



**2018 NYStretch-  
Energy –  
Commercial WG**

July 10, 2017

**nbi** new buildings  
institute

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## Agenda

- 1:00 – 1:15 Welcome / Roll Call / Review Workgroup Context and Objectives - Jeff Domanski (IBTS) Jim Edelson (NBI)
- 1:15 – 1:30 Energy Targets and Existing Building Options - Jim Edelson and Mark Lyles (NBI)
- 1:30 – 2:30 Commercial NYStretch Measures and Appendix g - Scoping and Discussion - (NBI)
- 2:30 – 2:45 Modeling of Results, Questions, Discussion - (PNNL and All)
- 2:45 – 3:00 Discussion and Wrap-up – Next Steps

## Welcome and Roll Call

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## NY Stretch – Energy Objective

- NY Stretch Energy Objective – Provide readily-adoptable code language for local governments in NY that will deliver energy efficiency performance significantly above anticipated 2019 NYECC code



## 2016 Commercial Results

Baseline = 2015 IECC

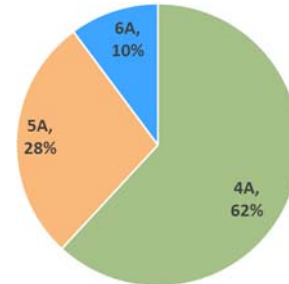
Measures	Weighted Average Savings
Base Stretch plus C406.2 More efficient HVAC Equipment*	9.1%
Base Stretch plus C406.3 Reduced air infiltration	8.4 %
Base Stretch plus C406.4 Enhanced envelope performance	12.8 %
*this measure also requires a DOAS system which we were unable to model due to the varying baselines and possible configurations. Analysis conducted by PNNL indicates that efficient equipment plus DOAS can provide 6% - 8% total savings beyond a building with a code level VAV system.	

## EUI Targets and NYStretch

- Helps provide comparisons among codes and policy objectives
- Generally aiming for weighted-average energy savings of 20% beyond 90.1-2013 / 2015 IECC
- Targets are computed as weighted-averages of 3 NY Climate Zones
- Can later be correlated to Performance Cost Index Targets framework in ASHRAE 90.1 Appendix g.
- Not currently calculated to be appropriate as outcome-based targets

# Energy Targets

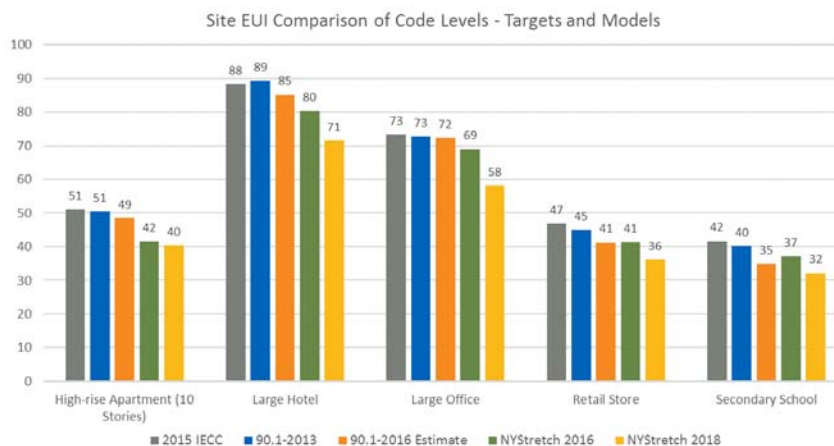
- PNNL prototype modeling basis
- Weighted average of NY climate zones
- 5 Building types making up 63% of NY construction
- 20% Reduction (Site, Source, or Cost) from 90.1-2013
- National costs
  - \$0.1032 / kWh
  - \$0.9900 / therm
- Site-to-source
  - 3.07 Electricity
  - 1.09 Natural Gas



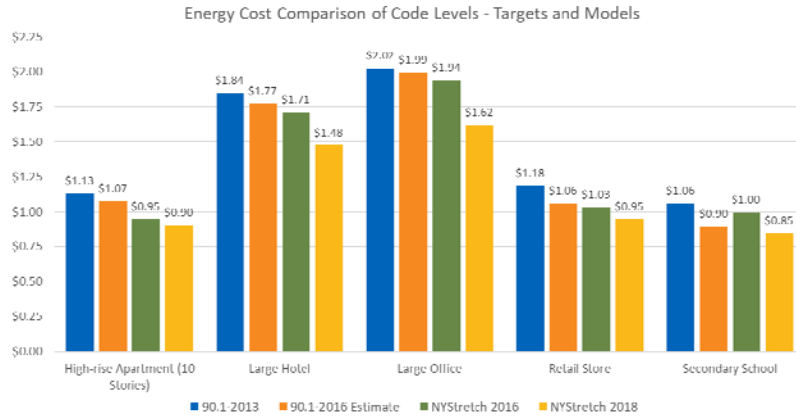
NY new construction weights by Climate Zone

Building Types	Weight
Large Office	52.8%
Standalone Retail	9.0%
Secondary School	10.1%
Large Hotel	16.7%
High-Rise Apartment	11.4%

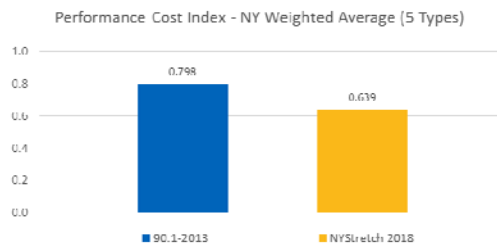
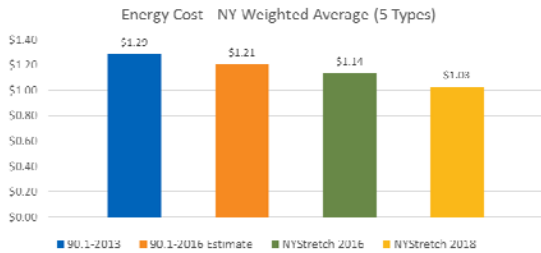
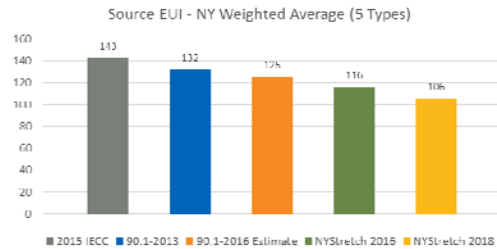
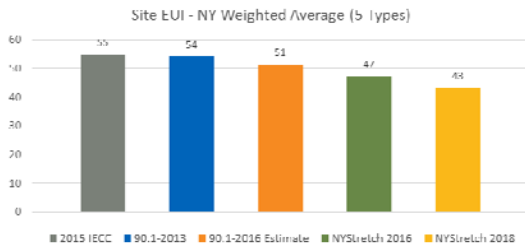
# Energy Targets



# Energy Targets



# Energy Targets



## Existing Buildings in NYStretch

Jim Edelson - NBI

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## EB Provisions in 2016 NYStretch

- **C502.2.3 Building mechanical systems.** New mechanical systems and equipment that are part of the *addition* shall comply with Section C403.
- **C503.6 Lighting systems.** New lighting systems that are part of the *alteration* shall comply with Section C405

**Exceptions.** *Alterations* that replace less than 10 percent of the luminaires in a space, provided that such *alterations* do not increase the installed interior lighting power

## New York City Some EB Provisions

- Greener, Greater Building Plan
  - Annual energy and water benchmarking
  - Energy audit and RetroCommissioning every 10 years
  - By 2025 lighting in non-residential spaces to be upgraded to meet code and large commercial tenants be provided with submeters

## New EB Structure – Title 24

### For each enclosed space:

Use Option 1, 2, or 3 to comply IF:

A. Replacing three or more luminaires as entire luminaires (also referred to as one-for-one luminaire replacement) without adding, removing, or replacing walls or ceilings.

Use Option 1 or 2 to comply IF:

B. Adding entire luminaire(s); OR

C. Replacing three or more luminaires as entire luminaires while adding, removing, or replacing walls or ceilings; OR

D. Removing  $\geq 10\%$  of existing luminaires and reinstalling the same luminaires while adding, removing, or replacing walls or ceilings.



## Lighting Retrofits T24 (proposed)

### Option 1

“85-100% of 2019 LPD Allowance”

all control requirements

### Option 2

“≤ 85% of 2019 LPD Allowance”

many control requirements

### Option 3

“Reduction of Existing Wattage by 35/50%”

few control requirements

## Commissioning System Replacements – NBI proposal

**C503.4.2 Commissioning** New heating, cooling and duct system components that are part of the alteration and the controls that serve them shall comply with Sections C408.2.2, C408.2.3 and C408.2.5.

**Exceptions:** The following systems are exempt:

1. Mechanical systems in alterations where the total mechanical equipment capacity is less than 480,000 Btu/h (140.7 kW) cooling capacity and 600,000 Btu/h (175.8 kW) combined service waterheating and space heating capacity.
2. Systems included in Section C403.3 that serve individual *dwelling units* and *sleeping units*.

# Commissioning System Replacements

**C503.5.1 Commissioning.** New service hot water system components that are part of the alteration and the controls that serve them shall comply with Sections C408.2.2, C408.2.3 and C408.2.5

**Exception:** Service hot water systems in alterations where the combined service water heating and space heating capacity is less than 600,000 Btu/h (175.8 kW).

# Level 3 Alterations

**C503.7 Level III Alterations.** Buildings undergoing Level 3 alterations shall comply with no less than two of the following:

1. The building thermal envelope shall comply with the requirements for "Walls, Above Grade" from Table C402.1.4.
2. The building thermal envelope shall comply with the requirements for "Roofs" from Table C402.1.4.
3. Fenestration shall comply with Table C402.4.
4. Where the building meets the conditions of Section C402.4.2.1, the building shall comply with Section C402.4.2.1.
5. The building shall comply with the air leakage testing requirement of Section C402.5.
6. The building shall comply with Section C403.2.9.
7. Where the building meets the conditions of Section C403.4.5, comply with Section C403.4.5 without exceptions.
8. The building shall comply with Sections C405.2 and C405.3.
9. The building shall comply with Section C406.2.
10. The building shall comply with Section C406.3.....4,5,6,7
- 11.

## Karpman Policy Recommendations

- Minimize the number of compliance options to simplify enforcement, making 90.1 Appendix G the only performance path
- Establish qualification requirements for modelers and reviewers
- Engage third part reviewers if there are no in-house staff with the necessary qualifications
- Adopt a detailed, structured submittal review template, aligned with the requirements of other compliance modeling applications common in New York
- Develop and document the review process; incorporate some QC checks into the submittal review template for automation; get input on the QC checks from vendors of the software tools popular in NY
- Provide trainings to the code officials and third party reviewers on the use of the submittal template and review process.

## Range of Commercial Provisions

Jim and Mark – NBI  
*(refer to document that was circulated)*

# Commercial Modeling Methodology

Bing Liu - PNNL

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## Modeling of NYStretch Savings

- Full modeling of residential and commercial measures
  - Supported by PNNL for commercial
  - Supported by Earth Advantage for residential
- Preliminary and final modeling rounds for savings determination
- Across three NY Climate Zones and five common commercial building types and two different sized residential buildings
- (Discussion of modeling after lunch)

## Wrap up and Next Steps

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## Timetable

MILESTONE	DATE
Kickoff	June 8, 2017
1 <sup>st</sup> round Technical Working Group meetings	June/July 2017
NYStretch-Energy Advisory Committee (Meeting 2) PRESENT DRAFT ENERGY ANALYSIS	August 10, 2017
2 <sup>nd</sup> Round of Technical Working Group Meetings	September/October 2017
NYStretch-Energy Advisory Committee (Meeting 3) PRESENT FINAL ENERGY ANALYSIS	November 9, 2017
NYStretch-Energy draft	December 2018
Legal review	January 2018
Public comment	February/March 2018
Toolkit updates	May 2018
Final NYStretch-Energy	May 2018