

# NYC's Ambitious New Energy Code – How Does It Stack Up?

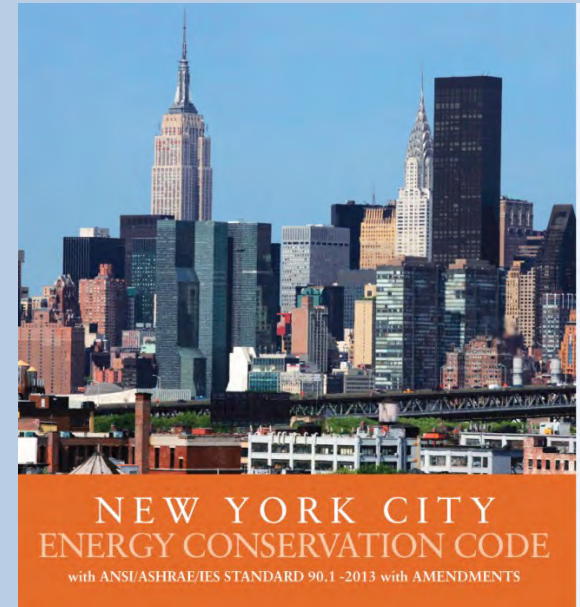
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# 2016 NYC Energy Code

The 2016 NYC Energy Code went into effect on October 3:

1. How was it created?
2. Why does it matter?
3. How has it changed?



# New DOE Study

Estimated potential savings due to energy codes (nationally, between 2010 and 2040):

1. \$126 billion in energy cost savings
2. 841 MMT of avoided CO<sub>2</sub> emissions
3. 12.82 quads of primary energy

*The Impact of Building Energy Codes:*

<https://www.energycodes.gov/about/results>

# 177 MILLION CARS



Source: Wikipedia Commons-  
photo by Robert Jack



# 245 COAL-FIRED POWER PLANTS

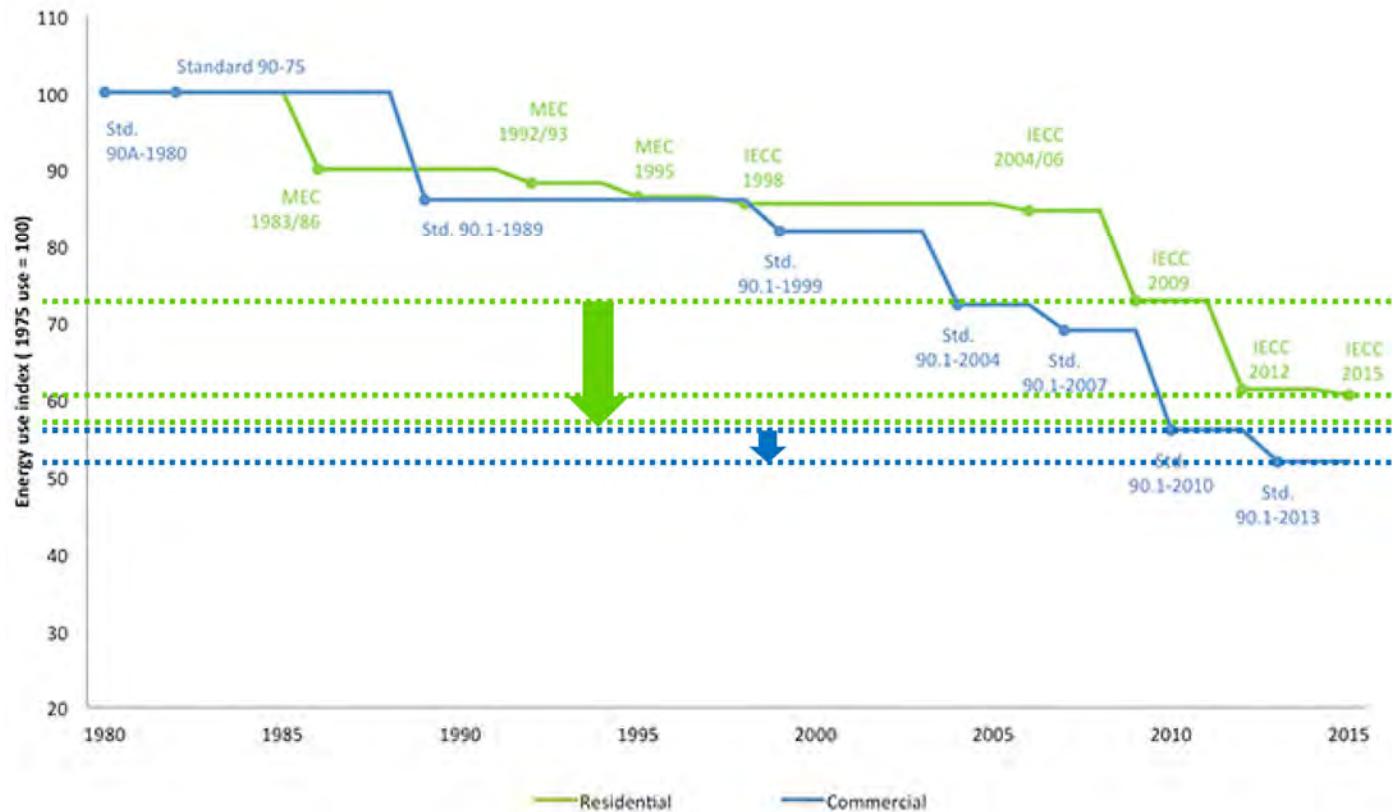
Source: Wikipedia Commons- photo by Pibwl



# CO<sub>2</sub> EMISSIONS OF 89 MILLION HOMES

Source: Wikipedia Commons- photo by Spyder\_Monkey

# Overview of NYCECC



Source: ACEEE

# DOB Program Summary

Codes are only as good as the enforcement:

1. 2014- DOB launched plan examinations for New Building and major alteration applications
2. 2015-2016- DOB launched a study on plan examination for minor alteration applications
3. Future efforts- implement plan examination of alteration projects and increase in-field audits



# Summary and Impact of Changes

State has adopted their update to the IECC 2015 and ASHRAE 90.1 2013:

1. 2014 NYCECC commercial code is based on IECC 2012 and ASHRAE 90.1 2010. New code will result in **8.5% more energy savings**.
2. 2014 NYCECC residential code is based on IECC 2009. New code will result in about **23.5% more energy savings**, including the increased stringency in the NYCECC.
3. Effective date is October 3, 2016.

# 2016 NYCECC: Amendments to 2015 IECC/ASHRAE 90.1-2013

# Building Envelope – Adopt the Climate Zone 6 prescriptive requirements for NYC

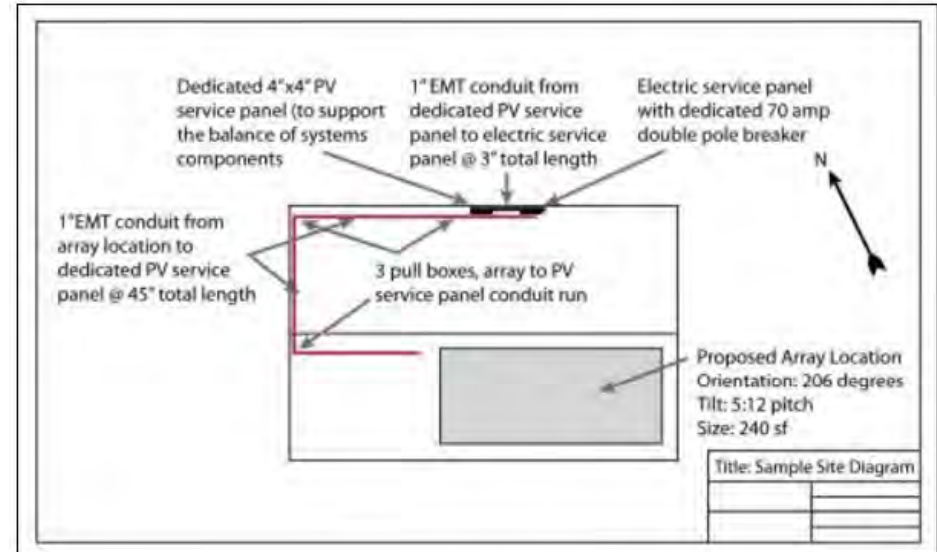
- **Adopt Climate Zone 6 requirements for NYC**- increases the minimum performance of the envelope with more stringent insulation and window performance requirements that are required in upstate NY
  - Has been analyzed for cost effectiveness by members of the Code Committee and by PNNL
  - Requirements will be in place for upstate and large portions of US, showing that products and construction methods are readily available
  - Will improve total performance by approximately 5%



Source: PNNL – Building America Solutions Center

# Mandatory “Solar Ready” Provisions

- Detached One- And Two-Family, Multiple Single-Family Dwellings (Townhouses)
  - This appendix outlines the requirements for solar-ready provisions.
  - Applies to 1- and 2-family homes, or townhomes only, **no multifamily**
  - Applies to roofs with a min. square footage of 600 Sq. Ft. with orientation between 110 degrees and 270 degrees of true north
    - Exempts buildings that are shaded **more than 50% of the time (modified based on committee feedback)**



Source: PNNL – Building America Solutions Center

# Envelope – Through-the-wall Mechanical Equipment



Interruptions of the opaque wall assembly thermally act more like windows than opaque wall

# Envelope – Air Barrier

- Major change- **Air barrier testing (ECC C402.5.1.3 and ASHRAE 5.4.3.5)**
  - Buildings 25,000 sq. ft. and greater, but less than 50,000 sq. ft. and less than or equal to 75' in height must show compliance through testing in accordance with ASTM E779 (whole-building leakage rate of 0.4 cfm/ft<sup>2</sup> or less).
  - Buildings 50,000 sq. ft. and greater must test or inspect each type of unique air barrier joint or seam for continuity and defects, as per an **Air Barrier Continuity Plan**, or may show compliance through testing in accordance with ASTM E779.

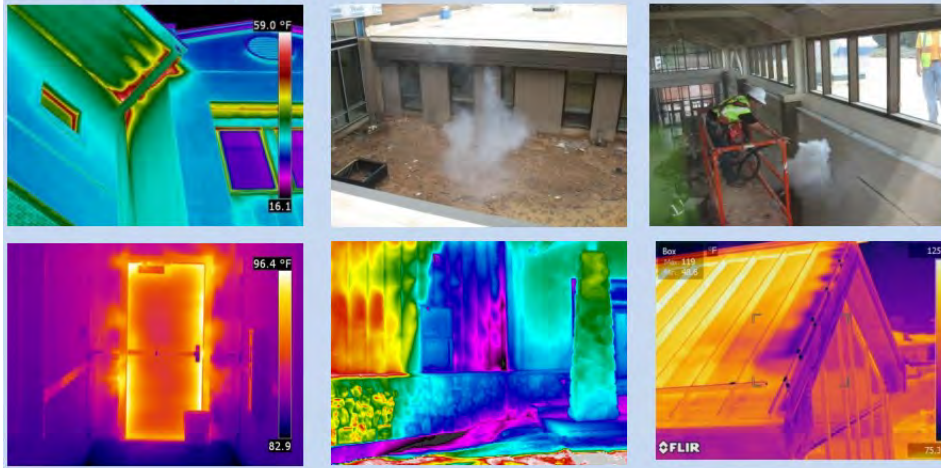


# Envelope – Air Barrier

- Major change- **Air barrier testing (ECC C402.5.1.3 and ASHRAE 5.4.3.5)**

## Air Tightness Testing Diagnostics

- ASTM E1186: Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems



**Photo No. 1**  
**Exterior View during Air Infiltration Test**

# HVAC – Energy recovery ventilation systems



Image: Google Earth 73<sup>rd</sup> Street & 1<sup>st</sup> Ave, 8/24/16



# HVAC – Guest room controls

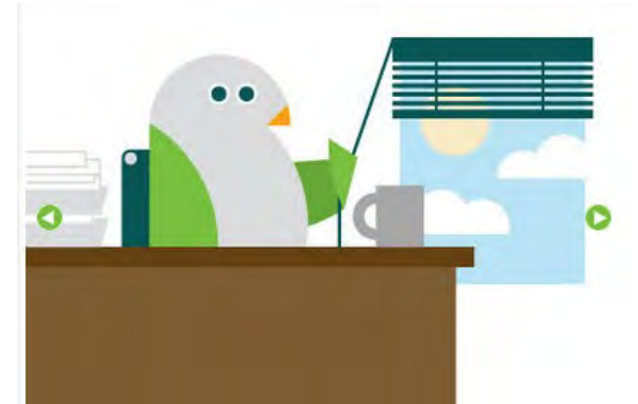
- Mandatory - Hotels with  $\geq 50$  guestrooms
- Captive key card system, OR
- Automatic HVAC setback controls
  - +/- 4F when unoccupied
  - 80F/60F when unrented



Wikipedia Commons, photo by Loftcwyouth

# NYCECC Lighting Amendments

- Exterior buildings alterations trigger LPD and controls requirements when replacing  $\geq 20\%$  connected lighting load or luminaires in space
- **No exception** for lighting within dwelling units!!!
  - 75% of fixtures shall be fitted for and contain only high-efficacy lamps
- Reduced LPD by about 10%:
  - **Enclosed office- 1.0**
  - **Open plan offices- 0.9**
  - **Sales area- 1.30**
- Occupancy sensors required in open plan offices



Source:  
<http://www.nyc.gov/html/greenyc/html/tips/work.shtml>

# C405.6.1 Submetering Requirements

- New buildings:  $\geq 25,000$  SQFT
  - Tenant spaces:  $\geq 5,000$  SQFT
- Not applicable to alterations



Photo courtesy of @iStockphoto/epantha  
Retrieved from [www.energy.gov](http://www.energy.gov)

# Energy Modeling – Appendix G

- Energy Modeling submitting on **EN1 Form**
- Performance Rating Method – Appendix G, adopted [addendum bm](#)
  - Permanent baseline established at ASHRAE 90.1-2004 version
  - Sets approximately 45% improvement target
  - No longer % improvement over baseline – compliance indicated by Performance Cost Index
  - Compliance indicated by  $PCI \geq PCI_t$

$$PCI_t = \frac{\text{Unregulated (\$)} + [BPF * \text{Regulated (\$)}]}{\text{Total Baseline (\$)}}$$

$$PCI = \frac{\text{Total Proposed (\$)}}{\text{Total Baseline (\$)}}$$

Building Area Type	Building Performance Factor (CZ 4A)
Multifamily	0.78
Healthcare/hospital	0.57
Hotel/motel	0.62
Office	0.58
Restaurant	0.58
Retail	0.55
School	0.49
Warehouse	0.58
All others	0.58

# The Future of the NYC Energy Code

# NYC Sustainability Plan

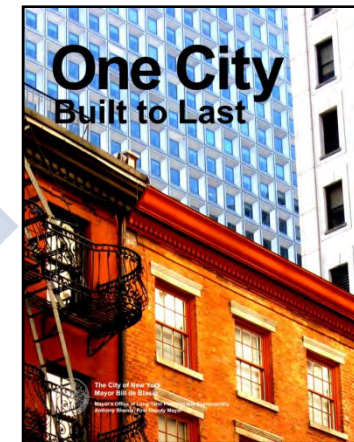
PlaNYC

- 30% x 2030



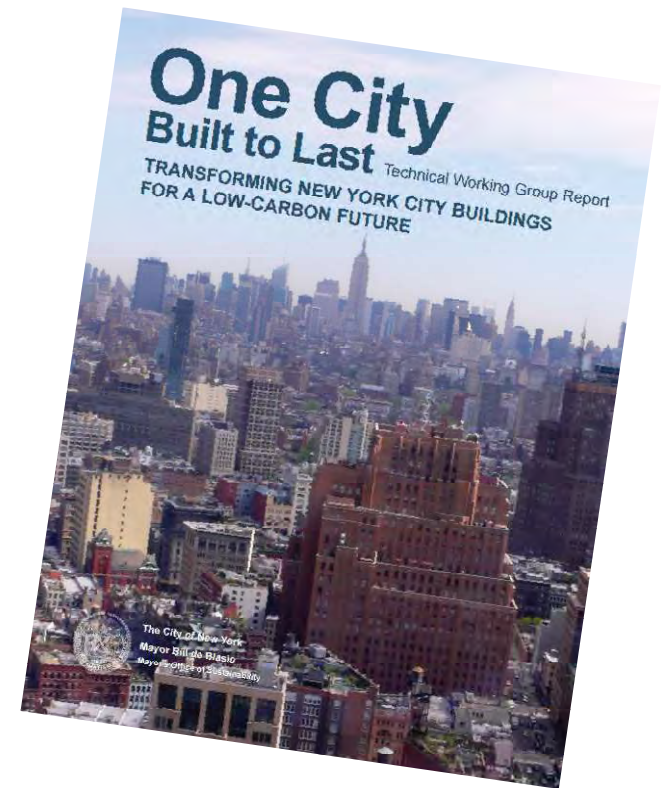
One City  
Built to  
Last

- 80% x 2050
- 40% x 2030



# Future of the NYCECC

- OCBTL- Technical Working Group Report, released in April, 2016
- Calls for performance-based standards
- Significant increases in energy savings for both new and existing buildings



# Sustainability in City-owned buildings

- NYC has a LEED requirement for city-owned projects or city-funded projects
  - Recently revised to LEED Gold version 4
  - Also amended the law to move the city toward a low-energy building performance standard, with an energy use target of 50% less than code (Local Law 31 of 2016)



# Thank-you!

For more information on the NYC Energy Code:  
<http://www1.nyc.gov/site/buildings/codes/energy-conservation-code.page>

Energy Code Technical Questions:  
[energycode@buildings.nyc.gov](mailto:energycode@buildings.nyc.gov)

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