC LL84, HUD, Enterprise Green Communities, eQUEST Modeling
- We provide **NYSERDA funded services**  
New York State energy and Research Development Authority  
Small Commercial Energy Efficiency Program, FlexTech, MPP
- We provide **general energy services**  
Preliminary Analysis, Investment Grade Audits, RCx
- Our Markets: Commercial, Industrial, Multifamily, Healthcare, Educational, Manufacturing
- **Existing Buildings AND New Construction**



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## Qualifications

- Providing energy efficiency services for 25 years
  - Completed over 10,000 studies
- NYSERDA
  - Exclusive energy auditor for small business and NFP
  - FlexTech Contractor
- NYSERDA Multifamily Partner
  - most accurate energy savings projections
- NJ P4P Partner
- Con Edison's Commercial & Industrial (C & I) Partner
- Provided services for nationwide locations and federal government campuses



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## The Daylight Savings Company Team

- Experienced auditors with CEM, MFBA and BPI certification
- Professional Engineers (PE)
- LEED-AP
- Existing Building Commissioning Professionals (EBCP)



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## One New York: The Plan for a Strong and Just City

A vision for New York City's fifth century around principles of growth, equity, sustainability, and resiliency.





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## One New York: The Plan for a Strong and Just City

**Growth:** create more affordable housing, foster job growth, create high-speed wireless networks, and invest in transportation.

**Equity:** offer well-paying jobs and opportunity, raise the minimum wage, support education, ensure access to physical and mental healthcare services. address hazards in homes, expand help for victims of domestic violence.





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## One New York: The Plan for a Strong and Just City

**Sustainable:** expanding from an initial focus on buildings to include energy supply, transportation, solid waste, and remediate contaminated land. (PlaNYC)

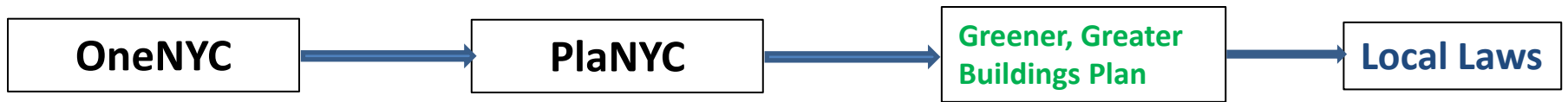
**Resilience:** prepare for response to adverse events to deliver basic functions and services to all residents, upgrade private and public buildings to be more energy efficient and resilient to the impacts of climate change, adapt infrastructure (transportation, telecommunications, water, energy) to withstand severe weather events and strengthen coastal defenses against flooding and sea level rise, strengthen homes, businesses, community-based organizations, and public services to reduce the impacts of disruptive events and promote faster recovery.







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The Mayor's Office of Sustainability and the Mayor's Office of Recovery and Resiliency oversee and implement the sustainability and resiliency initiatives in One New York with significant progress in just a few years:

- The cleanest air in 50 years
- 950,000 trees and six million square feet of reflective rooftop added to our urban landscape
- Building codes upgraded to prepare for floods, wind, and extreme weather
- 19% reduction in carbon emissions since 2005, on track to reaching an 80% reduction by 2050





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The city's square footage is highly concentrated in less than two percent of its properties: 15,000 properties over 50,000 square feet account for almost half of New York City's square footage and total energy use.

Larger buildings tend to have more sophisticated management and more financial and technical resources than smaller buildings so New York City enacted the **Greener, Greater Buildings Plan (GGBP)** to target energy efficiency in these large existing buildings.

GGBP is designed to ensure that information about energy is provided to decision-makers and that the most cost-effective energy efficiency measures are pursued.





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GGBP is four laws:

Local Law 84: Benchmarking: annual requirement to benchmark energy and water use

Local Law 85: NYC Energy Conservation Code (local energy code)

Local Law 87: Energy Audits & Retro-commissioning: conduct an energy audit and perform retro-commissioning once every 10 years

Local Law 88: Lighting & Sub-metering: by 2025, the lighting in non-residential spaces must be upgraded to meet code and large commercial tenants must be provided with sub-meters





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## Greener, Greater Buildings Plan

What you have to do:	What is the value to you:
LL84 Energy and Water Use Benchmarking	

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## Benchmarking Energy and Water Use Local Law 84

- Benchmarking results must be reported no later than **May 1st** every year.
- Requires use of the EPA's Portfolio Manager.
- Water benchmarking is required if the building was equipped with automatic meter reading (AMR) equipment by the DEP for previous year.
- Owners must report results to the Department of Finance.



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OMB No. 2060-0347

## Local Law 84

- Fine of \$500 per quarter for non-compliance
- Con Ed data for entire building is available
- Data / results are published
- Program can be tricky. Self-reporting is not recommended.



### STATEMENT OF ENERGY PERFORMANCE Sample-Multifamily

Building ID: 3095886  
For 12-month Period Ending: December 31, 2010<sup>1</sup>  
Date SEP becomes ineligible: N/A

Date SEP Generated: April 05, 2012

**Facility**  
Sample-Multifamily  
123 Main Street  
New York, NY 10001

**Facility Owner**  
N/A

**Primary Contact for this Facility**  
N/A

**Year Built:** 1950  
**Gross Floor Area (ft<sup>2</sup>):** 196,000

**Energy Performance Rating<sup>2</sup> (1-100):** N/A

**Site Energy Use Summary<sup>3</sup>**

Electricity - Grid Purchase(kBtu)	2,927,155
Fuel Oil (No. 5 and No. 6) (kBtu)	10,226,898
Natural Gas (kBtu) <sup>4</sup>	319,288
<b>Total Energy (kBtu)</b>	<b>13,473,341</b>

**Energy Intensity<sup>4</sup>**

Site (kBtu/ft <sup>2</sup> /yr)	69
Source (kBtu/ft <sup>2</sup> /yr)	104

**Emissions (based on site energy use)**  
Greenhouse Gas Emissions (MtCO<sub>2</sub>e/year)

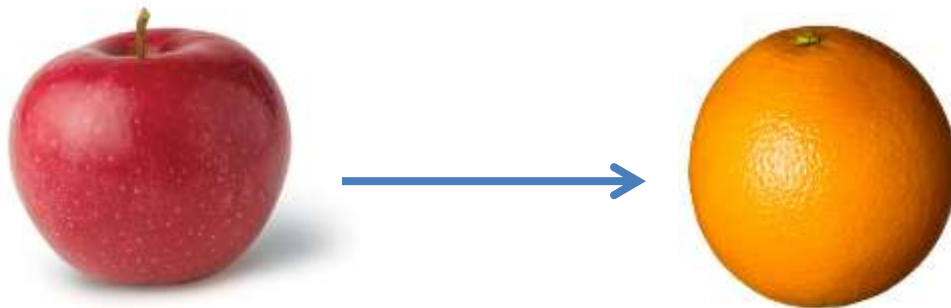
1,102





***Does it benefit you to compare to other buildings?***

- Complicated (many variables between buildings)



***Use to compare to prior years' data.***

- Provides weather-corrected comparisons.
- Verifies savings from implemented energy conservation measures.
- Identifies changes in annual energy use.
- Identifies “free” energy conservation measures that occurred “by accident”.





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## Greener, Greater Buildings Plan

What you have to do:	What is the value to you:
LL84 Energy and Water Use Benchmarking	<ul style="list-style-type: none"><li>• Anomaly correction.</li><li>• Continuous reduction of energy use due to annual evaluation.</li></ul>



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## Greener, Greater Buildings Plan

What you have to do:	What is the value to you:
LL84 Energy and Water Use Benchmarking	<ul style="list-style-type: none"><li>• Anomaly correction.</li><li>• Continuous reduction of energy use due to annual evaluation.</li></ul>
LL87 Energy Audit	



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## **NYC Local Law 87**

*When is it due?*

<b>Last digit of the Block #:</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
<b>Year Due:</b>	2020	2021	2022	2013	2014	2015	2016	2017	2018	2019

Fines: \$3,000 in the first year and \$5,000 each year thereafter.

All results must be entered into a spreadsheet tool and uploaded to the City.

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## Energy Audit

- The level of detail is mostly prescribed. The **required audit must be an ASHRAE Level II.** (ASHRAE defines audits as Level I, Level II, or Level III.)
- Building **owners DO NOT have to install** the energy conservation measures.
- Used to prioritize capital projects:
  - Keep projects “shovel ready” in case emergency situations dictate an immediate installation (e.g. boiler failure).





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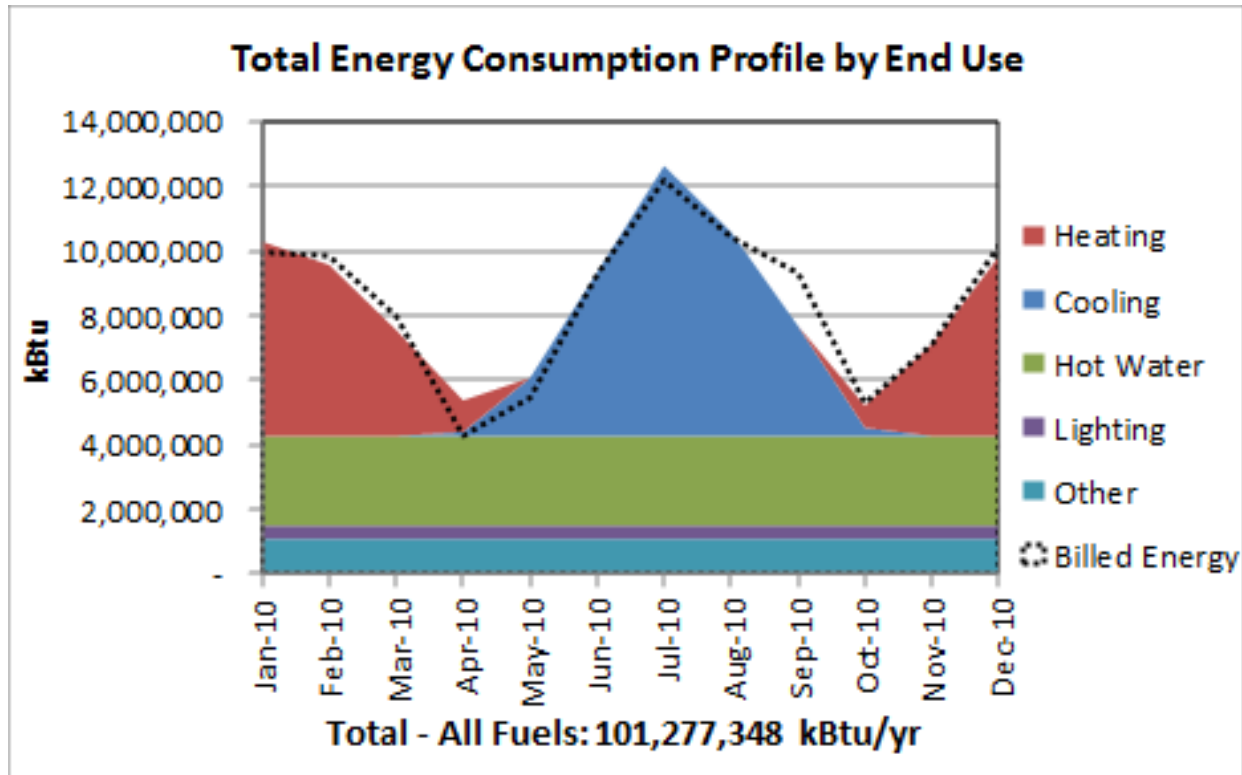
*Prioritize capital projects.*

Description	kW Saved	Annual kWh Saved	Annual MMBTU Saved	Annual \$ Savings	Installed Cost (*)	Pay-back (yrs)	% of Annual Energy Cost	Life	SIR	Life Cycle Savings
Upgrade the Lighting	30.5	171,015	(450.4)	\$17,936	\$101,102	5.6	1.4%	10	1.5	\$50,344
Install Lighting Controls		42,863	(44.0)	\$4,926	\$16,760	3.4	0.3%	10	2.5	\$24,838
Upgrade The Air Conditioning	44.1	107,181		\$27,492	\$138,700	5.0	1.6%	10	1.7	\$93,437
Install Variable-Speed Drives		146,634		\$19,062	\$62,330	3.3	1.1%	15	3.6	\$161,974
Install Pipe Insulation			615.8	\$9,040	\$30,000	3.3	0.5%	15	3.5	\$76,374
Install Pneumatic Zone Controls		90,342		\$11,744	\$23,550	2.0	0.7%	10	4.2	\$75,614
Install Stack Heat Reclaim			1,000.9	\$14,695	\$110,000	7.5	0.9%	10	1.1	\$14,082
Install De-Centralized Boilers			5,058.0	\$74,254	\$1,147,875	15.5	4.3%	25	1.1	\$116,773
<b>Totals</b>	<b>74.6</b>	<b>558,035</b>	<b>6,180.4</b>	<b>\$179,149</b>	<b>\$1,630,317</b>	<b>9.1</b>	<b>10.8%</b>	<b>21</b>	<b>1.7</b>	<b>\$1,064,607</b>



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Used to understand your utility use.





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## Greener, Greater Buildings Plan

What you have to do:	What is the value to you:
LL84 Energy and Water Use Benchmarking	<ul style="list-style-type: none"><li>• Anomaly correction.</li><li>• Continuous reduction of energy use due to annual evaluation.</li></ul>
LL87 Energy Audit	<ul style="list-style-type: none"><li>• Capital projects plan.</li><li>• Understand energy use.</li></ul>
LL87 RCx	



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## What is RCx?

Retro-Commissioning of Existing Buildings (RCX-EB)

A process of evaluating, testing, adjusting and correcting building systems to:

1. Meet the current facility requirements;
2. Improve comfort;
3. Improve environmental quality;
4. Optimize energy conservation.

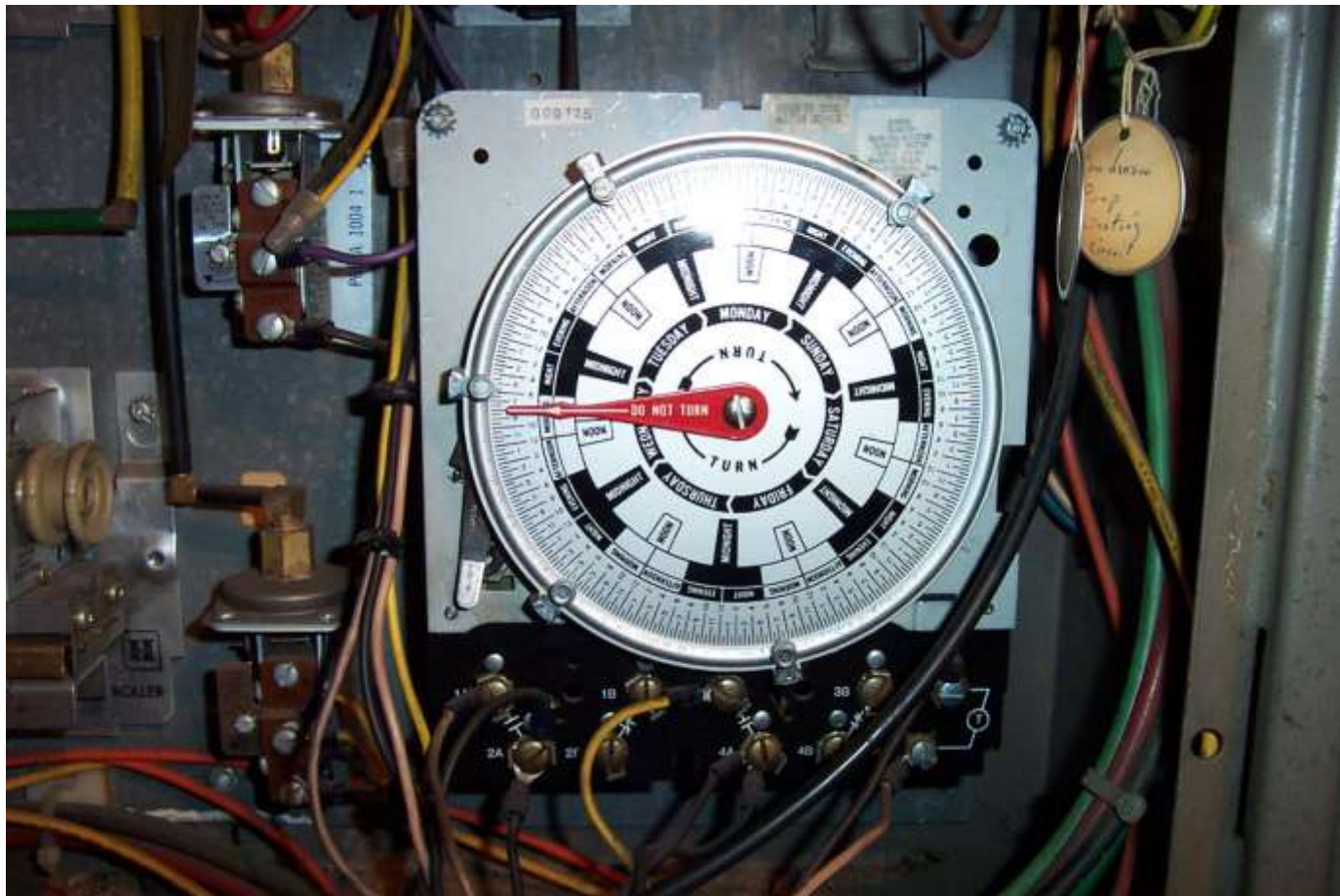
**For NYC this only applies to OWNER maintained base building systems:  
HVAC, lights, motors, conveyance, water, envelope.**





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What is RCx?





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## What is RCx? (a clarification of the definition)

Retro-Commissioning of Existing Buildings (RCX-EB)

A process of evaluating, testing, adjusting and correcting building systems so you:

- Don't spend unnecessary money on energy costs;
- Reduce your PM costs;
- Prolong your building's equipment life.



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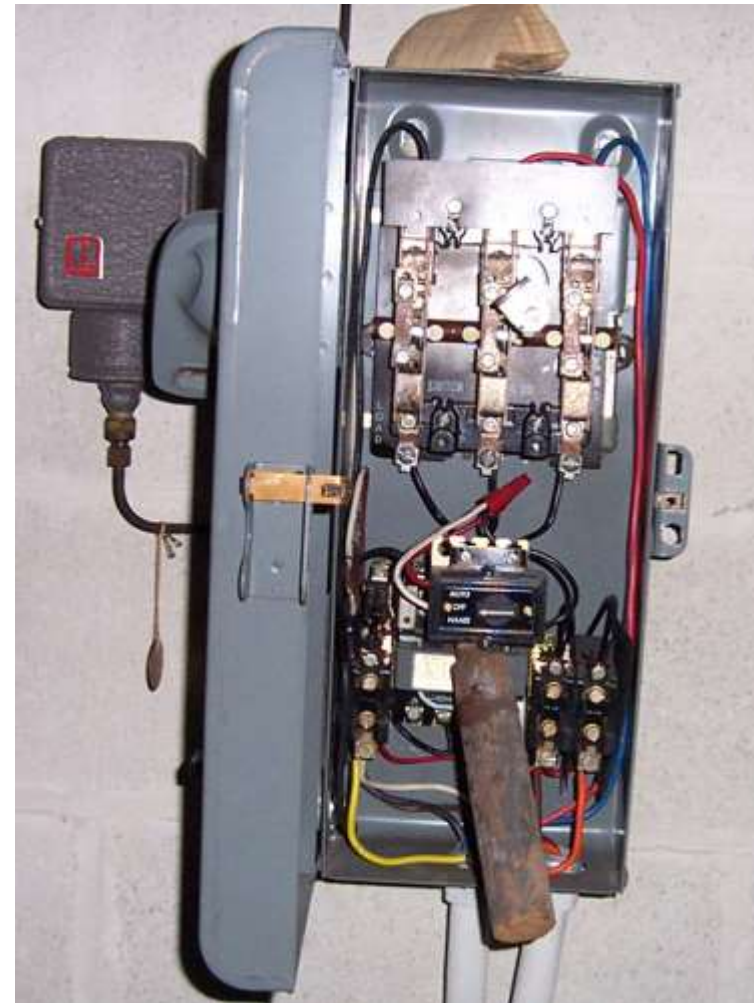




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## What is RCx?

- Typical measures:
  - AHU timeclock/EMS control re-connect.
  - AHU OA damper actuator replace.
  - Filter replace (or “place”).
  - Belt replace (or “place”).
  - Turn exhaust fan back on.
  - Add missing “off” pins to timeclocks.
  - Repair ductwork hole.
  - Repair/replace leaking vibration dampener.
  - Program/re-program the building controls.
  - Remove broomstick from the motor controller.





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What is RCx?

**Building owners MUST correct all identified deficiencies.**



## Greener, Greater Buildings Plan

What you have to do:	What is the value to you:
LL84 Energy and Water Use Benchmarking	<ul style="list-style-type: none"><li>• Anomaly correction.</li><li>• Continuous reduction of energy use due to annual evaluation.</li></ul>
LL87 Energy Audit	<ul style="list-style-type: none"><li>• Capital projects plan.</li><li>• Understand energy use.</li></ul>
LL87 RCx	<ul style="list-style-type: none"><li>• Fix your building. Reduce equipment operating cost.</li></ul>



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LL87 is mandatory, but there are odd cases (page 1 of 2):

Industrial **process equipment is not part of the law**. This makes compliance difficult when 90% of the energy in the building is used for process.

The law implies that most buildings would have a sophisticated building management system (BMS) so that trends could be used for required testing. In practice, there are very few buildings with a sophisticated BMS which leads to a lot of physical metering and testing.





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LL87 is mandatory, but there are odd cases:

ASHRAE Level II definitions are for a whole building analysis. LL87 is for “base building systems” which excludes tenant maintained HVAC. Therefore, the law contradicts itself in definitions.

Some buildings have almost no “base building systems” so the effort at the site is grossly disproportional to the reporting requirements. Whereas **steam traps can add an extremely expensive cost of the compliance.**



## How to complete LL87:

What to do:	Why you should do it:
<b>Start early</b>	Two seasons of testing are required and there needs to be time for corrections and retesting. Q1-Q2 is the prime schedule.
<b>Use an <b>experienced company</b></b>	The work will be examined for compliance for ten years. Compliance work is not conducive to “lowest bidder” solicitations. Loosely interpreting the law and rules to cut costs is bad business. A company that has an ongoing relationship with the DOB regarding LL87 will ensure a higher level of compliance durability.
<b>Prepare for LL87</b>	More preparation will reduce costs and the time needed for the RCx process: <ul style="list-style-type: none"><li>• assemble maintenance logs, records and plans,</li><li>• locate equipment lists, operation manuals and sequences,</li><li>• tune up prior to the site visit, especially items requiring sampling.</li></ul>
<b>Expedite the RCx process</b>	A streamlined RCx process will reduce costs and time burdens: <ul style="list-style-type: none"><li>• correct deficiencies in a responsive manner,</li><li>• manage contractors so they coordinate across disciplines.</li></ul>
<b>Plan extra time</b>	Certain deficiencies require more time to fix. If you are to use a funding source, the entity will need processing time.



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# Funding Opportunities

- NYSERDA
  - FlexTech
  - Multifamily Performance Program (MPP)
- Con Edison's Commercial & Industrial (C & I) Program



## Questions and answers:

1. Why did NYC enact LL84 and LL87?
2. Why did NYC target larger buildings?
3. What is required to be compliant with LL84?
4. What two activities are required to be compliant with the LL87?
5. ASHRAE defines energy audits as Level I, Level II or Level III. Which ASHRAE energy audit is required for NYC compliance?
6. Does the building owner have to install the energy conservation measures identified in the energy audit?
7. Is industrial process equipment included as part of LL87?
8. Does the law require retro-commissioning (RCx) of tenant maintained equipment?
9. Does the building owner have to repair the deficiencies identified during RCx?
10. What are the fines for non-compliance with LL84 and LL87?