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NEW YORK STATE OF OPPORTUNITY | Climate Smart Communities

NYStretch Energy Code

This webinar will start shortly.

Office of Climate Change
NYS Department of Environmental Conservation
October 13, 2016

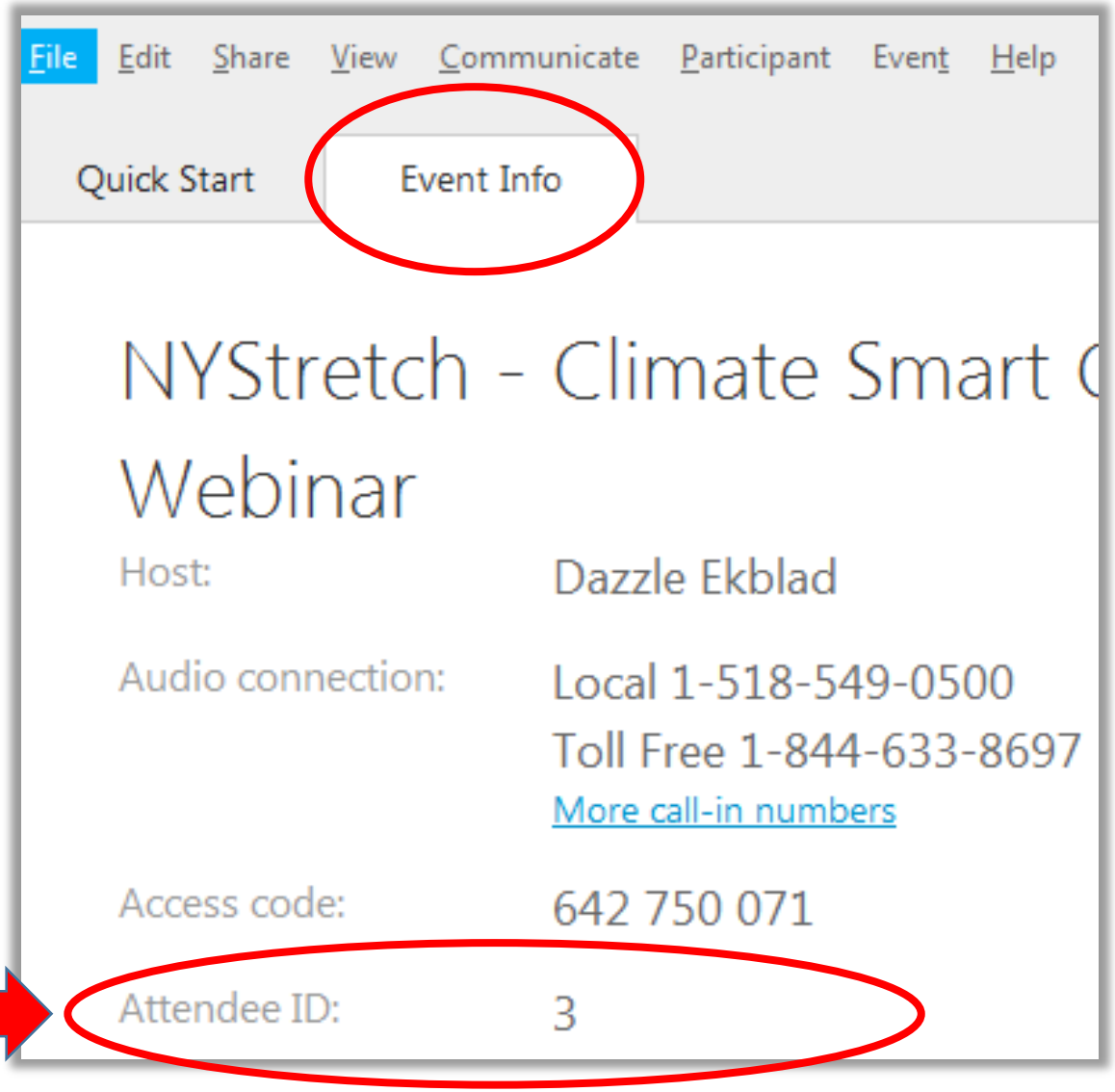
Welcome!

Today's topic: *NYStretch Code*

Connect to the audio with your phone:

1) **Go to the "*Event Info*" tab for call-in details, and**

2) **Enter *your unique attendee ID* when prompted.**



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Today's webinar topic:

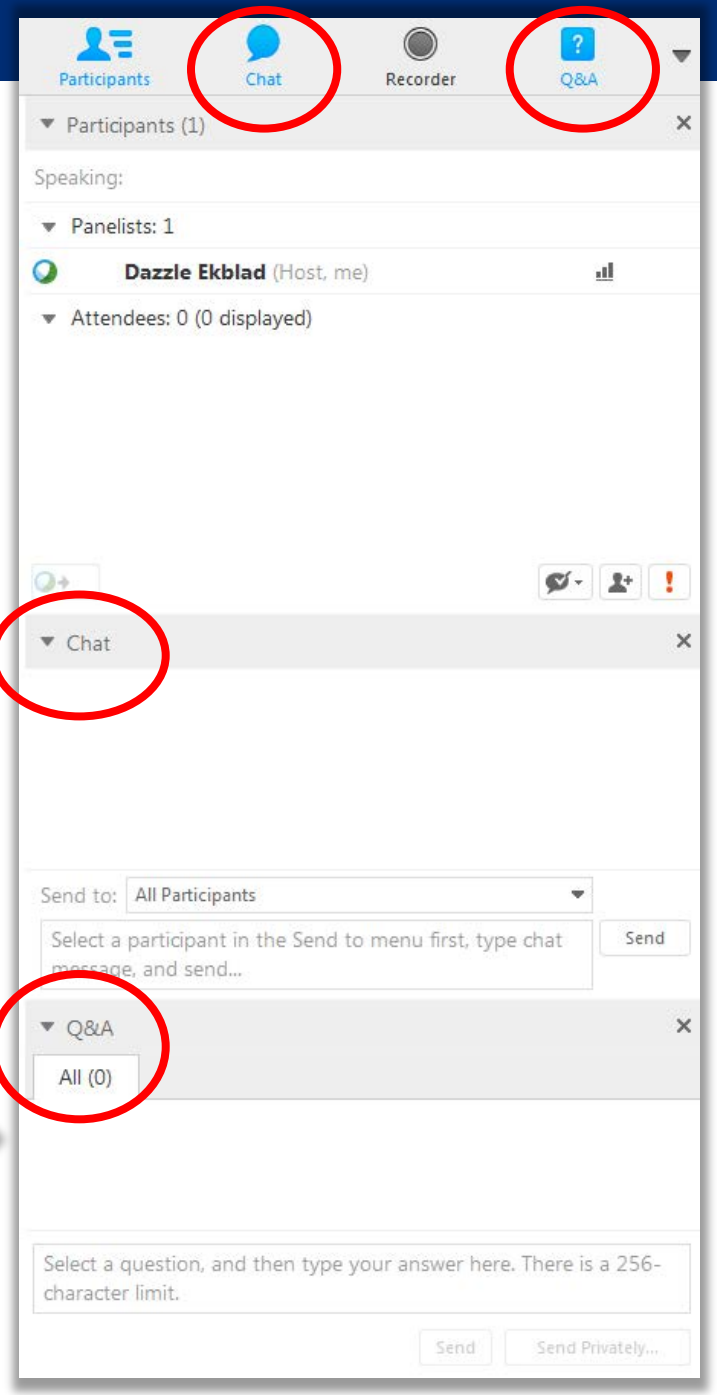
NYStretch Energy Code

Problems or technical questions?

Use WebEx chat

Content questions for speakers?

Use WebEx Q&A



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Agenda

- **Announcements** – Dazzle Ekblad, DEC
- **Climate Smart Communities Certification Program** – Dazzle Ekblad, DEC
- **NYStretch Energy Code** –
  - Dan Farrell, NYSERDA
  - Jim Edelson, New Buildings Institute
  - Mark Lyles, New Buildings Institute
- **Q & A** – All speakers

Upcoming Events

- Nov. 2-3: **State of NY Sustainability Conference** - for higher education institutions, New Paltz. https://sites.newpaltz.edu/sustainability/conference/
- Nov.3: **NY Climate Tools & Info Symposium**, Albany. https://www.eventbrite.com/e/new-york-climate-tools-and-information-symposium-registration-27947416475
- Nov. 10, 10:30 AM: **Climate Smart Communities Webinar**

NY's Newest Certified CSCs

Town of Mamaroneck

Certified Climate Smart Community
Supervisor Nancy Seligson

Ulster County

Bronze Certified Climate Smart Community
County Executive Mike Hein

NY's Other Certified CSCs

- Village of Dobbs Ferry (bronze)
- City of Kingston (bronze)
- Town of East Hampton
- City of Albany
- City of Watervliet
- Town of Cortlandt
- Orange County

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CSC Certification

- **CSC Certification Workbook** for estimating points for past actions, tracking progress & submitting documentation
  - Available by emailing climatechange@dec.ny.gov
- Certification actions potentially related to today's webinar:
  - **#3.7** Adopt a green building standard for local gov't bldgs. (4 points)
  - **#3.27** Utilize a green or sustainability rating system for infrastructure improvement projects

NYStretch Energy Code

Dan Farrell, Jim Edelson, Mark Lyles

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NYStretch - Energy

Development of Model Provisions for Voluntary Local Adoption in New York

DEC Climate Smart Communities Program Webinar
October 13, 2016

Agenda

I. Introductions
II. Overview
III. NY-Stretch project development recap/update
IV. Draft proposed Commercial Stretch Code
V. Draft proposed Residential Stretch Code
VI. NY-Stretch Framework
VII. Questions

What is NYStretch-Energy?

"Overlay" code, or alternative compliance path, for local adoption (as MRLS)

+ More rigorous than base energy code

+ Results in buildings that achieve greater energy savings and reduced GHG emissions

+ Anticipates succesor code advancements, culminating in a statewide Net Zero Energy code by 2028/30

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NY Stretch in Context

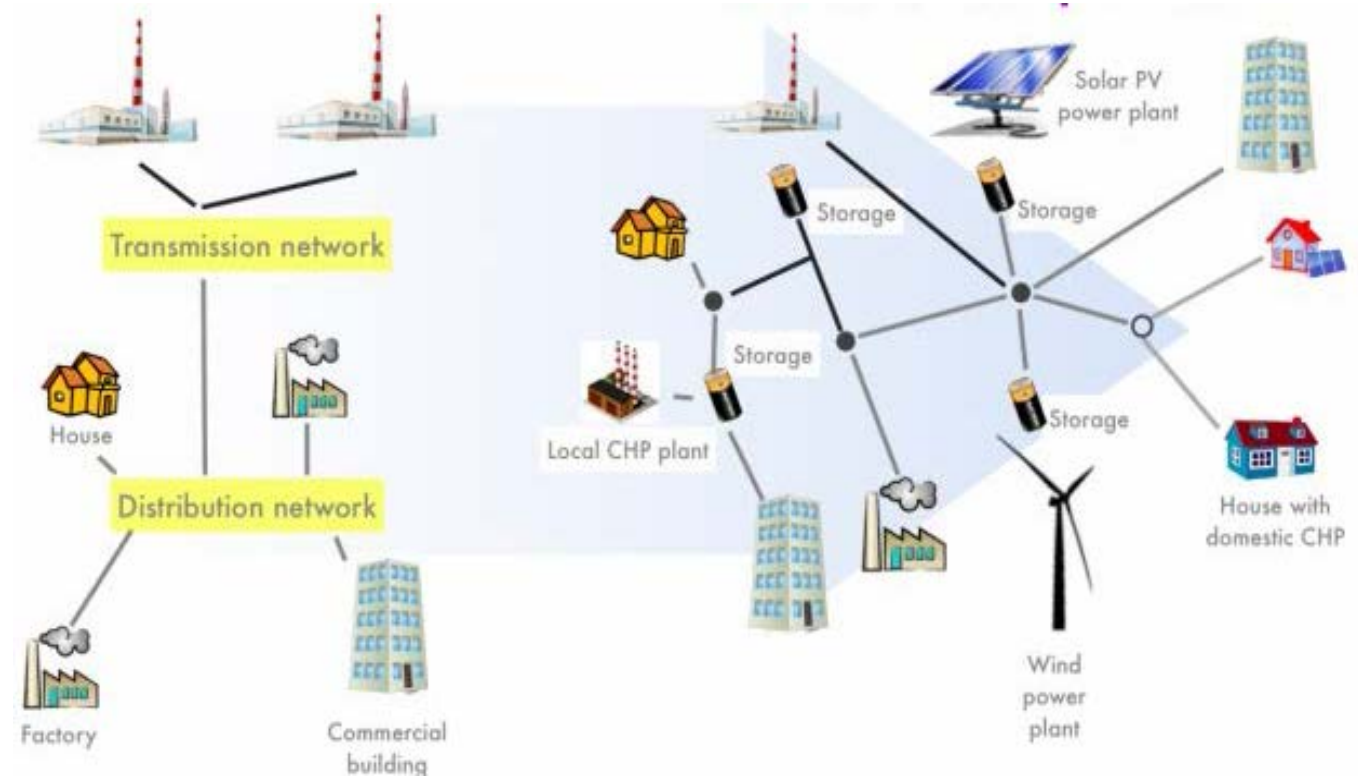
Part of NYSERDA's suite of code-related activities:

- ✓Online and classroom trainings
- ✓Municipal support/plan review
- ✓Code Commentaries
- ✓Codes conference (Spring 2017)

http://www.nyserdacodetraining.com/

Reforming the Energy Vision (REV)

Governor Cuomo's strategy to build a clean, resilient and affordable energy system for all New Yorkers



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Clean Energy Fund (CEF)

- 10-year, $5 billion funding commitment
- Reshapes New York's energy efficiency, renewable energy and energy innovation programs
- Reduces cost of clean energy
- Accelerates adoption of energy efficiency to reduce load
- Increases renewable energy to meet demand
- Mobilizes private investment in clean energy

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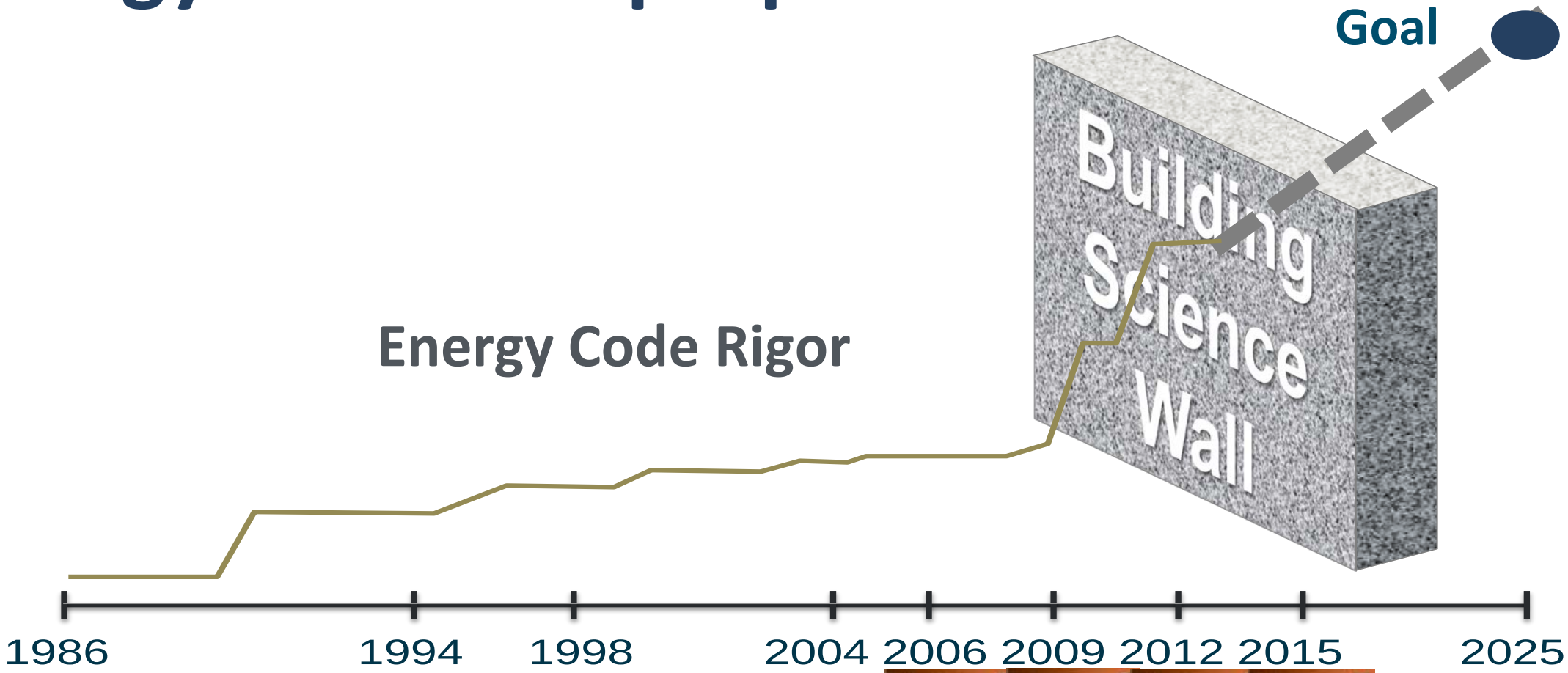
Benefits of a Stretch Code

- Lower building operating costs/increased energy savings
- Increased occupant comfort
- Improved resiliency (wrt power disruptions)
- Signal transition to performance-based codes
- Allows design flexibility
- Stimulates R&D and commercialization of products/systems to improve energy efficiency performance
- Provides consistency while leveraging developed above-code infrastructure
- Alignment with utility programs

Development challenges

- Finding balance point between meaningful savings and cost/achievability
- Maintenance and updates (prescriptive vs. performance)
- Potential for the “patchwork quilt” across jurisdictions
- Local governments have many other pressing issues to address
- 2015 IECC effective in NYS (Oct. 3) leaping a code cycle (on Residential side)
- Framework - How far to push into non-energy (green code) governed (site and land development, transit connectivity, stormwater, indoor environmental quality, materials,etc.)

Energy Code Ramp Up



Slide courtesy of U.S. DOE and Newport Partners

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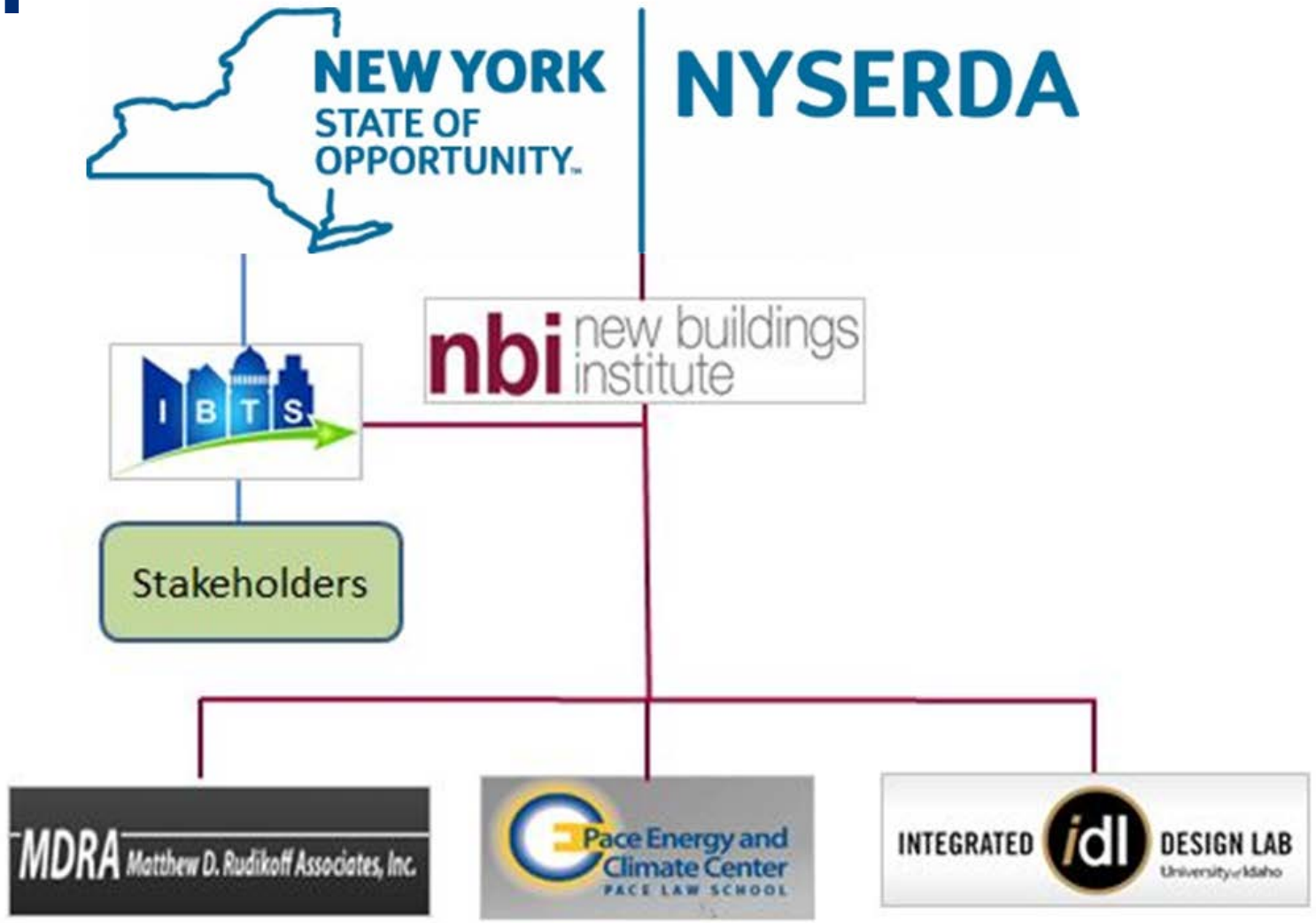
Path Options

1. NYSERDA develops and publishes the NY Stretch Code as a stand-alone document, configured for adoption (in whole or part) by resolution by a local code enforcement authority (More Restrictive Local Standard)
2. NYSERDA develops the NY Stretch Code for adoption by the New York State Code Council as a new voluntary code option for local enforcement authorities.
3. NYSERDA develops the NY Stretch Code for adoption by the NY Legislature as an addition to NY law, with a separate adoption and enforcement structure also adopted by law, with the legislature assigning implementation responsibility to NYSERDA, the Code Council, or other agency/office.

Content developed by Karl Rabago, Pace Law School Climate and Energy Center

The Team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nbi new buildings institute
IBTS
Stakeholders
MDRA Matthew D. Rudikoff Associates, Inc.
Pace Energy and Climate Center
PACE LAW SCHOOL
INTEGRATED idl DESIGN LAB
University of Idaho

NY Stretch – Mission and Team Members

- *NY Stretch Objective* – Provide readily-adoptable code language for local governments in NY that will deliver energy efficiency performance significantly above current code
- *Project Consultant Team*: New Buildings Institute (Jim Edelson, Mark Lyles); IBTS (Jeff Domanski, Art Pakatar, Debbie Russell, Mark Eggers); PNNL (Bing Liu, Jian Zhang); Pace University Climate and Energy Center (Karl Rabago); Bruce Harley Energy Consulting (Bruce Harley)

Stakeholder input

- 25-member Advisory Group (3 in-person meetings and webinar) –
- Commercial/MF and Residential Working Groups (3 calls/review sessions)
- Reviewed existing stretch codes, PV- and EV-ready language and ordinances
- Multiple calls/discussions with stakeholders (NYSDOS, NYC Mayor's Office and DPD, MA DOER, Efficiency VT)

Development Process

- Looking to what other states have done (MA, CA, VT)
- Advisory Group guidance - Make it rigorous but straightforward and achievable; backstop for best practices in building design/engineering
- Residential and Commercial/Multi-family Working Groups reviewed “topics documents” generated by project team w/ Advisory Group guidance
- Iterative energy modeling to predict savings and fine-tune

Important Notes

- We are presenting proposed (not final) provisions
- NYStretch will undergo internal legal review by NYSERDA counsel
- Language will be available for public comment (not a formal SAPA process)
- Final language to be issued year-end.

Renewables and Electric Vehicles

PV-ready

- Residential (1 and 2 family homes >1400 ft.)
  - (In accordance with 2015 IECC Appendix RB) Solar-zone on roof, free of obstructions
  - Dedicated (labeled) space on electric service panel

EV-ready

  - 1-2 family homes – Provide outlet (240V/40amp) or capability
  - MF (with common parking area) – Provide outlets (or infrastructure) for 5 % of parking spaces

Renewable Energy Options

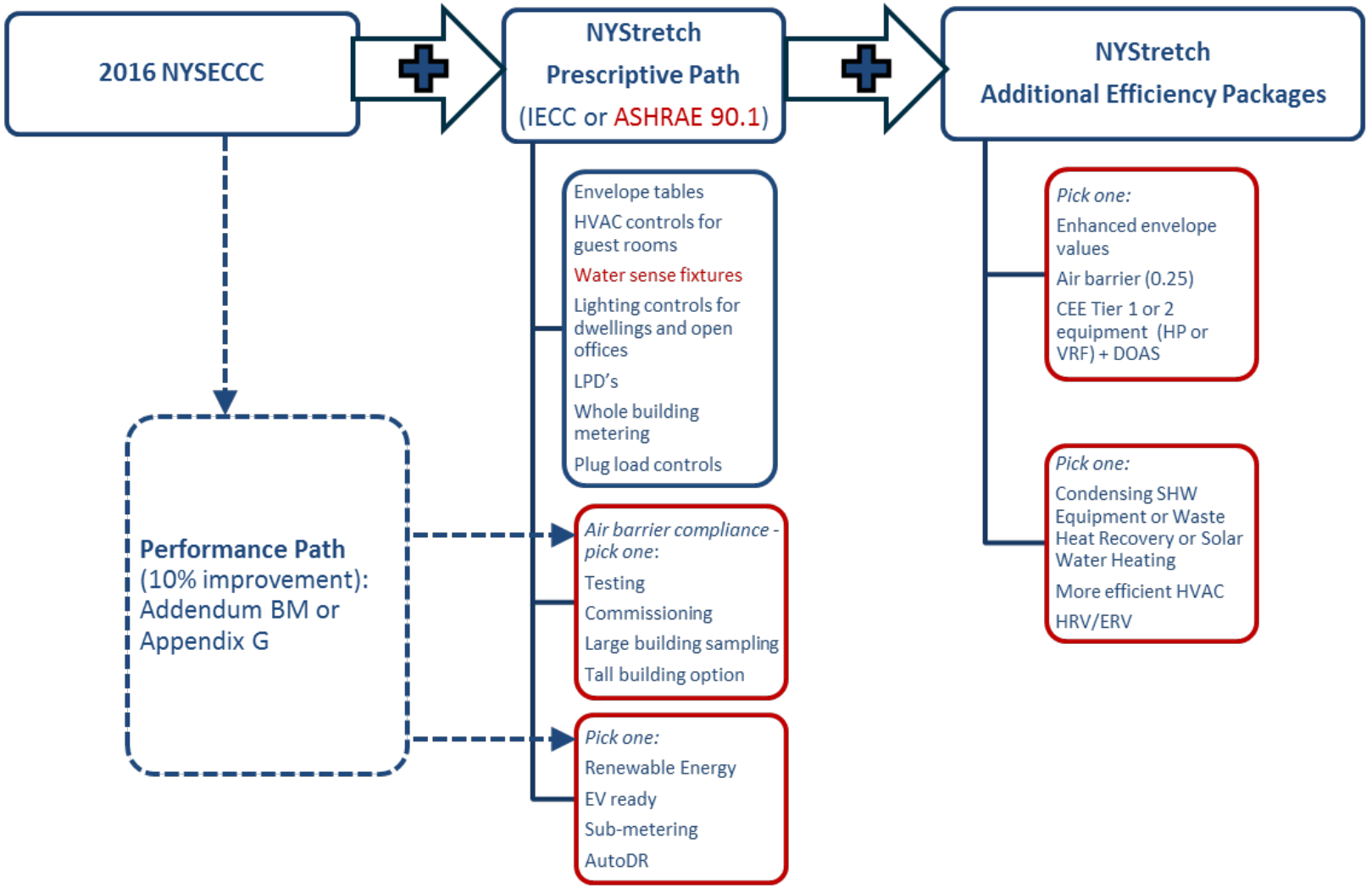
Residential (option packages)

- Solar thermal hot water system
- More efficient HVAC, including GSHP

Commercial (options packages)

- Meet 3% of load w/ onsite renewables
- Solar thermal hot water system

NYStretch: Commercial Buildings



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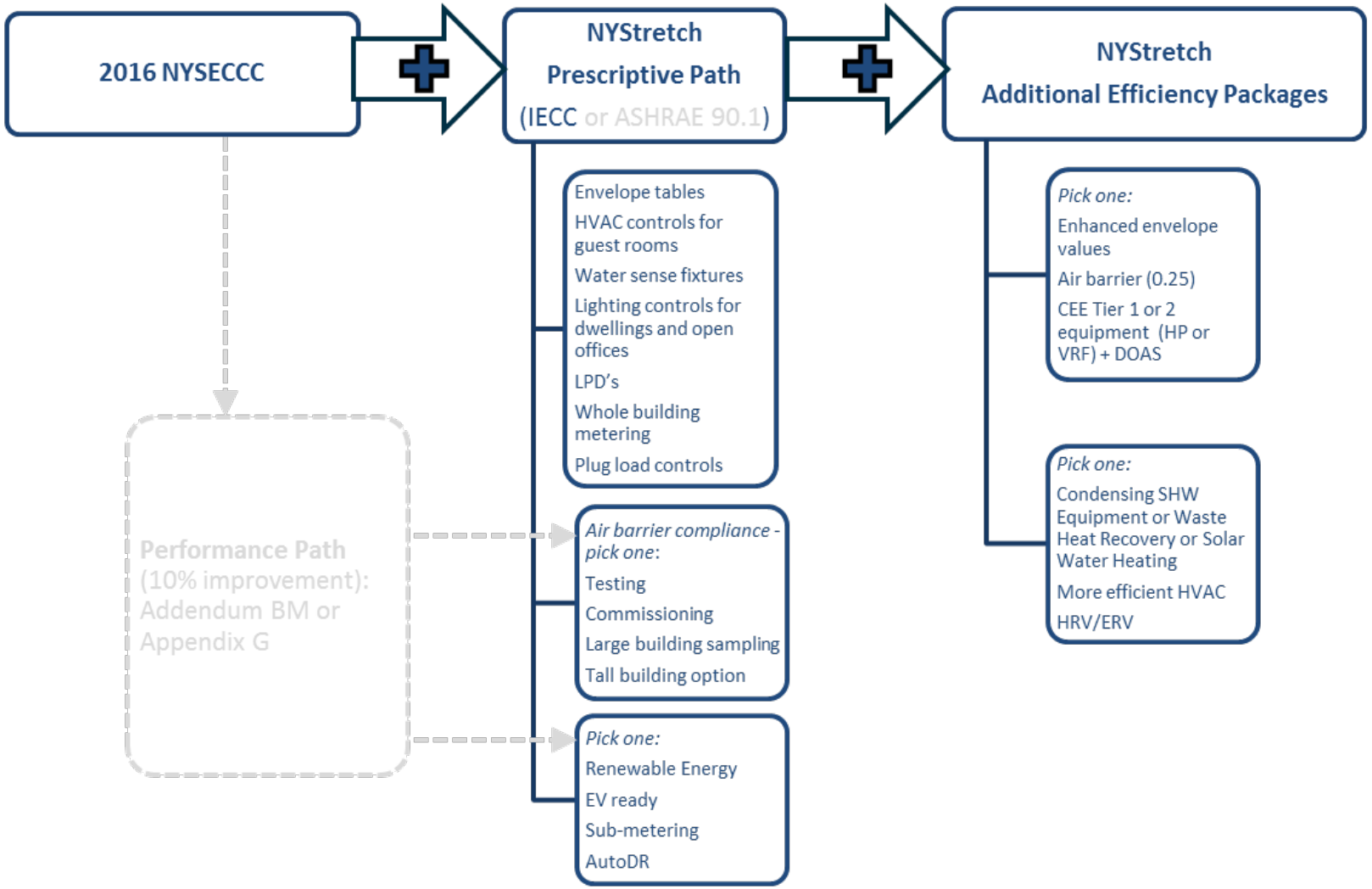
NYStretch: IECC Prescriptive Path



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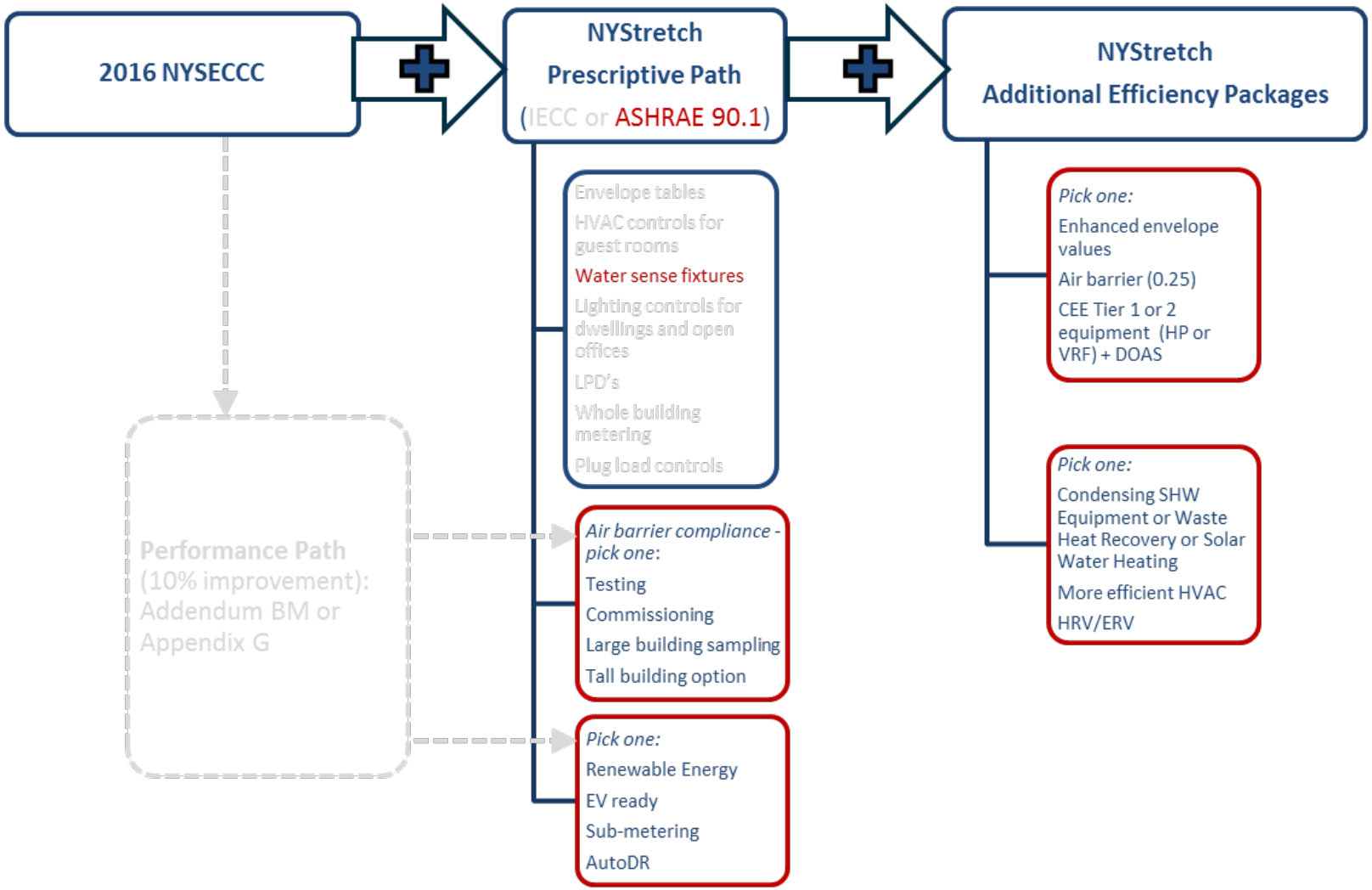
NYStretch: 90.1 Prescriptive Path



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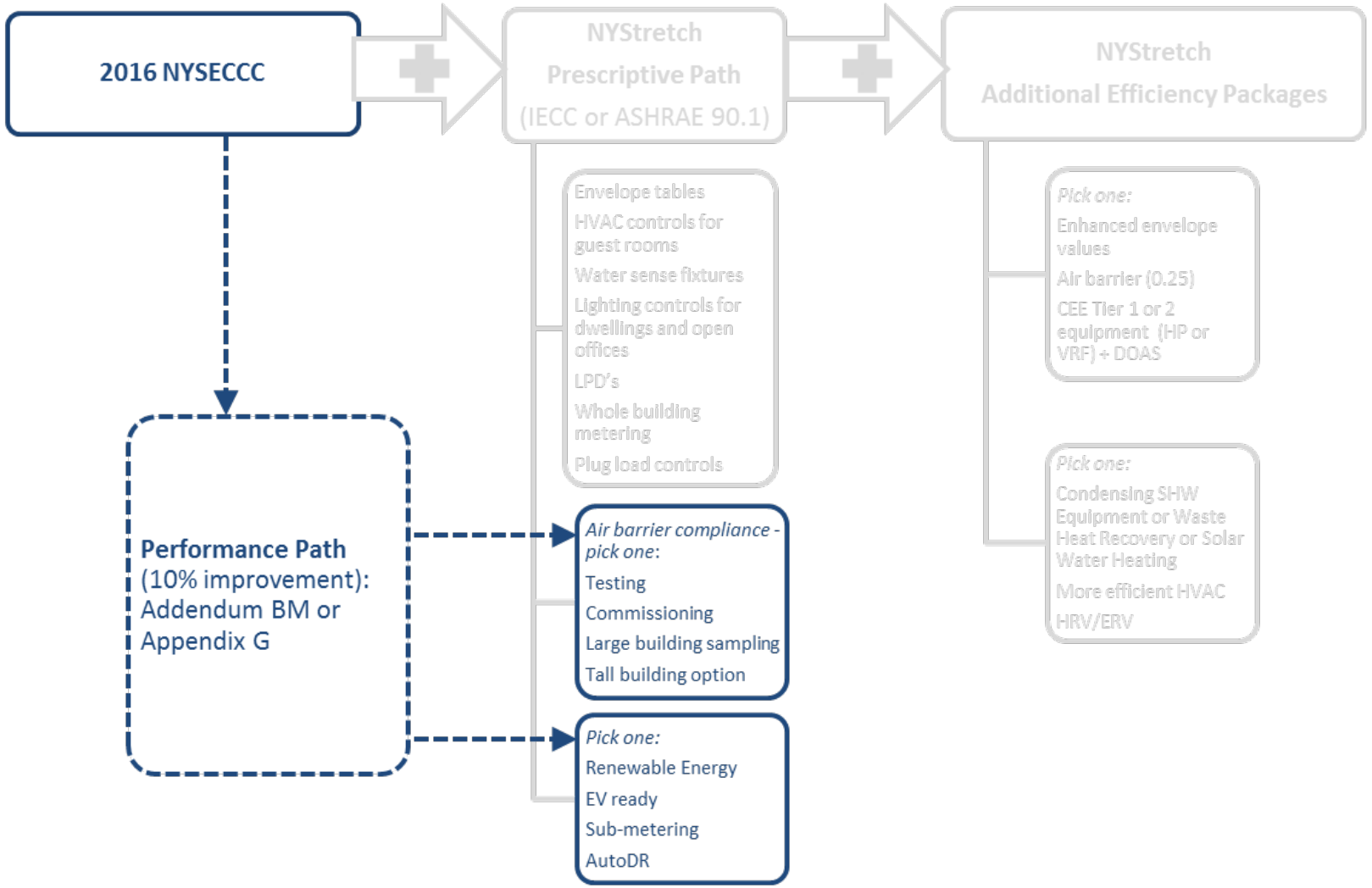
NYStretch: Performance Path



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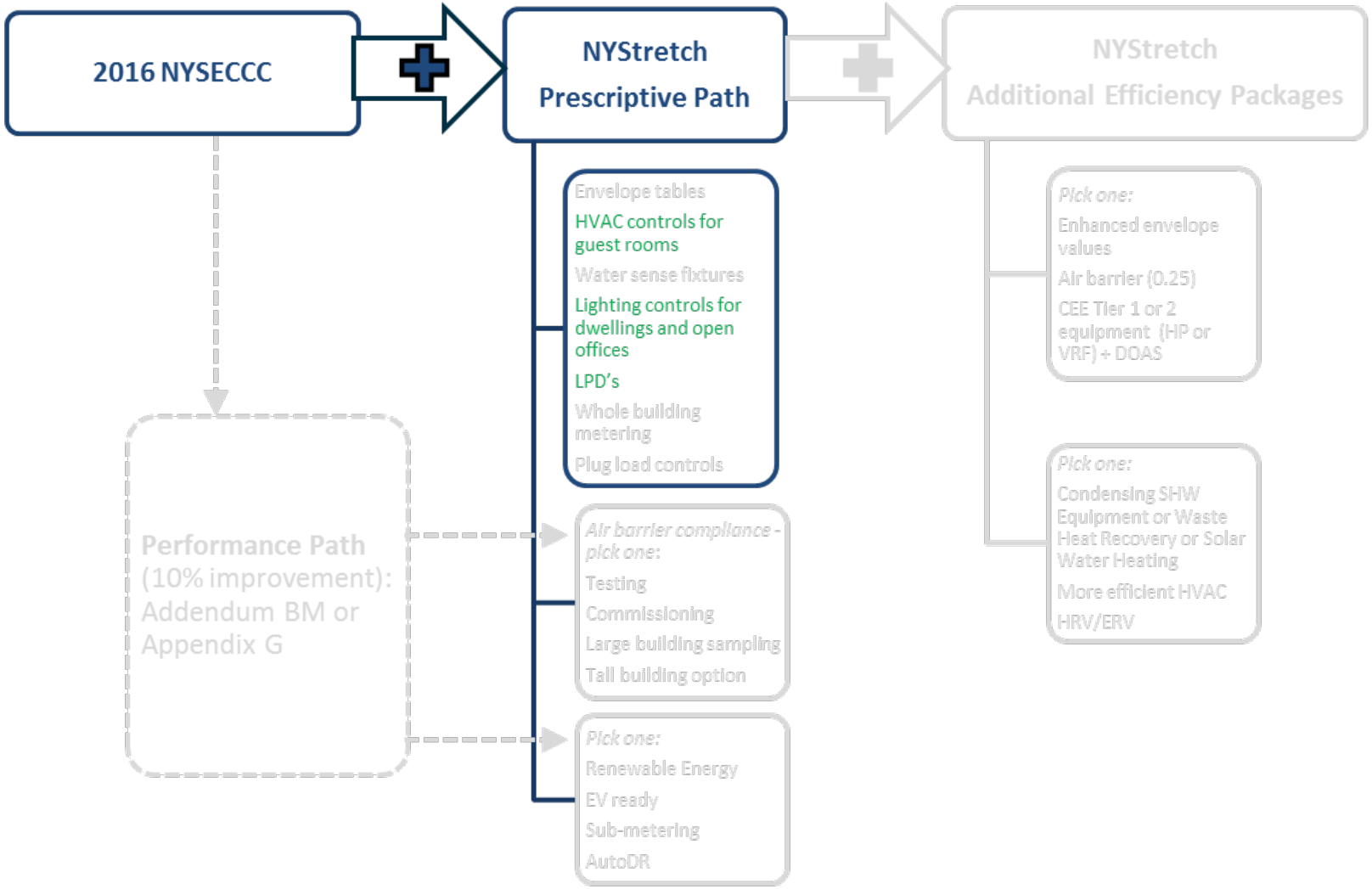
NYStretch: Existing Buildings Path



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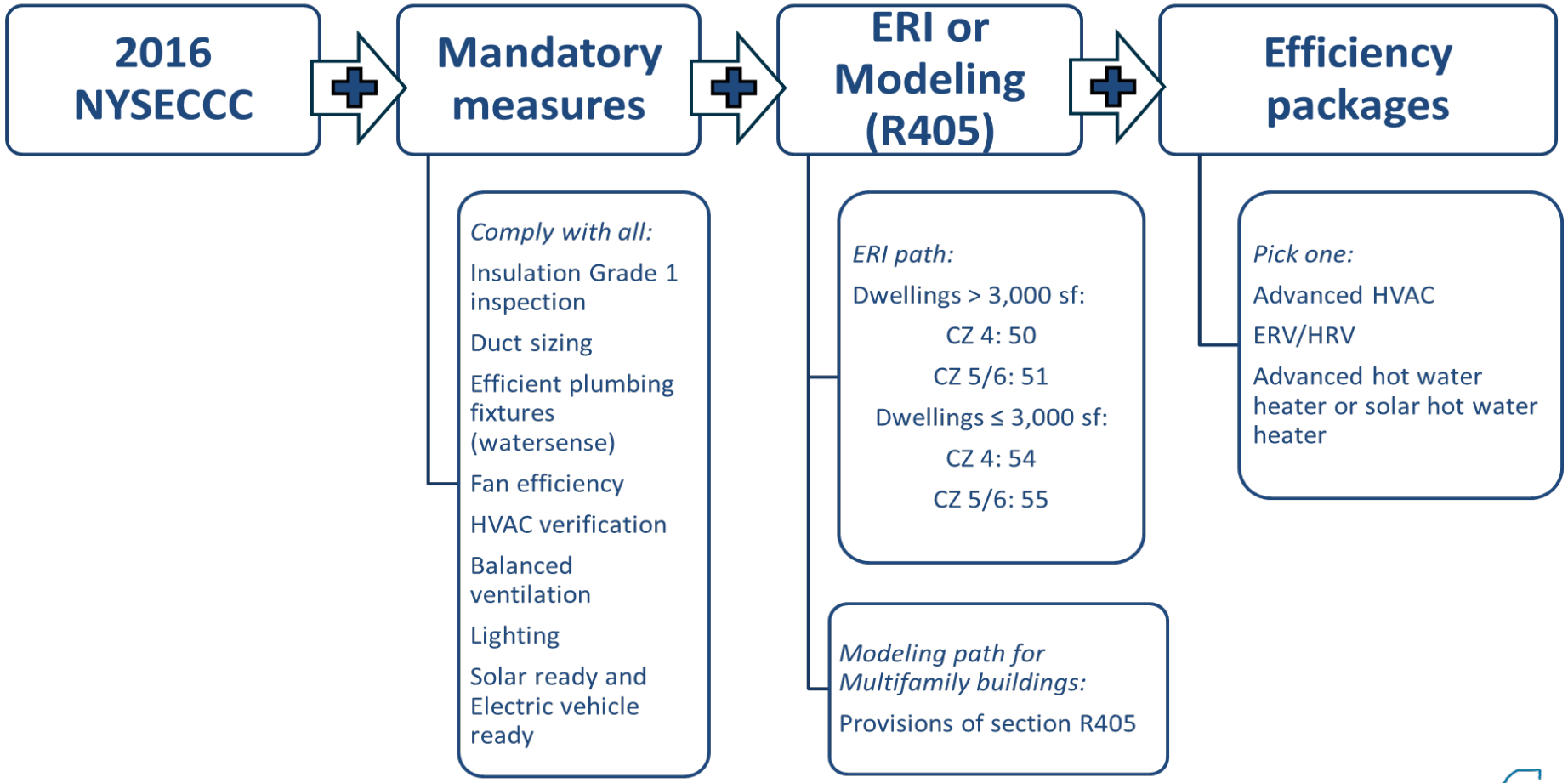
Weighted Results

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.	

NYStretch – Residential Buildings

- Performance based, with mandatory ERI requirements
- Size adjustment (lower ERI/HERS Index required for larger homes)
- Open-wall inspection (RESNET Grade I insulation install)
- Balanced ventilation
- 90% of lamps in hard-wired fixtures high-efficacy (above 75% required by 2015 IECC)

NYStretch: Residential Dwellings



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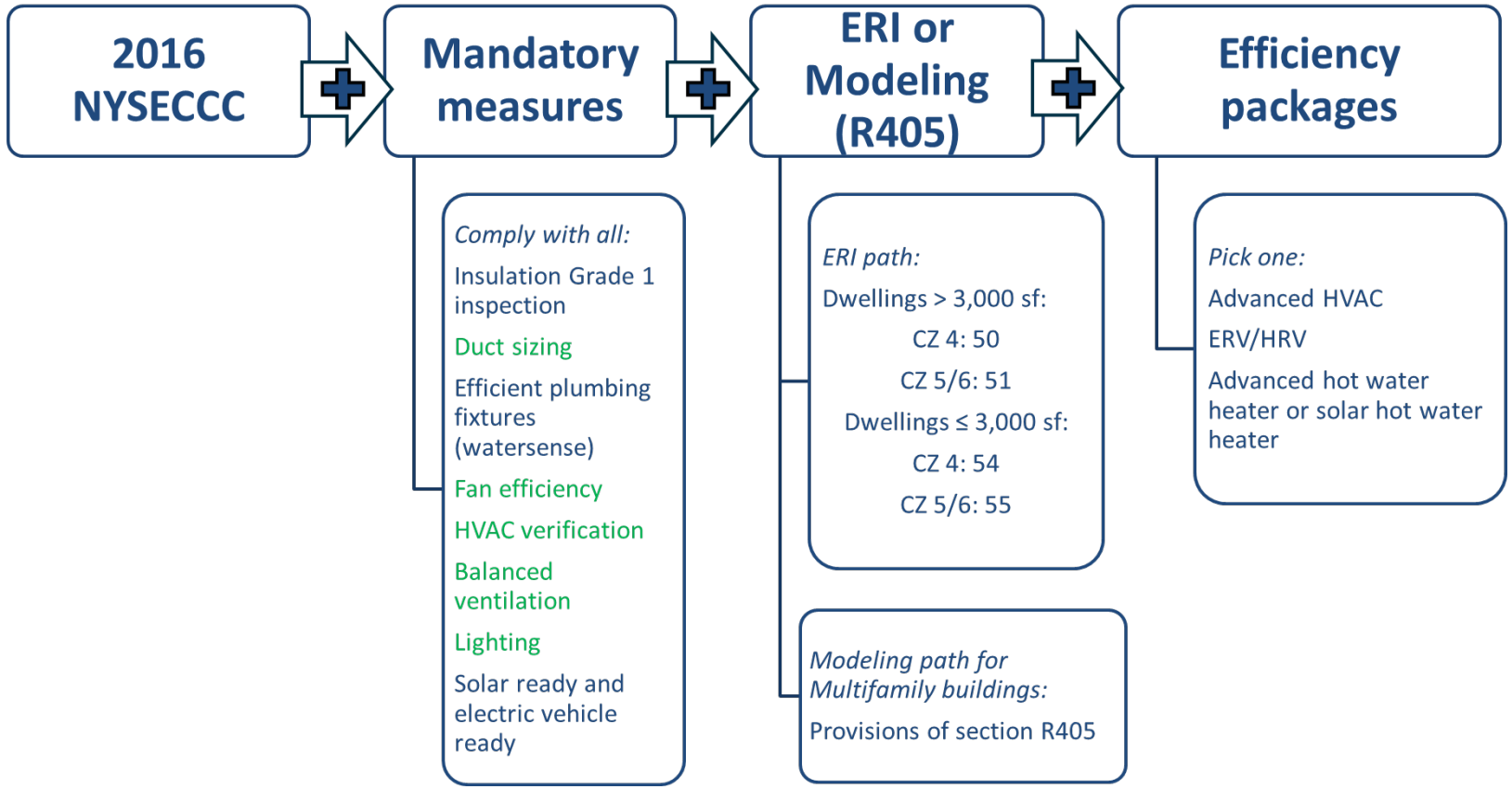
NYStretch: Existing Residential Dwellings



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Residential energy modeling

- Purpose: determine approximate ERI (HERS index) for stretch code targets
- Estimate associated stretch code savings relative to baseline
- Prototype house 2,376 Sq ft, 3 bedroom
  - 4 basement types (slab, crawl, heated/unheated basement)
  - 3 heating types (gas furnace, heat pump, gas boiler)
  - 3 code-defined climate zones represented in NY (4,5 & 6)
  - 36 total, weighted by 2015 baseline survey data from new homes

Baseline Home *(2015 IECC prescriptive path)*

Shell	HVAC	Lighting and Appliances
Leakage – 3ACH$_{50}$ (per code testing req.)	Efficiencies higher than federal minimums	Lamps – 75% high-efficacy (per code)
Insulation R-values (prescriptive per code)	Good heating and cooling equipment (92% AFUE furnace/13 SEER AC)	Appliances –defaults
Insulation install quality – Good (RESNET Grade 2)	Ducts in conditioned envelope	
Windows and Doors – good quality (per code)	Exhaust-only ventilation	

NYStretch Home *(proposed provisions modeled)*

Shell	HVAC	Lighting and Appliances
Leakage – 2.5 ACH_{50}	Modest, low-cost upgrades	90% meeting lighting power density requirements
Insulation R-values – Slightly higher than min. prescriptive	Furnace – 94% AFUE	Appliances – RESNET defaults
Insulation install quality – Better (RESNET Grade I)	A/C – 14 SEER	
Fenestration – Slightly better U-factors	Ventilation - Balanced	

Results

- 14% savings (weighted average) both electric and gas
- HERS index (weighted average) dropped from 63 to 56 from baseline to NYStretch home

Climate Zone	Baseline ERI (for 2015 prescriptive approach home)	NYStretch ERI (modeled; includes most NYStretch provisions)	Proposed NYStretch ERI for homes <3000SF	Proposed NYStretch ERI for 3000 SF+ home
4	63	55	54	50
5	64	56	54	50
6	62	55	54	50

Conservative savings estimates

- 2015 IECC prescriptive path home house with high efficiency (higher than federal minimum) HVAC equipment
- No duct sealing savings
- Savings from mechanical was upgrade from 13 to14 SEER A/C and 92.5 AFUE to 94 AFUE furnaces
- Upgrade does not account for every requirement in proposed NYStretch Energy (e.g. WaterSense fixtures not modeled for SF prototypes)

NY Stretch Framework

- Purpose: provide recommendations to local governments on other practices to improve the built environment (that could be included in a stretch code or local ordinance)

Presenter contact information

Daniel Farrell, NYSERDA

daniel.farrell@nyserda.ny.gov

Jim Edelson, New Buildings Institute

jim@newbuildings.org

Questions?

- Office of Climate Change
- NYS Department of Environmental Conservation
- 625 Broadway

  Albany NY 12233-1030
- climatechange@dec.ny.gov
- 518-402-8448

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