BUILDINGENERGY NYC

Finance Low-Carbon Multifamily at Scale Using Data and Program Innovation

Jon Braman, Bright Power
Elizabeth Kelly, EDK Associates
Jennifer Leone, NYC HPD
Samantha Pearce, NYS HCR
Molly Simpson, Fannie Mae Multifamily

Curated by Andrew Chintz (EIP) and Danielly Donnelly (CPC)

Northeast Sustainable Energy Association (NESEA)
October 12, 2023

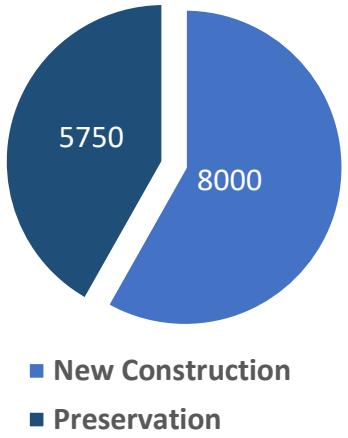
HPD & Utility Costs

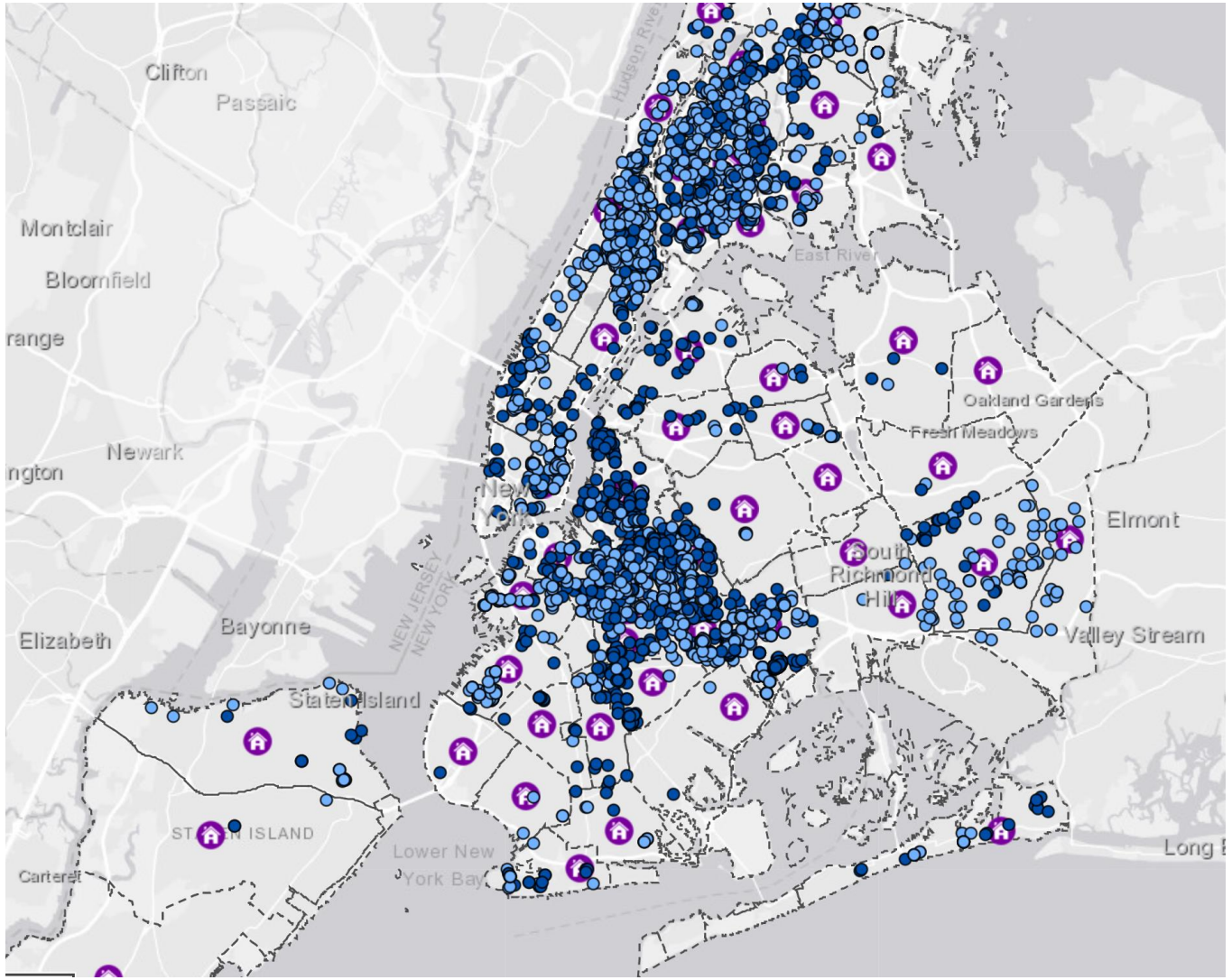
Building Energy NY: Fall 2023

NYC Department of Housing Preservation & Development

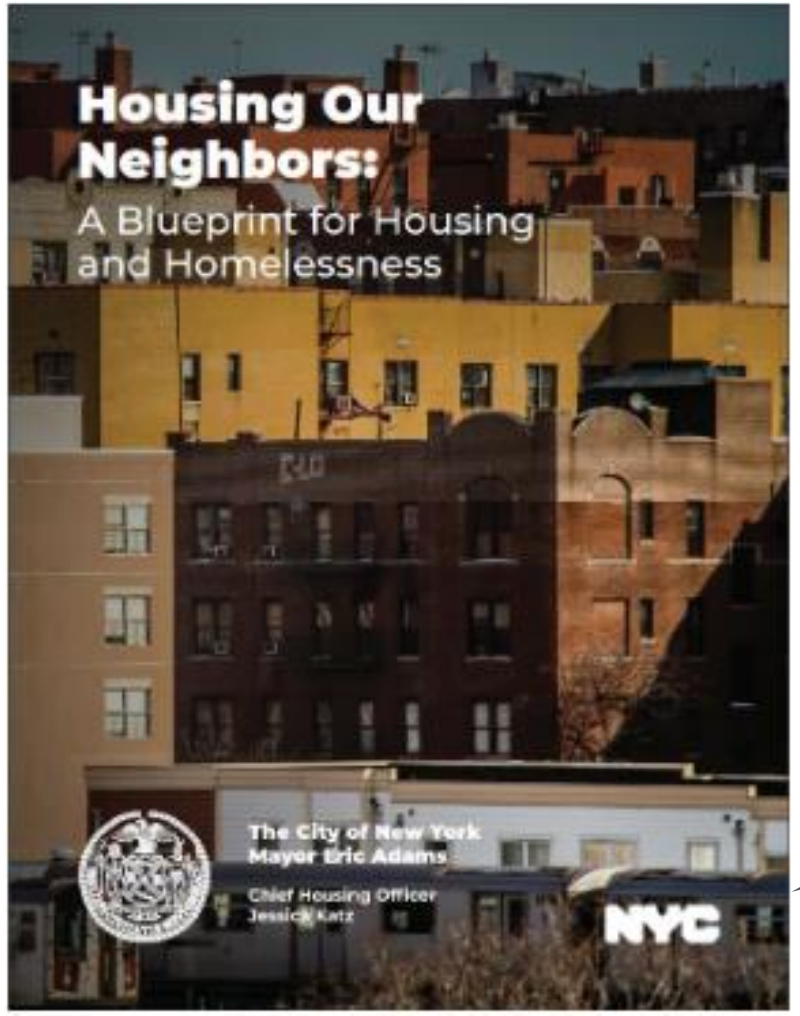
HPD is the largest municipal developer of affordable housing in the nation.

HPD constructs or preserves **over 16,000 units of affordable housing each year** across the five boroughs of which more than half are existing buildings.





A Blueprint for Housing: 2022



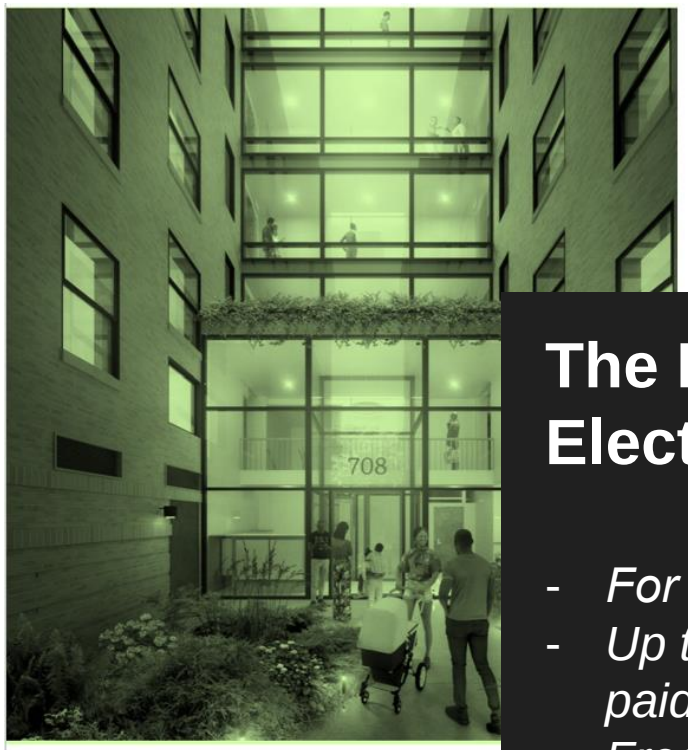
Fast-track equitable decarbonization and beneficial electrification to serve low-income households

We must ensure that the transition from a fossil-fueled economy is fair and equitable. Reaching New York City's ambitious climate targets while meeting our environmental justice goals will require significant investments in our housing stock, including scaling up beneficial electrification. Beneficial electrification reduces building emissions without creating additional costs for residents, and without stretching the energy grid in ways that may increase pollution and other environmental burdens in communities already disproportionately impacted by climate change.

SPOTLIGHT; Incubate new ideas to scale beneficial electrification & resiliency

SPOTLIGHT: Release Sustainable Design Guidelines that create a clear and equitable pathway to decarbonization

HPD's Retrofit Electrification Pilot



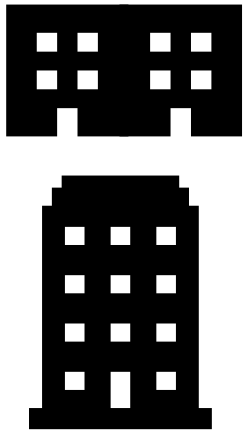
The HPD-NYSERDA $24 million Retrofit Electrification Pilot was announced in 2021

- *For projects in HPD's Preservation Pipeline*
- *Up to $26,400 per dwelling unit to electrify heating & hot water paid directly to building owners during construction*
- *Free Technical Support*

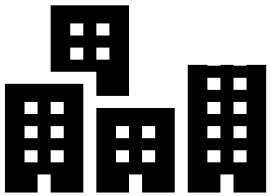
Nearly 50% of funding has been allocated to electrify 21 buildings

Retrofit Electrification Pilot – Process & Goals

Pilot will assist ~1,500 units in 35 Buildings



Small & Large Buildings



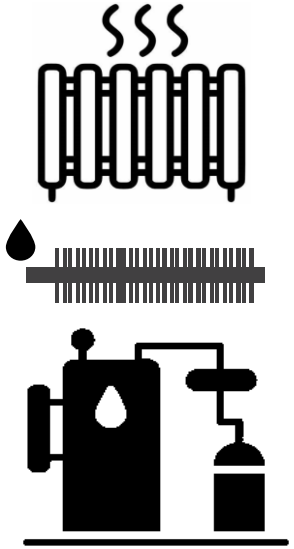
Multi-Building Clusters

Across multiple billing arrangements

Rentals & Coops

Metering Configurations

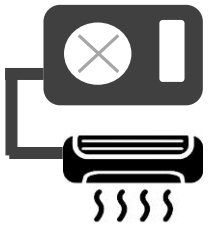
To transition Fossil Fueled Systems



Fossil-Fueled (mainly oil)

Electric Resistance

To Cold Climate Electric Heat Pumps



Space Heating

Domestic Hot Water

Retrofit Pilot Tools: Calculator

HPD/NYSERDA Retrofit Electrification Pilot: Eligibility Summary ("Pro Forma")

PROJECT INFORMATION:		
Date / Purpose:	8/25/2023	For HPD Final Approval
Project Name:	New Senate; 206 West 92 Street, Manhattan, NY	
Owner/ Architect/ Engineer:	Goddard Riverside/Magnusson A&P/LiRo Engineers	
HPD Program	Year 15	
Rental or Coop:	Rental (please confirm)	
# Buildings in Project (total)	1	
# Buildings being proposed for Pilot	1	
# Dwelling Units proposed for Pilot	136	
Commercial or Community Space?	0	
Current Heating Fuel Source:	Oil	
Comments or Questions	This is a fast-tracked project already designed (was originally rejected due to an incorrect IPNA stating it was a gas project)	
SCOPE (Proposed for acceptance into Pilot):		
Scope / Incentive being Requested	Scope 1 + 2 (both space heat and hot water): up to $26,300 / dwelling unit	
Baseline Scope as Described by Architect	Oil-to-gas, steam-to-hot-water conversion, decouple DHW, add flue for gas service. Upgrade windows & roof. ERV ventilation for common areas only. electrical service and upgrade work.	
Proposed Electrification Scope	VRF heating, central DHW heat pumps. Dunnage, electrical upgrades and patching.	
Proposed Metering for Heating, Hot Water & Cooling *Must comply w/ HPD's Electric Heating Policy. Conversion to resident-paid expenses is only allowed for coops and coop conversions.*	Team is proposing owner-paid heating & cooling.	
Scope Comments:	Note anything in scope that is questionable (e.g. too costly, exceeds incentive, non-approved billing strategy, etc.)	
ESTIMATED COSTS & INCENTIVE AMOUNT (Estimated based on proposed BAU and proposed Electrification Scope)		
Estimated Incremental Construction Cost	$2,283,335	Based on assumptions above, may change
Estimated Clean Heat Incentive	$259,315	NYS Clean Heat Incentives subject to change
Incremental Cost after Clean Heat	$2,024,020	
Maximum Available Pilot Incentive	$1,000,000	The smaller of the per-dwelling-unit maximum or the $1 million project cap.
Proposed Pilot Incentive	**$1,000,000**	The smaller of the max available incentive and the incremental cost.
Estimated Net Cost After Incentives:	$1,024,020	Based on assumptions above, may change.
Estimated Net Cost per DU:	$7,530	Based on assumptions above, may change.
Construction Cost Comments:	Project costs may vary as project is designed and/or bid. Does not include cost impact for non-pilot scope items.	
UTILITY ESTIMATES FOR HEATING, COOLING AND HOT WATER (based on HPD's Pilot M&O Standards)		
Existing Space Heating, Hot Water and Cooling Set up	**Normalized cost based on IPNA/ Utility Bills using current fuel rates**	
Heating	$51,284	Owner pays heating - oil/ steam
Hot Water	$34,189	Owner pays Hot Water - oil
Cooling	$0	Cooling may be present but is paid for by resident
New Space Heating, Hot Water and Cooling Set up	**Budgeted costs for electric heat pumps, based on Pilot M&O Standard**	
Heating (must comply w/ HPD's Elec Heating Policy)	$40,755	Pilot scope does not include heating
Hot Water (must comply w/ HPD's Elec Heating Policy)	$36,575	Pilot scope does not include Hot Water
Cooling	$13,585	Pilot scope does not include Cooling
Utility Cost Comments:	Project will be underwritten using HPD's Retrofit Pilot M&O Standards and applicable HPD Utility Allowances as necessary. See "Underwriting Owner-Paid Heating, Hot Water and Cooling" section below.	

Note: HPD Program Approval is required for acceptance into the Pilot.

please see below for additional conditions & next steps, including HPD Approval and Signature

Scope established, including metering strategy

Estimated project cost compared to "BAU"

Estimated utility costs after retrofit

HDC's Electric M&O Standard

ELECTRIC M&O

[Project Name]
[Program/Term Sheet]

Units: 100

Yes	Union
100	Units
357	Rooms

MAINTENANCE & OPERATING EXPENSES

Expenses			HDC UW	per rm/du		New Constr Standard	per rm/du		2023
Administrative									
Legal			$ 24,000	240	per du	$ 24,000	$ 240	per du	
Accounting			$ 17,500	$ 17,500	per project	$ 17,500	$ 17,500	per project	
Management Fee			$ 116,805	6.5%	of ERI	$ 116,805	6.50%	of ERI	
Fire and Liability Insurance			$ 135,000	$ 1,350	per du	$ 135,000	$ 1,350	per du	
Tax Credit Monitoring			$ 12,600	$ 126	*per TC formula*	$ 12,600	$ 126	*per TC formula*	
Benchmarking Expense	1		$ 495	$ 495	per bldg	$ 495	$ 495	per bldg	
Utilities									
Heating*	Electric		$ 55,692	$ 156	per room	$ 55,692	$ 156	per room	
Hot Water*	Electric		$ 62,475	$ 175	per room	$ 62,475	$ 175	per room	
Electricity			$ 66,045	$ 185	per room	$ 66,045	$ 185	per room	
Water and Sewer			$ 101,745	$ 285	per room	$ 101,745	$ 285	per room	
Broadband Service (100 Mbps)			$ -	0	per du	$ -	0	per du	
Maintenance									
Supplies/Cleaning/Exterminating			$ 49,980	140	per room				
Repairs/Replacement^			$ 105,000	1050	per du				
Super & Maintenance Salaries			$ 225,000	2250	per du				
Number of Supers	1	$ 123,641							
Number of Porters	1	$ 101,359							
Number of Handypersons	0	$ 107,770							
Elevator Maintenance & Repairs	1		$ 15,000	$ 15,000	per elevator				
Building Reserve			$ 35,000	350	per du				
Other									
Security				0	per du				
M & O Before Taxes and Debt Service			$ 1,022,337		Total				
				$ 10,223	per unit				
				$ 2,864	per room				
Real estate taxes			$ -						
TOTAL ANNUAL PROJECT EXPENSES			$ 1,022,337						
				$ 10,223	per unit				
				$ 2,864	per room				

New Construction Standard:

- Electric Heating – VRF
- Electric Heating – PTHP
- Electric Heating – Passive House
- Electric Hot Water

- Owner-Paid Cooling

Utility - Heat and Hot Water Detail:

Gas/Oil		Standard	Per/rm
Heat		$195	Room
Hot Water		$105	Room

All Electric	Select y/n	Standard	Per/rm	
Heat - VRF		$156	Room	
Hot Water		$195	Room	
Cooling	y/n	$65	Room	*(Only if owner paid)*

Passive House		Standard	Per/rm
Heat - PH		$73	Room

HPD's Green Utility Allowances

HPD'S 2023 UTILTY ALLOWANCE TABLE - For Electric Heating, Hot Water & Air Conditioning (use NYCHA for gas and	0 BR	1 BR	2 BR	3 BR	4 BR	5+ BR	
Apartment Electric & Cooking							
Apartment Electric, Includes Air Conditioning (aligns w/ NYCHA)	$75	$85	$110	$136	$162	$188	*This equipment is not allowed o… Preservation and New Constr…*
Apartment Electric, Excludes Air Conditioning	$63	$70	$90	$110	$130	$150	*Use when owner pays in… central owner-paid he…*
Electric Cooking (aligns w/ NYCHA)	$11	$13	$19	$25	$31	$37	*Used when tenant… stoves are now… …N*
Gas Cooking (aligns w/ NYCHA)	$24	$27	$31	$35	$39	$43	*Used when… …s for gas …*
HPD Non-Green Allowances: Non-Heat Pump Electric Heating & Hot Water							
Electric Hot Water Heating, not heat pump: Replaces NYCHA's Electric Hot Water Allowance	$36	$64	$128	$192	$224	$256	*…ed in very limited cases on HPD-financed programs, …prior HPD Approval is required.*
HPD Green Allowances: Cold-Climate Electric Heat Pumps for Heating & Hot Water							
Cold-Climate Heat Pumps: Multifamily Retrofits (see footnote)*	$33	$37	$47	$58	$66	$74	*Prior HPD Approval is required for resident-paid heating in HPD-financed Preservation programs and is typically limited to coops. See HPD Electric Heating Policy.*
Cold-Climate Heat Pumps: 1-4 Family Retrofits (see footnote)*	$39	$44	$56	$68	$75	$85	*Prior HPD Approval is required for resident-paid heating in HPD-financed Preservation programs and is typically limited to coops. See HPD Electric Heating Policy.*
Electric Hot Water Heat Pump (in-unit hybrid heat pump type)	$15	$26	$52	$78	$92	$105	*Prior HPD Approval is required for resident-paid hot water heating in HPD-financed programs. See HPD Electric Heating Policy.*

** All Heat Pumps must be NEEP Approved for Cold Climate: https://neep.org/smart-efficient-low-carbon-building-energy-solutions/air-source-heat-pumps*
Retrofits with electric heating must, at minimum, include building-wide air-sealing and 2016 NYCECC-compliant windows & roof insulation
NYCECC refers to the New York City Energy Compliance Code - the date reflects the code cycle that buildings must be designed to.

HPD's New Green Allowances:

- Heat Pump Heating for Multifamily & 1-4 Family
- Heat Pump Hot Water
- Apartment Electric minus cooling (when owner pays)

HPD Standards: Retrofit Electrification Pilot

2023 M&O Standards & Utility Allowance: for HPD Electrification Pilot

For use in Pilot only until approved

HPD 2023 HEATING, HOT WATER & COOLING STANDARDS (For Owner-Paid Expenses, HPD Retrofit Pilot)

	Utility Type	HPD (Pilot)	CPC 2023[1] (for reference)	HDC 2023 (for reference)	Comments on HPD S
	Heating & Hot Water	**Cost/ Room**	**Cost/ Room**	**Cost/ Room**	**Comments**
1	**Electric Heat Pump Heating & Hot Water**	**$380**	$330	-	*Extrapolated from HPD/ HDC M Allowance Analyses.*
	Heating	$195	$198		*Assumes 60% of total fr*
	Heating in Common Areas Only[2]	$10	$10		*Only if heating is re are heated (confirm with Design T*
	Hot Water	$175	$79		*Assumes 40% of total for hot wat*
2	**Gas Heating & Hot Water**	**$320**	$300	$320	*Aligns with HDC 2023 M&O for Pr*
	Heating	$192	$180	$192	*Assumes 60% of total for heating*
	Hot Water	$128	$120	$128	*Assumes 40% of total for hot water*
3	**Oil Heating & Hot Water**	**$400**	$330	-	*Based on Pilot Data for oil-heating bldg. w/ 15% envelope and equipment improvements*
	Heating	$240	$198		*Assumes 60% of total for heating*
	Hot Water	$160	$132		*Assumes 40% of total is for hot water*
	Electricity	**Cost/ Room**	**Cost/ Room**	**Cost/ Room**	**Comments**
4	**Common Area Electricity**	**-**	$140 walkup/ $170 elevator	$200	*Align w/ the standard being underwritten to (typically CPC but may be HDC)*
5	**Owner-Paid Cooling**	**$65**		$65	*Aligns with HDC's Cooling Standard*

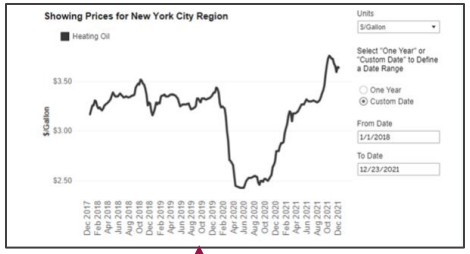
1. CPC has a common standard for new construction and existing buildings, and covers building state-wide, which tend to have lower utility rates.

2. Assumes 5% of total for lobbies, corridors and cellar. For buildings with no common area heating do not use. For buildings with signficant community space, work with Design Team to assess costs. Assumes Commercial Spaces are paid for by commercial tenant.

Existing Building Standard:

- Electric Heat Pump Heating
  Electric Heat Pump Hot Water
- Owner-Paid Cooling
- Coming soon: reduction factor for higher-performing retrofits

Retrofit Pilot Calculator



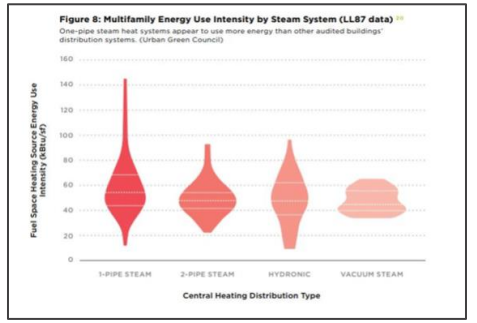
PROJECT INFORMATION		
Who will pay for heat when electrified?	Owner	*Default - Owner ("typical project")*
Who will pay for hot water when electrified?	Owner	*Default - Owner ("typical project")*
Who will pay for cooling when electrified?	Owner	*Default - Tenant ("typical project")*
Scope	Scopes 1+2	*Default - Scopes 1+2 ("typical")*
Fuel (select from drop down menu)	Oil	*Default - oil ("typical project")*
Existing DHW description	Integral with boiler	*Default - integral with boi*
Con Ed Service Class	EL9	*Default - if owner doesn't unless you want to evalu option*

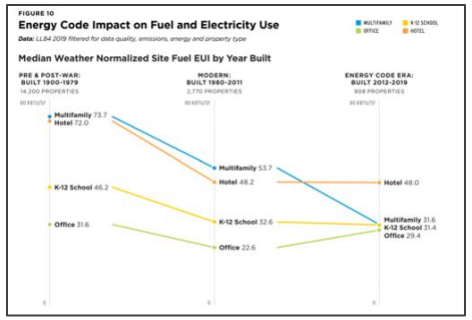
INFO PULLED FROM IPNA & UTILITY BILLS IF AVAILABLE:		
Item	Info	*Notes*
Project Name & Address:	New Senate; 206 West 92 Street, Manhattan, NY	*Check and change/edi building out of a group*
Building Square Footage	37045	*Default (to test calculator project"), 500 SF/unit*
Estimated SF common areas	5,557	*assumes 15% of GSF, co*
Number of Dwelling Units	136	*Default 25 ("typical proje*
Number of commercial units	0	*From screening tool*
If Oil, Oil Type	#4	*shouldn't this affect effici*
Oil Use (Gal/year)	23101	*From IPNA. Default 6600 see cell C140*
Space Plus DHW Energy Cost ($/year)	$69,303	
Oil Rate ($/gal) Based on IPNA	2.77	
Billing Period	1/28/22 - 1/	
Boiler Description	Old boiler	
Boiler Efficiency	75%	
Distribution Description	Steam	
Distribution Efficiency	60%	
% for Space Heating	60%	
Oil Usage for Space Heating (gals/yr)	13,861	
% for DHW	40%	
Oil Usage for DHW (gals/yr)	9,240	
Normalized Oil Rate ($/gallon)	$3.70	
Normalized Oil Usage (gals/yr)	100%	
Normalized Cost for Space Heating ($/yr)	$51,284	
Normalized Cost for DWH ($/yr)	$34,189	
Normalized Total ($/yr)	**$85,474**	
Heating Site EUI (kBtu/SF/yr) of this building	*90*	
Site Fuel EUI (heating + hot water)	*127*	

HEAT PUMP SPACE HEATING CO		
Oil Usage for Space Heating (gals/yr)		
Conversion (kbtu/gal)		
KBtu/year space heating	3,349,645	*90.4*
Overall space heating efficiency	45%	
Reduced envelope losses	2.5%	*2.5% typical, 10% if wall insulation*
Load (kbtu/year)	1,469,657	
Assumed COP	2	*Use 2.5 for minisplit, 2.0 for VRF*
kwh per year	215,366	*45227*
Cost/ kwh (master or direct)	$0.25	*Adjusted 8/23, see dropdowns*
Estimated Cost per year	**$53,800**	

HEAT PUMP HOT WATER COST ESTIMATOR		
Oil Usage for DHW (gals/yr)	9,240	
Conversion (kbtu/gal)	145	
KBtu/year DHW	1,339,858	
Overall DHW efficiency	40%	
DHW improvements (e.g. low flow)	0%	*Default zero, just to be safe*
Load (kbtu/year)	535,943	
Assumed COP	1.76	*to align w/ HPD M&O analysis*
Heat Pump DHW Use (kwh/year)	89,248	
Cost/ kwh (master or direct)	$0.25	*Adjusted 8/23, see dropdowns*
Estimated Cost per year	**$22,300**	

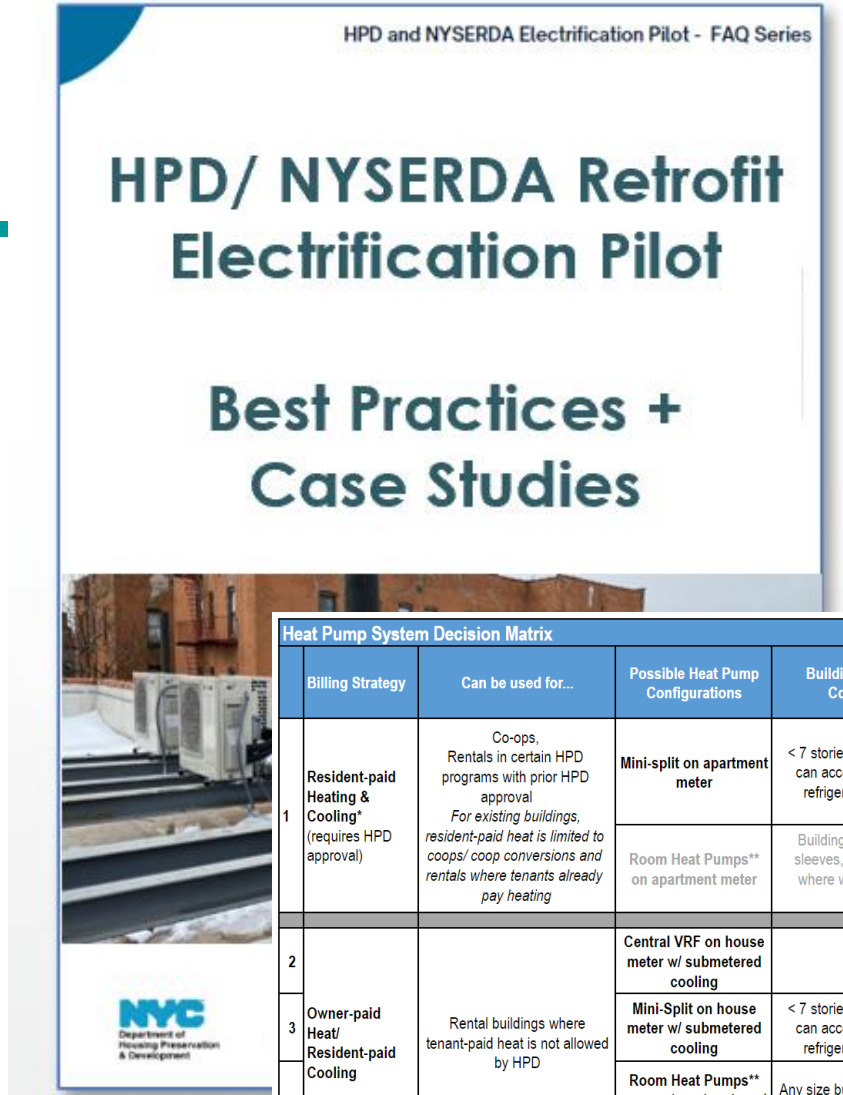
ESTIMATED ANNUAL UTILITY COSTS: HEATING, HOT WATER AND AIR CONDITIONING						
	Existing		Proposed	HPD Pilot Undewriting Standard		
				Note that the Pilot M&O standard is similar to the Utility Allowances and can be used interchangably		
Item	Per IPNA	Normalized to current rates	Worksheet Method	Gas	Oil	Heat Pumps
Space Heating - In Unit	$41,582	$51,284	$53,800	$40,128	$50,160	$40,755
Space Heating - Common Area	Included above	Included above	Included above	incl. above	incl. above	incl. above
DHW	$27,721	$34,189	$22,300	$26,752	$33,440	$36,575
Total Heating & Hot Water	**$69,303**	**$85,474**	**$76,100**	**$66,880**	**$83,600**	**$77,330**
Additional Items						
Air Conditioning Cost	**$0**	**$0**	**$12,503**	**$13,585**	**$13,585**	**$13,585**





Next Steps:

- Release 2024 M&O and Utility Allowances
- Continue to collaborate on the Future Housing Initiative
- Collect Round 1 data on the pilot and drill down into the utility cost estimates – as well as the cost data
- Continue to refine our process & guidance



Heat Pump System Decision Matrix

	Billing Strategy	Can be used for...	Possible Heat Pump Configurations	Building / Apartment Configuration	Considerations	First Cost	Service Cost	Energy Cost	Refrigerant Leak Risk
						estimates may vary			
1	**Resident-paid Heating & Cooling*** (requires HPD approval)	Co-ops, Rentals in certain HPD programs with prior HPD approval *For existing buildings, resident-paid heat is limited to coops/ coop conversions and rentals where tenants already pay heating*	**Mini-split on apartment meter**	< 7 stories or where building can accommodate limited refrigerant pipe legnths	Simple option when tenant-paid heating is allowed. Must comply w/ HPD's Electric Heating Policy.	$$$	$$	$$	High
			Room Heat Pumps on apartment meter**	Buildings w/ PTAC or AC sleeves, small apartments where wall penetration is feasible	No utility allowance availabe, not currently allowed by HPD	$$$**	$	$$$	Low
2	**Owner-paid Heat/ Resident-paid Cooling**	Rental buildings where tenant-paid heat is not allowed by HPD	**Central VRF on house meter w/ submetered cooling**	7+ stories	Billing for cooling usually requires a 3rd party and collecting can be difficult. Can be designed with heat recovery.	$$$$	$$$	$$$$	High
3			**Mini-Split on house meter w/ submetered cooling**	< 7 stories or where building can accommodate limited refrigerant pipe legnths		$$$$	$$	$$	High
4			**Room Heat Pumps** on apartment meter w/ heating wired to house meter**	Any size buildings, buildings w/ PTAC or AC sleeves, smaller apartments	Simplest solution for split-billing, but new to market, dual wiring adds cost, requires wall pentrations at each unit	$$$$**	$	$$	Low
5	**Owner-paid Heating & Cooling**	Senior/ Supportive Housing, rental buildings where cooling can be included in the M&O budget	**Central VRF on house meter**	7+ stories	Simple & minimizes risk for residents, but cost for cooling adds ~$65/year/room*** to M&O budget.	$$$$	$$$	$$$$	High
6			**Mini-Split on house meter**	< 7 stories or where building can accommodate limited refrigerant pipe legnths		$$$	$$	$$	High

** Tenant-paid heating is only allowed with prior HPD & HCR permission and must comply with all HPD resident-paid heat requirements. Shifting heating costs to tenants is NOT allowed for rent-stabilized or rent-controlled apartments*

HPD & Utility Costs

questions?

New York State Homes and Community Renewal

Samantha Pearce
Vice President of Sustainability
Office of Housing Preservation

NEW YORK STATE OF OPPORTUNITY. | Homes and Community Renewal

The Climate Act (CLCPA)

now

CLEAN ENERGY ECONOMY
over 157,000 clean energy jobs
- More than 200,000 new jobs added

by 2025

RENEWABLE ENERGY
6,000 MW of distributed solar
- 10,000 MW of distributed solar*

RESILIENT and DISTRIBUTED GRID
1,500 MW of energy storage
- 6,000 MW of energy storage

ENERGY EFFICIENCY AND BUILDING DECARBONIZATION
185 TBtu end-use savings in buildings and industrial facilities
- 1 million electric homes and 1 million electrification-ready homes

by 2030

RENEWABLE ENERGY/ CLEAN ENERGY STANDARD
70% electricity from renewable energy

GHG REDUCTION
40% reduction in greenhouse gas emissions from 1990 levels

As announced by Governor Hochul during Climate by 2030; NYSERDA and DPS Staff are now in the p

by 2035

RENEWABLE ENERGY
9,000 MW of offshore wind

CLEAN TRANSPORTATION
100% light duty zero-emission

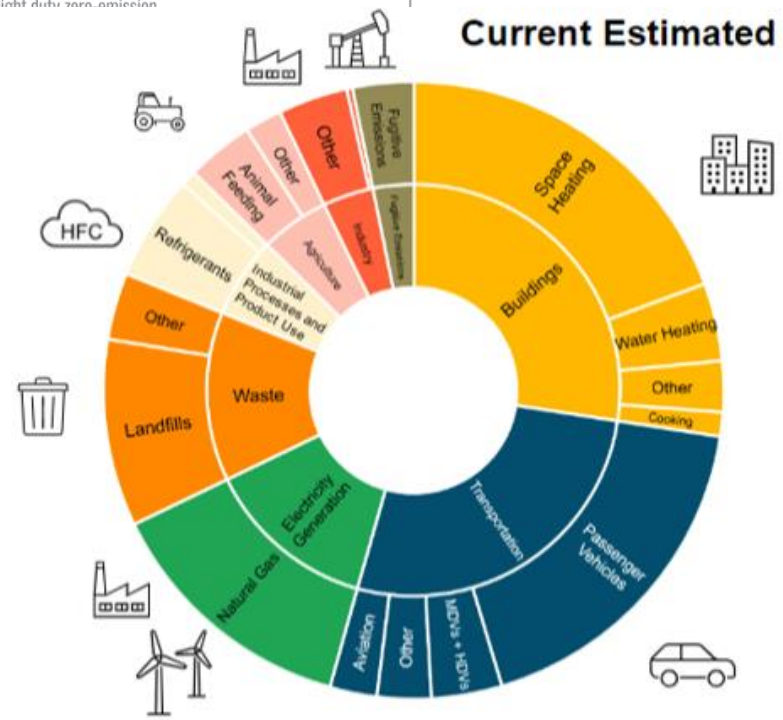
by 2040

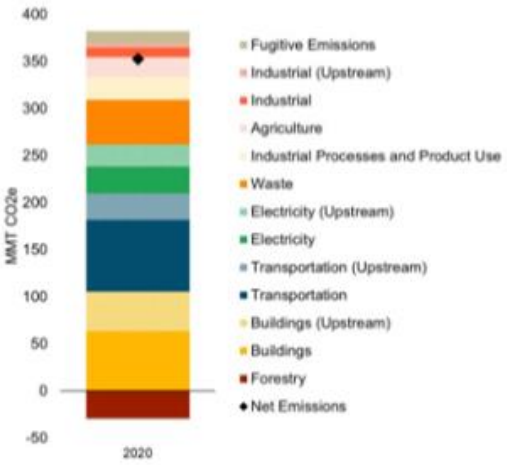
CLEAN ELECTRICITY
100% zero-emission electricity

by 2050

GHG REDUCTION
85% reduction in greenhouse gas emissions from 1990 levels

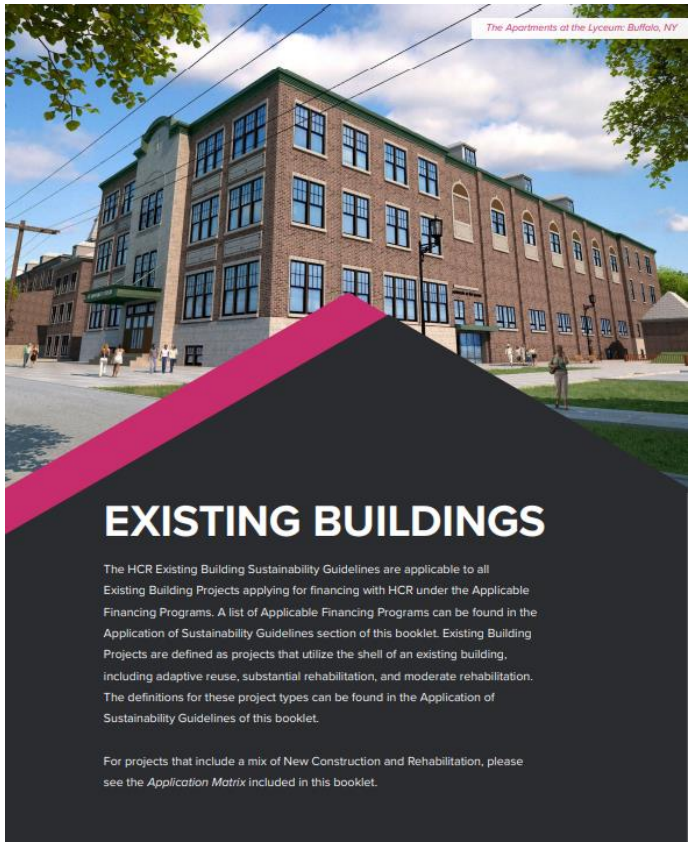
Current Estimated GHG Emissions by Sector*





*Draft 2020 results in line with DEC CLCPA accounting including upstream emission factors, 20-year GWP, and estimates from NY PATHWAYS

HCR Sustainability Unit: Programs



Clean Energy Initiative (CEI): Provides additional funding to LIHTC projects reaching Stretch goals aligned with decarbonization & efficiency measures. CEI is funded through a partnership and commitment of $100M from NYSERDA

Climate Friendly Homes Fund (CFHF): Funded through the HTFC capital budget at HCR, this program will provide $250M to electrify 10,000 units of small multifamily programs. The program will be administered by the Community Preservation Corporation (CPC) and their community and CDFI partners.

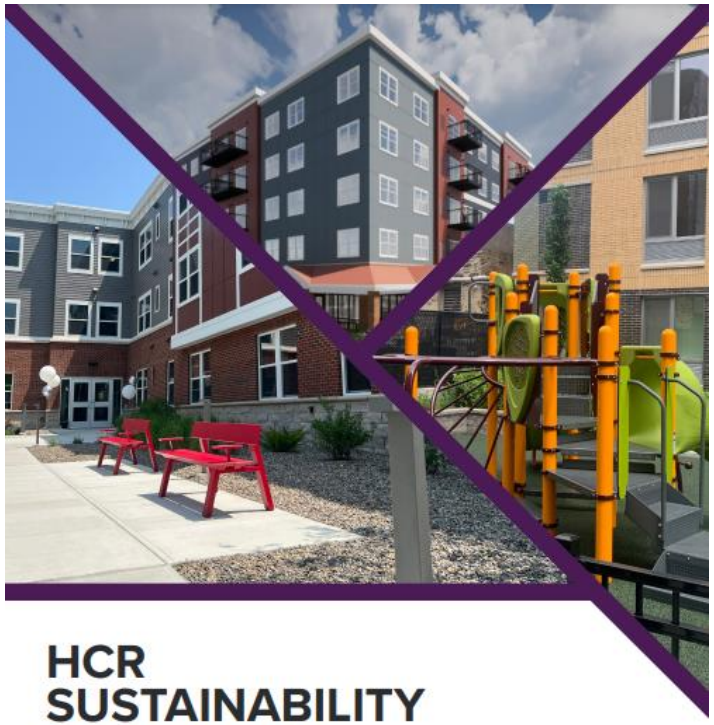
Weatherization Assistance Program (WAP): Provides weatherization services to LMI households through a network of non-profit community action agencies. Funded through DOE and LIHEAP programs annually about $90M serving around 12,500 units

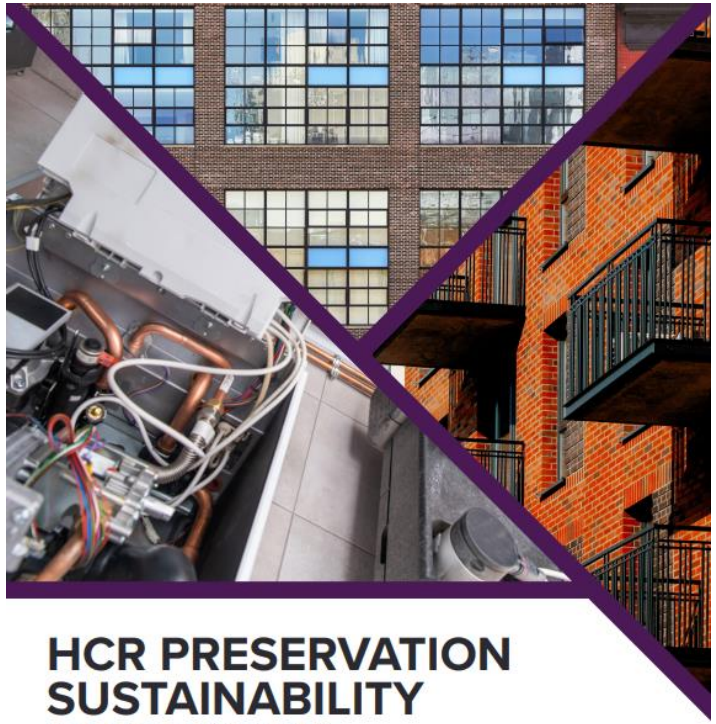
Technical Support: The Sustainability Unit provides support to HCR's F&D and SAMU teams for IPNA review, Sustainability Guidelines compliance, and other decarbonization scopes of work

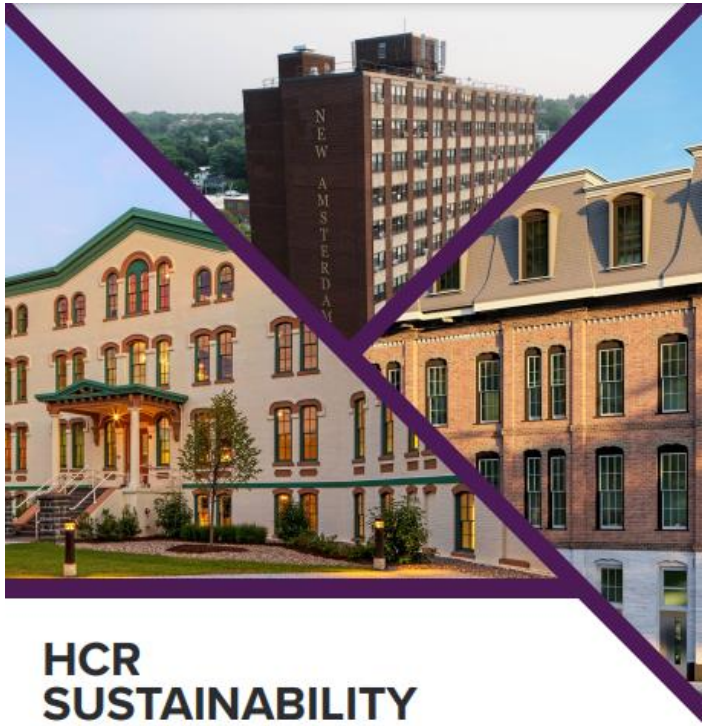
NEW YORK STATE OF OPPORTUNITY. Homes and Community Renewal

Sustainability Guidelines Booklets

1. Visit our new Sustainability landing page at hcr.ny.gov/sustainability
2. Click on “Sustainability Guidelines”
3. Each book sets standards for construction or rehabilitation







NYS Clean Energy Initiative (CEI)

On August 2021, NYS Homes and Community Renewal (HCR) and the NYS Energy Research and Development Authority (NYSERDA) announced the availability of **$100 Million** for a new Clean Energy Initiative, designed to create energy-efficient, all-electric affordable housing units.

New Construction

1. $5,500/unit in Clean Energy funding for reaching one of the Section 1 Stretch Goals
2. For eligible projects, up to $7,500/unit
3. The site must pay into SBC

Existing Buildings/Adaptive Reuse

1. Choose from 3 scopes for up to $25,000/unit (Space Heating electrification, DHW electrification, building envelope)
2. Adaptive Reuse, up to $12,500/unit following Stretch Goals – OR- for SHPO sites, follow the EB term sheet
3. Funding for SBC and non-SBC sites

Stretch Goals:

A. Third-party Standard Certification [2]**:** Select one of the following third-party certification programs to certify the project in lieu of the programs listed in the Baseline Requirements:

1. LEED Zero Energy[3] AND:
   a. LEED v4 BD+C with a rating of Gold or higher OR
   b. LEED v4.1 BD+C with a rating of Gold or higher
2. 2020 Enterprise Green Communities Plus
3. Passive House PHI/PHIUS or equal

NYS Clean Energy Initiative (CEI)

Awarded	Projects	Units	Funding
	25	2338	$21,797,000

How Data is driving CEI program design and deployment

Measure Costing:	Analysis of the existing market and collaboration with NYSERDA to evaluate the GAP in business as usual against HCR Stretch Goals aligned with CEI
Accessing Funds:	Worked with developers to understand challenges with past projects related to cash flow
Types of Scope:	Reviewed NYSERDA MPP and NC-H programs with NYSERDA staff support to identify feasible scope in Existing Buildings to reach full and partial electrification

Inflation Reduction Act (IRA)

EPA Greenhouse Gas Reduction Fund

The Greenhouse Gas Reduction Fund will be implemented via three grant competitions, as described below. EPA recently released the Notices of Funding Opportunity for these competitions: the $14 billion National Clean Investment Fund, the $6 billion Clean Communities Investment Accelerator, and the $7 billion Solar for All competition.

$14 billion National Clean Investment Fund

2–3 national nonprofit clean financing institutions capable of partnering with the private sector to provide accessible, affordable financing for tens of thousands of clean technology projects across the country.

$6 billion Clean Communities Investment Accelerator, and the

provide grants to 2–7 hub nonprofits that will, in turn, deliver funding and technical assistance to build the clean financing capacity of local community lenders

$7 billion Solar for All competition

60 grants to states, territories, Tribal governments, municipalities, and eligible nonprofit recipients... expand existing low-income solar programs or design and deploy new Solar for All programs nationwide.

Finance Low-Carbon Multifamily at Scale Using Data and Program Innovation

October 2023

Fannie Mae®

Our place in the mortgage financing system

Green Financing Loan Options

Already Green?
Green Building Certification

Benefits:
Preferential Green Pricing

To Qualify:
Property has one of the recognized Green Building Certifications in place by Rate Lock

Making Some Improvements?
Green Rewards

Benefits:
Preferential Green Pricing
Free Energy and Water Audit
Increased Loan Proceeds

To Qualify:
Choose to implement Green improvements projected to reduce at least 30% combined energy and water, of which a minimum of 15% must be attributable to savings in energy consumption

Execution

Green Mortgage Backed Security

Challenges for Green Mortgage Loan Borrowers

Borrowers have found it difficult to comply with Fannie Mae's energy and water reporting requirements due to the following challenges:

1. Coordinating with local utilities
2. Gathering tenant data
3. Using the ENERGY STAR® Portfolio Manager platform
4. Understanding when and how they are required to report
5. Selected energy and water efficiency improvements are not installed as required

To overcome these challenges and provide an exclusive benefit to Green Mortgage Loan Borrowers, Fannie Mae manages the Green Measurement and Verification Service.*

*Fannie Mae Green Measurement and Verification Service is subject to change but will continue throughout 2023.

Green Measurement and Verification

Measurement

Green Rewards Mortgage Loans
Green Building Certification
Preferential Pricing

- Energy and water utility data reported to Fannie Mae.
- Portfolio performance analytics for Lenders and Borrowers with EnergyScoreCards.

Verification

Green Rewards Mortgage Loans

- Site visits to confirm energy and water efficiency measures were installed as specified in the Schedule 6 of the Loan Agreement.

Steps to Decarbonization

Efficiency

Reducing energy consumption is key to decarbonization. The cleanest kilowatt-hour is the one you never use.

Electrification

Converting fossil fuel equipment to efficient electric equipment (i.e., heat pumps) significantly decreases site energy use. Often cited as the “single most important lever considered” regarding pathways to reduce emissions in the building sector.

Grid Decarbonization

As the electric grid supply gets cleaner, the emissions from efficient, electrified buildings will further decrease.

Building Impact with Multifamily Decarbonization

Path to decarbonization

Grid Decarbonization

As the electric grid supply gets cleaner, the emissions from efficient, electrified buildings will further decrease.

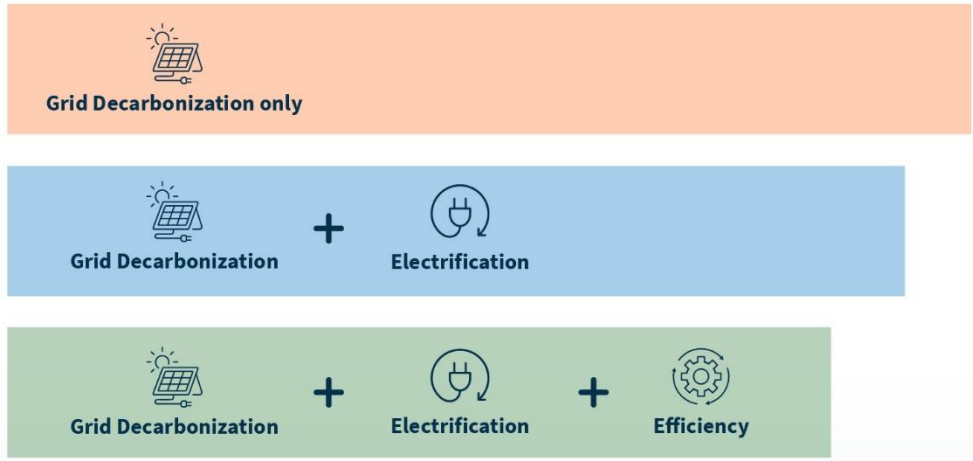
Electrification

Converting fossil fuel equipment to efficient electric equipment (i.e., heat pumps) significantly decreases site energy use.

Efficiency

Reducing energy consumption is key to decarbonization. The cleanest kilowatt-hour is the one you never use.

Estimated total emissions from Multifamily properties (MMT CO2e)



Change in electricity grid over time

2020
Electricity Grid is **20%** powered by clean energy

2035
Electricity Grid is **95%** powered by clean energy

2050
Electricity Grid is **100%** powered by clean energy

Why does it matter?

Estimated

320 million

metric tons of emissions saved by layering electrification and efficiency with grid decarbonization

That's equivalent to

the emissions from **86** coal-fired power plants in one year **or**

the carbon sequestered by **5.3 billion** tree seedlings grown for 10 years.

Estimated emissions from multifamily properties based on Fannie Mae analysis and Cambium 2022 future-looking emission factors, developed by NREL (National Renewable Energy Laboratory).

Electrification Cost Analysis

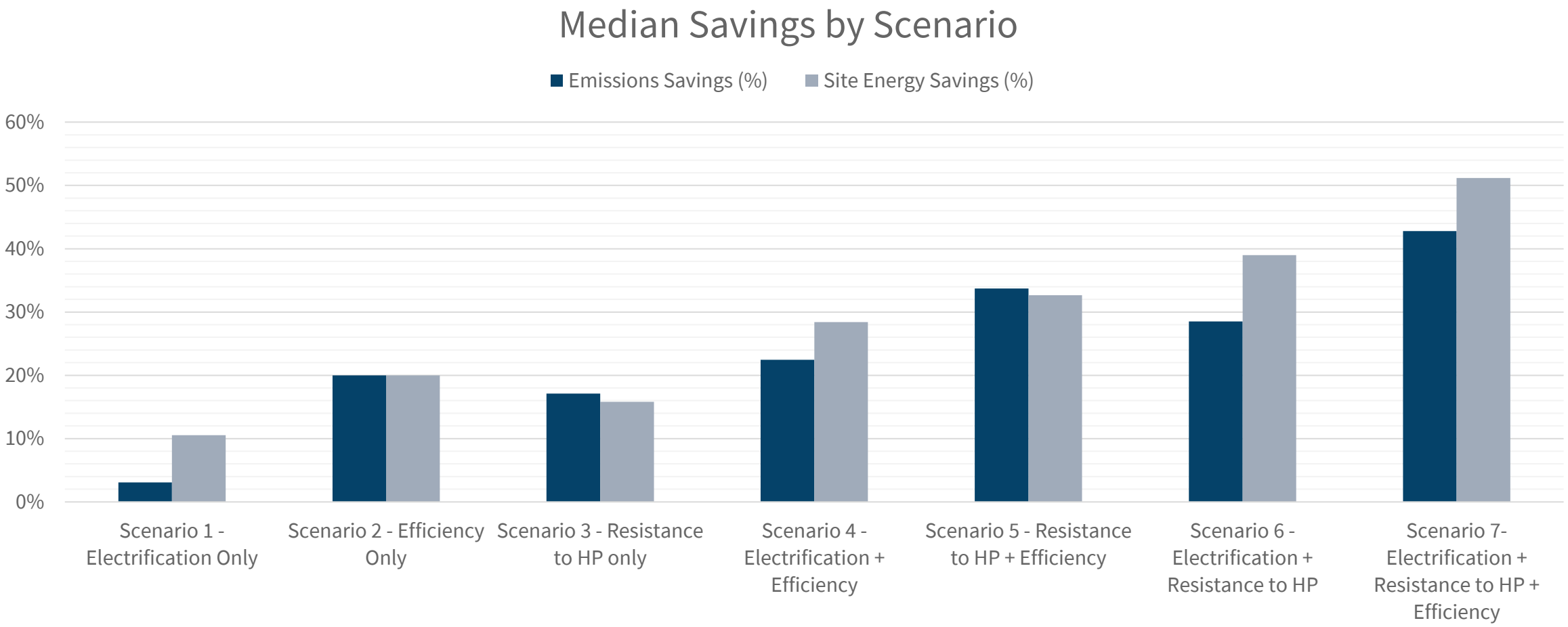
Insights from Fannie Mae's 2022 Multifamily Electrification and Decarbonization Roadmap

The cost of electrification depends on the specific system configuration being installed.

Category	Efficiency Measure	Cost Range (per unit)
Water heating	Install central heat pump water heater	$2,000 - $8,000
Water heating	Install in-unit heat pump water heater	$1,500 - $3,000
Heating	Convert central gas boiler to central heat pump	$10,000 - $30,000
Heating	Convert in-unit gas boiler to in-unit heat pump	$5,000 - $15,000
Heating	Convert in-unit PTAC or gas furnace to in-unit PTHP	$4,000 - $12,500
Cooking	Install induction ranges	$1,000 - $3,000
Dryers	Install electric dryers	$1,000 - $3,000

Emissions & Energy Savings

Insights from Fannie Mae's 2022 Multifamily Electrification and Decarbonization Roadmap




Fannie Mae®

Future Housing

Overview:
Drive the transition to low-carbon, multifamily housing with **real world data and analysis** of building performance.

Current Projects:

- Equity & Carbon Database for Multifamily Housing + Health Metrics
- Underwriting Standards for Low-Carbon Housing

Partners:

be ex building energy exchange

BRIGHT POWER

cpc

NYC Department of Housing Preservation & Development

Steven Winter Associates, Inc.

Co Equity CONSULTING

KINETIC COMMUNITIES CONSULTING

Funders:

NEW YORK STATE | NYSERDA Supported

BANK OF AMERICA

Discussion Questions

What key program innovations did we hear about?

How do we get the data?

How is the data used?

What do we need to scale up to fully decarbonize the sector by 2050?

Appendix

Fannie Mae®

Green Property Profiles

What can your Green deal look like?

Green Rewards: Property & Loan Type

- Market Rate or Affordable properties
- Acquisition, refinance, and supplemental

Most popular improvements

- High efficiency interior and exterior lighting
- ENERGY STAR® certified learning thermostats
- Green Rewards can be used to support deeper energy retrofits, such as installation of solar photovoltaic systems
- See Tips For Choosing Energy and Water Efficiency Measures for Multifamily Borrowers

Green Building Cert: Property & Loan Type

- Market Rate or Affordable properties
- Acquisition or refinance

Most popular certifications

- Green Globes Multifamily for Existing Buildings
- Green Globes Multifamily for New Construction
- NGBS Green Multifamily Building Certification
- ENERGY STAR, Existing Multifamily Buildings
- See Green Building Certifications at a Glance

Green Rewards Requirements and Benefits

Properties making energy and water saving improvements at refinance, acquisition or supplemental financing.

- Financial benefits:
  - Preferential Green pricing reduces the interest rate of most loans
  - Fannie Mae reimburses 100% of the cost of High Performance Building (HPB) Report.
  - **Up to 5% additional loan proceeds, subject to normal LTV constraints.**
- No minimum property age or improvement budget.
- Cost of improvements escrowed at 125%; must be completed within 12 months.

2023 Eligibility

30% energy + water savings combined, including a minimum energy savings of at least 15%.

High Performance Building (HPB) Report

HPB Report identifies and quantifies energy and water saving opportunities

- Borrower selects final scope of work from list of energy- and water-saving opportunities in HPB Report
- Report is ordered by Lender, completed by an energy auditor, and requires a site visit
- Report can be completed up to 6 months prior to rate lock
- 100% of HPB Report cost is reimbursed by Fannie Mae

Sample Improvement Opportunities 250 unit, $10 million loan	Estimated Project Cost	Energy Savings	Water Savings	Projected Owner Annual Cost Savings	Projected Tenant Annual Cost Savings
27 kW Solar Photovoltaic System	$65,000	6%	-	$6,000	$3,000
WaterSense Low-flow Bathroom Faucets & Showerheads	$15,000	4%	14%	$18,000	
ENERGY STAR® Smart Thermostats	$50,000	4%	-		$4,000
ENERGY STAR® rated dishwashers	$144,000	3%	2%	$2,000	$3,000
Total	**$274,000**	**17%**	**16%**	**$26,000**	**$10,000**

Escrow at 125%

Save at least 30% energy and water combined, with at least 15% energy savings to be eligible

Underwrite a portion of projected savings

Green Rewards
Extra Loan Proceeds

Underwrite a portion of projected cost savings to increase loan amount.

- Net Cash Flow may be increased by underwriting a portion of projected energy and water cost savings:
  - 75% of Owner projected savings
  - 25% of Tenant projected savings, if based on actual (not modeled) tenant data
- Up to 5% additional loan proceeds available, subject to normal LTV constraints.
- Underwriting of greater than 5% additional loan proceeds subject to Credit pre-review.

	Standard Loan	Green Loan
Net Cash Flow	$805,000	$805,000
75% of Projected Owner Energy and Water Cost Savings + 25% of Projected Tenant Energy and Water Cost Savings	-	$22,000
Underwritten Net Cash Flow	$805,000	$827,000
Maximum Loan Amount	$10,000,000	$10,275,000
LTV	71%	73%
DSCR	1.25	1.25
Green Rewards Additional Loan Proceeds		**$275,000**

Green Building Certification (GBC) Requirements and Benefits

Properties that have already invested in going green.

- **Preferential Green pricing reduces the interest rate of most loans, including acquisitions and refis.**
- **Towards Zero Certifications receive top pricing benefit.**
- Certification must be finalized and delivered by Rate Lock.
- Certifications available for new construction, major renovations, and existing properties.
- On a Pre-Review only basis, will extend preferential pricing benefit to MAH forward commitments.

35+ Eligible Certifications

A current list of the eligible certifications and requirements can be found in Form 4250.

Measurement Reporting Steps

For Borrowers in the Green Measurement & Verification Service

1 Measurement Setup

Borrower completes the Measurement Property Setup Form.

This is a requirement only during initial Measurement Setup.

2 Owner Data Access

Borrower completes the Credential Capture Form to provide owner utility data access to Bright Power.

Online account login credentials are preferred and require the least staff time.

There are alternatives if login access is not available.

3 Whole Property Utility Data

Borrower provides tenant-paid utility information, either in the form of aggregate data, if available, or a sample of tenant utility bills.

Bright Power will provide the tools and tips needed to gather tenant-paid utility information.

Verification: Servicers and Bright Power

Servicer Verification Inspections

Servicers will coordinate and perform the Verification Inspections.

- Servicers will select their own Inspectors, coordinate the Inspection, and submit the Inspection report to Fannie Mae.
- Bright Power will manage the Inspection report format and provide program support.

Green Impact Inspections

Bright Power will coordinate inspections for 10-20% of properties.

- Fannie Mae will assign a selection of properties to Bright Power for a Green Impact Inspection.
- These Inspections will help to research and monitor the progress of the program.