

Climate Mobilization Act Series:



31 Chambers Street
New York, NY

If, How, When — NYC Building Envelopes

Building Energy Exchange and NRDC welcome a panel of industry experts to demystify the policy and technical conditions regarding envelope upgrades, when they are advisable, how to get them done, and their importance for sustainability and safety.

presenters

Gabrielle Brainard, Associate Principal, Enclosure Design Specialist, SOM

moderator

Todd Kimmel, US Senior Manager of Sustainable Solutions, Rockwool

panelists

Gabrielle Brainard, Associate Principal, SOM

Bill Edwards, Executive Vice President, Core Holdings, Rockefeller Group

Jack Jenkins, Director of Energy and Sustainability, Robert Derector Associates

Alissa Bucher, Partner, Rogers Partners

July 27, 2023
9:30 to 11:00am

1.5 AIA
LU | HSW



Envelope Retrofits: If, How, When?

Climate Mobilization Act Series

Building Energy Exchange

July 27, 2023

SOM

Envelope Retrofits: **If**, How, When?

CMA: Decarbonization Requires Efficiency Upgrades

DIVE BRIEF

NYC could face up to 446 MW power deficit in 2025, due to electrification and peaker retirements: ISO

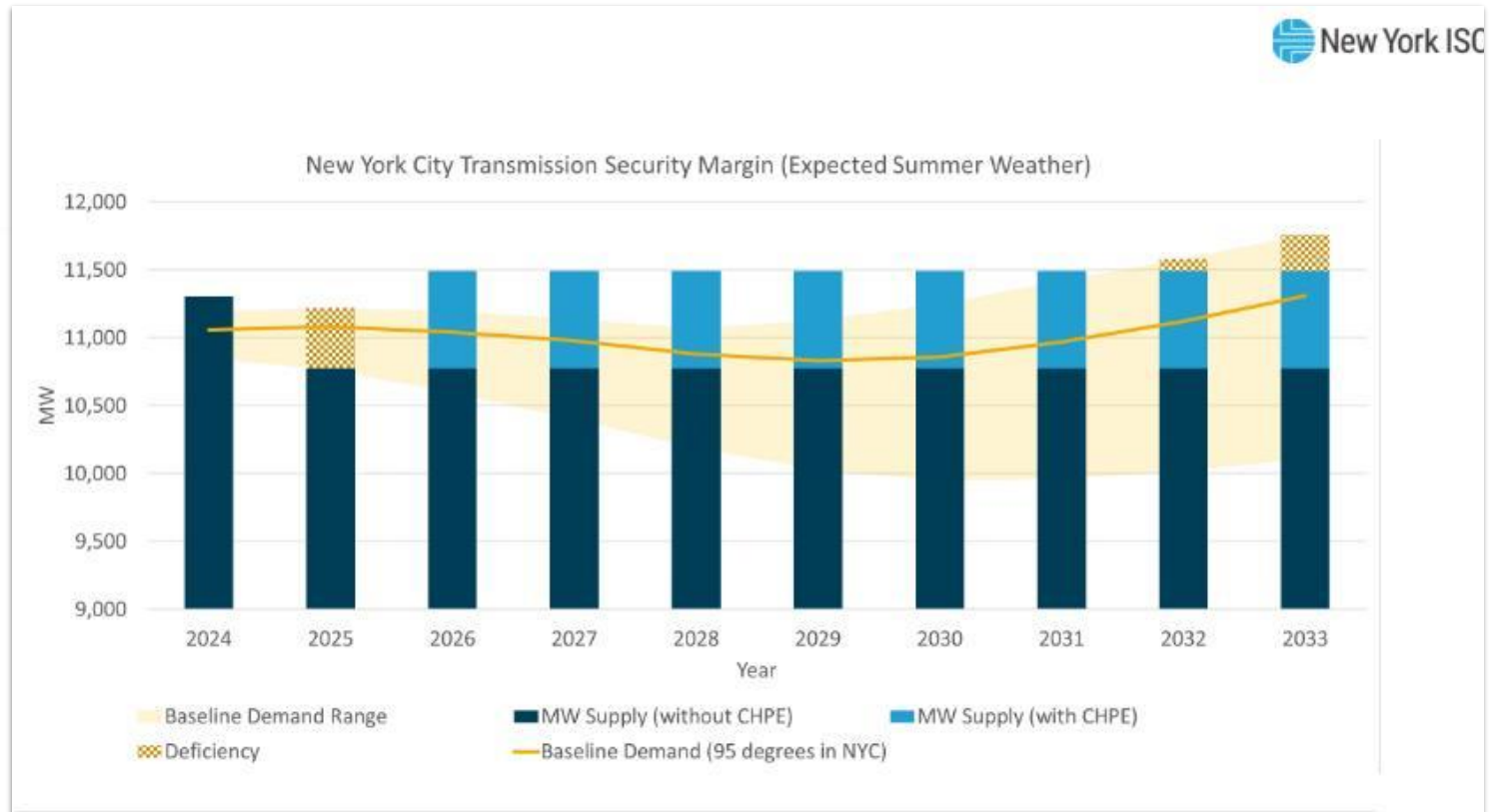
Completion of the Champlain Hudson Power Express transmission line, which will bring power to New York City from Quebec, is expected to improve reliability margins beginning in 2026.

Published July 19, 2023

Dive Brief:

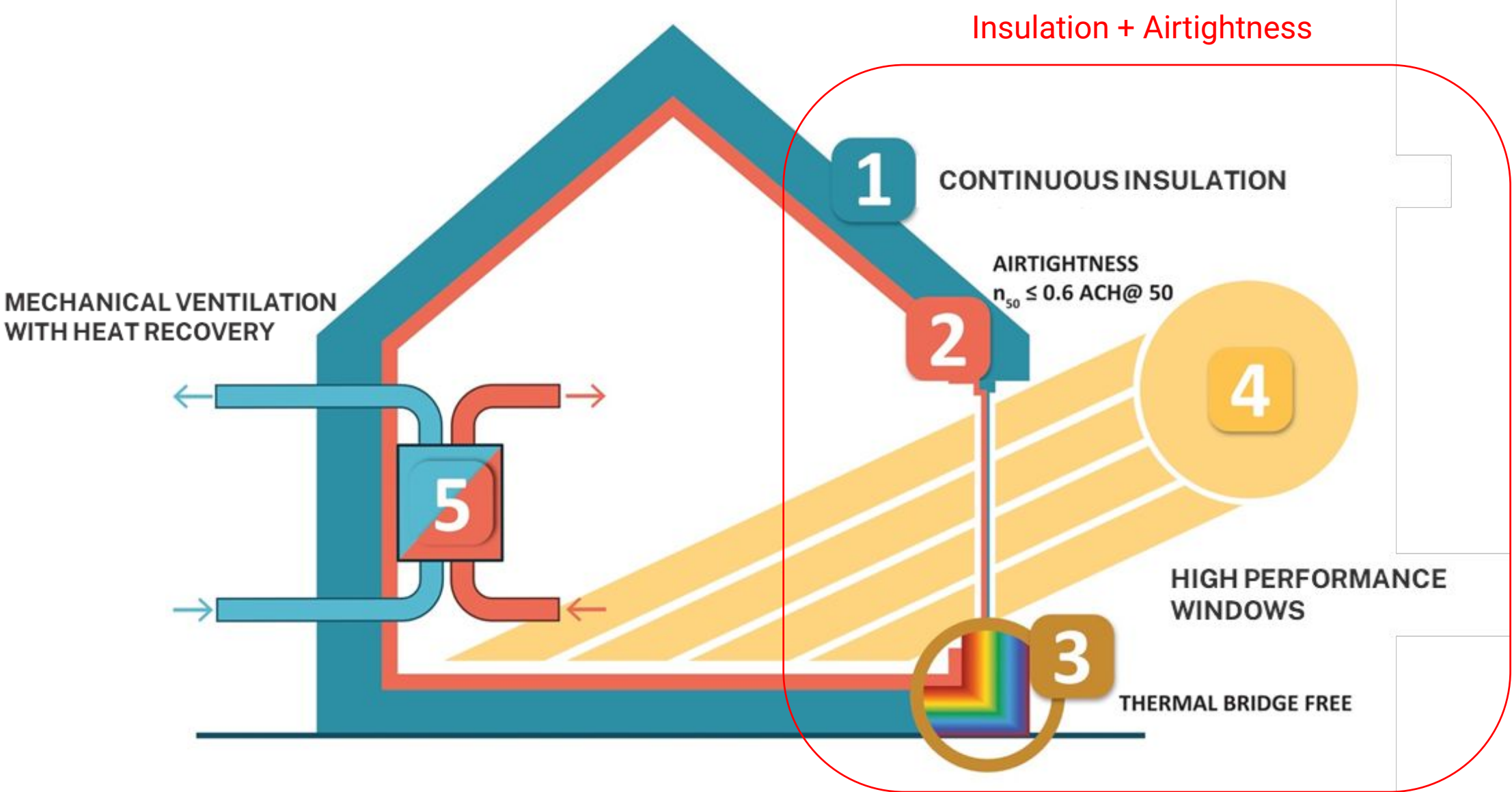
- New York City faces a 446 MW deficit in its reliability margin beginning in the summer of 2025 due to rising demand and the retirement of peaker plants facing new limits on nitrogen oxide emissions, according to a [quarterly report](#) released Friday by the state's grid operator.

<https://www.utilitydive.com/news/new-york-city-faces-2025-power-shortage-up-to-446-mw/688335/>



Efficiency Drivers for Building Envelopes

Passive House Principles

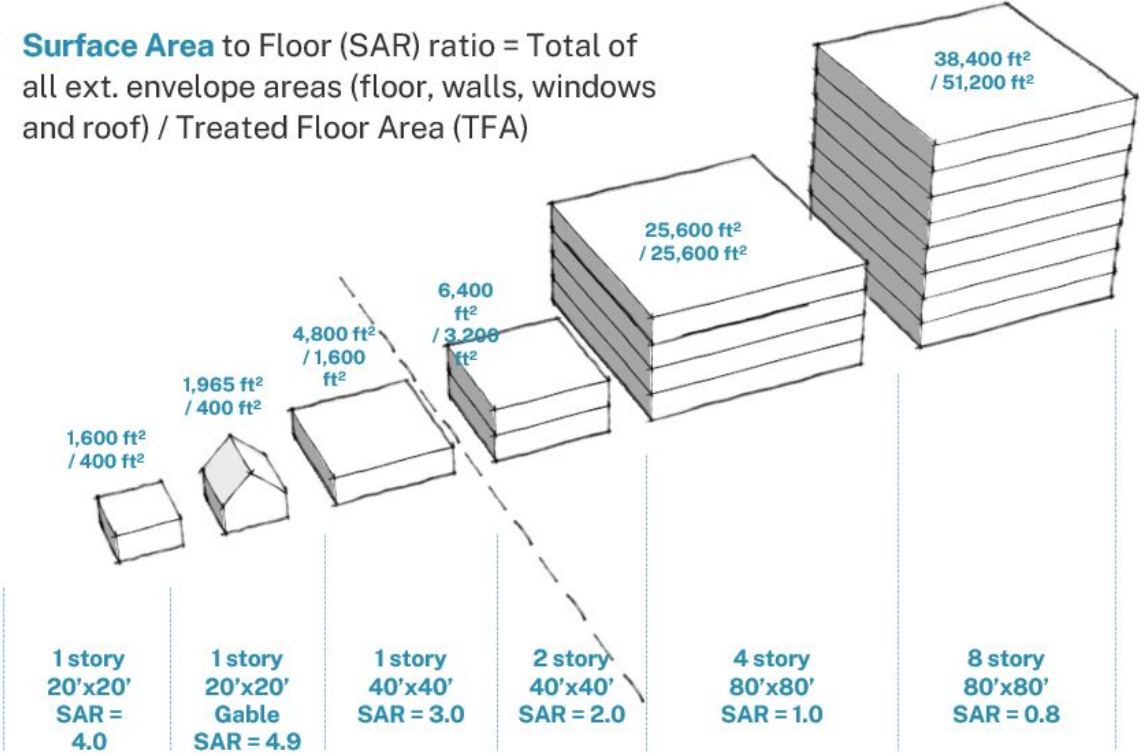


How Does Envelope Impact Energy Use? It Depends...



NY Public Health Lab (SOM)

Surface Area to Floor (SAR) ratio = Total of all ext. envelope areas (floor, walls, windows and roof) / Treated Floor Area (TFA)



Source: The Passive House Network



Why Upgrade Envelopes? Performance Issues



Lever House (SOM)

- Occupant Discomfort
- Air / Water Leaks, Condensation
- Material Degradation / Failure

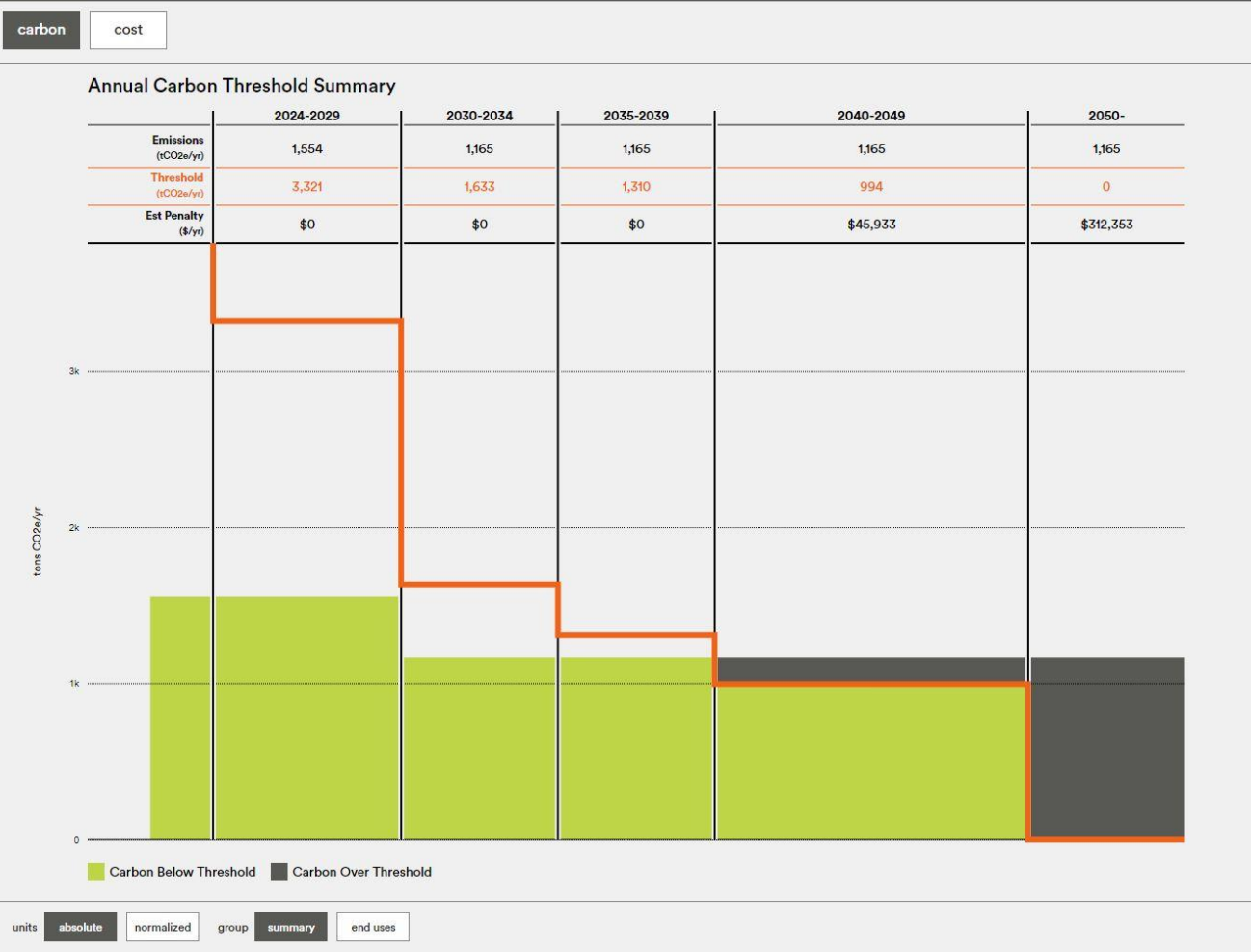


Why Upgrade Envelopes? Compliance



- LL11 Compliance
- LL97 Compliance

211 East 70th Street LP LL84 2022 (calendar year 2021)



211 East 70th St (SOM)

Why Upgrade Envelopes? Commercial Considerations



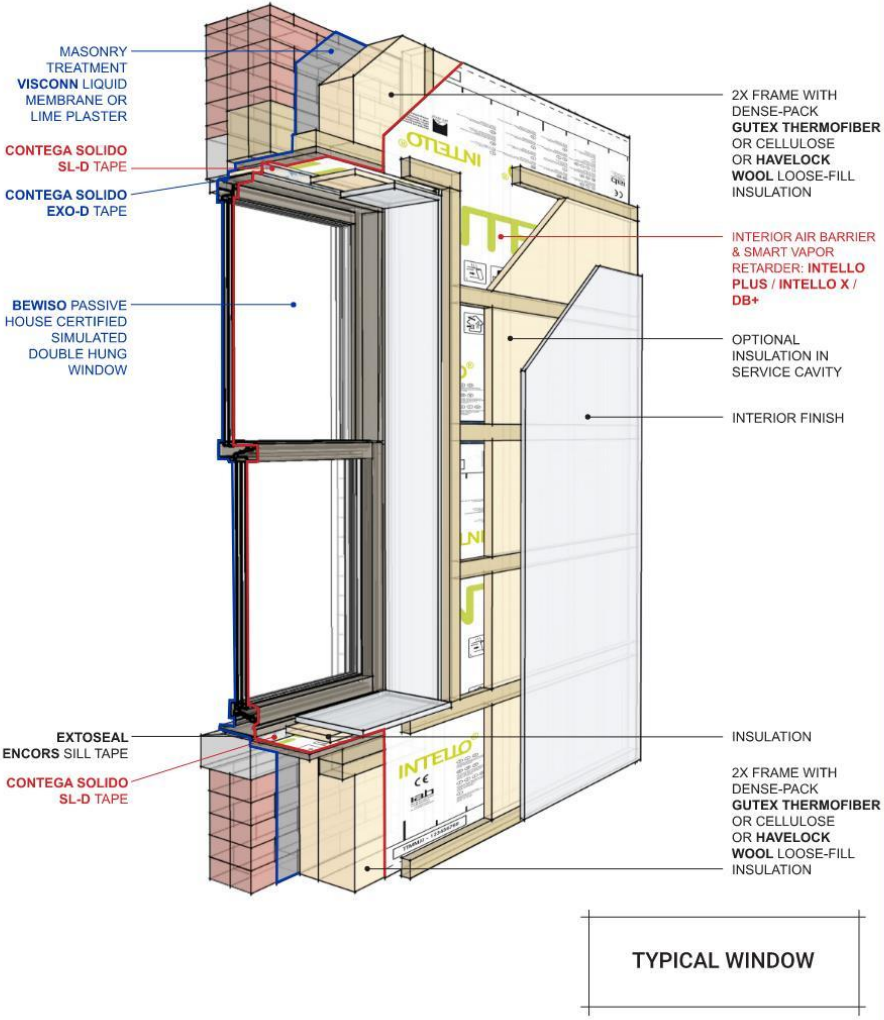
5 Manhattan West (Brookfield / REX)

- Building Repositioning
 - Class B to Class A Office Space
 - Commercial to Residential Conversion
 - Aesthetics, Amenities, etc.

Envelope Retrofits: If, **How**, When?

Masonry + Punched Windows

Interior Insulation



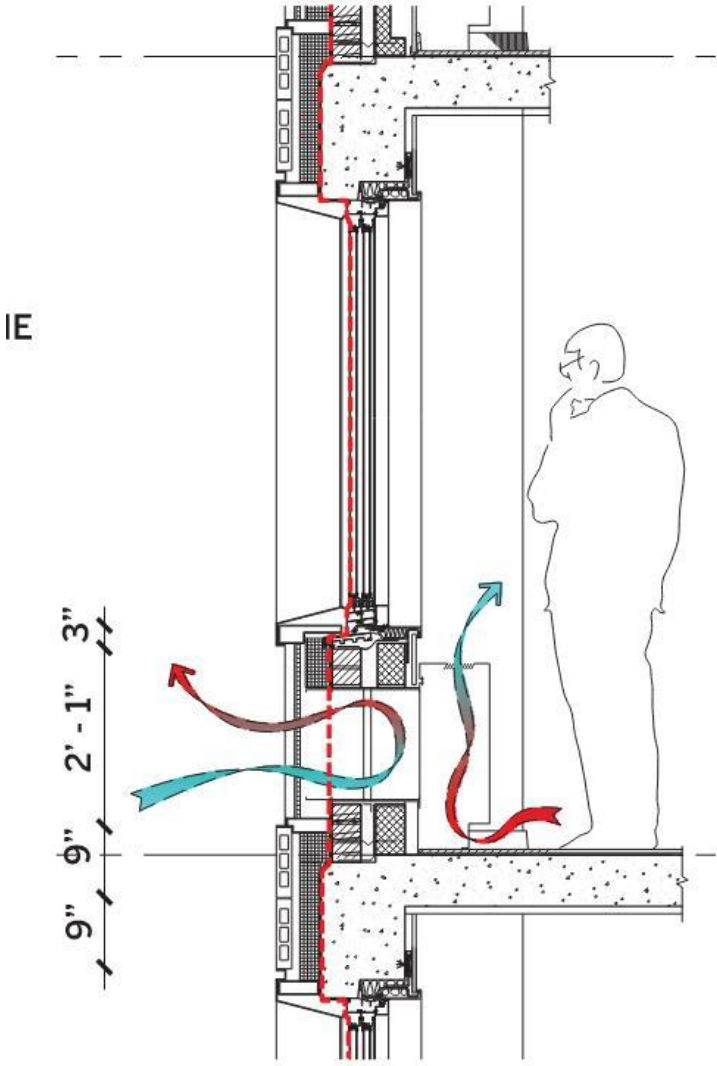
Brooklyn Townhouse (Baxt Ingui)

- 475 High Performance Building Supply “Smart Enclosure System” masonry retrofit

Masonry + Punched Windows Exterior Insulation



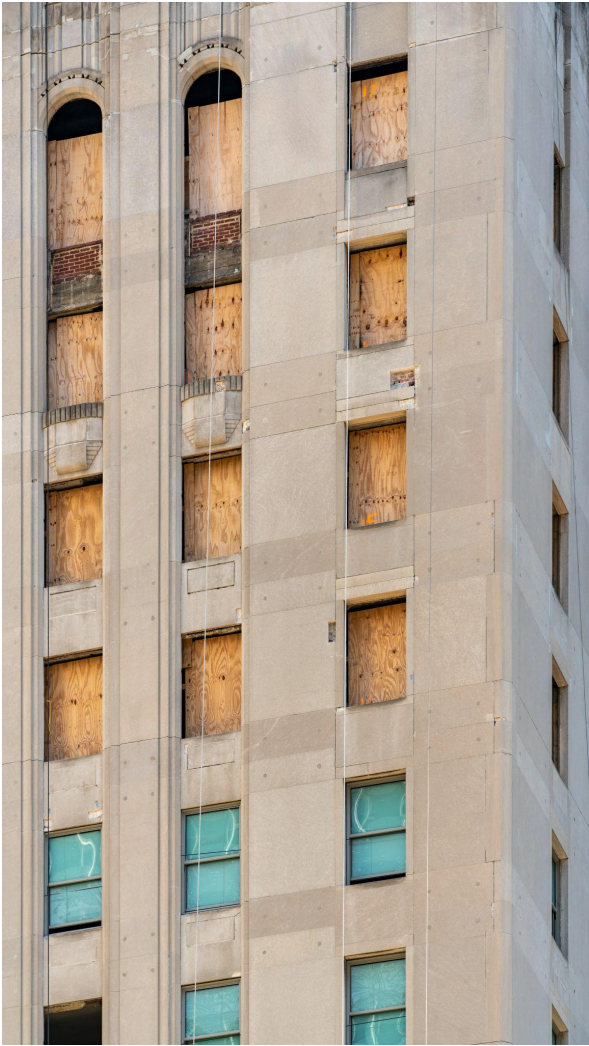
Proposed Section Detail



- 211 East 70th Street - Overclad, No Window Replacement

Masonry + Punched Windows

Window Replacement



- Waldorf Astoria - Landmark, Window Replacement

Curtainwall
Reclad



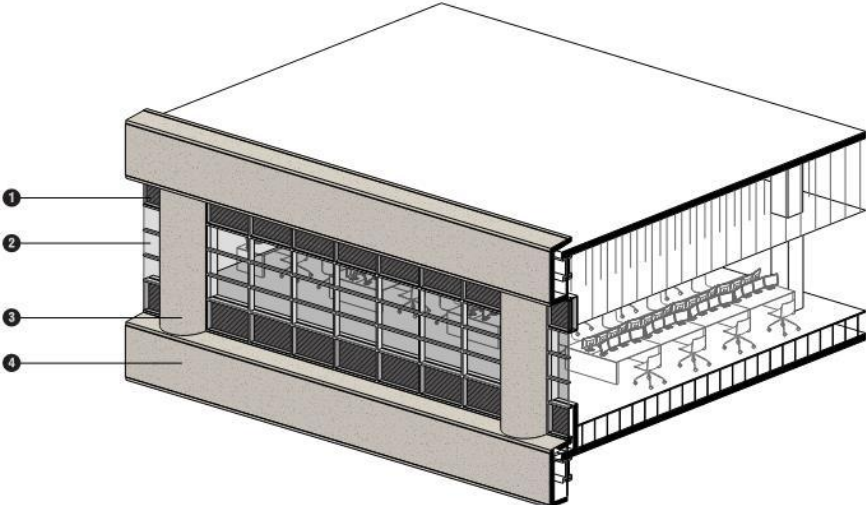
- 388 and 390 Greenwich (Citigroup) - Reclad with tenants in place

Curtainwall Reclad

390 RECLAD FACADE - PHASING

1 Existing Condition

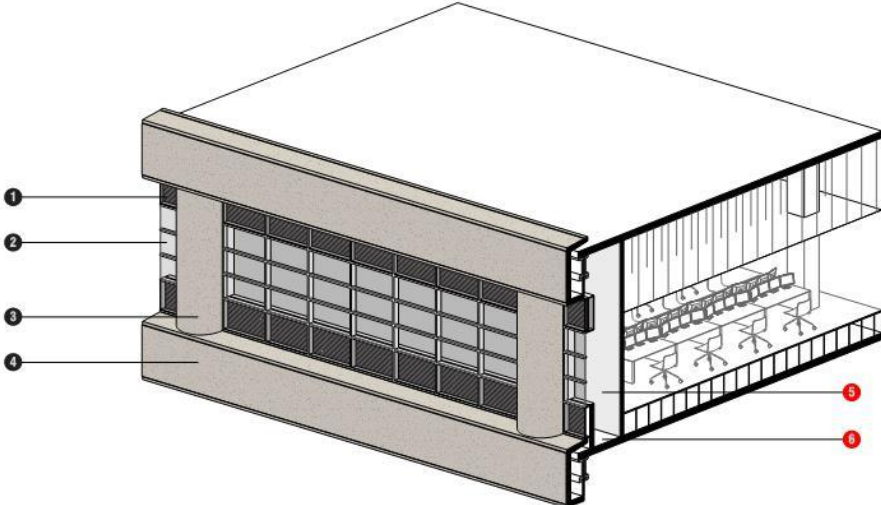
- 1 Spandrel Glazing
- 2 Vision Glazing
- 3 Precast Column Cover
- 4 Precast Spandrel Panel



390 RECLAD FACADE - PHASING

2 Temporary Weather Wall

- 1 Spandrel Glazing
- 2 Vision Glazing
- 3 Precast Column Cover
- 4 Precast Spandrel Panel
- 5 Weather Wall
- 6 Construction Zone

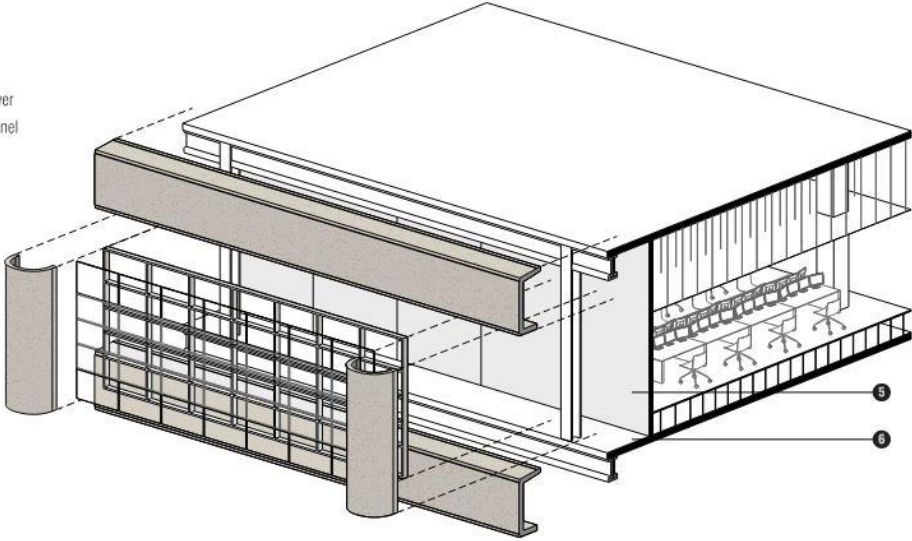


Curtainwall Reclad

390 RECLAD FACADE - PHASING

3 Demolish Existing Facade

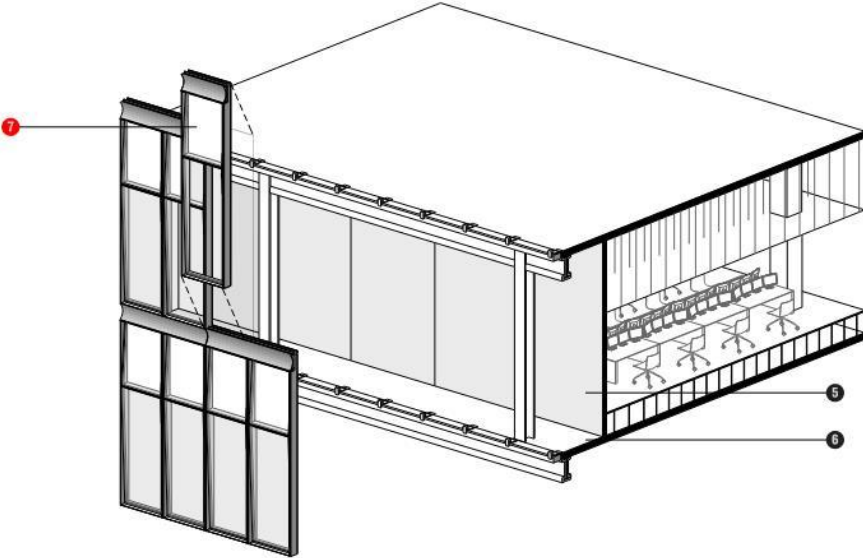
- 1 Spandrel Glazing
- 2 Vision Glazing
- 3 Precast Column Cover
- 4 Precast Spandrel Panel
- 5 Weather Wall
- 6 Construction Zone



390 RECLAD FACADE - PHASING

4 Install New Curtain Wall

- 1 Spandrel Glazing
- 2 Vision Glazing
- 3 Precast Column Cover
- 4 Precast Spandrel Panel
- 5 Weather Wall
- 6 Construction Zone
- 7 New Curtain Wall Unit

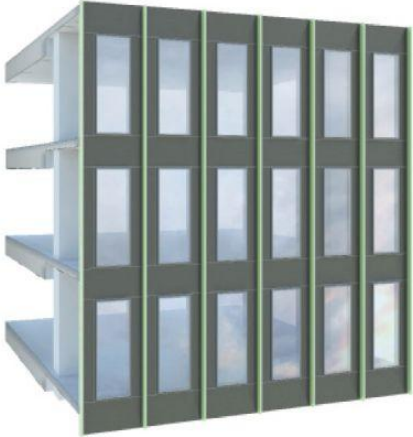


**Curtainwall
Overclad**



- 1801 K Street - Overclad with tenants in place

Curtainwall Overclad



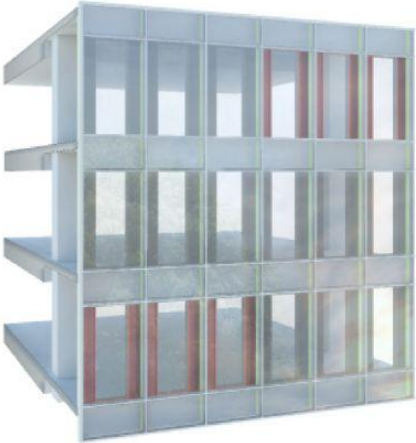
1: Reinforce Structural Mullions



2: Install Clips to Attach New Facade



3: Install New Curtain Wall Over Existing Facade



4: Leases Expire and Tenants Move



5: Remove Old Curtain Wall Panels



6: After Complete Removal of Old Facade

Envelope Retrofits: If, How, **When**?

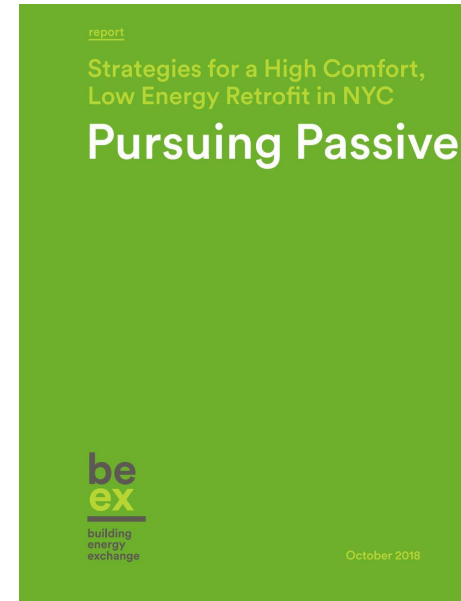
Major Renovation vs Retrofit Over Time

Major Renovation

- Address all systems holistically at the same time
- Phasing, occupants in place is possible
- Best outcome, but expensive and invasive

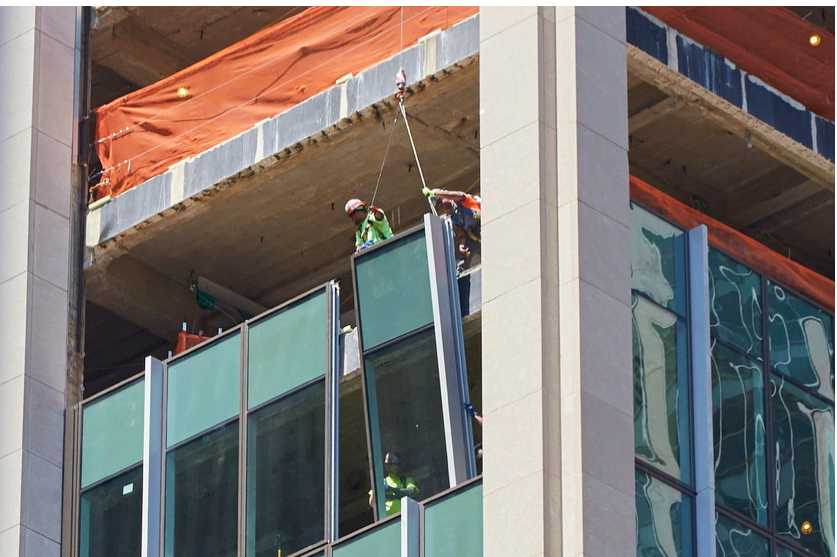
Retrofit Over Time

- Address one system at a time as part of a long-term capital improvement plan
- Less capital-intensive (in the short term)
- Replacement can be planned for end-of-life of building elements
- Consider order of steps carefully! Systems impact each other (ie: airtightness / ventilation, envelope improvements and HVAC sizing)



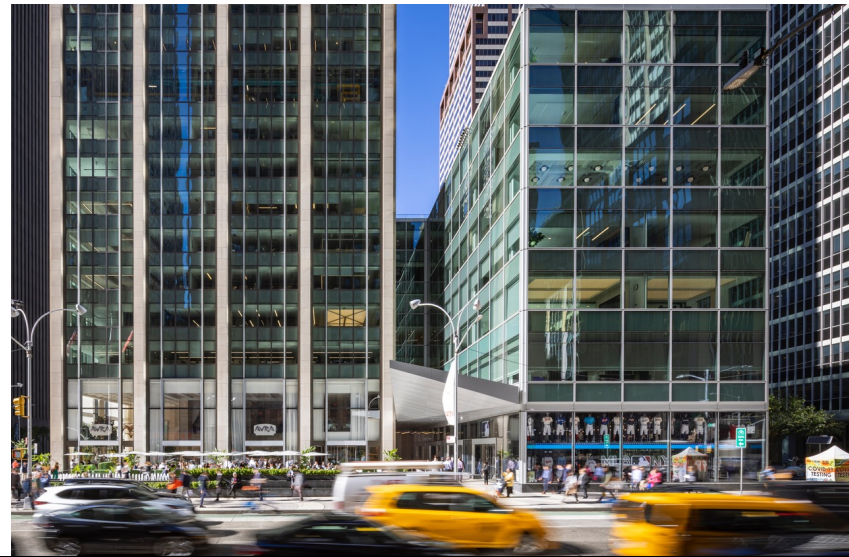
Phases

- 1 Year 0**
Envelope 1: windows + roof insulation
- 2 Year 4**
Ventilation system (balanced ERV system + exhaust)
- 3 Year 8**
Envelope 2: wall insulation & airtightness
- 4 Year 12**
Replace heating/cooling systems with VRF system
- 5 Year 16**
Replace domestic hot water boiler with high efficiency model
- 6 Anytime**
Upgrade lighting to LED, upgrade elevators, install energy efficient appliances



ROCKEFELLER
GROUP

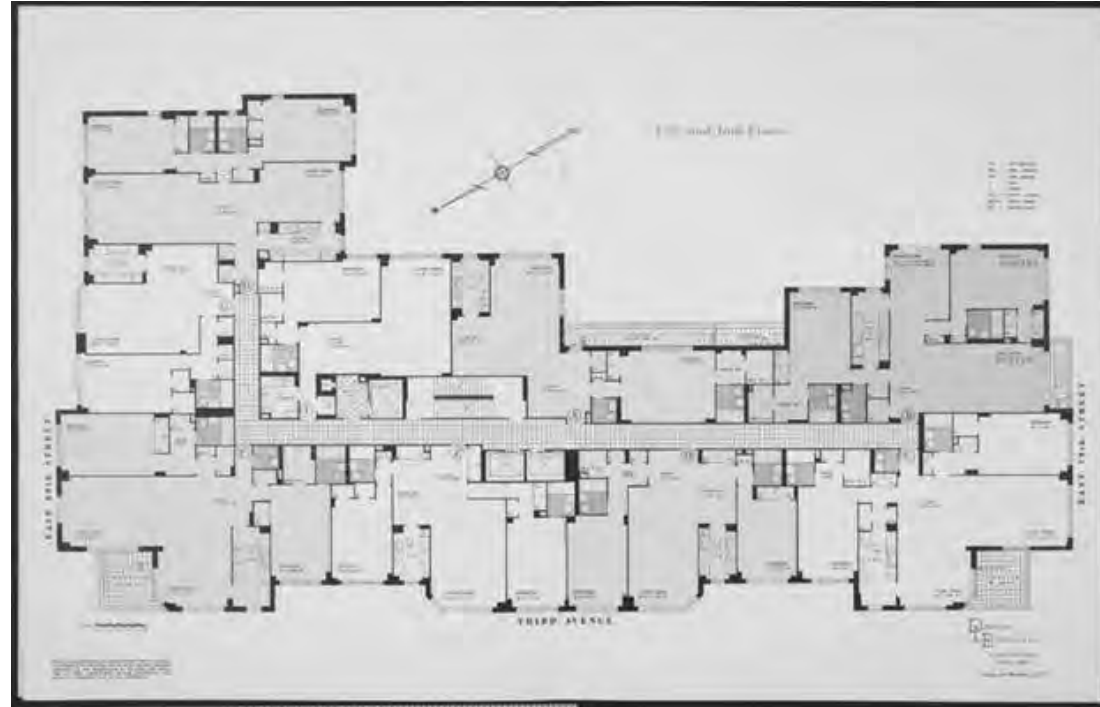
1271 AVENUE OF THE
AMERICAS
ROCKEFELLER
CENTER





201 East 79th Street

A DISTINCTIVE NEW COOPERATIVE RESIDENCE



201 E 79TH STREET

ROGERSPARTNERS
Architects+Urban Designers



201 E 79TH STREET

ROGERS PARTNERS
Architects+Urban Designers



201 E 79TH STREET

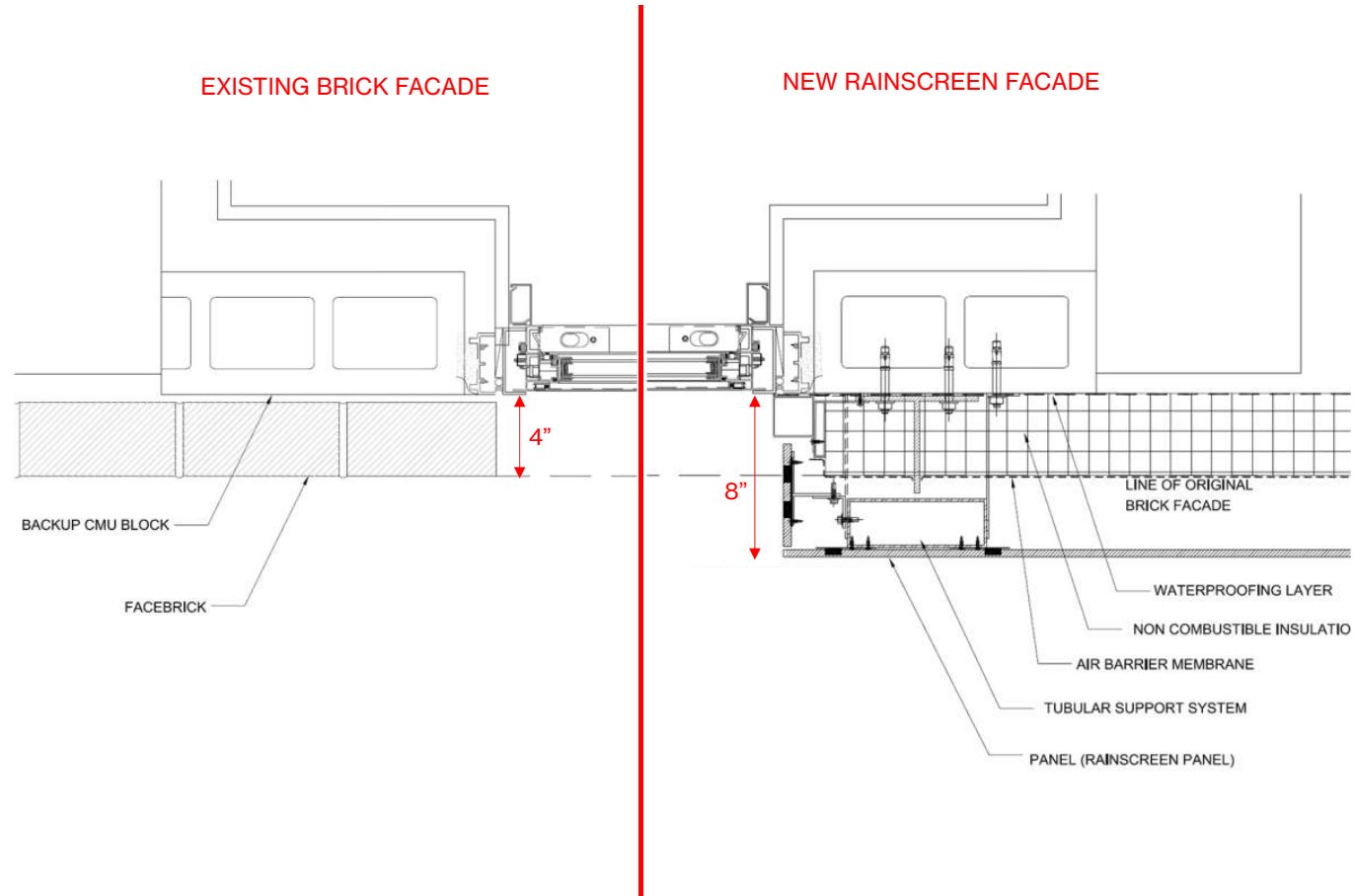
ROGERSPARTNERS
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201 E 79TH STREET



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ROGERS PARTNERS
Architects+Urban Designers



201 E 79TH STREET



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BROADWAY

“New York’s ultimate skin building”
Ada Louise Huxtable (NYT Architecture Critic), 1968.

“SOM’s “best” work in New York City”
Paul Goldberger (NYT Architecture Critic), 1979.

“An acclaimed example of mid-20th century modernism... the building’s smooth mullion-less skin was singled out for its remarkable simplicity and color” Landmarks Preservation Commission, 2013.

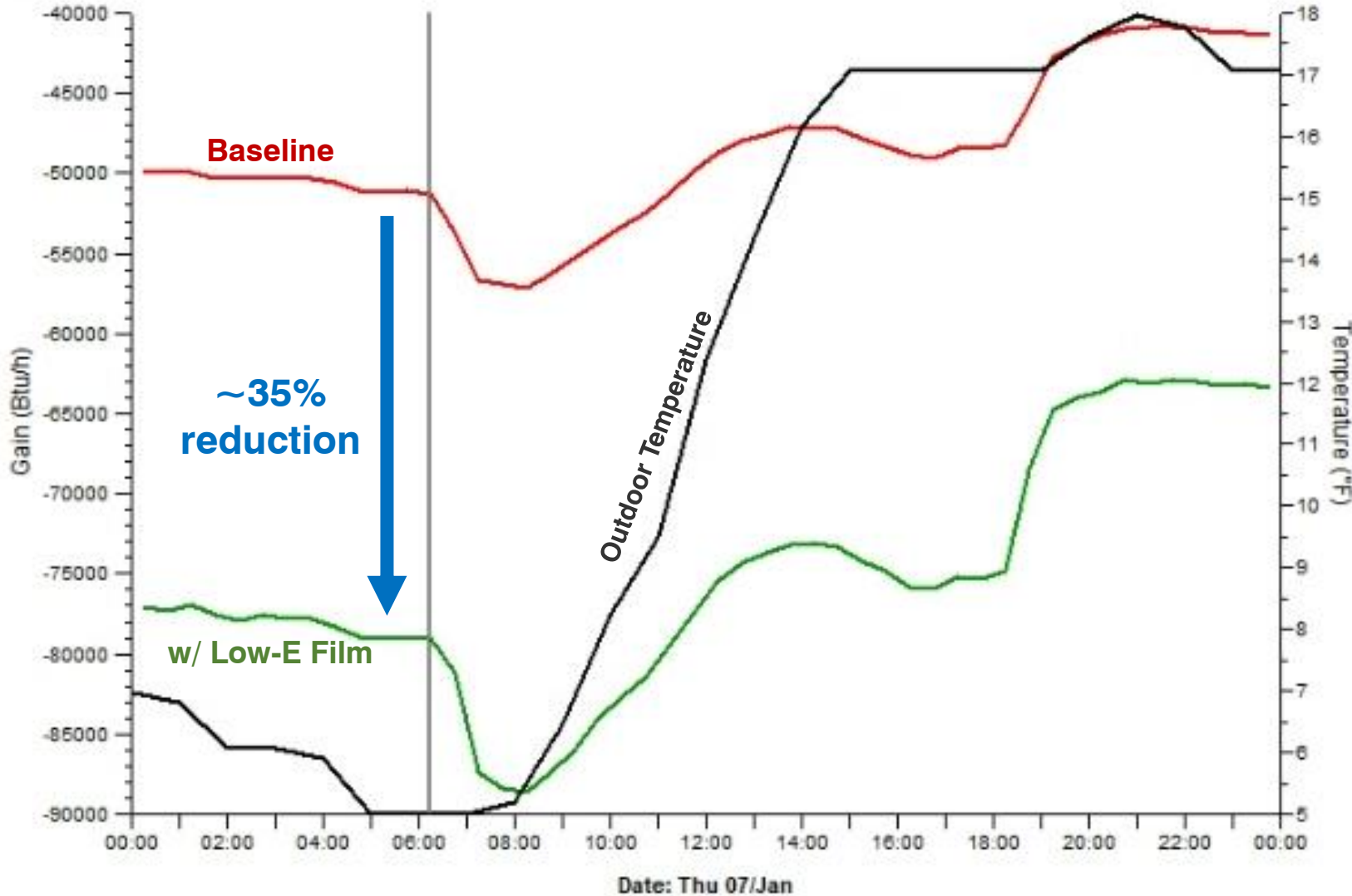
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BROADWAY

Calibrated Building Energy Modeling Simulation.

- 1) REDUCE LOADS
(fewer Btu to treat)
- 2) IMPROVE PERFORMANCE
(less energy to treat each Btu)
- 3) REDUCE CARBON EMISSIONS
(less GHG per unit energy used)

CONDUCTION HEAT LOSS: Impact of Low-E Film



REDUCE LOADS

3M Low-E window film provided by EPD and installed by Layr:

- 35% reduction in conduction heat loss at perimeter
- 20% reduction in annual space heating energy use



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ex

building
energy
exchange

discuss.

Moderator

- *Todd Kimmel, US Senior Manager of Sustainable Solutions, Rockwool*

Speakers

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exchange

thank you.