

# NYSERDA's Grid-Interactive Building Showcase

**be  
ex**

**building  
energy  
exchange**

31 Chambers Street  
New York, NY

May 17, 2023  
3 to 6pm

2.5 AIA LU

Join BE-Ex and NYSERDA for an industry showcase of Grid-interactive Efficient Buildings, exploring solutions for demand flexibility that leverage smart technology coupled with deep energy retrofits to reduce operating costs, meet climate objectives, and increase grid stability.

speakers

Cody Glavey-Weiss, Project Manager, NYSERDA  
William Xia, Director, Multifamily Residential, NYSERDA  
David Klatt, Chief Operating Officer, Logical Buildings  
Cindy Zhu, Director of Grid Services, Prescriptive Data  
Grayson Jordan, Partner, Paul A. Castrucci Architects  
Ryan Cassidy, Director of Sustainability & Construction, RiseBoro Community Partnership  
Luis M. Rios, Assistant Vice President, Rudin Management Co.

moderator

Kristen Palma, Strategic Engagement Manager, RTEEM, NYSERDA



**NYSERDA**

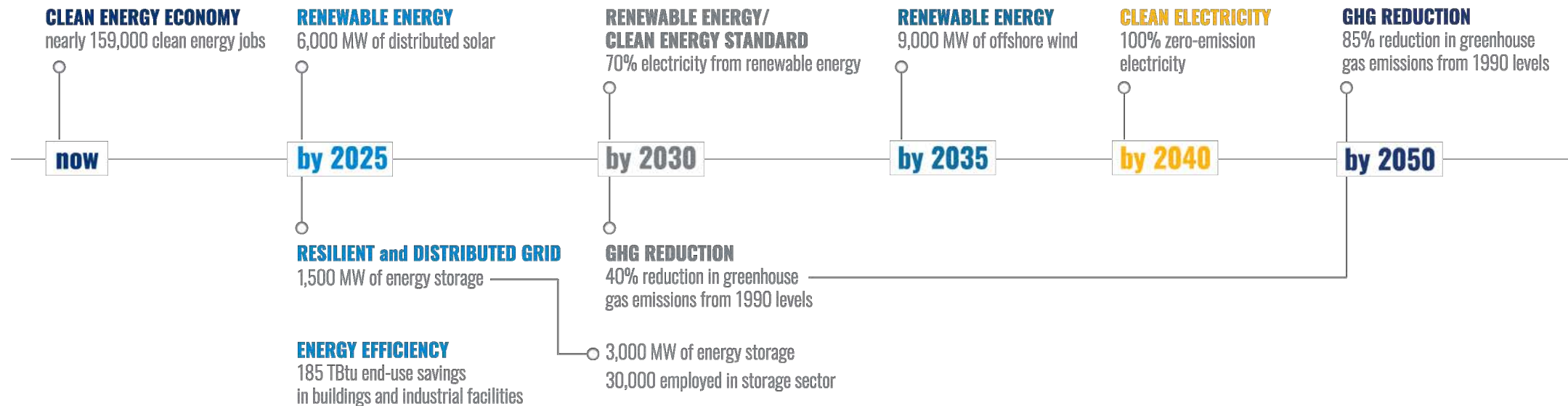
# **NYSERDA** **multifamily program overview**

**May 17, 2023**



# Climate Leadership and Community Protection Act

## New York State's Clean Energy Goals



- > Most aggressive greenhouse gas reduction goals of any major economy:
  - > **40%** by 2030, **85%** by 2050
- > **70%** renewable energy by 2030
- > **100%** zero-emission electricity by 2040
- > Codifies clean energy targets
- > Makes commitments to environmental justice, disadvantaged communities (DACs), and just transition
  - > **40%** of overall benefits of clean energy investments to DACs

# New York State Climate Action Plan

- **Climate Action Council Scoping Plan**
  - Recommendations to meet the Climate Act's goals and requirements
- **2 Million Climate Friendly Homes**
  - Electrify 1 million homes and up to 1 million electrification-ready homes by 2030
- **New Efficiency: New York**
  - 185 trillion BTUs of end-use energy reduction below the 2025 energy-use forecast
- **Carbon Neutral Buildings Roadmap**
  - A roadmap of strategies to address climate change and improve the quality of life for all New Yorkers

# NYSERDA programs for multifamily buildings

- **75%+ of existing buildings will still be here in 2050**
- **Support needed to promote energy efficient new construction**

## General program eligibility requirements

- Pay into electric System Benefits Charge or Clean Energy Fund
- Buildings must have 5 or more dwelling units
- At least 50% of the gross heated square footage is residential space



# NYSERDA multifamily program overview

## Technical Assistance

- Flexible Technical Assistance Program (FlexTech)
- Low Carbon Capital Planning (LCCP)

## Implementation

- Low Carbon Pathways (LCP)
- Clean Energy Initiative – “Direct Injection” work with NYS HCR, NYC HPD
- RetrofitNY

## Financing

- Through the New York Green Bank (*Community Decarbonization Fund, others*)

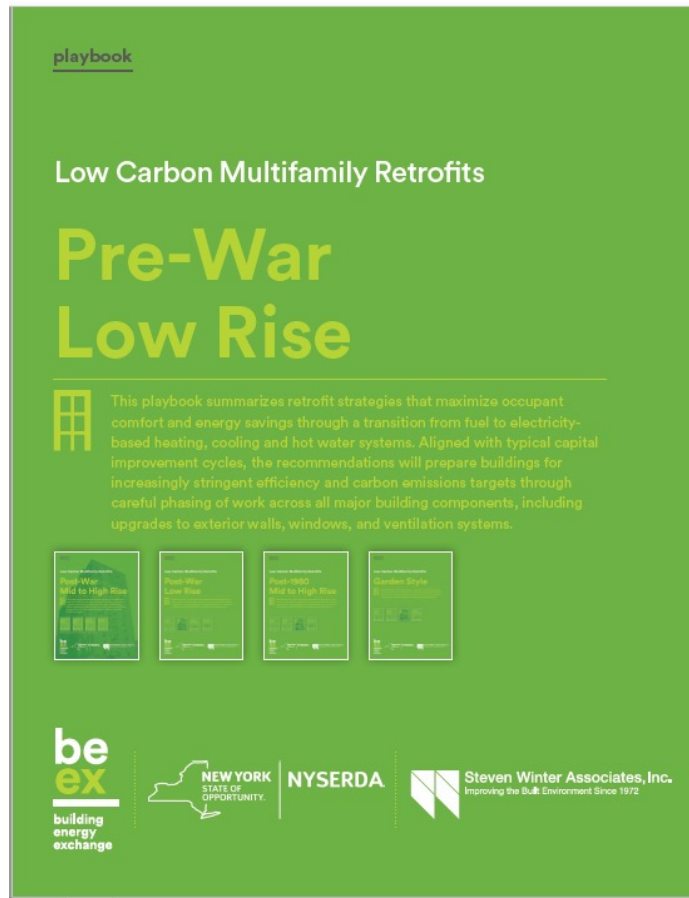
## Program Webpage



# Additional resources

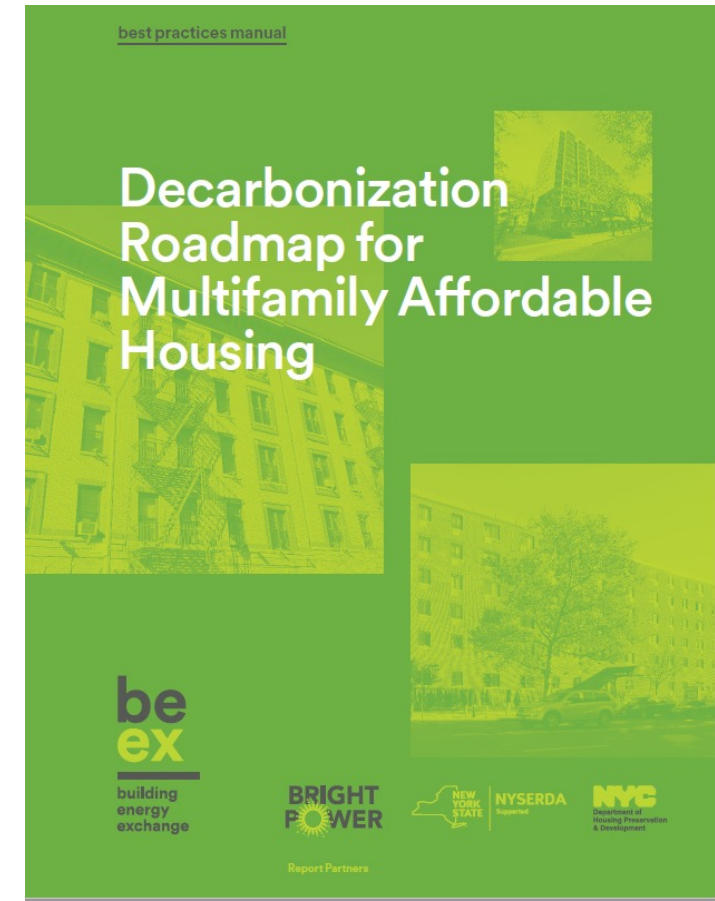
## > Low Carbon Multifamily Retrofit Playbooks

- Covers most common building types in NYS
- Identify retrofit pathway for implementation over time
- <https://be-exchange.org/lowcarbonmultifamily-main/>



## > Low Carbon Multifamily Retrofit Playbooks

- This manual provides a decarbonization roadmap for various affordable housing building typologies in NYC
- <https://be-exchange.org/report/hpd-1197-decarbonization-roadmap/>



# High-Performance Retrofits & Grid-Interactivity

- **Deep energy retrofits** provide significant energy savings and **grid-interactivity** provides demand flexibility
  - Deep energy retrofits can potentially reduce building energy consumption by over 50%
  - Grid-interactivity can potentially reduce energy cost by 30% and daily peak demand by 30-50%

## Deep Energy Retrofit

- Envelope improvements
- Energy efficient heat pumps for space heating, cooling and hot water
- LED lighting
- Energy efficient appliances

## Grid-Interactivity

- Smart devices and sensors
- Smart controls (building management system)
- Distributed generation (solar PV)
- Thermal and battery storage





# The Case for Deep Energy Retrofits + Grid Interactivity

Grayson Jordan, Principal Architect

paul a. castrucci architects

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An architectural rendering of a multi-story brick building. The building features a mix of brick and light-colored panels. It has numerous windows, some with decorative elements. A prominent feature is a rooftop garden with a glass railing and potted plants. The sky is blue with scattered white clouds. A semi-transparent white box is overlaid on the center of the image, containing the text "\$375 per square foot".

**\$375 per square foot**

why retrofit? **CONSTRUCTION COSTS**

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**NATURAL GAS COST: \$0.06/KW**

\$

**ELECTRIC COST: \$0.23/KW**

\$

\$

\$

\$

**why retrofit? OPERATIONAL COST**

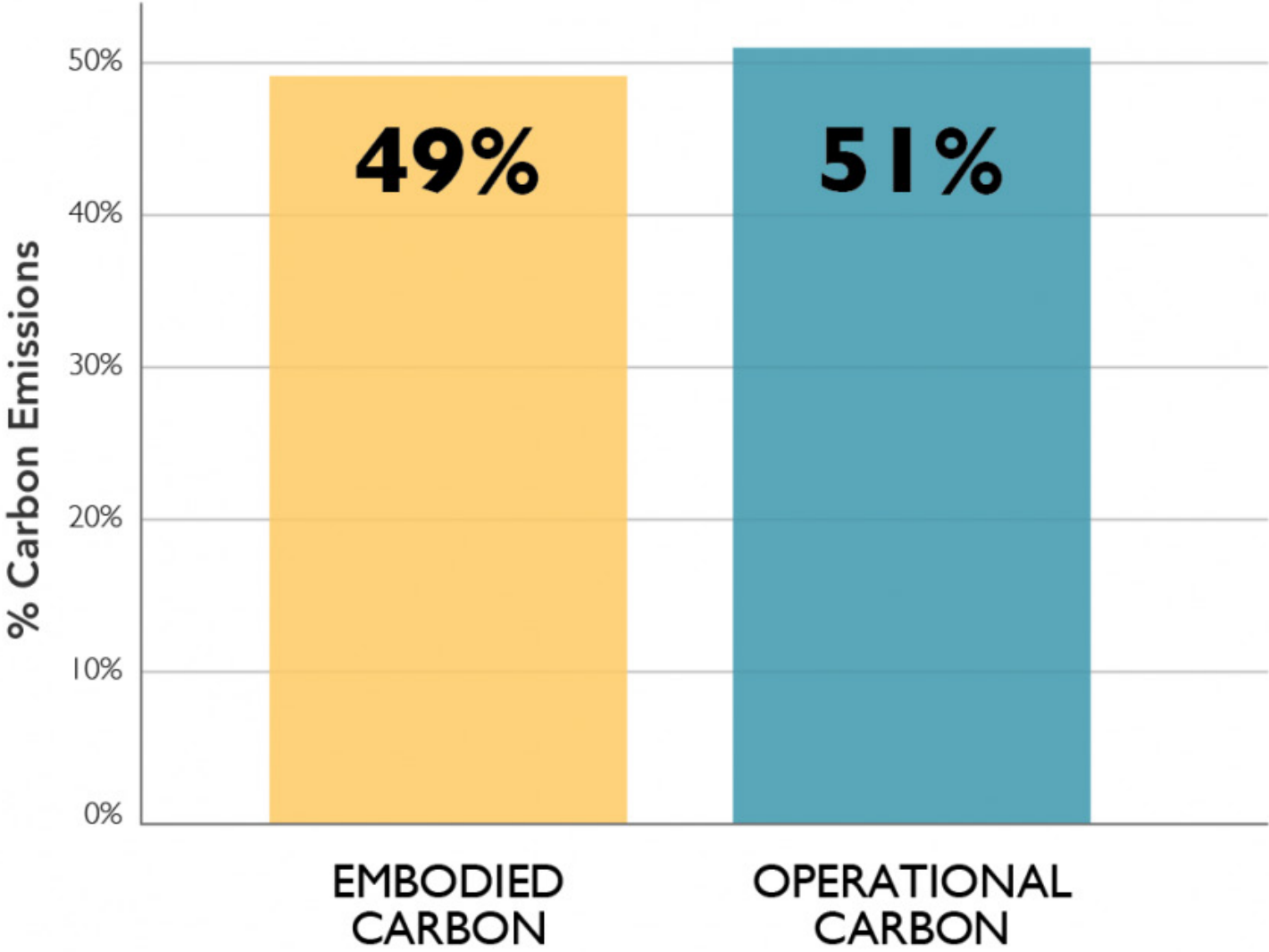
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why retrofit? **LOCAL LAW 97**

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# Total Carbon Emissions of Global New Construction from 2020-2050 Business as Usual Projection

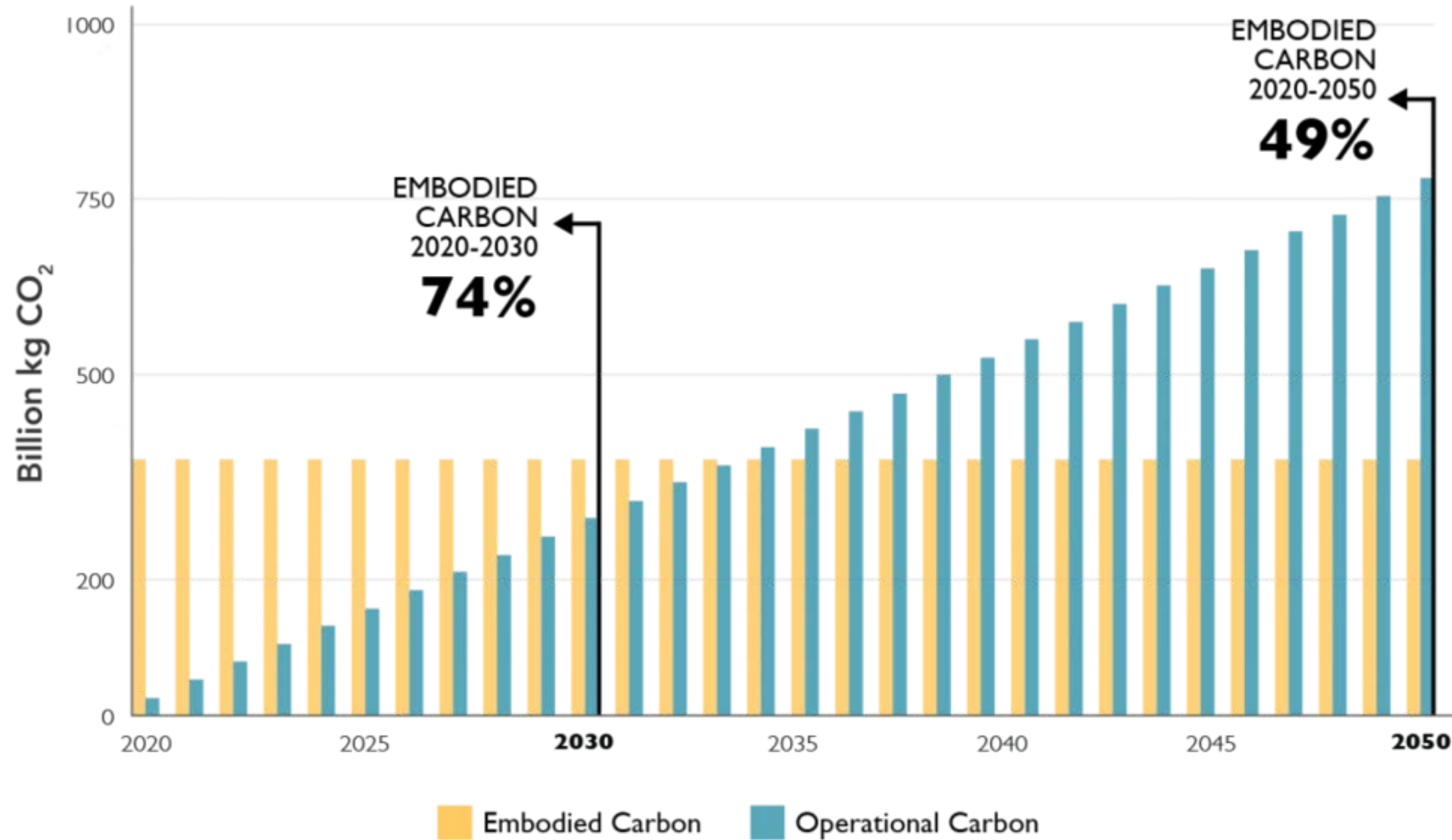


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why retrofit? **EMBODIED CARBON**

# Total Carbon Emissions of Global New Construction from 2020-2050

Business as Usual Projection



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Data Sources: UN Environment Global Status Report 2017; EIA International Energy Outlook 2017

why retrofit? **EMBODIED CARBON**

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why retrofit? **URBAN CONTEXT**

image from travellocal.com

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why retrofit? **URBAN CONTEXT**

image from wikipedia.org

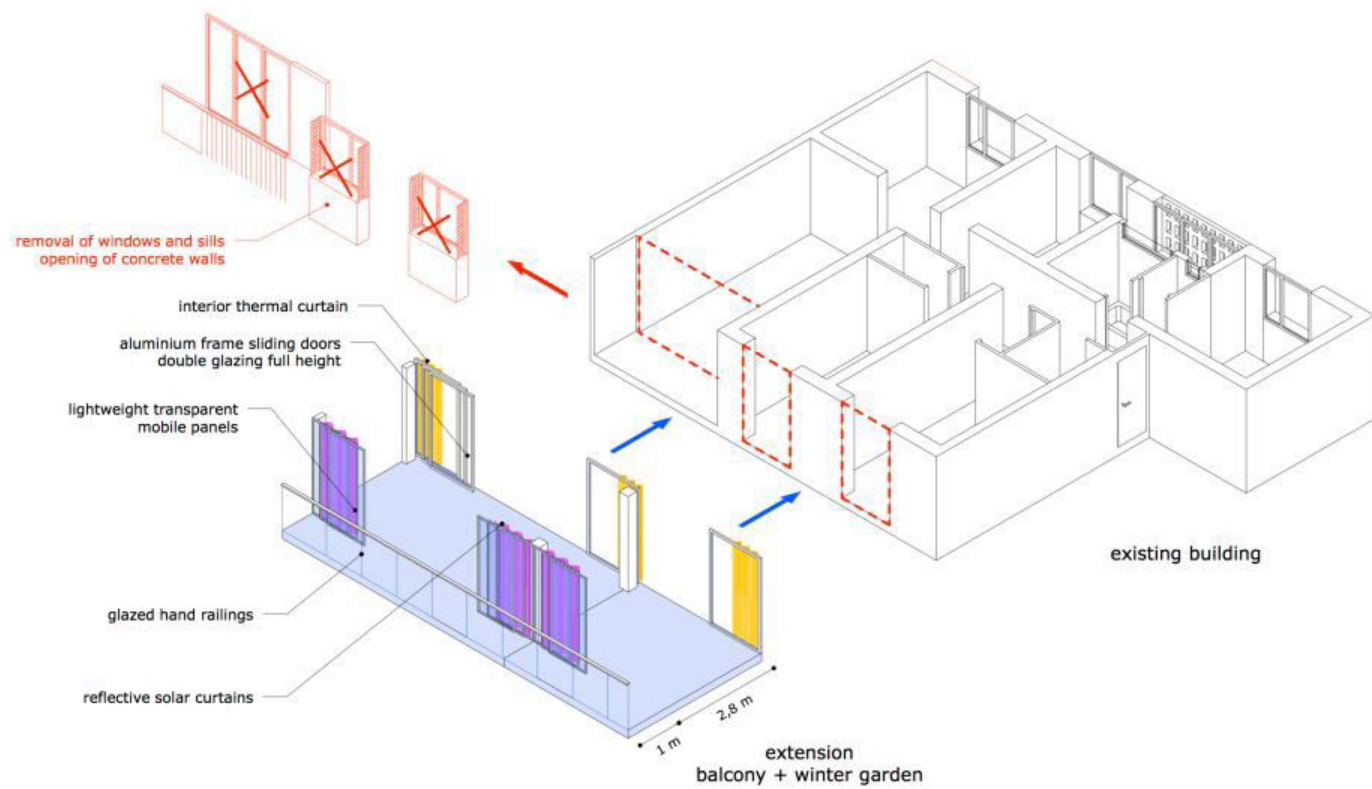
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image from yimby.

why retrofit? **CULTURAL/SOCIAL**



LACATON & VASSAL






**inspiration: LACATON & VASSAL NEVER DEMOLISH ETHOS**

**why retrofit? CULTURAL/SOCIAL**







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# EXISTING BUILDING PERFORMANCE

Electricity Usage:	3,314,073 kWh	
Gas Usage:	606,599 Therms	
Site EUI:	191.81	
Annual Utility Cost:	\$1,532,288/ year	
Annual Carbon:	529 tCO2e / year	

# RETROFITTED BUILDING PERFORMANCE (MODELED)

Electricity Usage:	4,600,036 kWh	 (38% Increase from Existing)
Gas Usage:	0 Therms	(100% Reduction from Existing)
Site EUI:	41.84	 (78% Reduction from Existing)
Annual Utility Cost:	\$905,850/ year	 (41% Reduction from Existing)
Annual Carbon:	83 tCO2e / year	 (84% Reduction from Existing)

## why retrofit? RESULTS

Retrofit of an Affordable East Village Co-op:

● 544 EAST 13TH ST  
377 EAST 10TH ST

# Retrofit of an Affordable East Village Co-op: Existing Conditions



## About the project:

- 12,000 GSF
- 6 floors + cellar
- Pre 1900 tenements,
- In flood zone
- Dire need of rehab

## Deficiencies:

- Structure
- Masonry
- Roof/Parapet damage
- No Insulation / Missing windows
- Drafty
- No heating
- Multiple fire damages
- Fire escape stairs unsafe

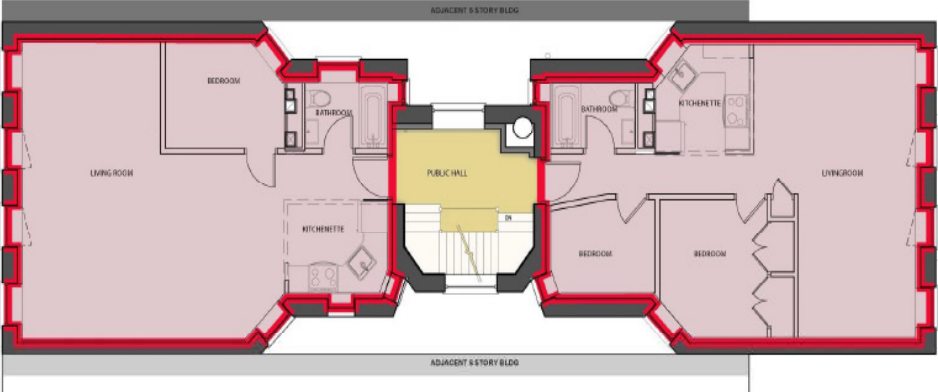
## Limitations

- Constrained budget
- Orientation fixed
- Exterior masonry walls to remain
- Preserve historic facade & tenement character
- No change in window openings
- No A/C - not in budget

# Retrofit of an Affordable East Village Co-op: Scope of Work and Design Goals

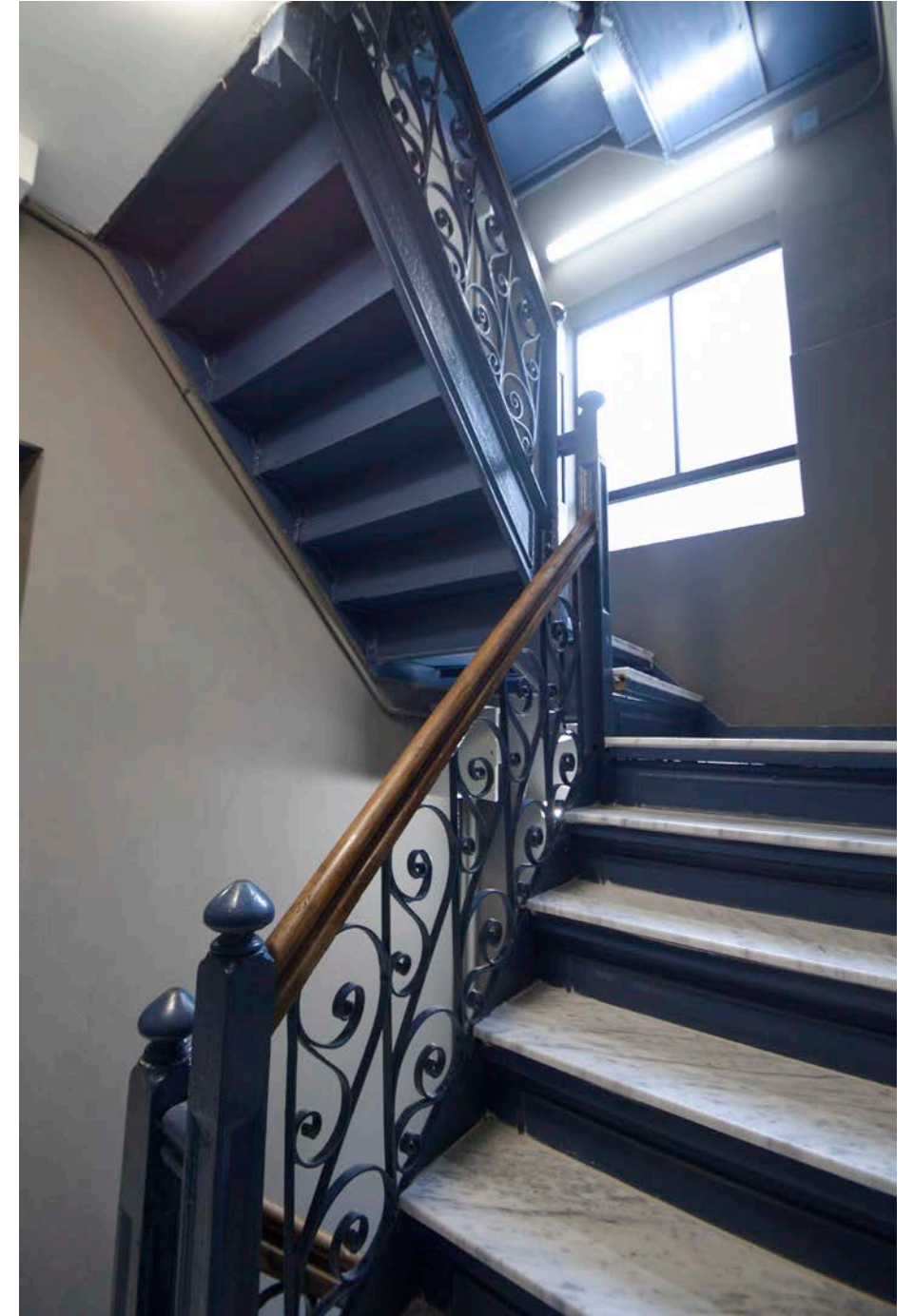


# Retrofit of an Affordable East Village Co-op: Envelope Strategy



Typical Floor Plan  
Not to scale

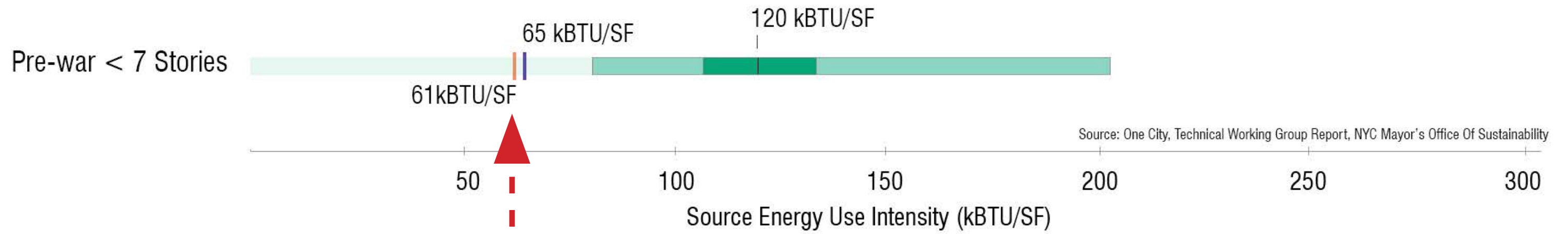




**East Village Co-op: COMPLETED INTERIORS**

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# East Village Co-op: **BENCHMARKED PERFORMANCE**

Retrofit / New Construction combo for Affordable Housing and Community Center  
**Selected Work: BEACON EAST HARLEM**

THE BEACON  
EAST HARLEM



# Retrofit / New Construction combo for Affordable Housing and Community Center

## Selected Work: BEACON EAST HARLEM



wxy architecture

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# Retrofit / New Construction combo for Affordable Housing and Community Center

## Selected Work: BEACON EAST HARLEM



# Retrofit / New Construction combo for Affordable Housing and Community Center Selected Work: BEACON EAST HARLEM



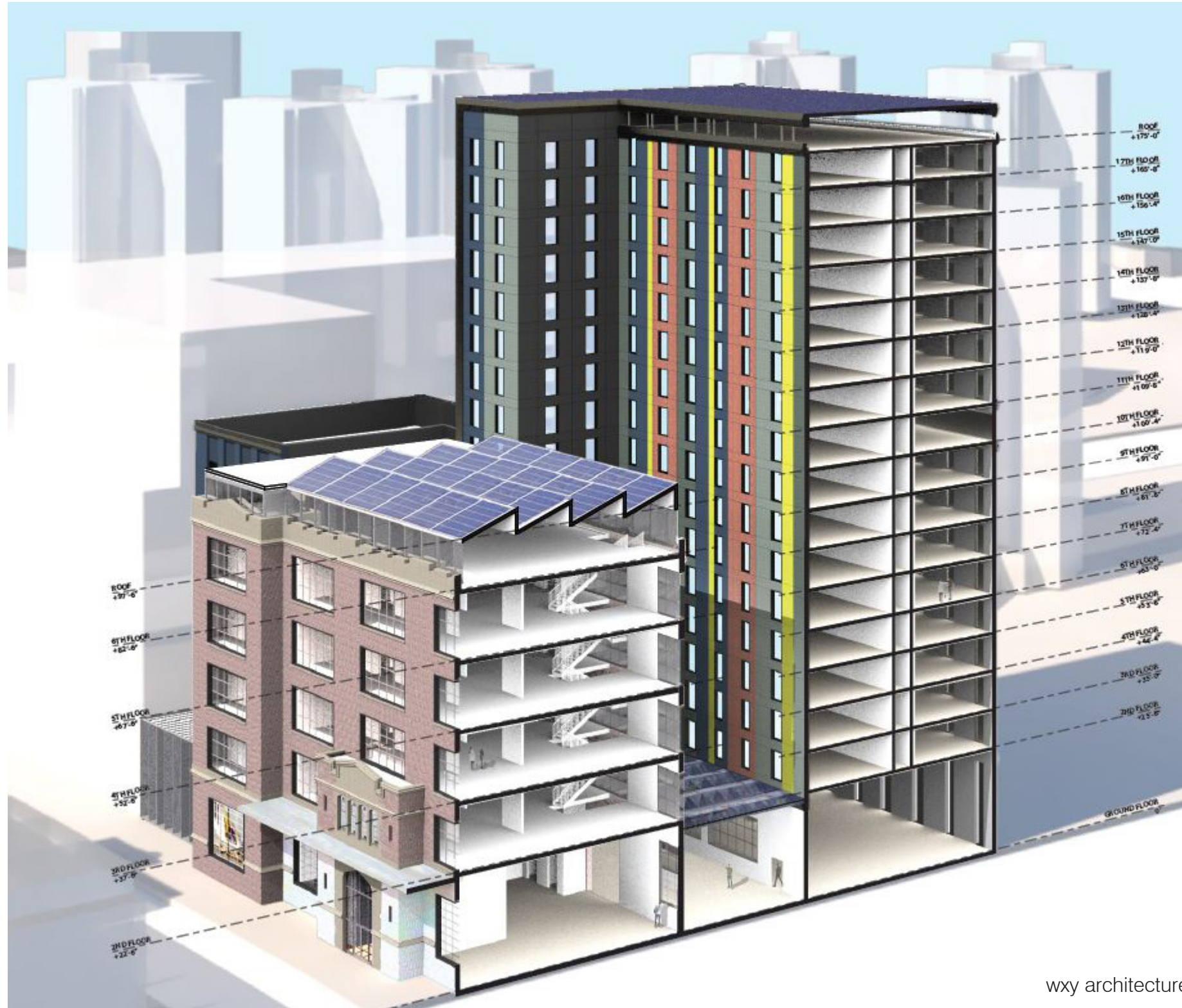
# Retrofit / New Construction combo for Affordable Housing and Community Center Selected Work: BEACON EAST HARLEM



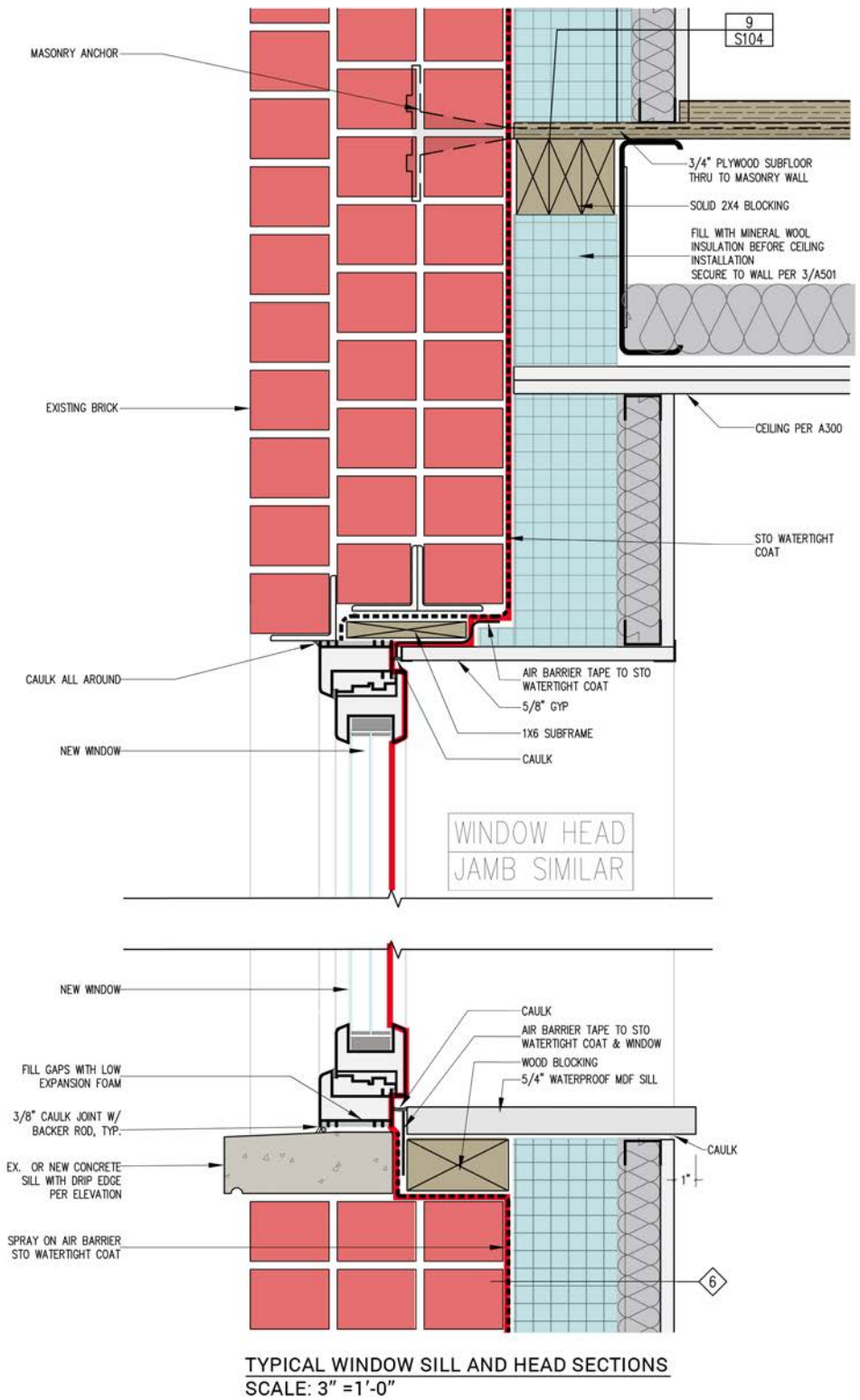
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# Retrofit / New Construction combo for Affordable Housing and Community Center

## Selected Work: BEACON EAST HARLEM



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Energiesprong Retrofits  
**Selected Work: RETROFITNY (VARIOUS SITES)**

**VARIOUS SITES  
RETROFITNY**

**VARIOUS SITES  
RETROFITNY**



# Energiesprong Retrofits

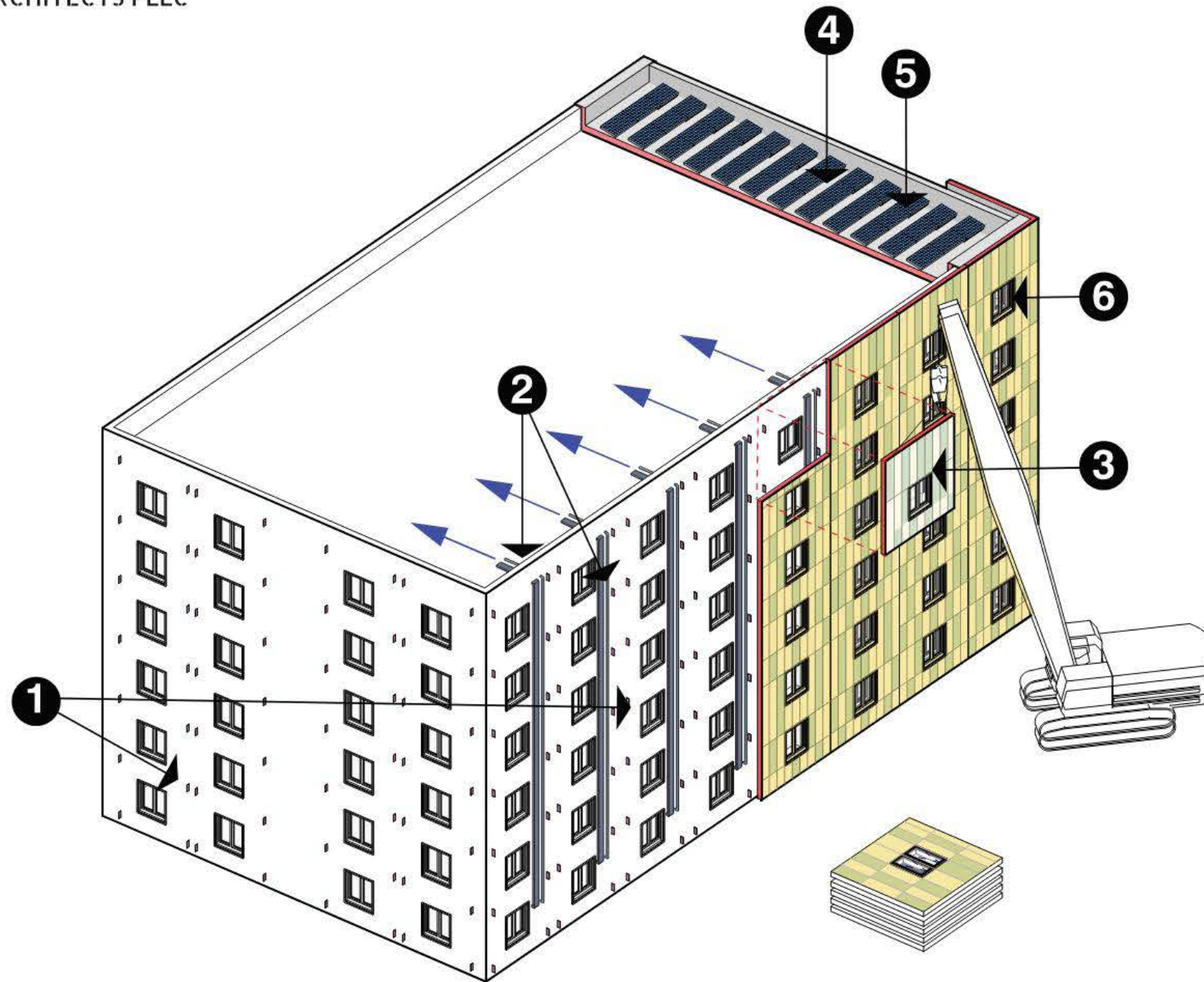
## Selected Work: RETROFITNY (VARIOUS SITES)



# Energiesprong Retrofits

## Selected Work: RETROFITNY (VARIOUS SITES)

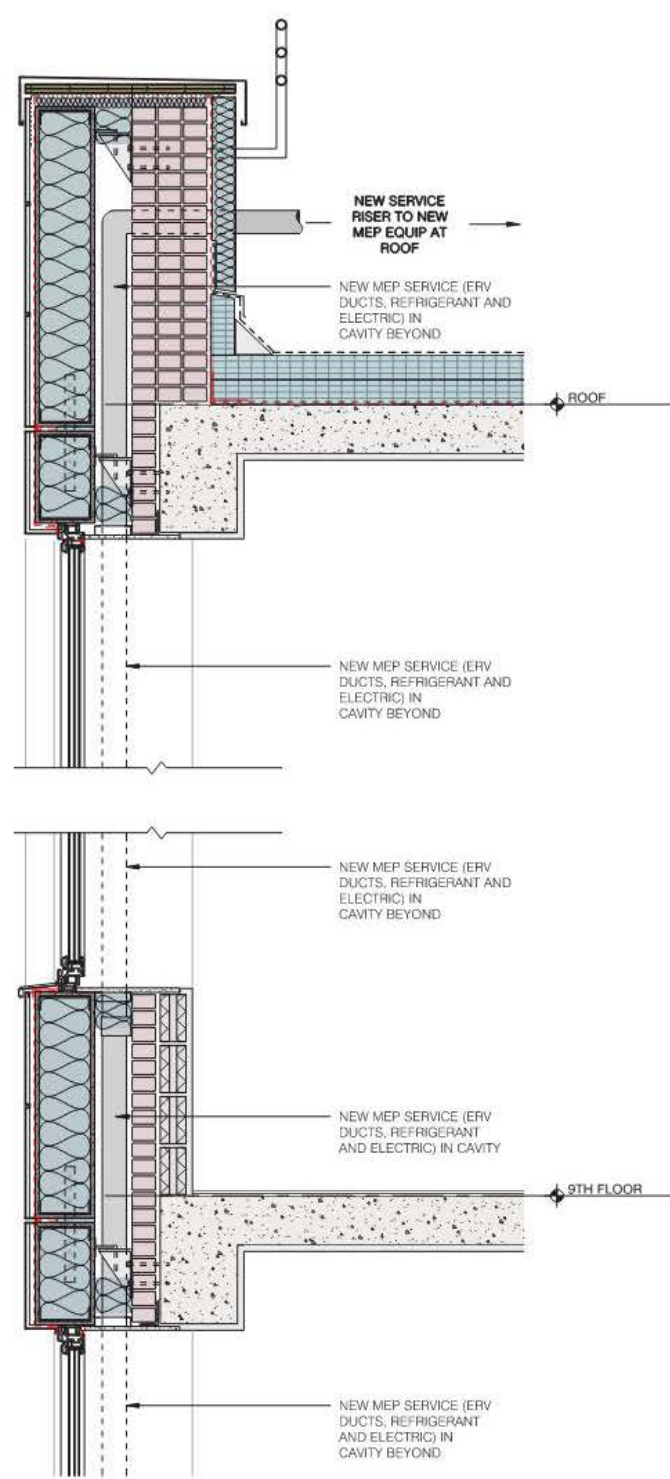
**RESIDENT-IN-PLACE DEEP ENERGY RETROFIT**  
(COMPREHENSIVE SCOPE ///ENERGIESPRONG)  
PAUL A. CASTRUCCI, ARCHITECTS PLLC



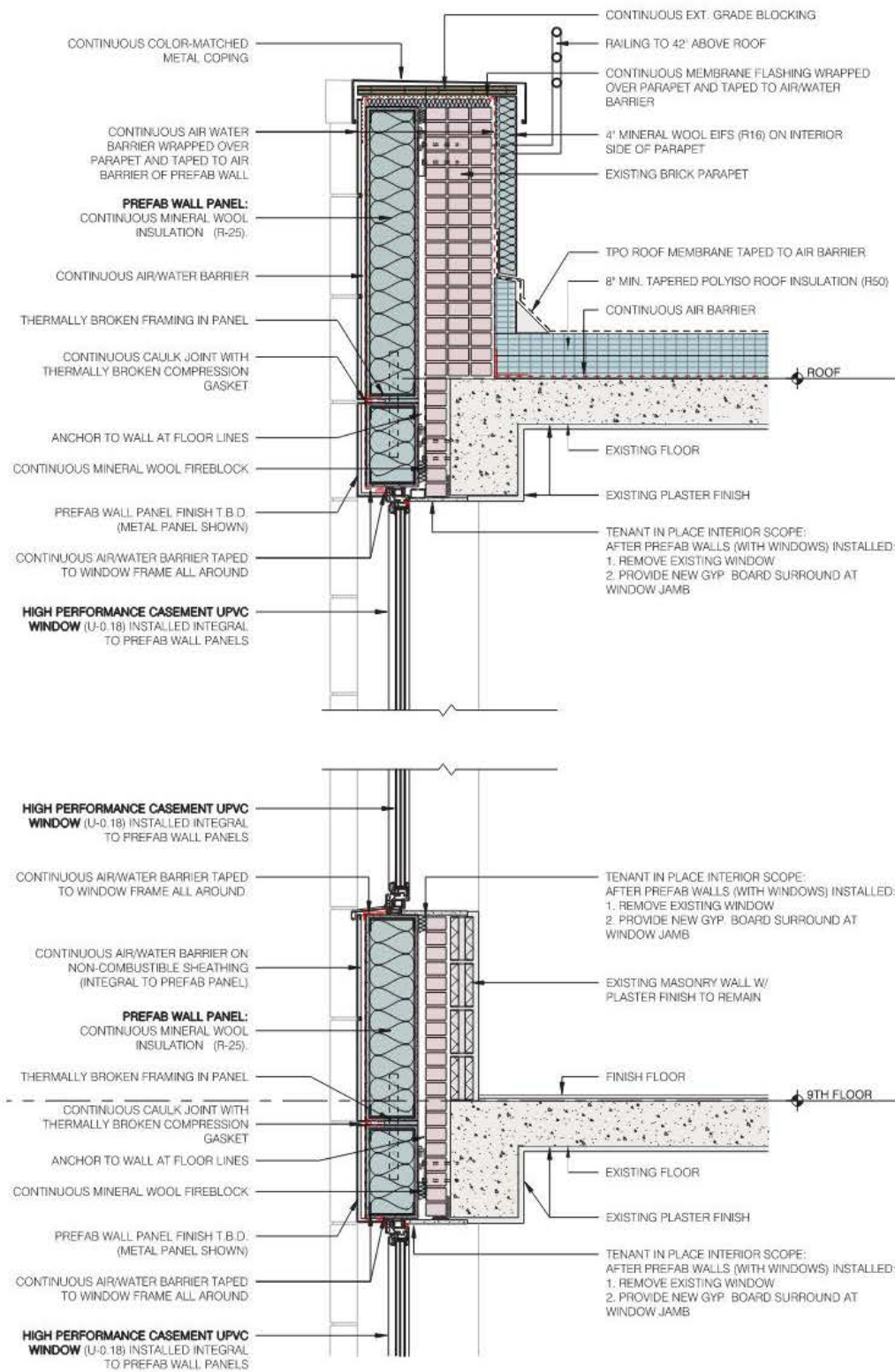
- 1 WALL ANCHORS**  
INSTALL ANCHORS AT FLOOR LINES
- 2 MEP SERVICE CAVITY**  
INSTALL MEP SERVICES (ELEC, HEAT PUMP LINES, VENTILATION) ON OUTSIDE FACE OF WALL. CONNECT TO NEW MEP EQUIPMENT AT ROOF  
  
HIGH PERFORMANCE VRF HEAT PUMP HEATING AND COOLING  
  
ERV: ENERGY RECOVERY SUPPLY AND EXHAUST BALANCED VENTILATION
- 3 HIGH PERFORMANCE PRE-FAB PANELS**  
NEW HIGH PERFORMANCE, PRE-FABRICATED WALL AND WINDOW PANELS CRANED INTO PLACE (R24 CI WALLS WITH THERMALLY BROKEN FRAMING, R7 WINDOWS)  
  
WALL + WINDOW PANELS INSTALLED OVER MEP SERVICE CAVITY  
  
AIR & WATER TIGHT GASKETS AT EDGES
- 4 HIGH PERFORMANCE ROOF**  
NEW ROOF INSULATION (R50) AND ROOF MEMBRANE. NEW PARAPET INSULATION AND FINISH INSTALLED IN THE FIELD.
- 5 SOLAR PV AND BATTERIES**  
MAXIMIZE NEW SOLAR PV ARRAY AND SOLAR BATTERY BACKUP ON ROOF AREA
- 6 EXISTING WINDOWS REMOVED**  
AFTER EXTERIOR PANELS ARE INSTALLED, REMOVE EXISTING WINDOWS, PROVIDE MINOR PATCHING OF WINDOW JAMB (RESIDENTS REMAIN IN PLACE)

# Energiesprong Retrofits

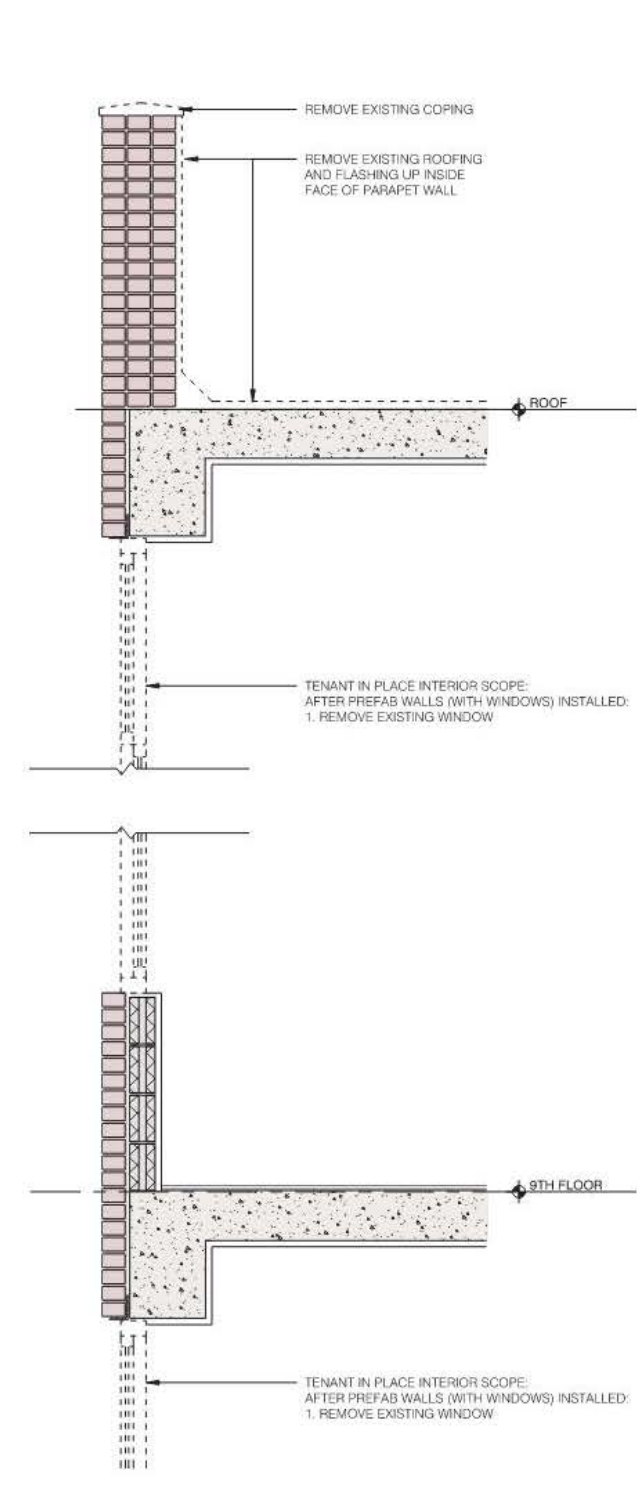
## Selected Work: RETROFITNY (VARIOUS SITES)



**PROPOSED WALL SECTION @  
BUMP OUT FOR MECHANICALS**



**PROPOSED WALL SECTION W/  
PRE-FAB WALL PANEL OVERCLAD**

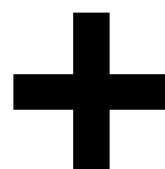
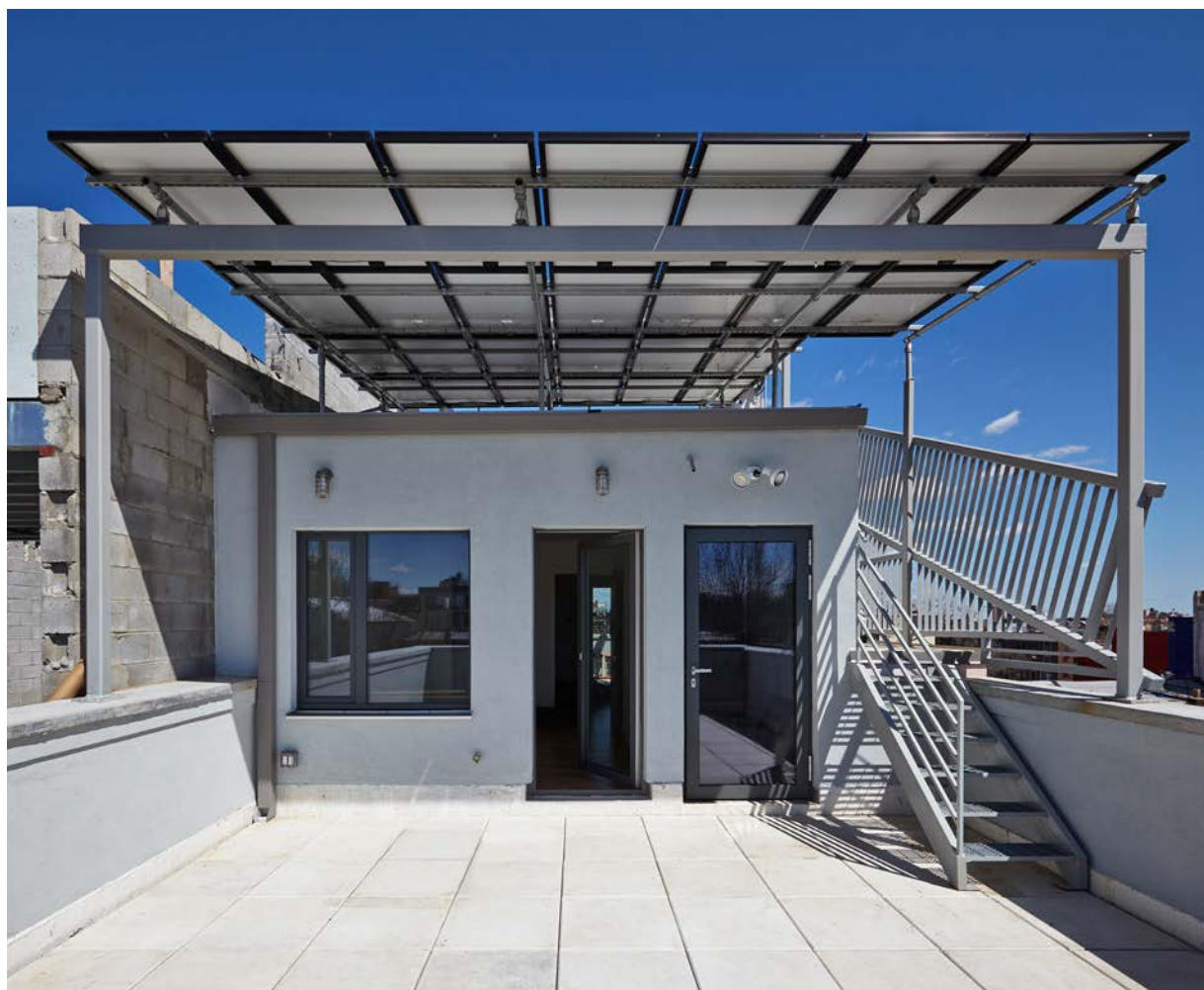


**EXISTING WALL SECTION**

# Energiesprong Retrofits

## Selected Work: RETROFITNY (VARIOUS SITES)





kuga electrical

**grid interactivity SOLAR PV + BATTERIES**

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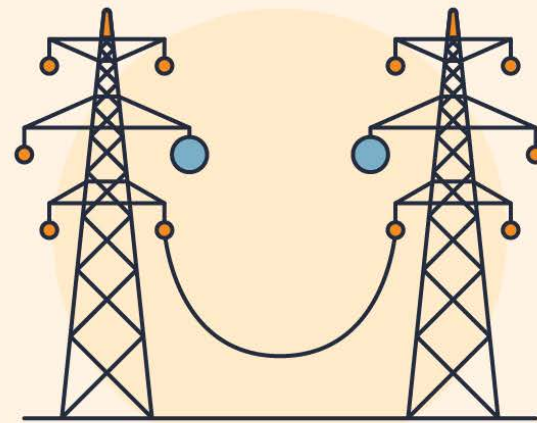
Automated buildings **use less energy overall** compared to non-automated ones.



System automation **reduces waste** accumulated from operating during off-hours.

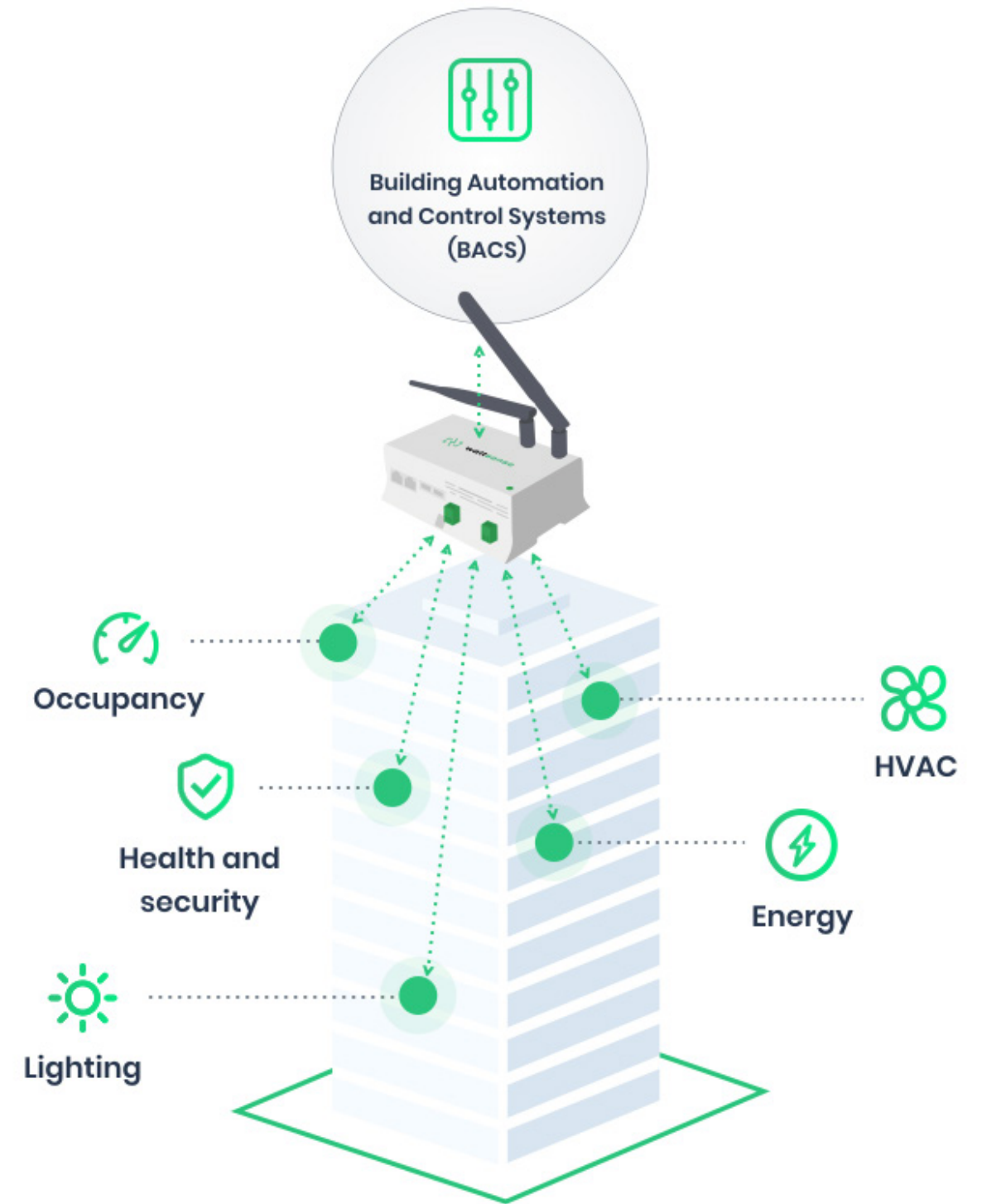


**Operating costs decrease** for every automation that's introduced in a building.



**Reduced strain to the electrical grid** benefits the community as a whole.

bigrentz.com



the continental automated buildings association

# grid interactivity **BUILDING CONTROLS AND AUTOMATION**

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## Residential Time Periods and Delivery Rates\*

Time-of-Use Periods	Peak Rates 8 a.m. to Midnight	Off-Peak Rates All other hours of the week
June 1 to Sept 30	25.50 cents/kWh	1.80 cents/kWh
All other months	9.44 cents/kWh	1.80 cents/kWh

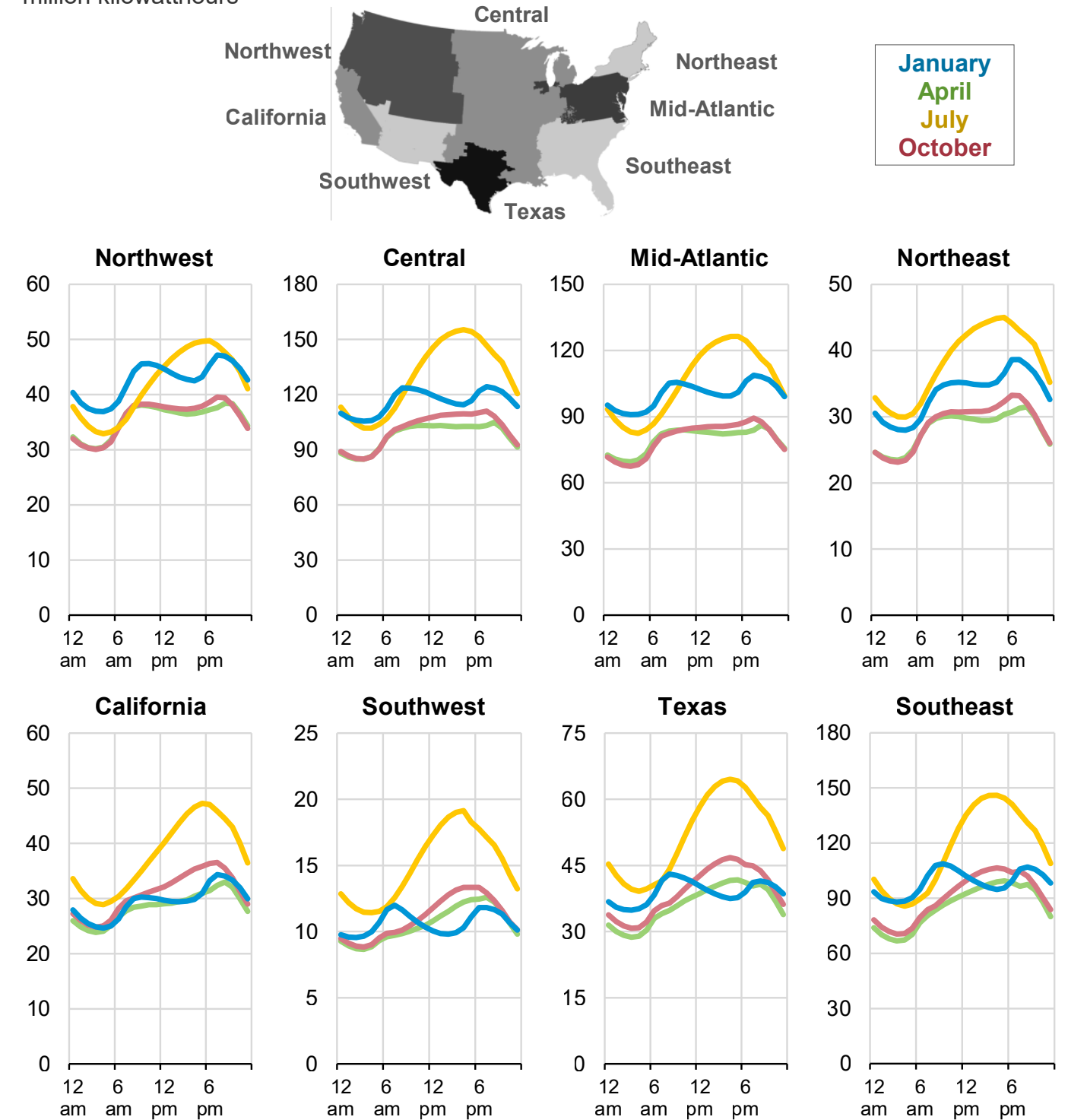
\* The time-of-use rate has a monthly customer charge of \$21.46.

Standard Delivery Periods	Rates <250 kWh	Rates >250 kWh
June 1 to Sept 30	12.732 cents/kWh	14.635 cents/kWh
All other months	12.732 cents/kWh	12.732 cents/kWh

The standard rate has a monthly customer charge of \$17.00

con edison

Average hourly electricity load during typical day by region, selected months  
million kilowatthours



us energy information administration

grid interactivity **TIME OF USE RATES**

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***NEXT STEPS....***

why retrofit? **CONSTRUCTION COSTS**

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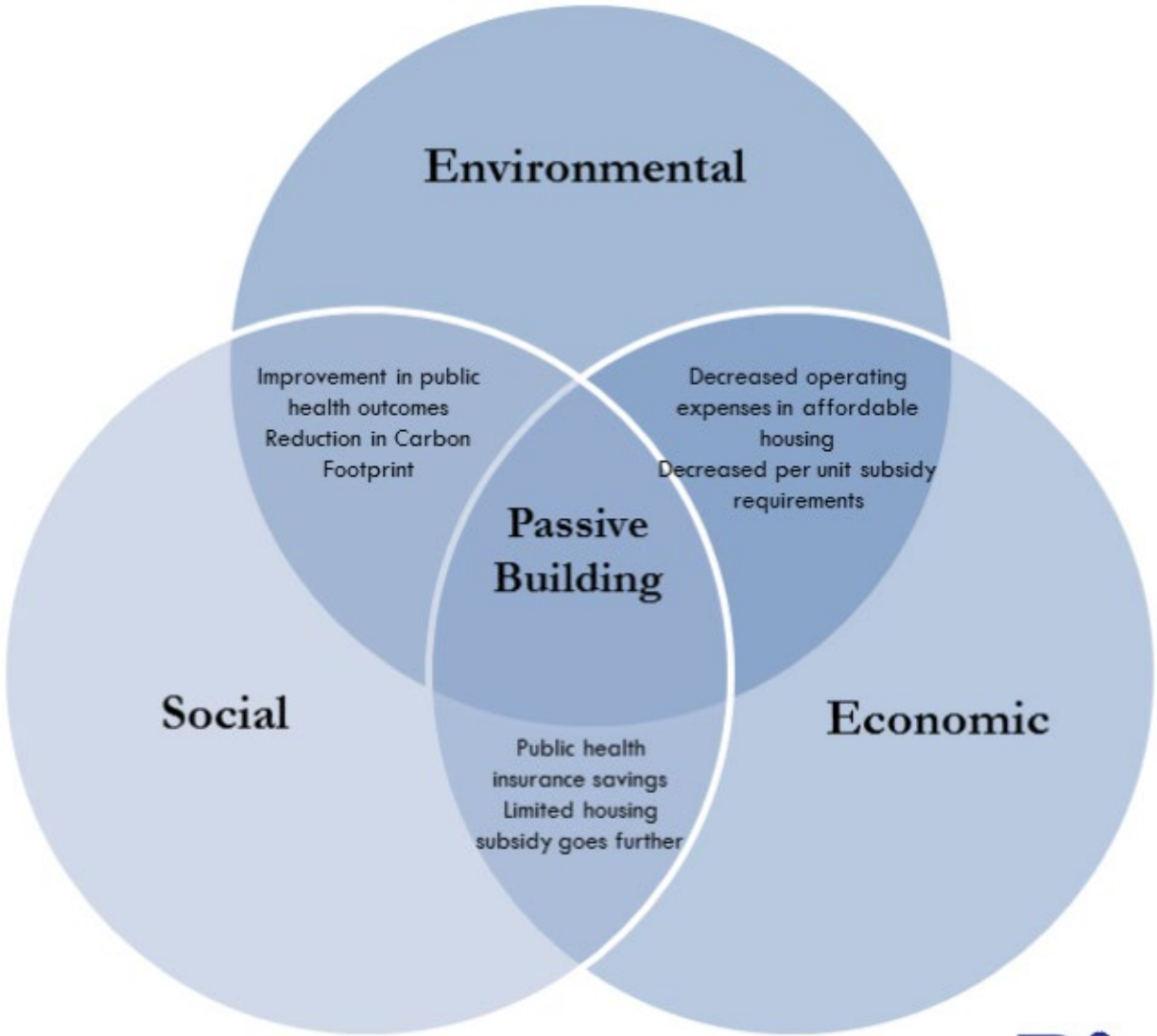
# Questions?



NYSERDA Grid Interactivity Building Showcase  
CASA PASIVA

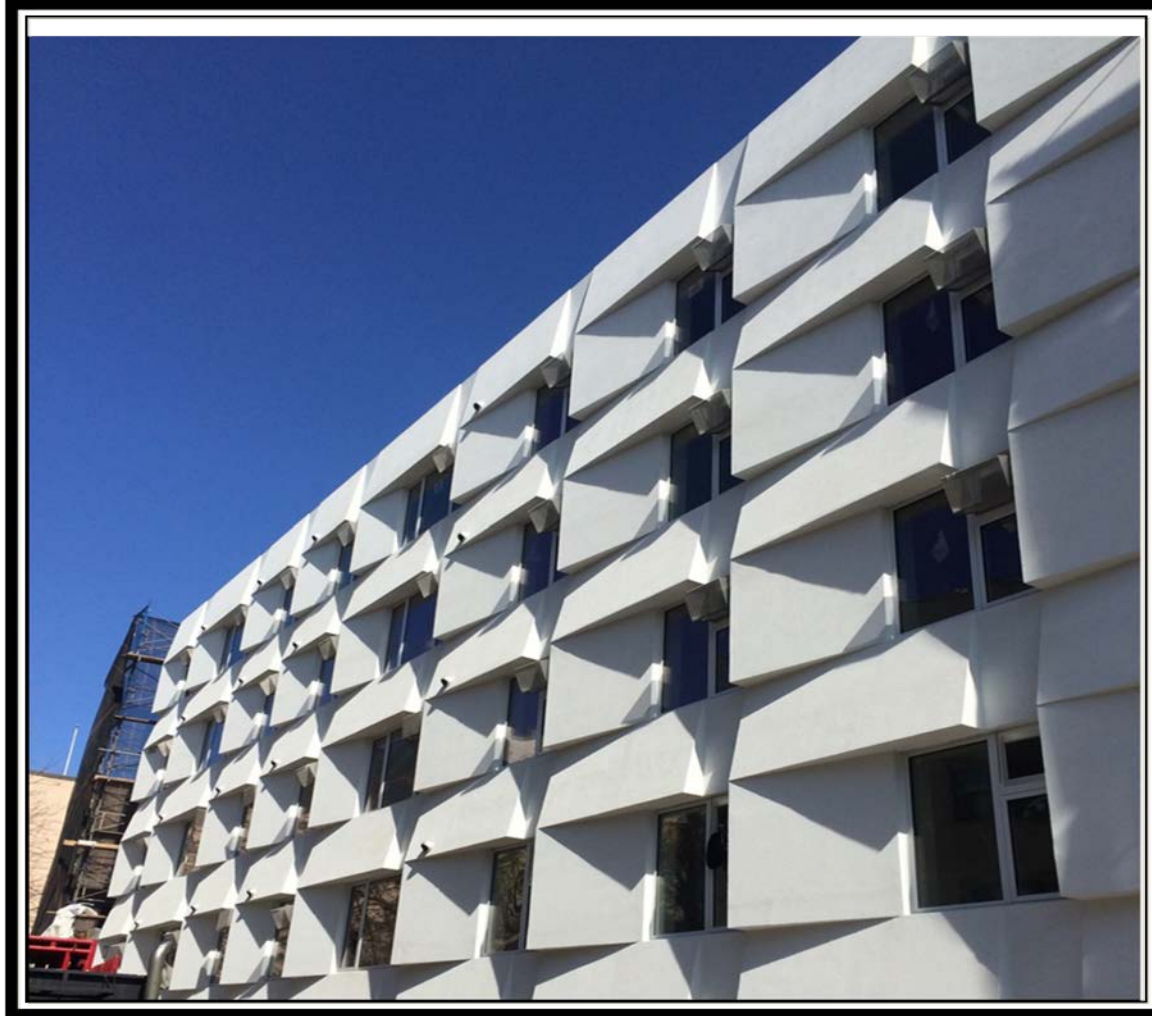
Ryan Cassidy  
Construction Administrator

# Triple Bottom Line of Passive Building



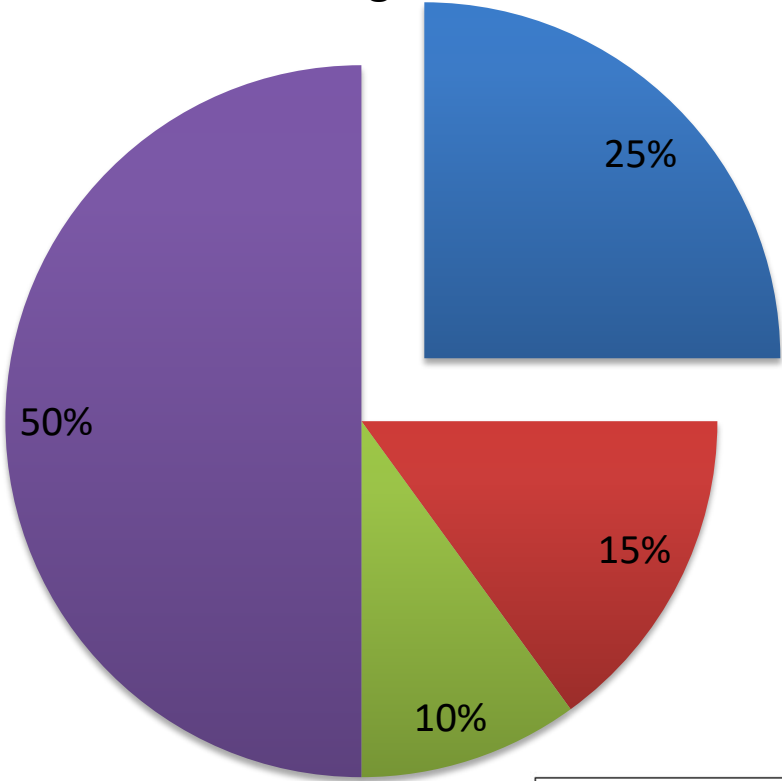
# Developing Long Term Sustainability

## Two Paths to “80 by 50”

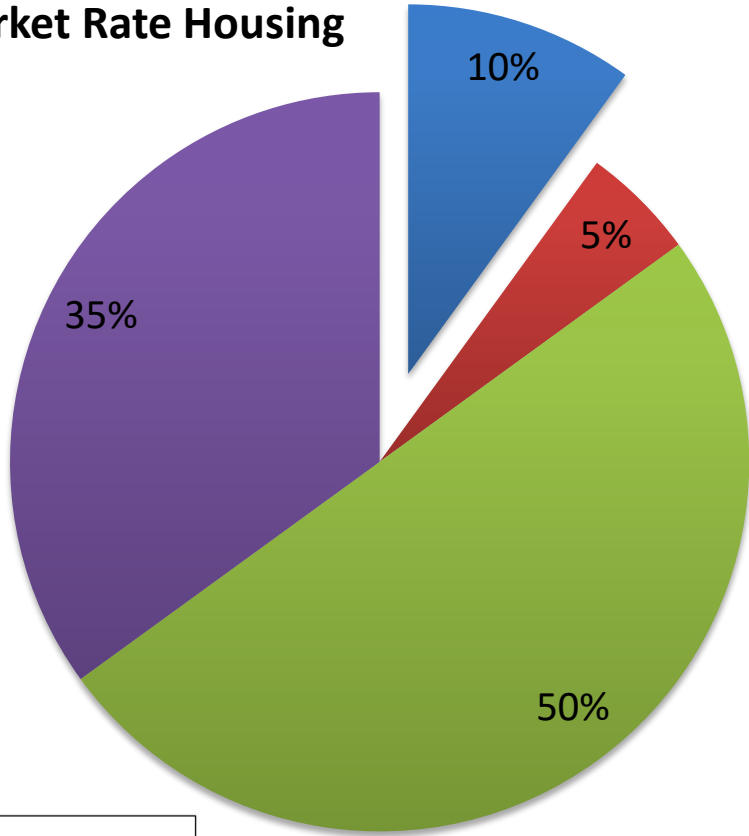


# A Comparison of Typical Annual Maintenance & Operational Expenses

### Affordable Housing



### Market Rate Housing



Legend

- Utilities (heat/gas/electricity)
- Water & Sewer
- Real Estate Taxes & Insurance
- Other Maintenance & Operational Expenses

# New Construction

## Mennonite United Revival Apartments



- 24 units, 100% affordable w Sect 8 PBV, Passive House Design
- Hydronic Heating, Unitized ERV, Solar Thermal
- Completed December 2013
- **Total Hard Cost \$235 sqft**

## Knickerbocker Commons



- 24 units, 100% affordable, Passive House Design
- Hydronic Heating, Unitized ERV
- Completed June 2014
- **Total Hard Costs \$225 sqft**

# New Construction

## Our Lady of Lourdes Apts



- 76 units, 100% affordable w Sect 8 PBV, Passive House Design
- 2 pipe VRF, Unitized ERV, Solar PV
- Completed December 2017
- **Total Hard Cost \$232 sqft**

## Atlantic East Apts



- 67 units, 100% affordable, Passive House Design, faith based partnership 1stfl
- 2 pipe VRF, unitized ERV, solar PV ready
- Completion July 2021
- **Total Hard Costs \$306 sqft**

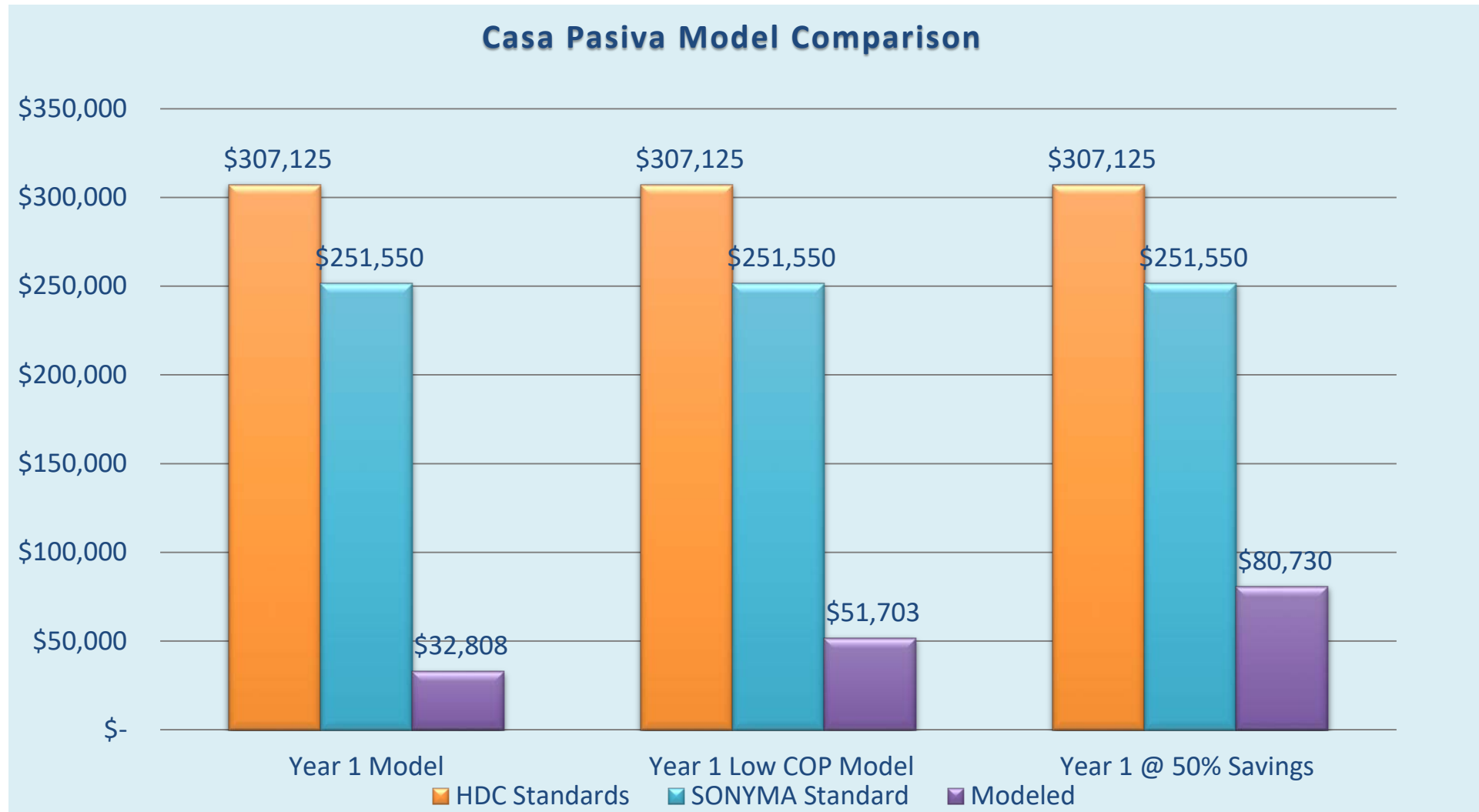
# New Construction



- 80 units, 100% affordable w Sect 8 PBV, Passive House Design
- 2 pipe VRF, centralized ERV, Solar PV
- Completed August 2021
- **Total Hard Cost \$527 sqft (prevailing wage)**



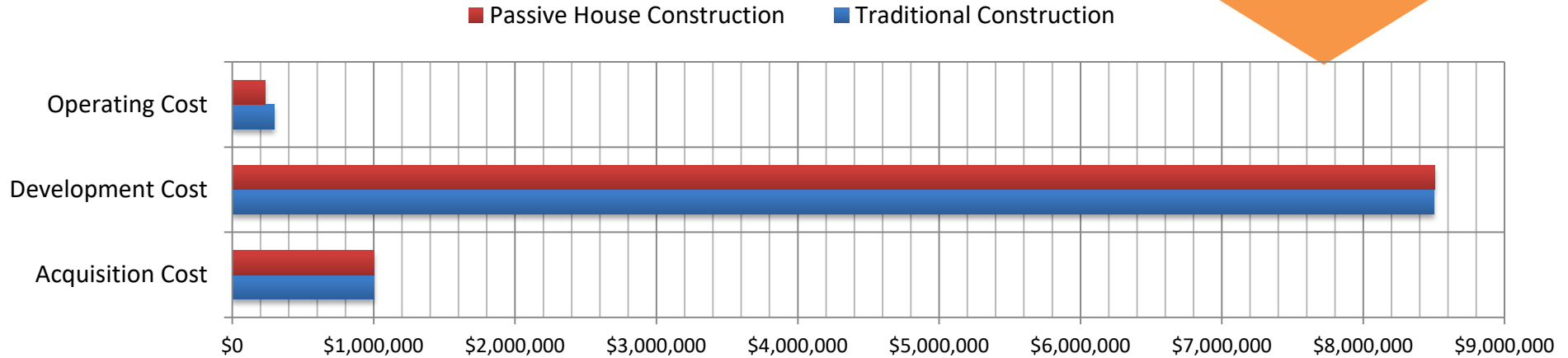
# Underwriting



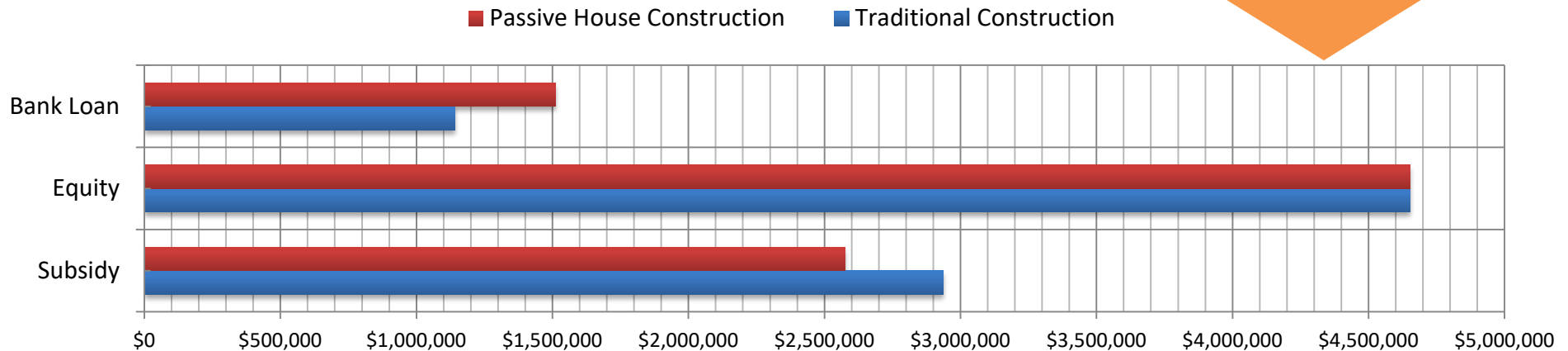
# Underwriting to Savings

## Impact on funding: 50% reduction in gas & electric cost

### Uses of Funds



### Sources of Funds



# Pathway 2

## Renovating to the Passive Standard



Before



&

After



# Pathway 2

## Renovating to the Passive Standard

- Typical YR15 Financing Methods
- Moderate Rehab/Tenant In Place
- Underwrite to Savings
- Gap financing by NYSERDA
- Meet Passive House (PHIUS) Standard
- Bonus: Renewables/Solar

# Pathway 2

## Passive Rehab: Means & Methods

### HVAC Systems (VRF and ERV)

**Opportunity:** Controlled, efficient distribution

**Challenge:** Cost, Billing, Submetering

### Insulate Outside Existing Walls (Rainscreen or EIFS)

**Opportunity:** Run HVAC lines in new insulation

**Challenge:** Lot line easements for new insulation

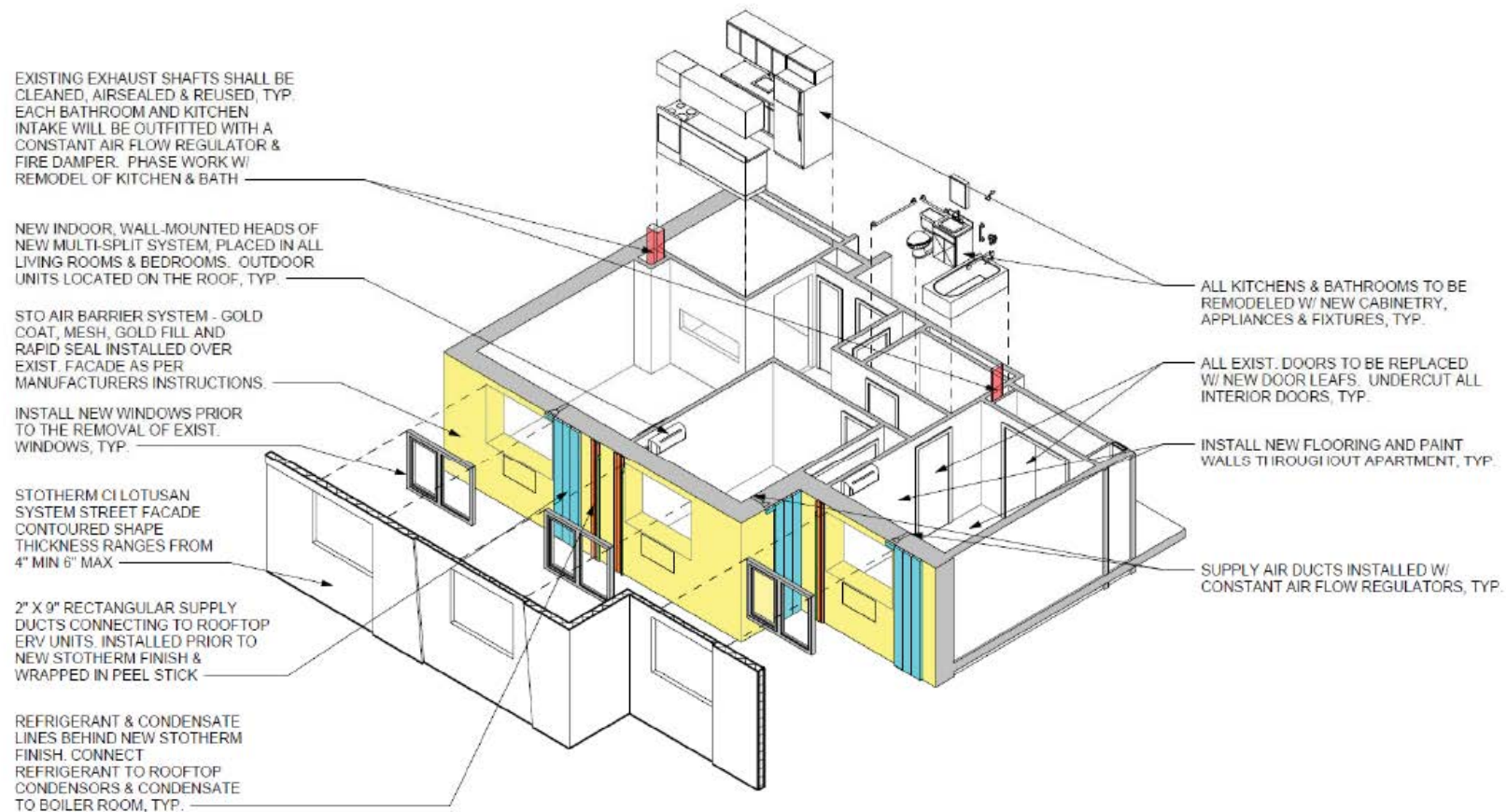
**Opportunity:** New air & moisture barrier



# Scope of Work

## Newer Buildings (built after 1990)

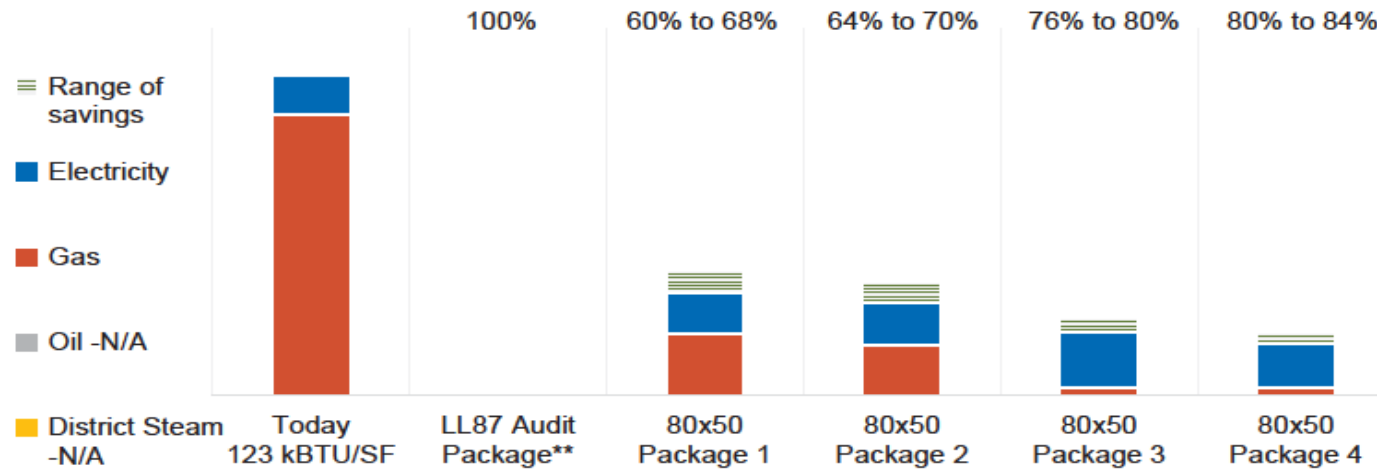
### Scope of Work Diagram:



# “80 by 50”

## NYC Deep Energy Retrofit Planning Report

**Potential Site Energy Use Reductions for Your Building**  
75 Linden Street





# Existing Roadblocks?

- Utility Allowance Reform
- Healthcare + Housing
- Insurance reductions for sustainable/resilient buildings
- Retainage withheld from Contractor for Building Performance
- Energy Reserve
  - Funded From Developer Fee
  - Performance-based

# Questions?



# Changing [Set] Points of View

5/17/23



NYSERDA

# The Challenge: You need to reduce emissions

## One Problem: Buildings are not occupant responsive

In New York City, while commercial occupancy dropped to as low as 5% and then stabilized around 15% by the fall of 2020, electricity consumption in Class A buildings was only down 20-30%.

### **Why? Because you can't manage what you don't measure**

There is a [disconnect between building occupancy and energy use](#)...

- Limited real-time visibility into energy use in occupied spaces
- Lack of holistic accounting for total building footprint and end-uses

**As we adjust to the new Hybrid workspace, are you ready?**

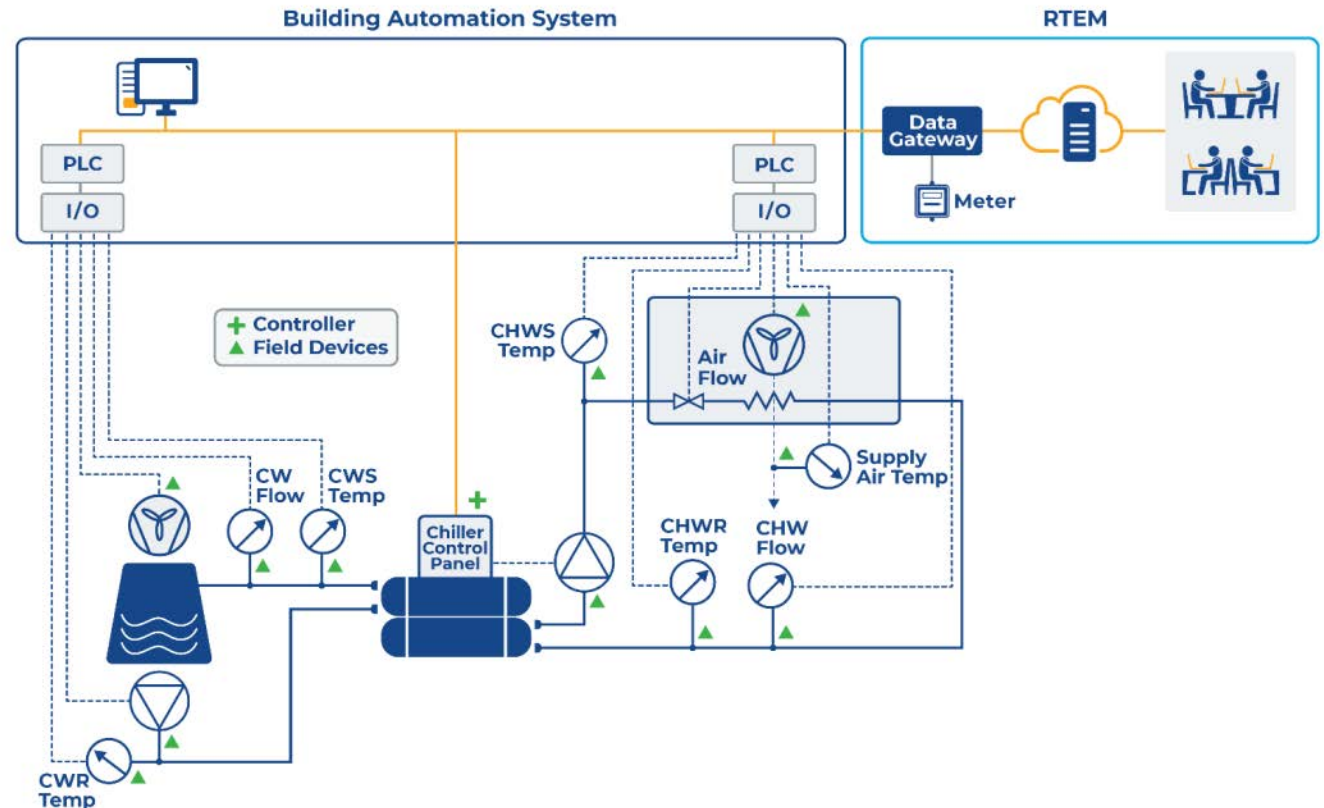
# What is Real-Time Energy Management?

## Capabilities:

- Persistent data repository in the cloud
- Visualization of building performances
- Forecasting of loads and consumptions
- Fault Detection and Diagnostics (FDD)
- Automated System Optimization (ASO)

## Benefits:

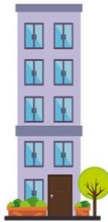
- Improve Net Operating Income (NOI)
- Enhance Occupant Comfort & Wellness
- Gain Real-Time Visibility of Siloed Equipment
- Improve Maintenance & Uptime of Assets
- Improve Staff Productivity



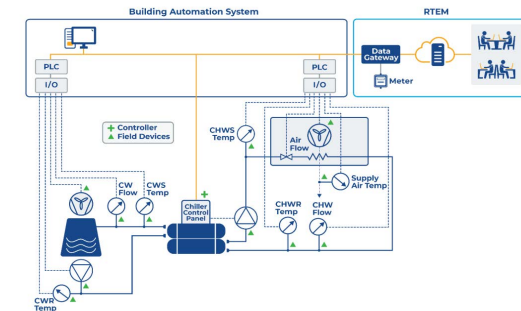
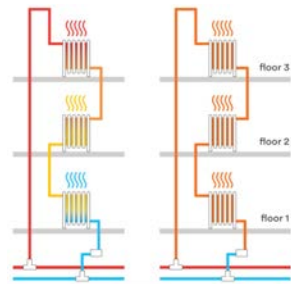
# Real time energy management works in every building



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RTEM measures and analyzes multiple data sources then identifies opportunities for energy savings  
You make informed decisions on how to adjust energy use and can verify savings  
You evaluate the effectiveness of the energy conservation measures  
Repeat

# Proven benefits in over 1000 installations

**1,185** RTEM Sites to Date

**308.9M** RTEM Impacted Square Footage

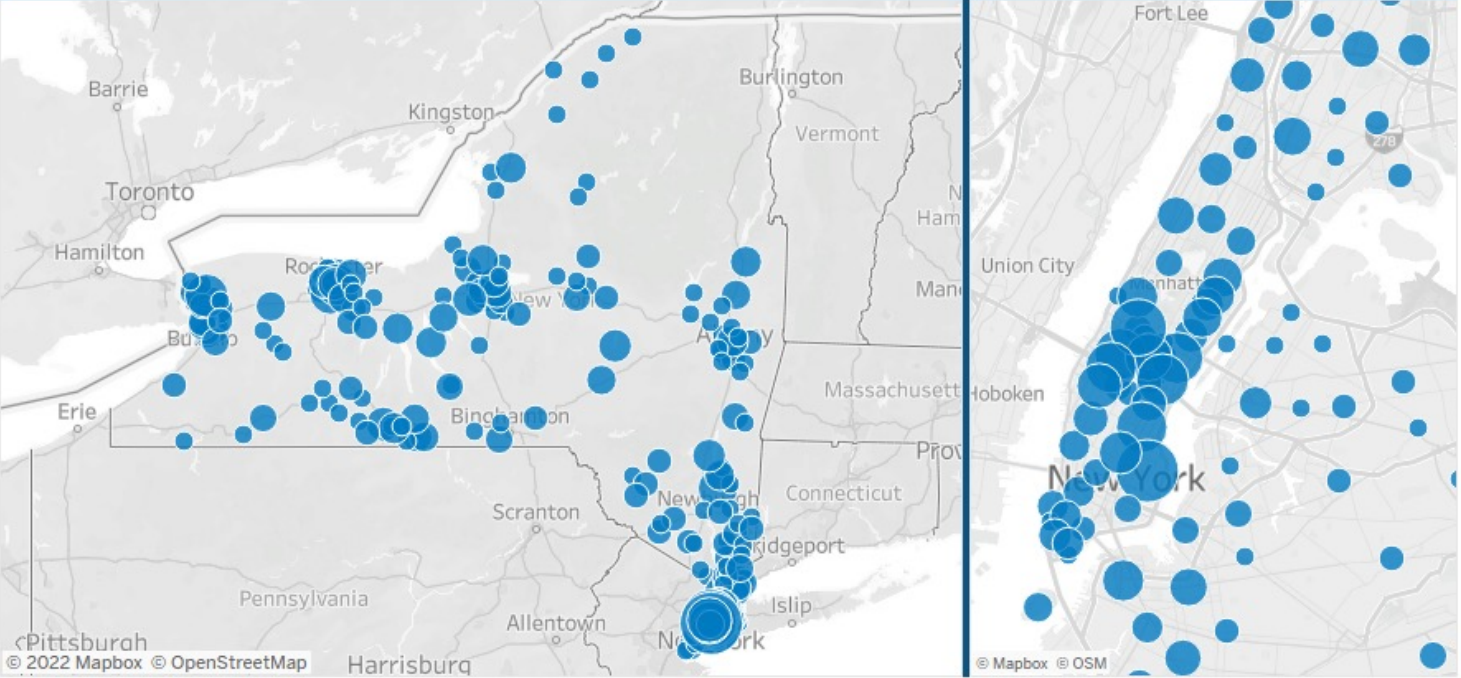
**\$75.7M** NYSERDA Incentives

**\$236.7M** Direct Private Investment

Multifamily Industrial

Commercial

Click Sector to Filter Data



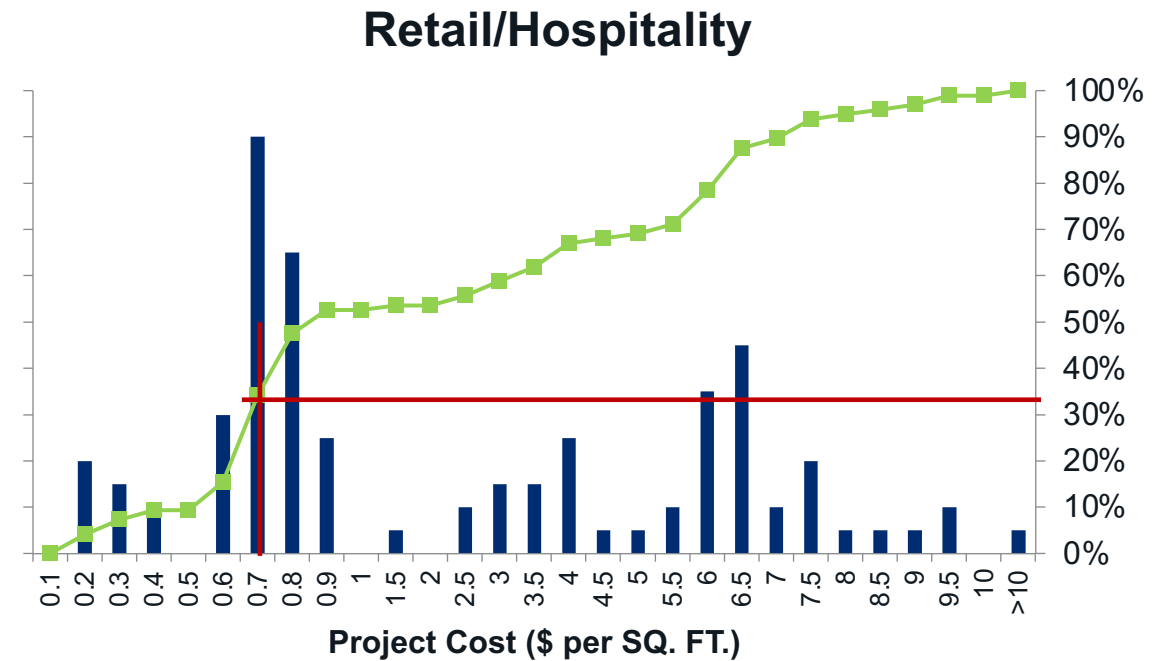
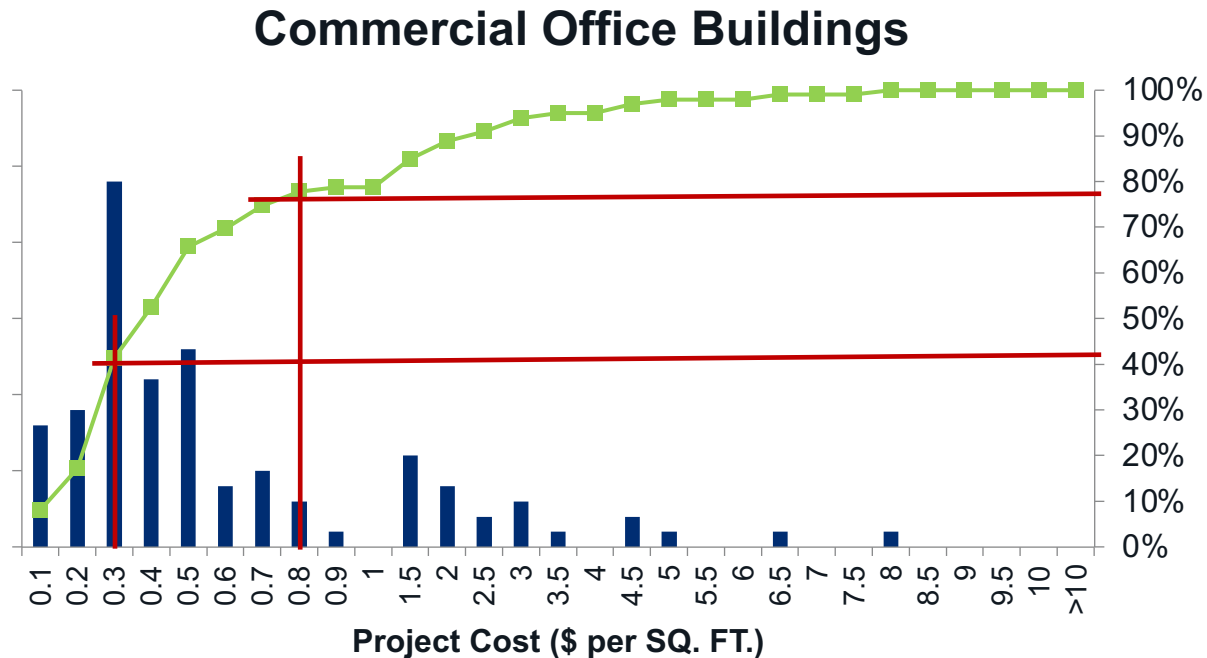
# Top 10 Most Wanted for Wasted Energy

1. **Equipment control in bypassed/override/manual mode**
2. Faulty devices (e.g., leaky valves, sensors, controllers)
3. Extensive operations during unoccupied periods
4. Set points too high/low or inconsistent
5. Inefficient equipment/plant sequencing
6. Coincidental equipment operation generating high demand
7. Convert constant set points to conditionals
8. Free cooling/heating opportunities not used
9. Unintended heating, cooling and simultaneous conditioning
10. Manual operations that should be automated



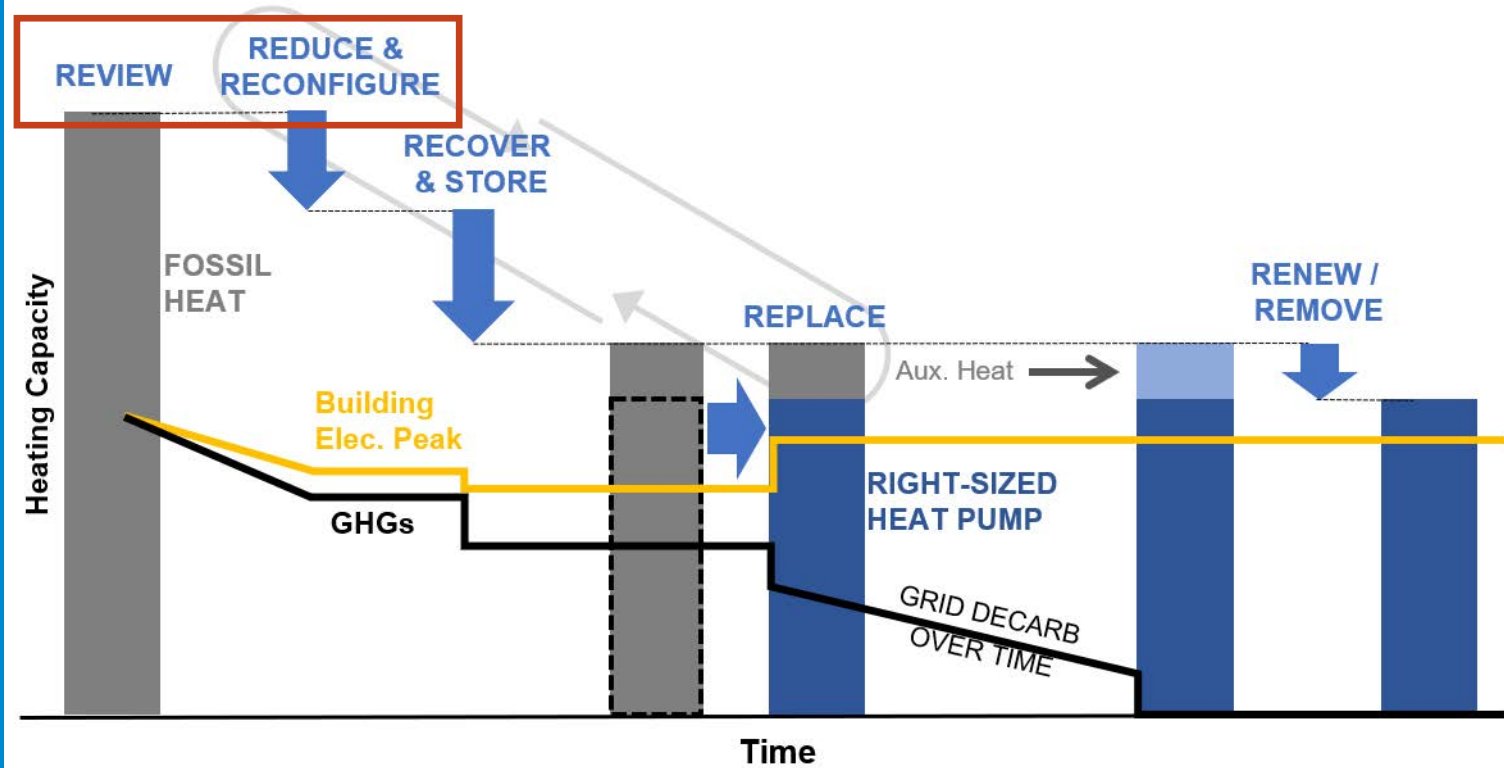
# A cost-effective solution: 80% of commercial office buildings have a project cost $\leq$ \$.80/sq ft

- > No correlation between Commercial square footage and project costs. The biggest determinant is whether the project includes additional Control or upgrading existing BAS.



- RTEM is a cost-effective solution, available today that supports owners in taking action to reduce exposure to upcoming Local Law 97 fines
- RTEM helps hedge against rising energy costs & inflation
- RTEM can help extend equipment life, reducing need for special assessments or capital projects earlier than expected

# A Solution / The First Step



**For more information, for any help - our team is ready to talk!**

**Reach out to us at:  
RTEM@nyserda.ny.gov**



# NYSERDA's Grid-Interactive Building Showcase

## fireside chat

### moderator

Kristen Palma, Strategic Engagement Manager, RTEM,  
NYSERDA

### panelists

David Klatt, Chief Operating Officer, Logical Buildings  
Cindy Zhu, Director of Grid Services, Prescriptive Data  
Luis M. Rios, Assistant Vice President, Rudin

# NANTUM OS

NYSERDA's **Grid-Interactive Building** Showcase

May 17, 2023

Presented by:

**Cindy Zhu**, Director of Grid Services

Office Owner Challenges

# Today's Office Challenges Need A Data Culture



**Data Management**

Managing The Rise Of Exponential Real Estate Data



**Consumers & Investors**

Consumers Are Demanding Sustainability & Investors Are Rewarding Sustainability



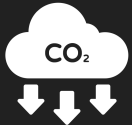
**Risk & Compliance**

Avoiding Carbon Emission Regulation Fines & Automating Reporting Compliance



**Asset Valuation & Cap Rates**

Decreasing Operational Costs & Increasing Asset Revenue



**Sustainability & ESG**

Corporate Net-Zero Goals & Climate-Related Risk



**Leasing & Tenants**

Attract & Retain Tenants, Predict Tenant Behavior

# NANTUM RTEM

## Observed Benefits of the NYSERDA RTEM Program

- NYSERDA brings credibility to RTEM approved vendors.
- Incentives reduce project payback by 50%, making it easier for owners to move forward with projects.
- Software as a Service (SaaS) solutions are new to Commercial Real Estate and can be challenging to sell.
- RTEM incentives on annual SaaS fees are helping to overcome this challenge.

## • \$1.13M - Total Incentive Money

- \$500k - For Nantum OS Installation
- \$613k - For Annual Software as a Service (SaaS)
- 10 - Projects Receiving NYSERDA RTEM Incentives

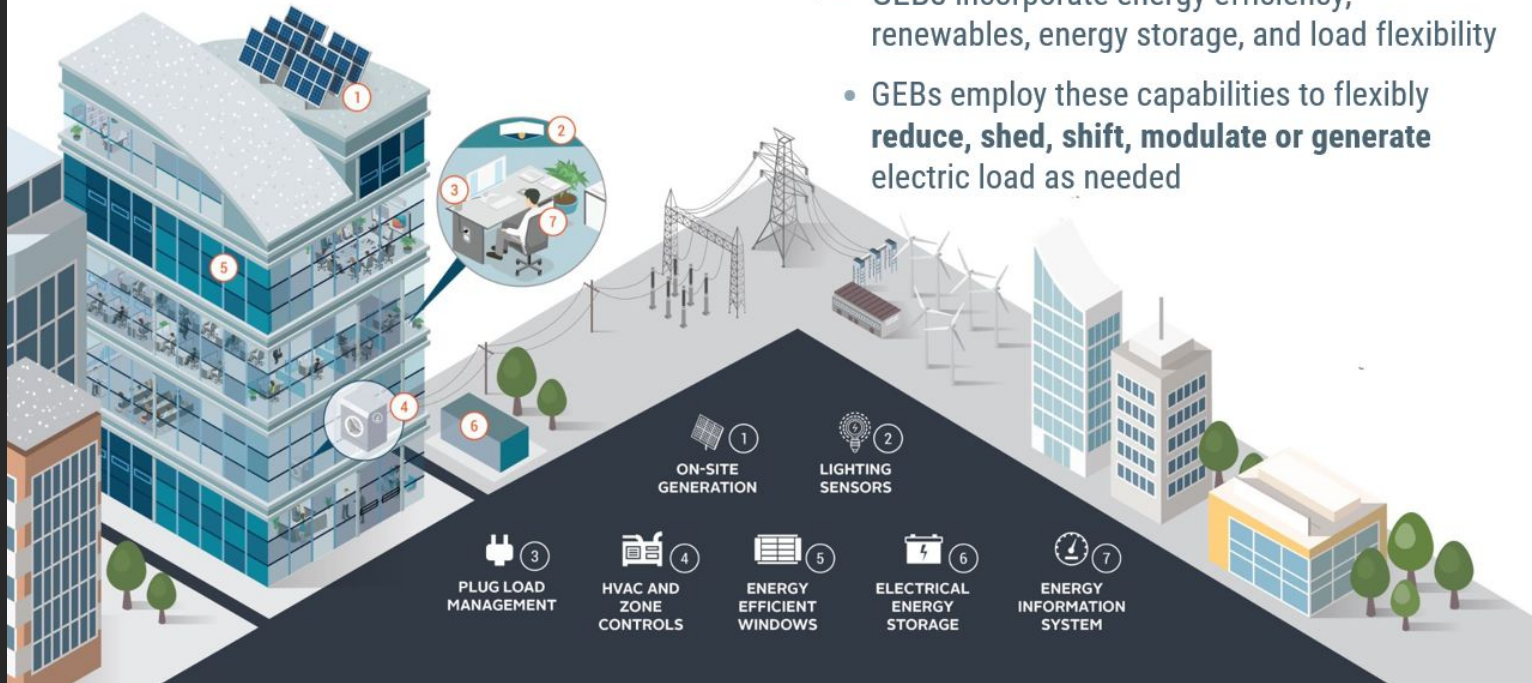
# NANTUM GEBS

Grid-Interactive Efficient Buildings



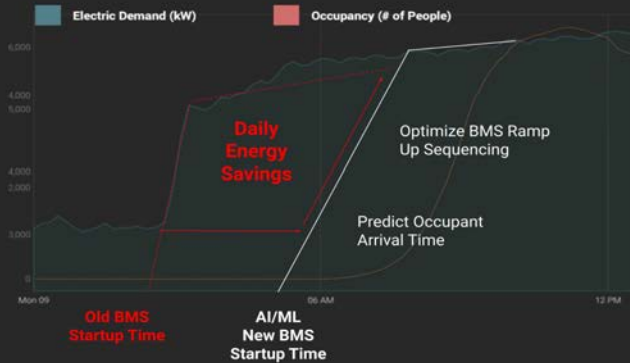
# What are Grid-Interactive Efficient Buildings (GEBs)?

- GEBs incorporate energy efficiency, renewables, energy storage, and load flexibility
- GEBs employ these capabilities to flexibly **reduce, shed, shift, modulate or generate** electric load as needed

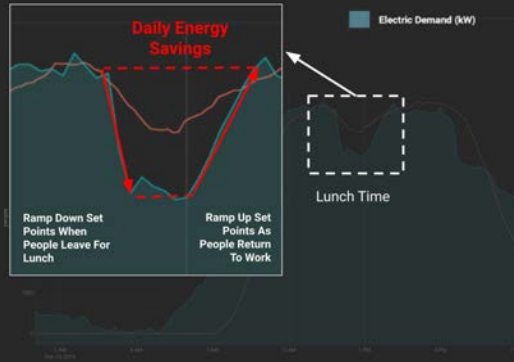


Save Dollars, Energy, & Carbon Emission

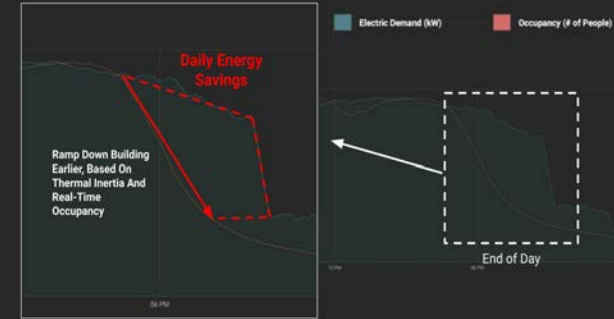
# Office Building Energy + Occupancy Automation



Morning AI Startup



Mid-Day Ramps

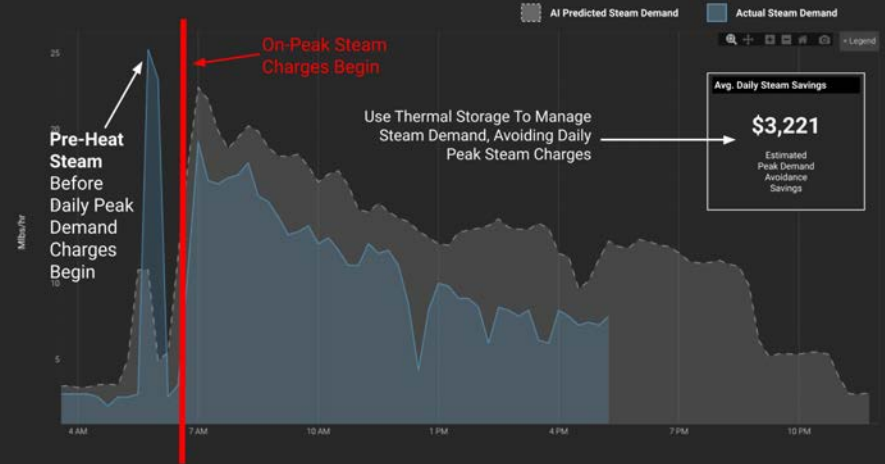


End Of Day Ramp Down

# Reduce Peak Demand Charges



ADM - Automated Electric Demand Management



ASM - Automated Steam Demand Management

# Automated Demand Response

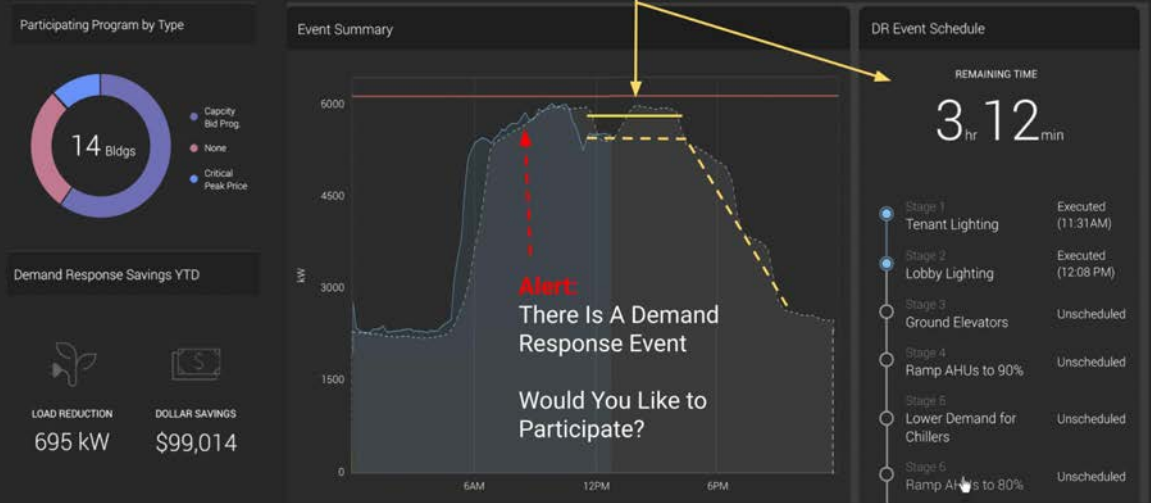
## ADR - Automated Demand Response

Nantum OS uses openADR2.0 protocols for its automated demand response (ADR) capabilities:

- Virtual Top Node (VTN) for utilities or aggregators to initiate ADR events
- Virtual End Node (VEN) for customers to participate in ADR events

Customers can earn incentives for enrolling their building as a participating resource during the DR season and additional performance payments during actual DR events.

A fully automated demand response strategy allows operators to maximize their incentive revenue.



## Energy Management

# Distributed Energy Resource Management

Manage On-Site Generation or Storage from Solar, Fuel Cell, & Batteries For Real Time Visualization and Energy & Cost Savings

Automate & manage your on-site energy generation resources



# GEBs Case Studies

Since 2022, RMC has been rolling out automated curtailment strategies throughout the commercial portfolio, creating **new demand flexible resources** that can use automated demand management for peak cost reduction, participate in automated demand response programs, and create additional reliability for the grid.

How some of these sites are doing it:

## 80 Pine Street

- 1MSF, built in 1960, located in Financial District

### Automated Curtailment Strategies Include:

- Securing exhaust fans
- Ramping down interior and perimeter supply fan speeds
- Offsetting supply and return fan temps
- 225 kW in flexible load

### DR Program Participation

- ConEd CSR
- ConEd DLRP
- NYISO SCR

## 345 Park Avenue

- 1.8 MSF, built in 1969, located in Midtown

### Automated Curtailment Strategies Include:

- Ramping down main supply fan speeds
- Securing return air fans
- Securing mechanical room equipment
- 600 kW in flexible load

### DR Program Participation

- ConEd CSR
- ConEd DLRP
- NYISO SCR

## One Battery Park Plaza

- 860,000 SF built in 1969, located in Financial District

### Automated Curtailment Strategies Include:

- Securing exhaust fans
- Ramping interior and perimeter supply fan speeds
- Reducing secondary pump speeds of chilled water system
- 450 kW in flexible load

### DR Program Participation

- ConEd CSR
- ConEd DLRP
- NYISO SCR

# 2023 RTEM GEBs Demonstration

## What's the problem to solve?

Significant electric loads in buildings can function as fast-responding grid-support resources, just like on-site renewables. Real-world demonstrations will gather data to support future utility program development.

## What hypotheses will be tested?

- Sizable electric loads can be shed or shifted quickly and dependably, delivering performance like battery storage.
- Demand shed and shift from buildings will be as cost effective to procure as battery storage.

## How will we demonstrate it?

- Collaborate w/ demo sites to implement custom automated curtailment strategies that can shed significant electric load
- Use Nantum's **Virtual Top Node** to send an openADR message to participating buildings to **shed/shift electric load in 10 mins**
- Use Nantum's **Virtual End Node** and edge computing capabilities at demo sites to receive the openADR message and curtail load **within 10 mins of receiving the signal**
- Share rich dataset with NYSERDA, such as power quality, load shed performance to help determine baselines and performance criteria that will benefit the marketplace

# NANTUM OS



**Cindy Zhu**

Director of Grid Services  
[czhu@prescriptivedata.io](mailto:czhu@prescriptivedata.io)

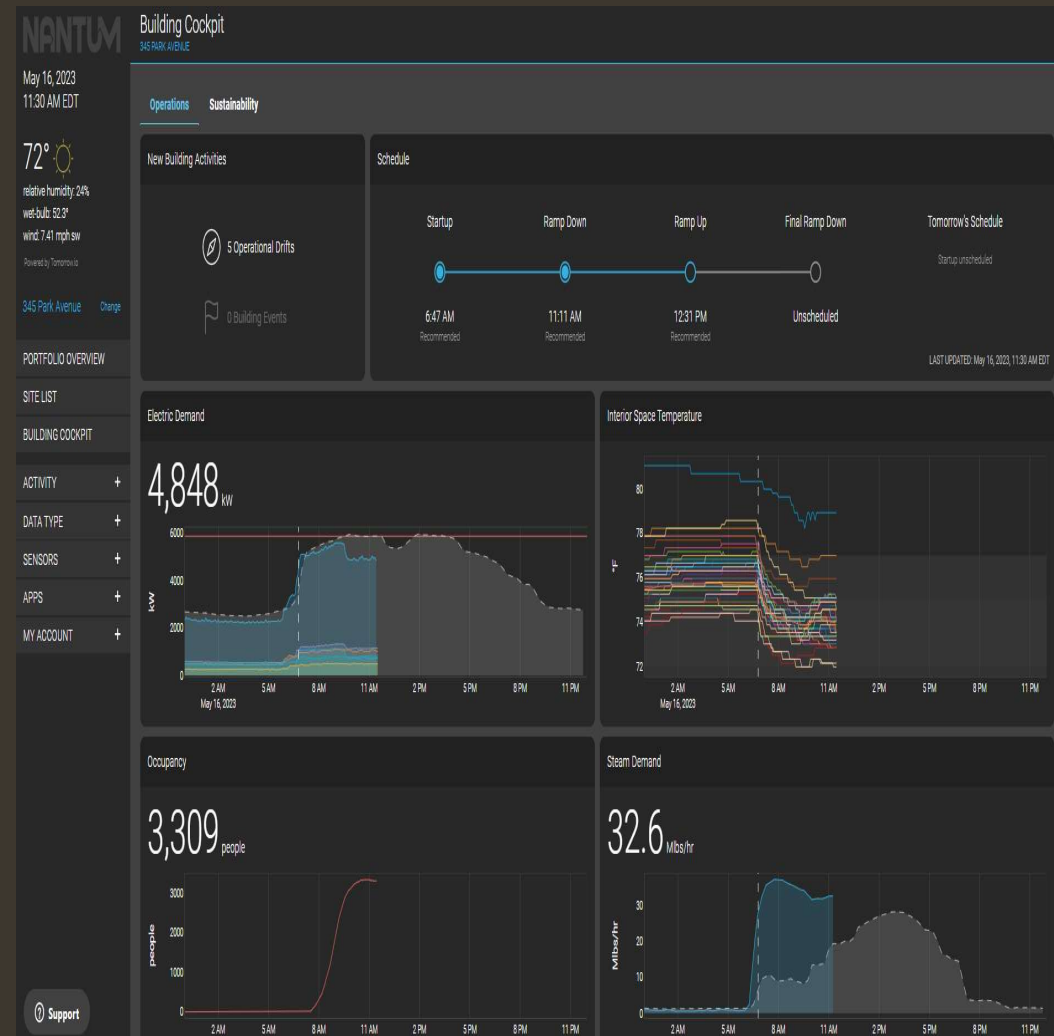


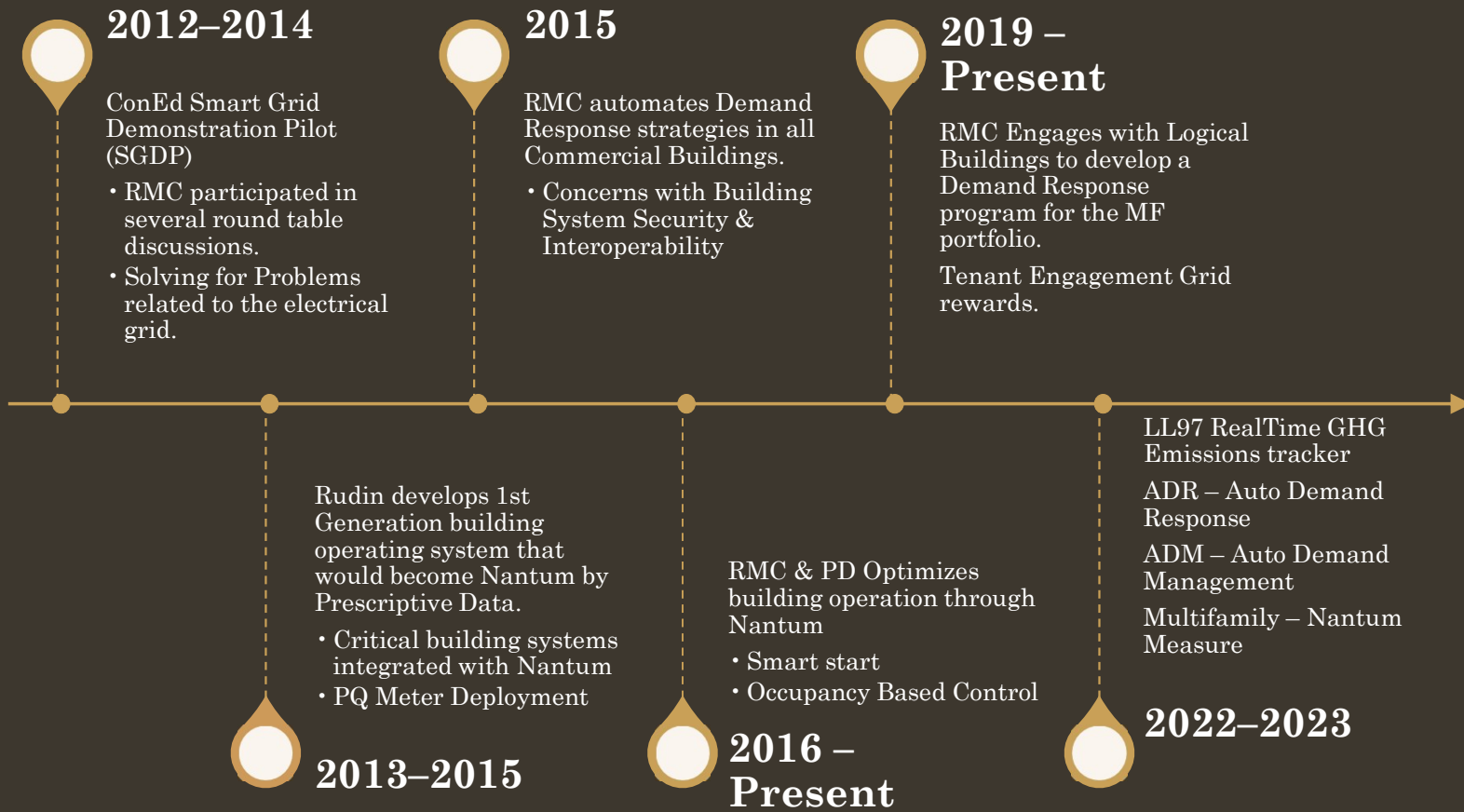
# Rudin Management



# Rudin Management Company

- NYC Portfolio - 15 Million Sq.Ft.
  - 10M – Commercial Office
  - 5M – Multifamily Residential
- Sustainability and innovation have always been guiding forces for Rudin Management Company.
- Rudin has always evaluated prospective properties and building sites in light of accessibility to mass transportation. In recent decades, focus has turned to both optimizing management with advanced technology and pursuing best-in-class approaches to environmental responsibility.





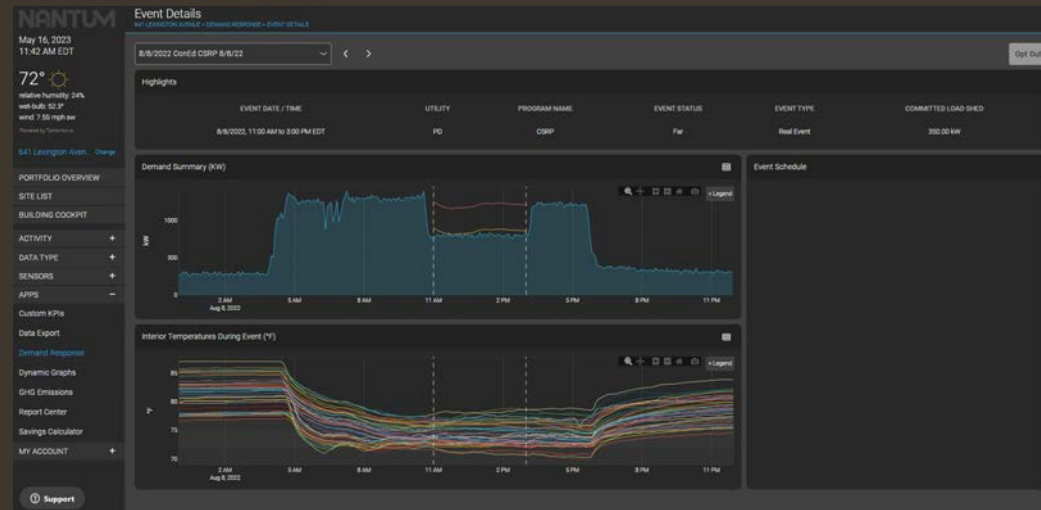
## GridTech Evolution

# Rudin

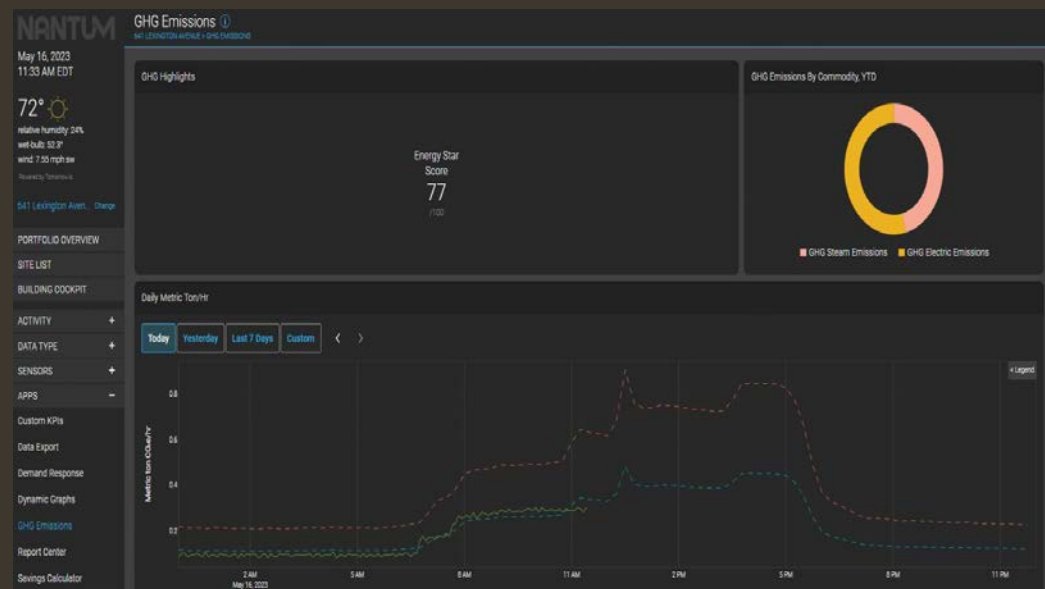
Commercial  
 CSRP  
 Summer SCr  
 Winter SCR

Utility  
 Coned  
 NYISO  
 NYISO

Total Sites Enrolled in Programs	Total Commitment, All Sites (KW)
13	1805
13	1700
13	1150



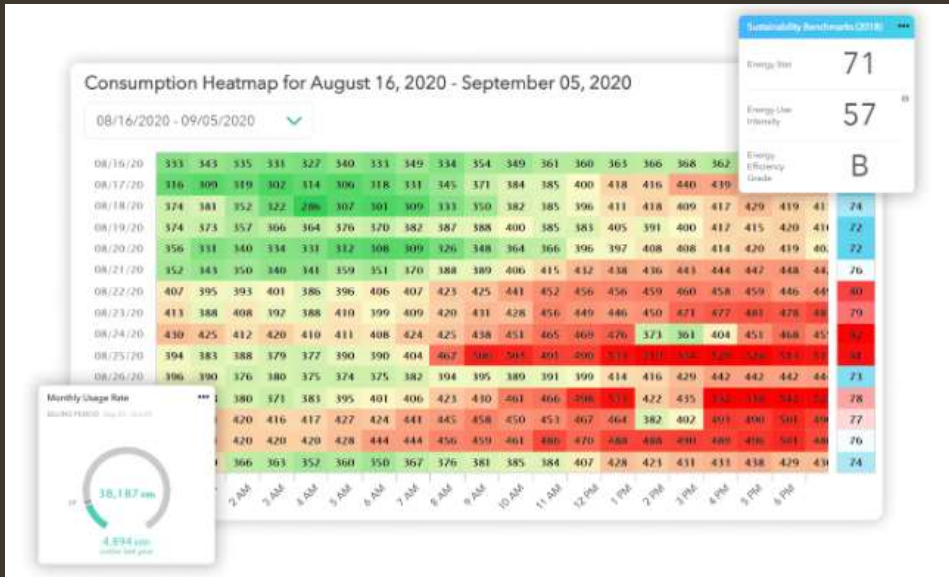
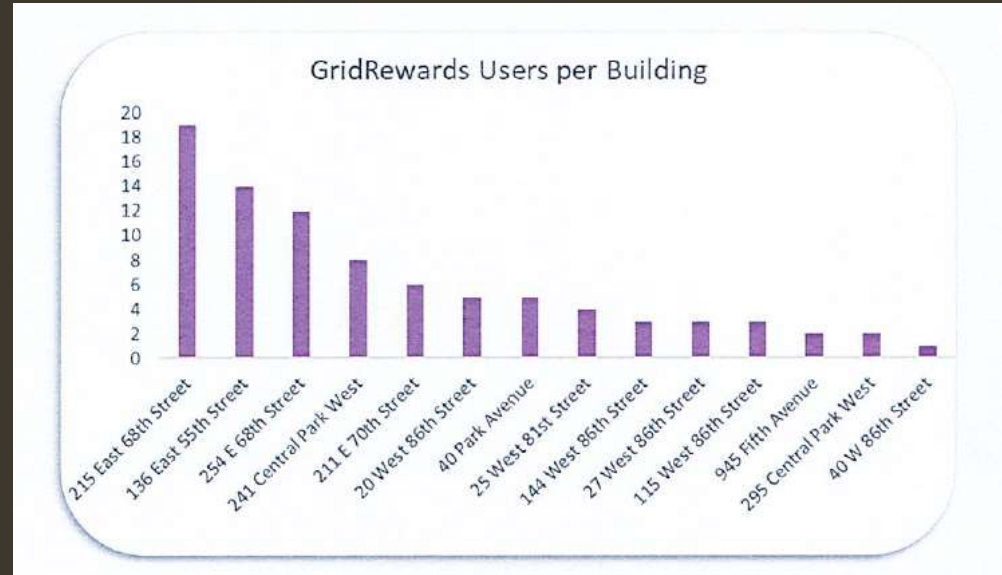
LL97 Realtime GHG Emissions Performance



# Rudin

Multifamily  
CSR  
Grid Rewards  
(Tenants)

Utility	Total Sites Enrolled in Programs	Total Commitment, All Sites (KW)
Coned	16	245
Coned	78	87



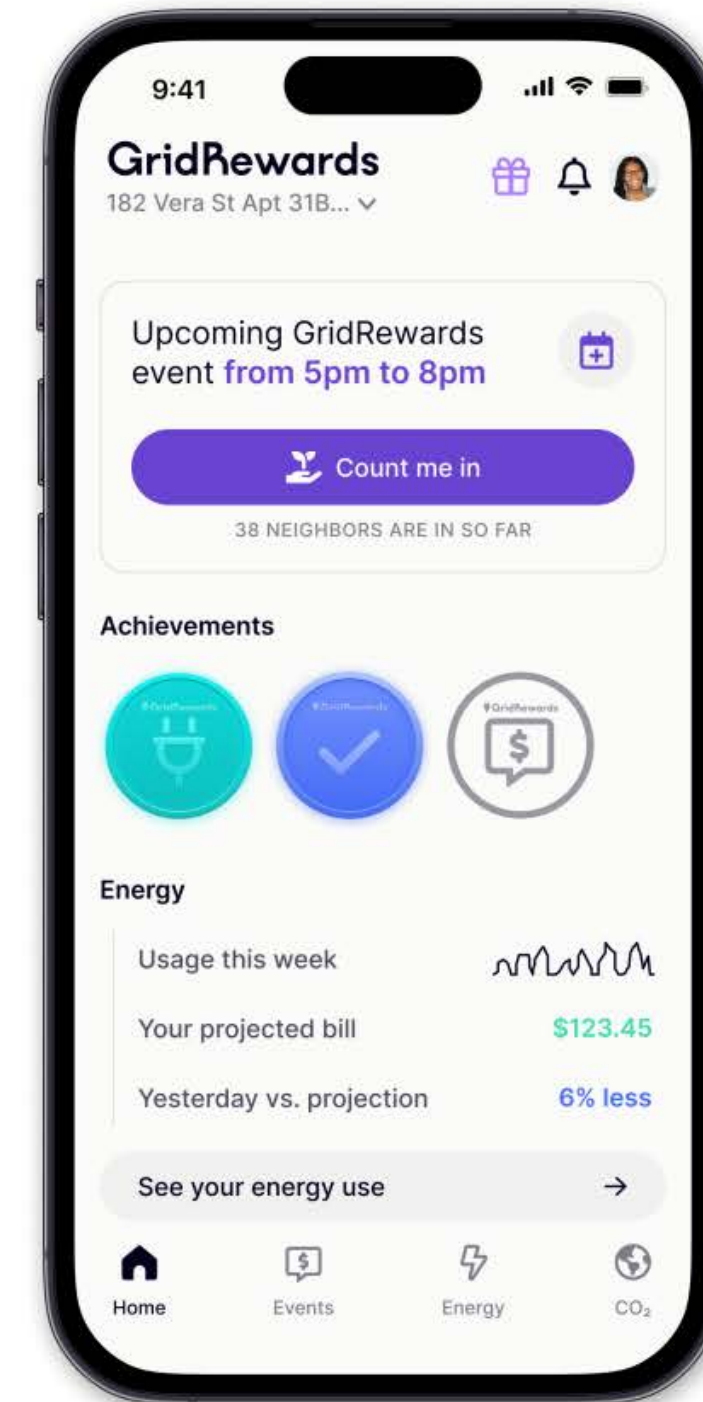
Consumption Heatmap  
(Real-Time Consumption Management)

# GridRewards

An award-winning, free app that tells you when and how to reduce your energy usage. Earn cash payments and reduce your electricity bill all year round.

## Core Features

- Earn GridRewards for reducing usage the highest carbon intensity hours — up to 15% of your annual electric bill.
- Energy efficiency insights and recommended actions.
- Real-time electricity, natural gas, and carbon usage tracking and performance data.
- Smart thermostat control and optimization.



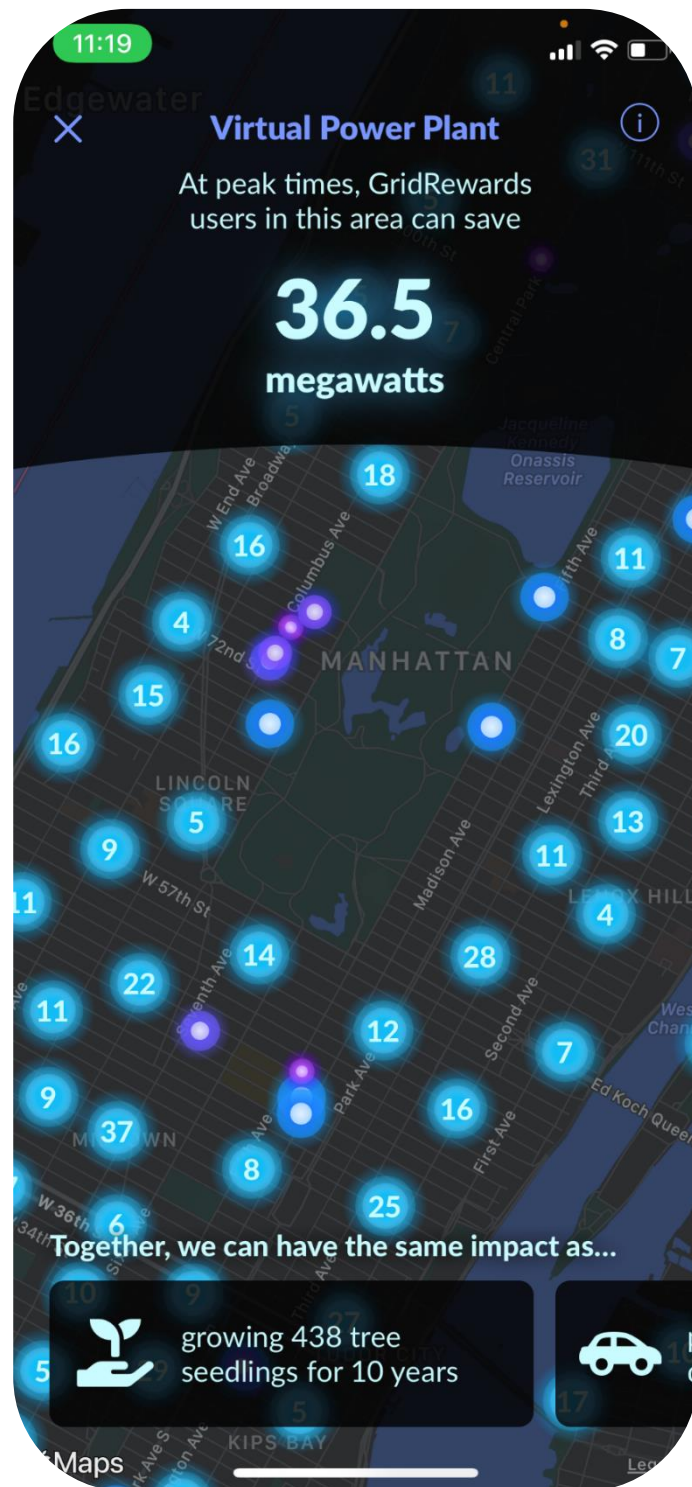
# New Con Edison smart meters are the data backbone of GridRewards

## Smart Meters

We've installed nearly five million smart meters, which provide more information about how you use energy so you can make better energy decisions.

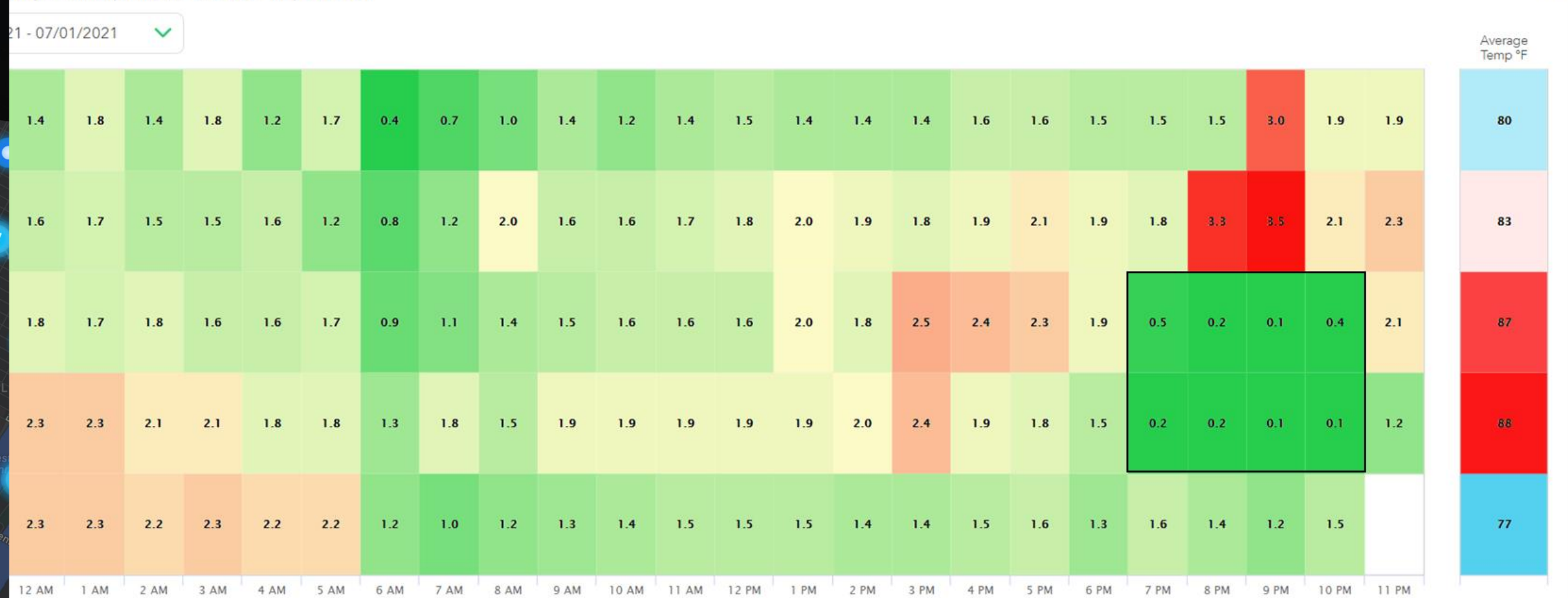


# GridRewards in Action: Automated Performance in an Apartment During Con Edison CSRP Events

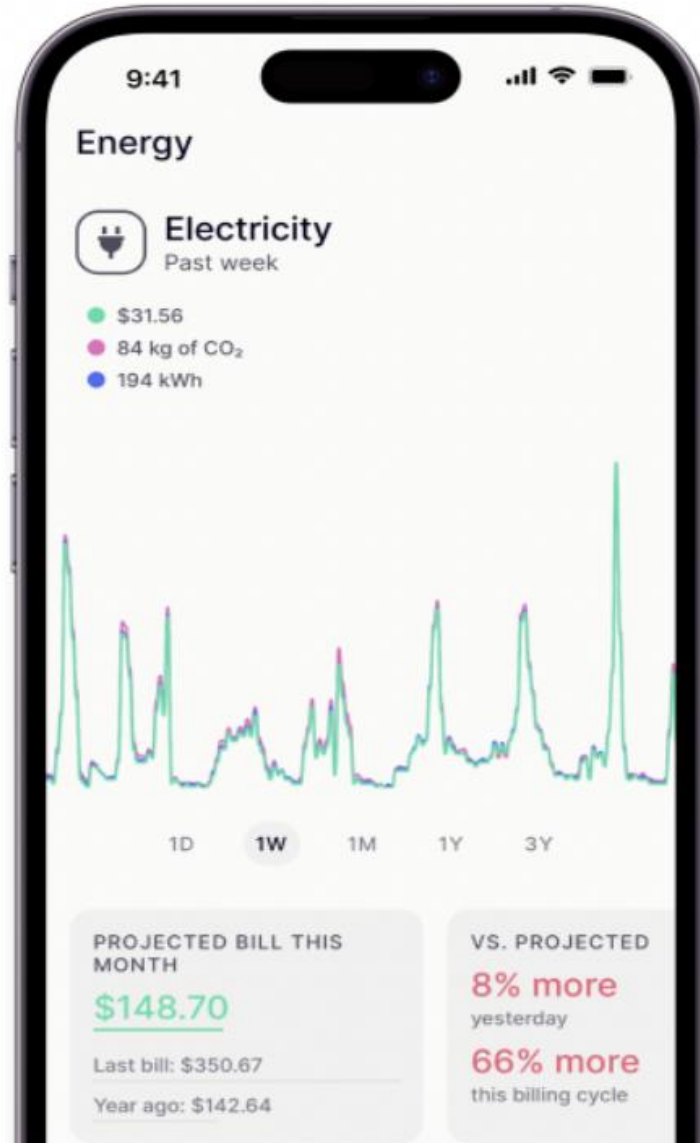


2kW = \$400 of annual GridRewards revenue

Usage Heatmap for June 27, 2021 - July 01, 2021







## Download GridRewards

Scan QR code with your phone camera.



Download on the  
**App Store**



GET IT ON  
**Google Play**

## How it works

### Sign up

- Download GridRewards and connect one or more Con Edison accounts to your profile.

### Unplug during events

- We'll tell you the most important times to save electricity and when they're happening — usually during hot summer afternoons, about 5-10 times per year.

### Get paid

- Make real money — earn cash, reduce your electricity bill and carbon footprint.

# YOUR TOOLKIT TO FIGHT CLIMATE CHANGE AT HOME



## 1. THE ESSENTIALS



GRIDREWARDS APP

 **GridRewards**



SMART METER

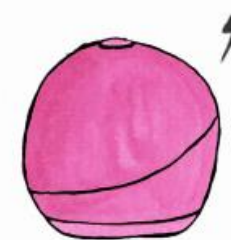
## 2. STARTER KIT



SMART PLUG



SMART  
THERMOSTAT



SMART  
APPLIANCES

## 3. POWER PACK



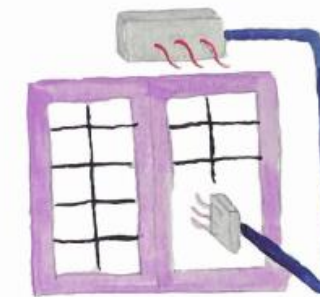
BATTERY



COMMUNITY SOLAR



EV CHARGING



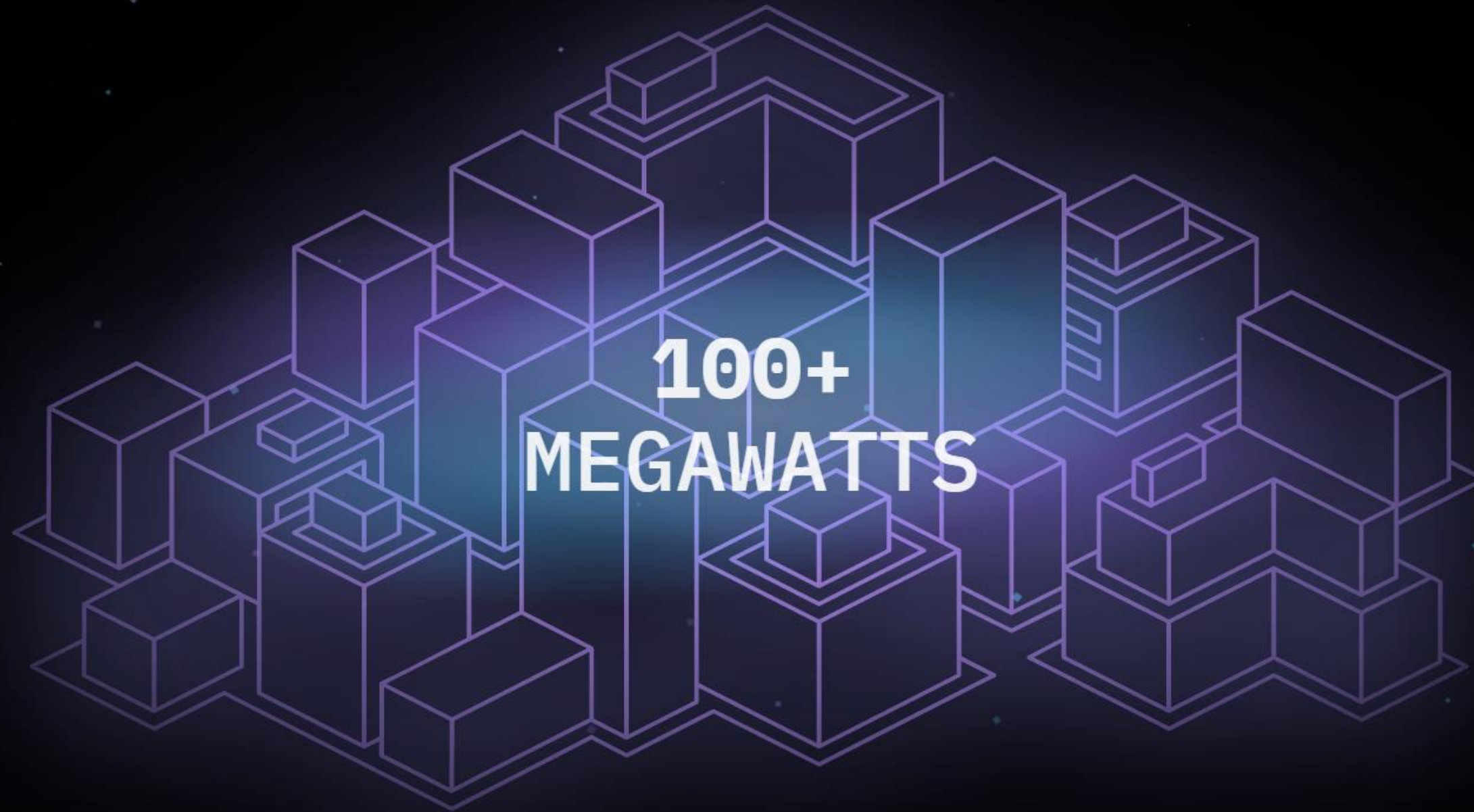
HEAT PUMP

VIRTUAL POWER PLANT

Smart Building Status | ONLINE

SMARTKIT AI

GRID ANALYSIS | NYC ID 24



Creating the largest-ever multifamily building virtual power plant, together.

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# Questions?

# NYSERDA's Grid-Interactive Building Showcase