

GREEN AFFORDABLE HOUSING

ONLINE
TEACH-IN



**PARTNERS
FOR GREEN
AFFORDABLE
HOUSING
& JOBS**



**JAMAL LEWIS, GREEN & HEALTHY
HOMES INITIATIVE**



**MICHAEL DIRAMIO, ASSISTANT
DIRECTOR OF ENERGY
AFFORDABILITY & EQUITY AT
NYSERDA**



ZACH FINK, ZBF GEOTHERMAL



GUY KEMPE, RUPCO



**ELIZABETH MCDADE, ROCHESTER
ENERGY EFFICIENCY &
WEATHERIZATION (RENEW)**



**JEN METZGER, FORMER NYS STATE
SENATOR & NYCP POLICY ADVISOR**

Green Affordable Housing Teach In

July 1, 2021

Jamal Lewis
Director of Climate, Energy, and Health
Green & Healthy Homes Initiative
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About GHHI

Vision: Advancing racial and health equity and opportunity through healthy housing.

Mission: The Green & Healthy Homes Initiative is dedicated to addressing the social determinants of health and the advancement of racial and health equity through the creation of healthy, safe and energy efficient homes. By delivering a standard of excellence in its work, GHHI aims to eradicate the negative health impacts of unhealthy housing and unjust policies for children, seniors and families to ensure better health economic and social outcomes in low-income communities of color.

Operating Value: Ensuring racial equity in all policies, practices and actions



The Opportunity in New York

New York State Clean Energy Goals

Climate Leadership and Community Protection Act (Climate Act)

CLEAN ENERGY ECONOMY

nearly 159,000 clean energy jobs



now

RENEWABLE ENERGY

6,000 MW of distributed solar



by 2025

RESILIENT and DISTRIBUTED GRID

1,500 MW of energy storage

ENERGY EFFICIENCY

185 Tbtu end-use savings
in buildings and industrial facilities

RENEWABLE ENERGY/ CLEAN ENERGY STANDARD

70% electricity from renewable energy



by 2030

GHG REDUCTION

40% reduction in greenhouse
gas emissions from 1990 levels

3,000 MW of energy storage
30,000 employed in storage sector

RENEWABLE ENERGY

9,000 MW of offshore wind



by 2035

CLEAN ELECTRICITY

100% zero-emission
electricity



by 2040

GHG REDUCTION

85% reduction in greenhouse
gas emissions from 1990 levels



by 2050

**Requires 35% with a goal of 40%
of the benefits from clean energy
investment to flow to disadvantaged
communities.**

Energy Efficiency and Housing Advisory Panel Members

CHAIR

RuthAnne Visnauskas

Commissioner
Homes & Community Renewal

Janet Joseph

Senior Vice President for Strategy &
Market Development
NYSERDA

Peggie Neville

Deputy Director of Efficiency &
Innovation
Department of Public Service

Gina Bocra

Chief Sustainability Officer
NYC Department of Buildings

Kyle Bragg

President, 32BJ SEIU

Amy Sugimori

Director of Policy and Legislation

Molly Dee

Head of Deep Carbon Reduction
Jaros, Baum & Bolles

Dan Egan

Senior Vice President of Energy &
Sustainability
Vornado Realty Trust

Bret Garwood

Chief Executive Officer
Home Leasing, LLC

Clarke Gocker

Director of Policy and Strategy
PUSH Buffalo

Jin Jin Huang

Vice President for Generation
Development
Ecosave, Inc.

Elizabeth Jacobs

Executive Director
Akwesasne Housing Authority

Jamal Lewis

Sr. Policy & Technical Assistance
Specialist
Green & Healthy Homes Initiative

Sadie McKeown

EVP, Lending & Initiatives
The Community Preservation
Corporation

Bill Nowak

Executive Director
NY Geothermal Energy
Organization

Daphany Sanchez

Executive Director
Kinetic Communities Consulting

Laura Vulaj

Senior Vice President & Director of
Sustainability
SL Green Realty Corp.

Public Outreach and Engagement

- **Public Panel Meetings**
 - 8 public meetings, September 2020 – March 2021
- **Expert Round Tables**
 - 3 round tables in November 2020
 - Builders, installers, designers of single family/multifamily housing; landlords, owners, agents
- **Stakeholder Survey**
 - October – December 2020
 - ~65 responses
- **Carbon Neutral Buildings Roadmap outreach process**
 - 15 stakeholder engagement sessions; notes distributed to Panel members
 - >950 stakeholder participants across sessions
- **Public Engagement Session, February 4, 2021**
 - 270 attended, ~330 including NYS agency staff
 - Written comments received through 2/18/21
 - 110 unique comments (session and email)
 - ~320 comments via two coordinated emails
- **Meetings with REBNY condo/coop managers**
 - February 2020 (x2)
- **Meeting with residential property owner associations**
 - Rent Stabilization Association (RSA), Community Housing Improvement Program (CHIP), New York State Association for Affordable Housing (NYSFAFH) in March 2021

CLCPA Panel Coordination

Panel-level Coordination

- Oct. 2020 – CJWG presented at EEH Panel about DACs
- Dec. 2020
 - EEH Panel delegates attended CJWG
 - DEC/DOS/NYSERDA presentation on Resilience and Climate Adaption, with LULG reps
- Jan. 2021
 - Local Building Decarbonization Laws and Services learning session, with LULG
 - EEH Panel reps attended bioeconomy subgroup of Agriculture and Forestry
- Feb. 2021
 - 2/5 subgroup meeting with Power Gen & utilities on gas transition, rates, grid impacts of electrification
 - HFCs learning session, with Waste Panel
- March 2021
 - Engagement session with residential property owner associations, with Power Gen

Staff-level Coordination

- Land Use and Local Government (LULG)
 - Adaptation and Resilience
 - Clean energy recommendations
- Power Generation Panel
 - LMI/DAC
 - Equitable access to solar
 - Electrification and gas system transition
- Agriculture and Forestry; Energy-Intensive and Trade-Exposed Industries
 - Embodied carbon and mass timber
- Waste
 - HFCs and embodied carbon
- Just Transition Working Group
 - Workforce development

Mitigation Strategies

	Description	Action type	Emissions impact by 2050	Ease of implementation	Cost*
1	Enact enabling legislation and adopt codes, standards, and regulations to improve energy efficiency, reduce emissions, and enhance building resilience. Adopt regulations that phase out fossil fuel use in buildings, requiring energy-efficient electric heating and cooling, electric hot water heating, and electric appliances.	Legislative, regulatory, programmatic	High	Medium/Hard	\$\$\$
2	Require measuring building energy usage, benchmarking energy performance, and making that information accessible via disclosure or labeling.	Legislative, regulatory, programmatic	Low (but enables other mitigation)	Easy	\$
3	Advance a managed, phased, and just transition from reliance on fossil gas and the gas distribution system to a clean energy system, including elimination of embedded subsidies for fossil gas.	Legislative, regulatory	High (overlap with #1)	Hard	\$\$\$
4	Advance a managed and just transition from reliance on HFC use as refrigerants and in all products used in building construction.	Legislative, regulatory	High	Hard	\$\$

Cost estimates for mitigation strategies reflect total resource costs statewide, expressed as an equivalent annualized cost. The total resource cost approach measures costs to upgrade buildings and utility infrastructure net of energy savings across all entities (public and private sector). The categories used for **equivalent annualized total resource cost are: \$ (<\$250M, resources are already on hand), \$\$ (\$250M - \$1B, requires some new resources), and \$\$\$ (>\$1B, requires high degree of new resources).*

Enabling Initiatives

	Description	Action type	Ease of implementation	Cost*
<p>Cross-cutting: The scale of transformation will require mobilizing private capital and a significant increase in public resources. The CAC should conduct an economy-wide analysis to identify public and private resources and funding mechanisms.</p>				
1	Public Financial Incentives	Financial, regulatory, programmatic	Hard (given scale)	\$\$\$
2	Public and Private Low-cost Financing	Financial	Hard (given scale)	\$\$\$ + mobilize private capital
3	Workforce	Financial, regulatory, programmatic	Medium	\$\$
4	Consumer Education	Programmatic	Medium	\$\$
5	Innovation	Financial, programmatic	Easy	\$\$
6	Embodied Carbon	Financial, regulatory, programmatic	Easy	\$

Cross-cutting recommendations also address federal support, energy prices, resilience, and the importance of energy efficiency.

Cost estimates for enabling strategies reflect new State resources above current levels of investment, through 2030. State investments in market enabling strategies will be needed for at least the coming decade, with ongoing State resources thereafter to support LMI households and DACs. The categories used for **new State resources (through 2030) are: \$ (<\$25M, resources are already on hand), \$\$ (\$25M - \$100M, requires some new resources), and \$\$\$ (>\$100M, requires high degree of new resources).*

Cross-Cutting Panel Recommendations

Initiative	Panel Recommendation
Federal Agenda	The Panel recommends the CAC advocate for Federal resources and policy support in the scoping plan. Climate change is a national and global problem. New York State is a leader but will need significant assistance and partnership from the Federal government to bring these recommendations to fruition.
Revenue Sources	The Panel recommends the CAC conduct an economy-wide analysis to identify resources and funding mechanisms to support the final scoping plan. While the Panel identified and recommended some potential funding/financing mechanisms, these do not address the full need outlined in the recommendations. Further analysis and expert/stakeholder input is needed to identify resources for this scale of transformation.
Energy Costs and Price Signals	The Panel recommends ongoing PSC attention to rate design and retail rate price signals for both electricity and gas , to ensure affordability as buildings electrify and to promote demand flexibility.
Adaptation and Resilience	Adaptation and Resilience recommendations are of material importance as buildings electrify heating systems, and as the frequency of extreme weather events increases the probability and scale of grid outages. At the building level, the Panel recommends several changes in the State codes that support more resilient buildings and efficient, flexible technologies that can enhance grid reliability and resilience, including high-performance walls/roofs/windows to improve passive survivability, solar PV along with energy storage readiness, grid-interactive appliances, and EV readiness to position for vehicle-to-grid/vehicle-to-building applications. The Panel also supports multiple specific recommendations advanced by the cross-panel Adaptation and Resilience group, notably: (i) to develop policies and programs to reduce human risks associated with new patterns of thermal extremes (e.g., community-based cooling and warming centers, weatherization from thermal extremes, cool roofs); (ii) to ensure the reliability, resilience and safety of a decarbonized energy system (e.g., modernize the energy system, energy efficiency upgrades and capital improvements to buildings to endure grid failures and to accept power when the system is re-energized); and (iii) to strengthen meaningful community engagement and public education and build adaptive capacity (e.g., train building operations staff in disaster preparedness, provide home and small business resilience audits/refinancing). The Panel underscores the need for additional research, analysis, and policy development on this critical topic.
Energy Efficiency Upgrades for Existing Homes	Although the Panel's recommendations do not include a regulatory requirement to perform energy efficiency upgrades to existing residential buildings, the Panel underscores the importance of insulation/weatherization and energy efficiency measures to make homes comfortable and to reduce emissions, heating costs, and seasonal demand peaks. Either regulations and/or substantial subsidies likely will be needed in the future to effectuate this at scale. Given market challenges and costs, the Panel recommends that the first step is to require energy benchmarking and disclosure as described in Mitigation Strategy #2, which can then inform future policy deliberations and programs to assist low-income New Yorkers. In the meantime, funding for LMI weatherization/energy efficiency efforts will need to be substantially increased.

Questions & Comments

The image shows the exterior of a brick building with a modern glass entrance. A sign on the brick wall reads "Green & Healthy Homes Initiative" with a leaf logo. A semi-transparent grey box is overlaid on the center of the image, containing social media information. A young tree is planted in a planter box in front of the entrance.

www.greenandhealthyhomes.org
Twitter: @HealthyHousing
Facebook
LinkedIn

Low-Income Housing and the New York State Carbon Neutral Buildings Roadmap

Ensuring equitable access to benefits

Climate Act requires 35% with a goal of **40% of all benefits from clean energy investment** to flow to disadvantaged communities.

Four-part approach to support disadvantaged communities

Electrification while preserving affordability

Efforts to decarbonize buildings in low-income housing and disadvantaged communities must prioritize efficiency and be designed so to not increase residents' economic burdens

Address diverse low-income housing types

Address specific barriers by housing type with matching regulatory, policy, and financial remedies that recognize “one size does not fit all”

Community-led strategic initiatives

Empower impacted communities to take part in the decision-making process so that decarbonization of these communities is done together and works for the residents

Holistic approaches to low-income and disadvantaged communities

Will support equitable transition and bring benefits to all New Yorkers that include health and safety improvements, job creation, and reduced energy burden

Current Initiatives for LMI Housing Efficiency, Electrification and Renewables in New York State

\$1 Billion+ for LMI Clean Energy Investments in LMI Housing in NYS through 2025

- > \$300 million for energy efficiency for LMI homeowners and renters + \$500 million for multifamily energy efficiency
- > \$30 million to test and demonstrate early opportunities for heat pumps in LMI housing
 - Incentive Adders to Existing [Single Family EmPower](#) and [Multifamily Performance Program](#)
- > \$135 million set aside for [LMI inclusive community solar](#)
- > Affordable Housing Agency Pilots -- NYSERDA funding allocated for direct inclusion in housing agency term sheets to support energy retrofits including beneficial electrification
- > [\\$150 million for clean energy project finance in affordable housing](#) via NY Green Bank
- > [Clean Energy Workforce Development](#)
 - Funding for internships, on the job training, building operations and energy efficiency and heat pumps training targeted to priority populations and disadvantaged communities



Carbon Neutral Buildings Road Map

We need to hear from you!

All New Yorkers must take a no regrets approach to fighting climate change.

Here are actions you can take:

- 1 Provide feedback via our website at nyserderda.ny.gov/Carbon-Neutral-Buildings
- 2 Sign up to stay informed about new developments on the Roadmap.
- 3 Share this presentation with colleagues, customers and others in your network.
- 4 Learn about NYSERDA programs that will help us realize the Roadmap goals www.nyserderda.ny.gov/all-programs

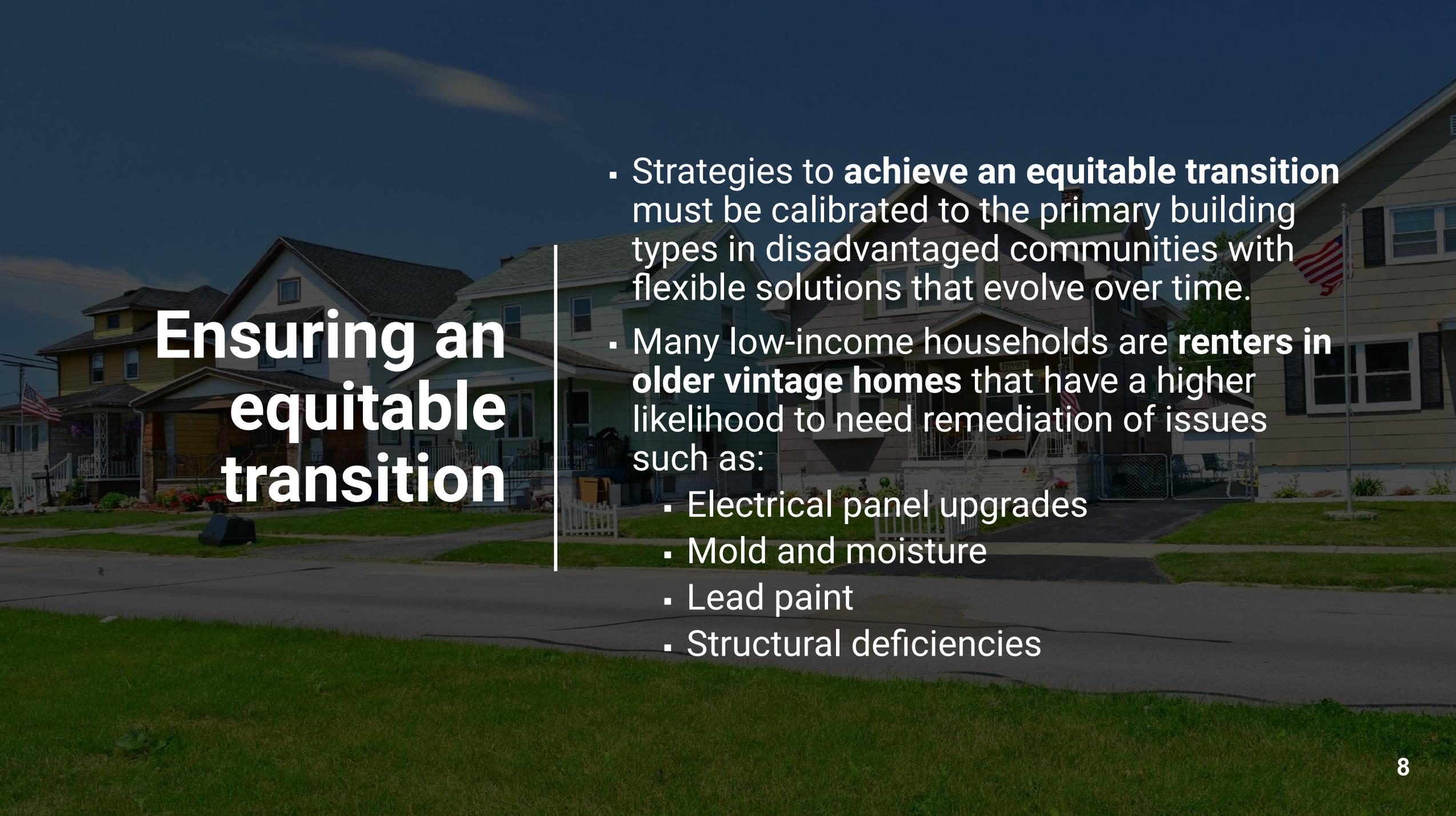
Appendix

Scaling the market for an equitable transition

- Remove barriers as part of early-stage market development
- Develop pilot programs and demonstrate a market to electrify low-income housing
- Facilitate private capital investment in highly efficient, all-electric affordable housing
- Public investments and incentives in building efficiency and electrification in public housing and disadvantaged communities
- Ensure households heating with gas are not left paying for stranded assets from the gas transition



Prioritizing disadvantaged communities can help repair generations of structural inequities



Ensuring an equitable transition

- Strategies to **achieve an equitable transition** must be calibrated to the primary building types in disadvantaged communities with flexible solutions that evolve over time.
- Many low-income households are **renters in older vintage homes** that have a higher likelihood to need remediation of issues such as:
 - Electrical panel upgrades
 - Mold and moisture
 - Lead paint
 - Structural deficiencies

48% of New York's households are LMI

- Households with annual incomes at or below 80% of the Area Median Income
- Climate change heightens the vulnerabilities of low-income neighborhoods and communities of color
- Lower-income households have a higher energy burden



NYCHA NZE Retrofit Pilot

Anticipated Retrofit Strategy

Envelope Treatment

Pre-fabricated Panels:

- Airtight
- Well insulated
- New windows
- Additional insulation at roof

MEP Systems

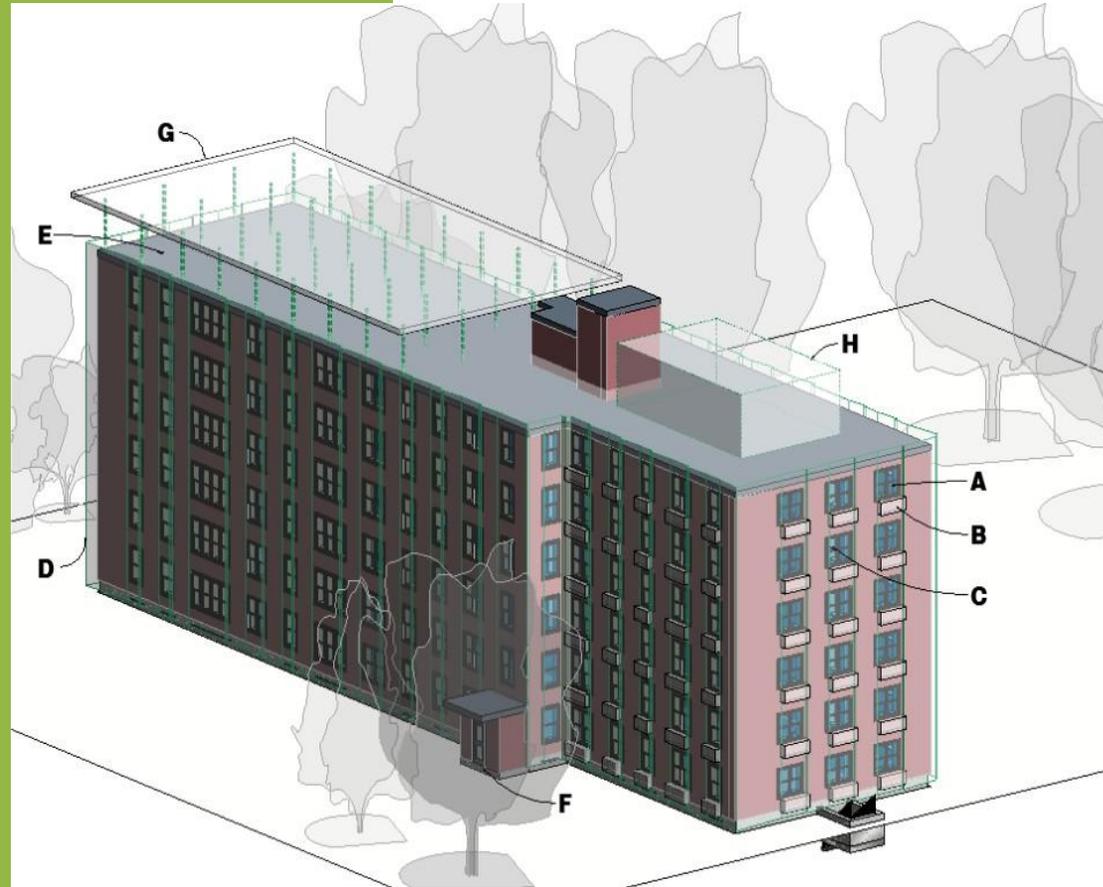
In process:

- Packaged heat pump
- Split system / VRF
- Air to water heat pump

Onsite renewables

In process:

- Solar Canopy
- Battery Storage



BUILDING 12 RETROFIT

ENERGY EFFICIENT WINDOWS

A New energy-efficient windows will be provided, reducing drafts and noise from outside.

NEW HEATING AND COOLING EQUIPMENT

B Apartments will receive new heating and cooling. Residents will have full control over temperatures in each room of their apartment. NYCHA will provide cooling to all apartments in each room, eliminating window ACs

NEW LIGHTING AND APPLIANCES

C New energy efficient appliances and lighting within apartments and energy efficient lighting in hallways and public areas.

NEW INSULATED EXTERIOR WALLS

D New exterior wall panels will improve the building's insulation and the appearance of the building.

NEW INSULATED ROOF

E New well-insulated roof will improve comfort for residents as well as eliminate leaks

NEW FRONT ENTRANCE DOOR

F New entry doors will improve security for residents and reduce drafts from outside.

SOLAR CANOPY:

G Solar panels will produce carbon free electricity for use at Ravenswood.

ROOFTOP MECHANICAL ROOM

H Energy efficient mechanical equipment would be placed on the rooftop.



Cycle Architecture + Planning
Brooklyn Navy Yard 141 Flushing Ave,
Building 77
Suite 1122 Brooklyn, NY 11215
646.308.1603

Economic benefits to disadvantaged communities



Reduced energy cost burden through investment in home upgrades and bill assistance



Improved housing that provides better comfort and value



Clean energy workforce and entrepreneurial opportunities



Increased investment (and wealth creation/asset building) in disadvantaged, underinvested communities

Additional benefits to disadvantaged communities



Improved health and safety outcomes with better indoor and outdoor air quality, and new cooling capacity (in units with no A/C)



Improved mental health, productivity, and cognitive outcomes with improved thermal comfort, lower noise levels and reduced energy burden



Better resilience for vulnerable populations with passive and active building strategies



Engagement of disadvantaged communities to self-determine how they will participate so that programs create local benefits and local jobs



Beach Green Dunes II

NYC First Affordable Geothermal
Housing Building



Presented by:
Zachary Fink

Beach Green Dunes II

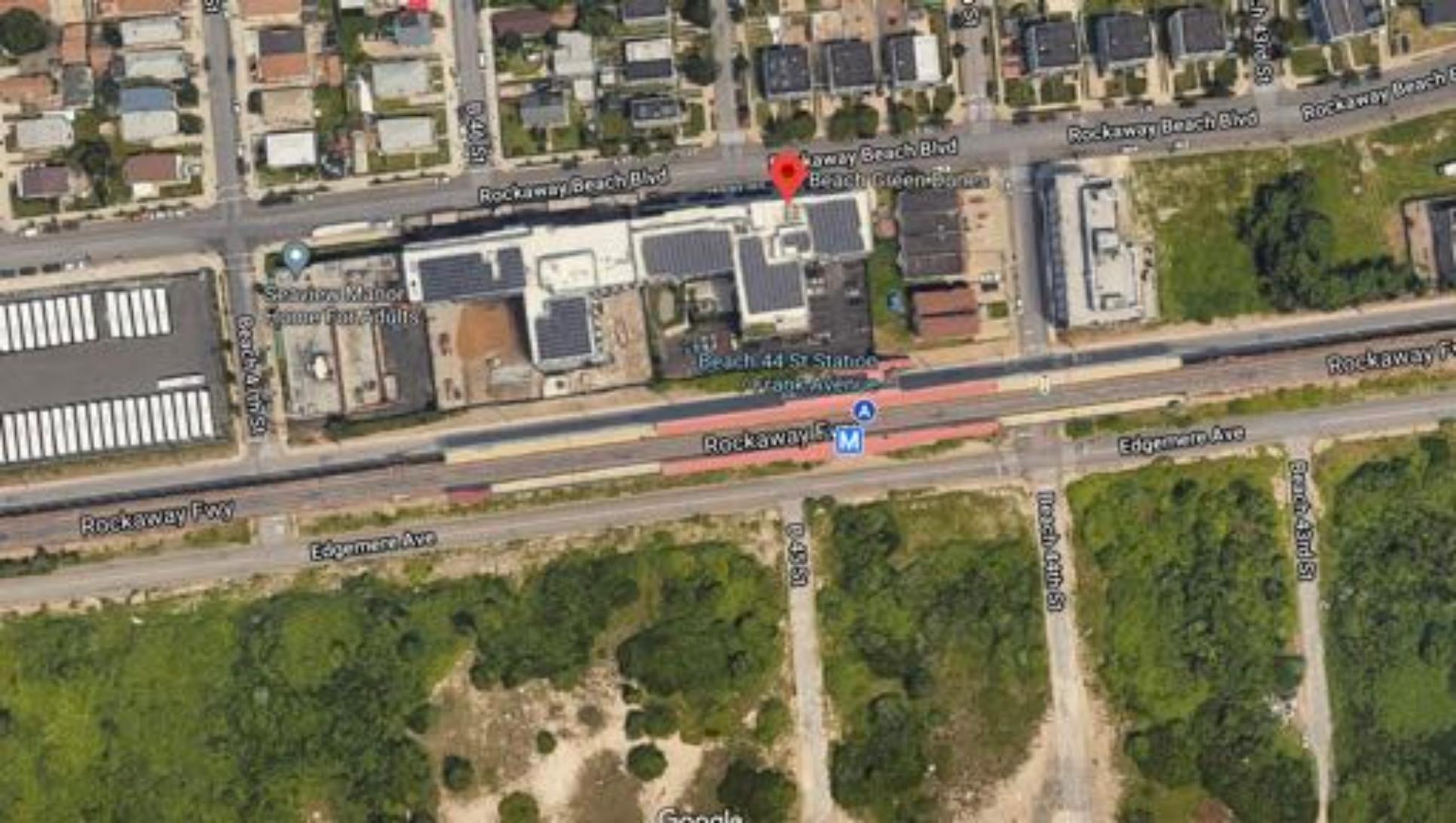
- 127-unit affordable housing building located in Far Rockaway, NY
- 121,000 square feet, including 2,500 sq ft of retail space
- Beach Green Dunes I was built with an Air Source VRF system
- Rent starting at \$311





“Beach Green tenants paid roughly \$10 a month max for cooling costs during the summer months; in some places in New York, those bills can be \$100 or more a month.”

Source: Curbed Magazine, *In these super-sustainable new apartments, you may never pay a heating bill*, by Patrick Sisson



Rockaway Beach Blvd

Rockaway Beach Blvd

Rockaway Beach Blvd

Rockaway Beach Blvd
Beach Greenway

Science Manor
Senior Center

Beach 4th St Station
Frank Avenue

Rockaway Fwy

Rockaway Fwy

Edgemont Ave

Rockaway Fwy

Edgemont Ave

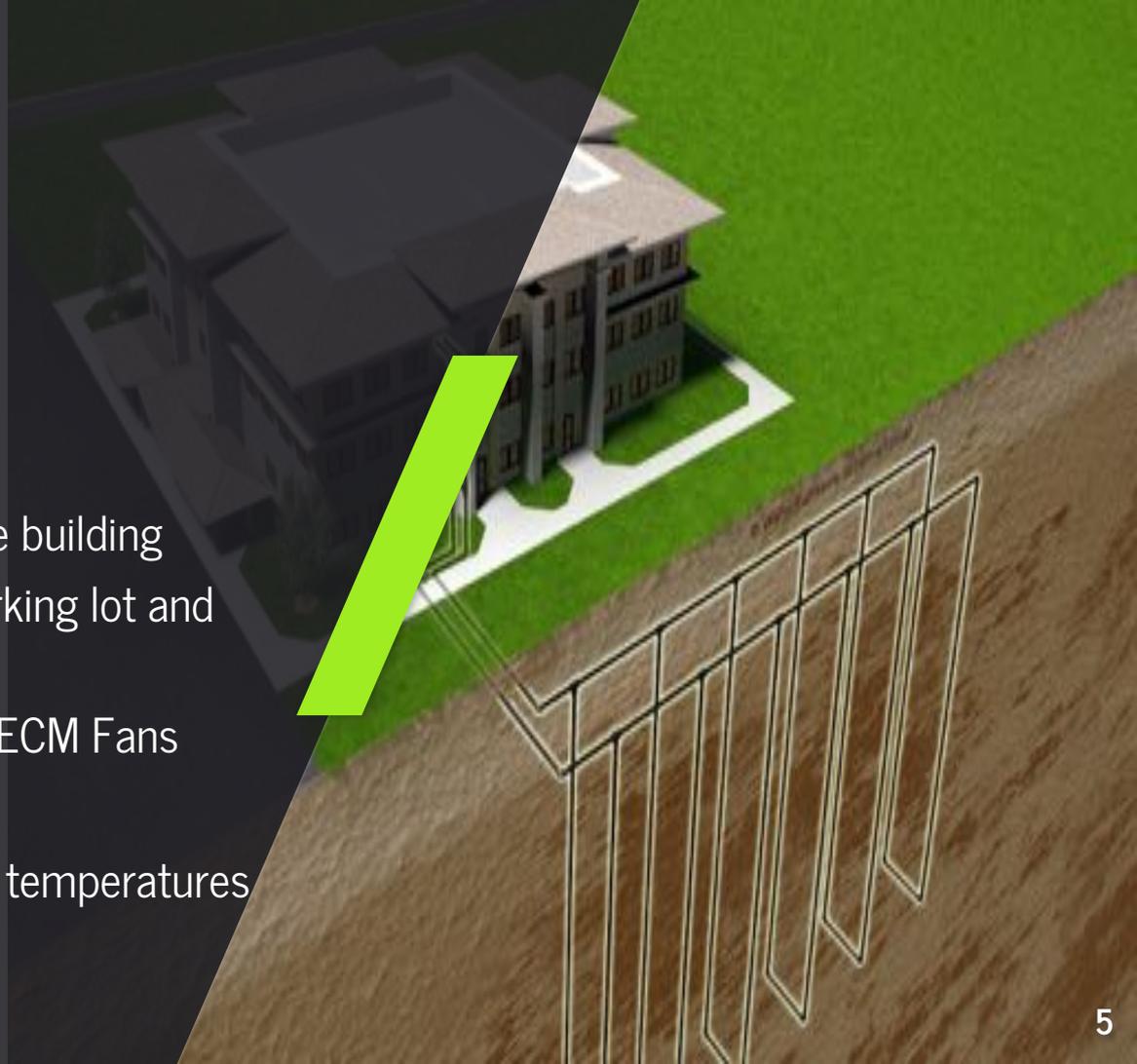
Beach 4th St

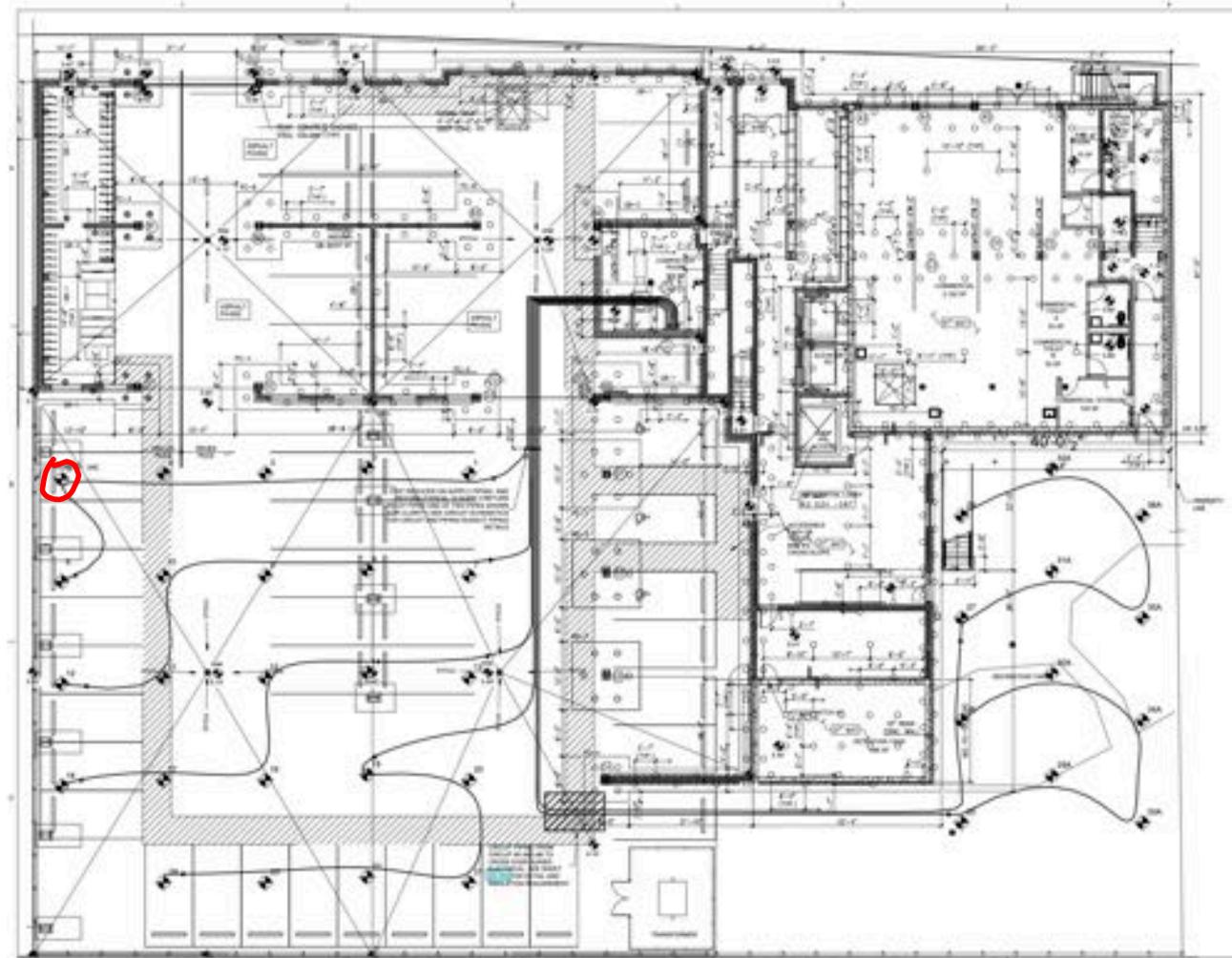
Beach 4th St

Beach 4th St

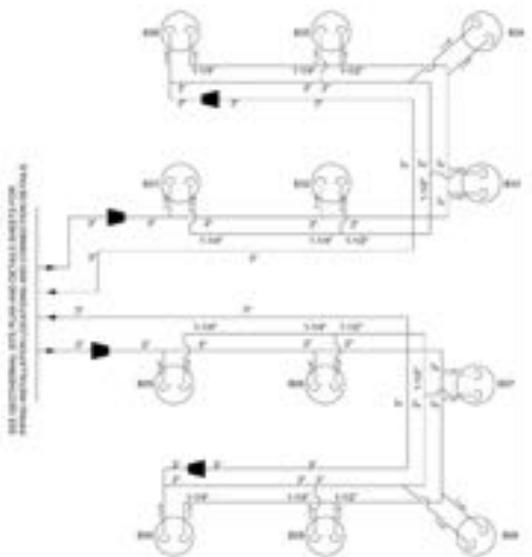
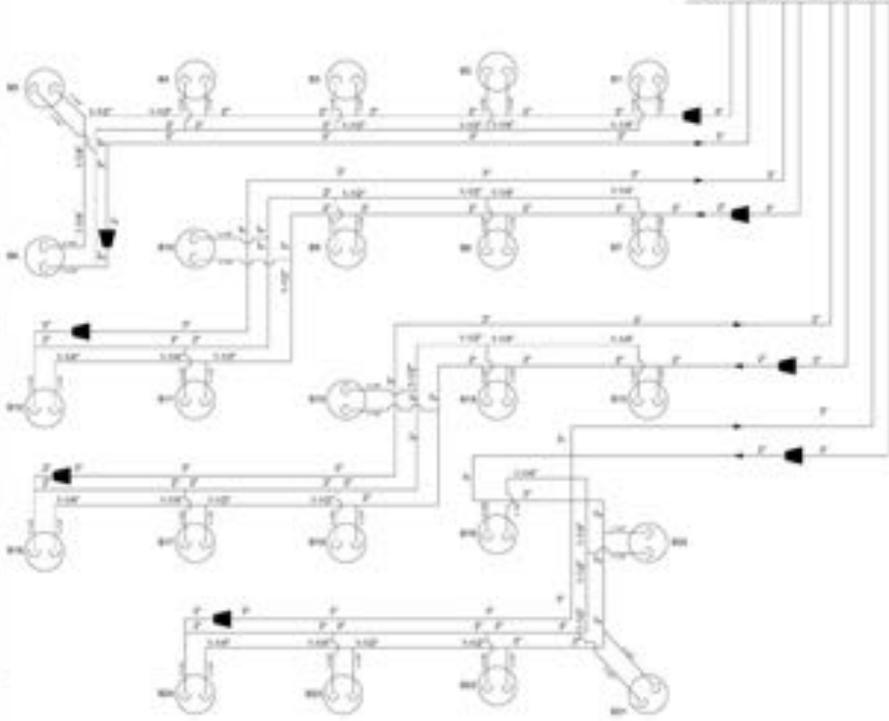
Geothermal System

- 36 boreholes to a depth of 450'
- 1-1/4" pipe in 5-6" bores
- 6 Circuits of 2 to 3" pipe into the building
- Loop field installed under the parking lot and playground
- Vertical Stack Heat Pumps with ECM Fans
- Sensorless VFD pumps
- Remote monitoring for loop field temperatures





SEE GEOTHERMAL SITE PLAN AND DETAILS SHEETS FOR PIPING RETAILLATION LOCATIONS AND CONNECTION DETAILS



CIRCUIT PIPING NOTES

1. ALL CIRCUIT PIPING MATERIAL TO BE HOPE
2. CIRCUIT SUPPLY AND RETURN PIPING TO REDUCE FRAM 8" TO 2" AT BUILDING AS SHOWN ON **3000**
3. MINIMUM BURIAL DEPTH OF PIPING TO BE 4' BELOW FINISH GRADE
4. ALL PIPING CHANGES TO BE COORDINATED BY GENERAL CONTRACTOR AND RESPECTIVE TRADES

LEGEND

- B1 (with well symbol) GEOTHERMAL BOREHOLE
- ➔ FLOW DIRECTION ARROW
- PIPING REQUIRED FITTING
- 2" HOPE PIPE SIZE

CIRCUIT MANIFOLD SCHEDULE

- CIRCUIT 1 B1- B6
- CIRCUIT 2 B7- B12
- CIRCUIT 3 B13- B18
- CIRCUIT 4 B19- B24
- CIRCUIT 5 B25- B30
- CIRCUIT 6 B31- B36



Geothermal System – “The First”

- First Closed Loop affordable housing building in NYC to install a geothermal system
- First TA approval in NYC to drill an uncased geothermal borehole within 200 feet of a TA structure
 - Replicated on 3 additional projects since
- Largest Affordable Housing Building in US to install geothermal at time of installation
- First Geothermal Rebate for a Multi Family Building in PSEG LI's Service Area



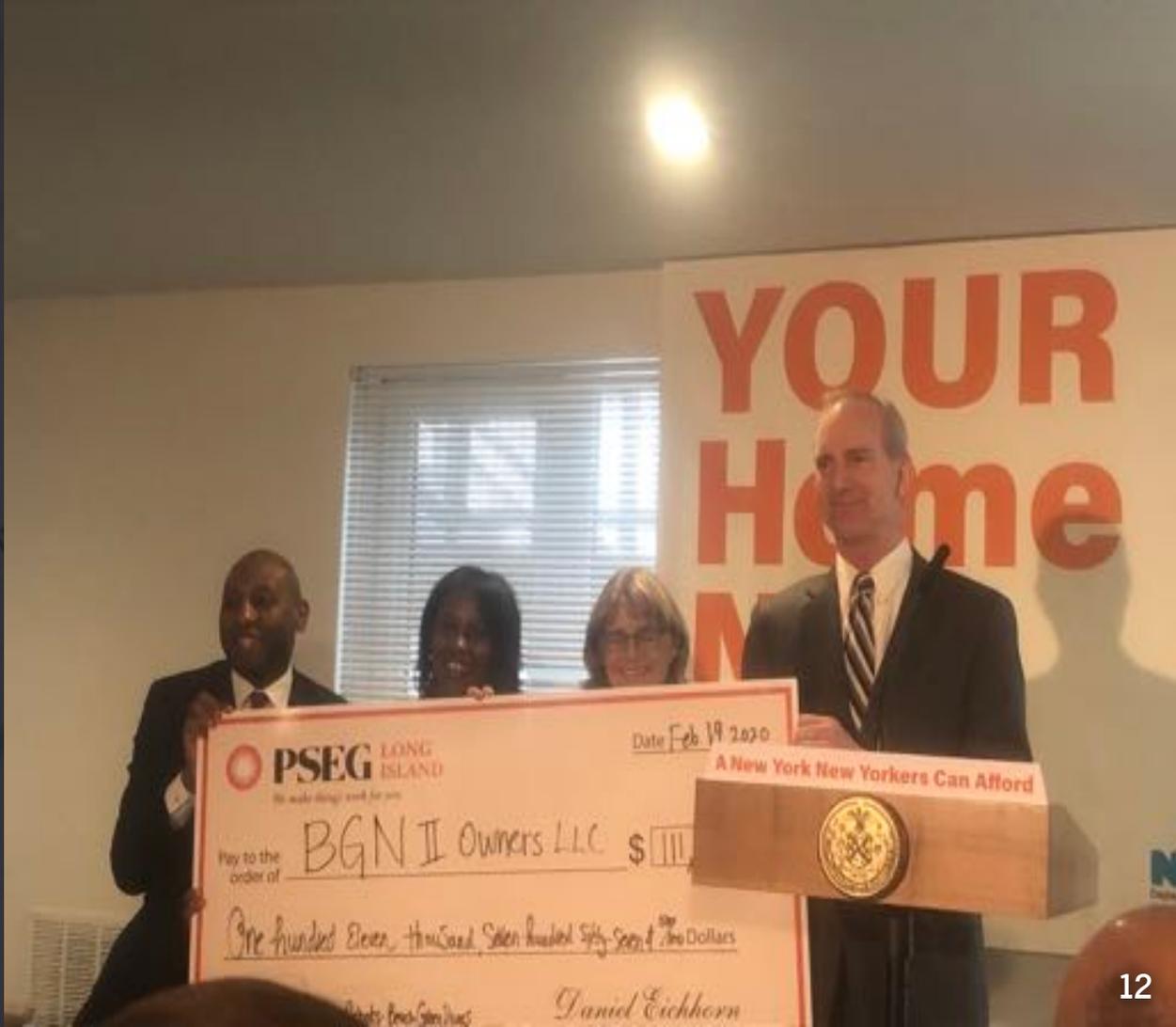






\$111,000

PSEG Long Island Rebate.



\$10/month

Cost per apartment for AC.

Compared to \$100+ for a
hydronic PTAC Building



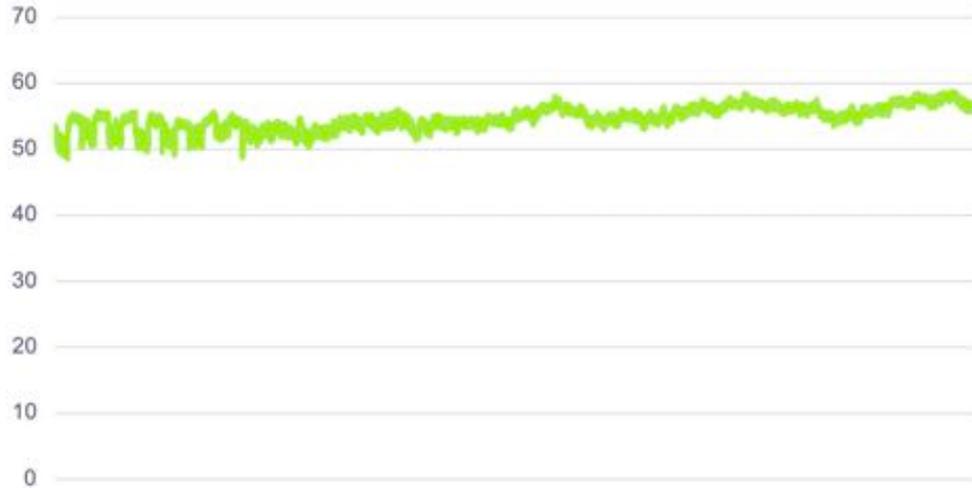
Energy Usage (geothermal) – 7 month period

Time Period	KWh Usage
May 2020	17,640
June 2020	23,310
July 2020	20,160
August 2020	17,640
September 2020	15,540
October 2020	15,750
November 2020	22,050

Average kwh usage per month is 18,870

This is 25% of the average usage of a similar building

Beach Green 2 Water Entering Loop



Loop Field performing better than expected over 3-month period

- Flowing ground water helps with thermal imbalance
- Passive house construction reduces peak load to ~40 tons instead of ~125 tons for a similar building



Questions?



Zachary Fink

(516) 992-5566

Zach@ZBFGeothermal.com

ENERGY SQUARE

RAISING THE BAR

- Energy affordability for residents
- Minimize the carbon footprint of the building's operation



ENERGY SQUARE

THE CHALLENGE OF URBAN FOOTPRINT FOR NET-ZERO ENERGY BUILDINGS...

Limited area for renewable energy generation (Solar PV)



ENERGY
SQUARE

ENERGY SQUARE

57 APARTMENTS WITH RESIDENTIAL COMMON AREAS
AND COMMERCIAL SPACE AT FIRST FLOOR



ENERGY SQUARE

57 APARTMENTS WITH RESIDENTIAL COMMON AREAS
AND COMMERCIAL SPACE AT FIRST FLOOR



ENERGY SQUARE

HIGH PERFORMANCE BUILDING PRINCIPLES INTEGRATED INTO THE PROJECT DESIGN

1st Priority

- Optimize Thermal Enclosure to reduce building energy use (ie: heating and cooling loads)

2nd Priority

- High Efficiency Mechanical Systems

3rd Priority

- On-site Renewable Energy Source





ENERGY SQUARE

OPTIMIZE THERMAL ENCLOSURE

- Continuous insulation with R-12 rigid
- Sub-slab insulation under the entire structure
- Roof decks have 7" rigid foam
- High Efficiency Windows
- Consistent and continuous air barriers between the living spaces and the outdoors
- Compartmentalization



High Efficiency, triple-glazed Windows (U-Value ≤ 0.20)

ENERGY SQUARE

OPTIMIZE THERMAL ENCLOSURE



Air sealing
between apartment units

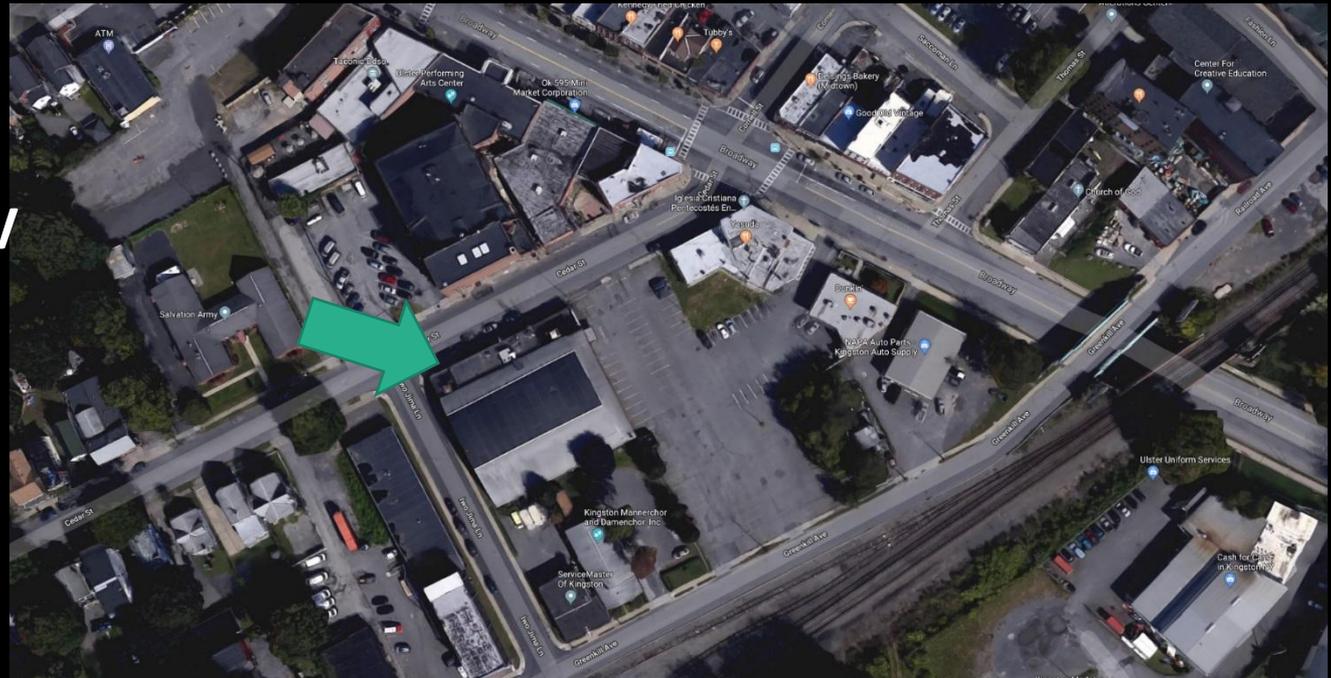


Roof Insulation

ENERGY SQUARE

INTEGRATION OF CARBON REDUCTIONS MEASURES FOR TRANSPORTATION

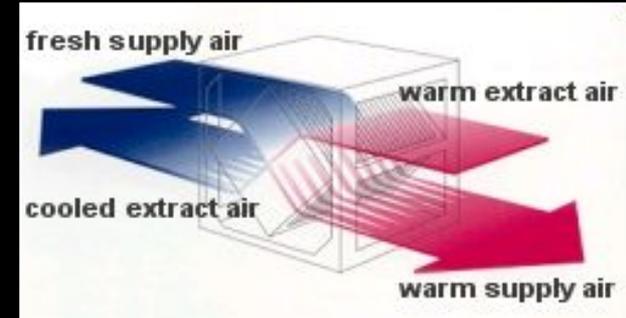
- Central location
- Installation of EV Charging Stations in parking area



ENERGY SQUARE

ENERGY RECOVERY VENTILATION

- Exchanges energy from indoor, conditioned air to incoming outdoor air
- Recovers 60-80% of energy
- Also provides superior ventilation – when installed properly!



Core: Heat Recovery Units feature a lifetime warranty on the aluminum core.

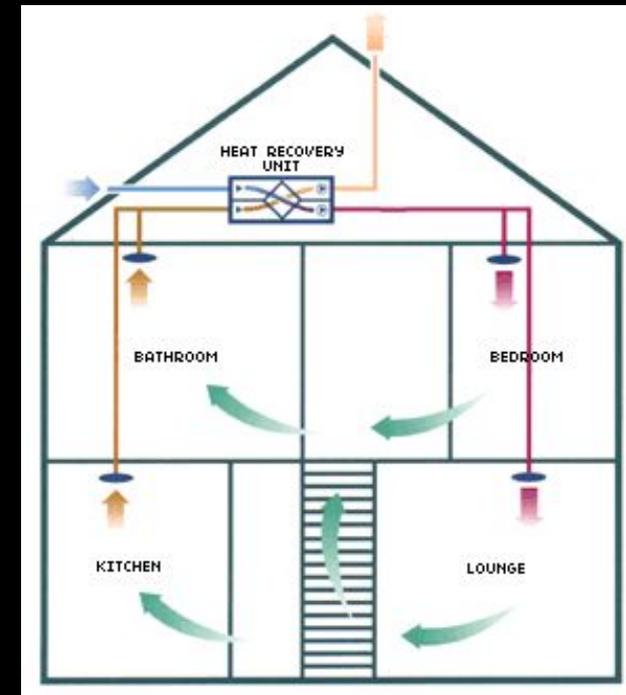
Washable Electrostatic Filters

Superior EBM Motors: Units are designed with German manufactured EBM external rotor motorized impellers – the most durable motors in the industry. Precise balancing ensures vibration-free operation. No maintenance needed. 7 Year Limited Warranty.



Fully Insulated Cabinet: Baked powder-coat finish. Insulated with 1" (25mm) foil-faced, high density polystyrene foam. For quiet, trouble-free operation.

Electronic Control Board: Units feature state-of-the-art control boards for easy connection to existing HVAC equipment. All units are designed for easy operation from a series of optional remote controls.



ENERGY SQUARE

Comparative to PASSIVE HOUSE (PH) DESIGN

- Would likely meet the European Passive House Institute (PHI) standard; very close to meeting the American Passive House Institute-US standard
- Achieved LEED Platinum



ENERGY SQUARE

HIGHEST EFFICIENCY HVAC

- Geo thermal system for space heating and cooling
- High efficiency natural gas boiler system with central distribution system for all domestic hot water
- Dedicated fresh air and exhaust ventilation for each unit



ENERGY SQUARE







ENERGY SQUARE

TOTAL DEVELOPMENT COST

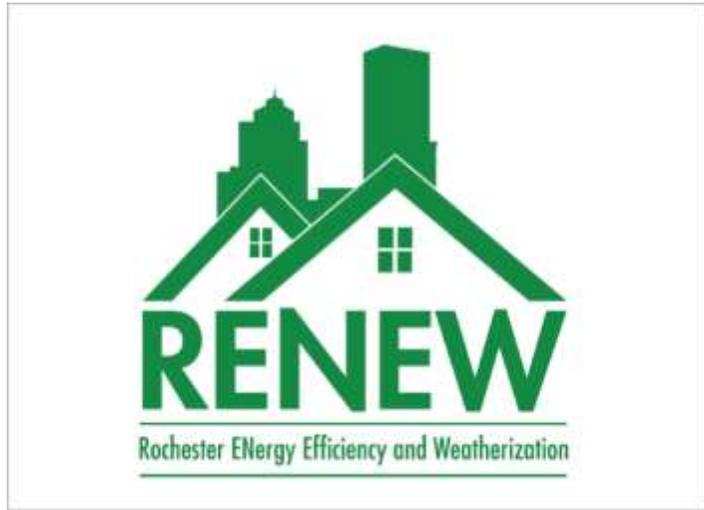
\$21,862,189

Capital Funding Sources

CPC First Mortgage	\$3,050,000
Solar Investment Tax Credit	154,595
Federal LIHTC	9,847,271
NYS LIHTC	1,874,813
NYS HCR Middle Income	550,000
NYS Housing Trust Fund	2,274,272
City of Kingston RESTORE	305,000
NYS Community Investment Fund (CIF)	2,000,000
NYSERDA Cleaner, Greener Communities (CGC)	1,000,000
NYSERDA Incentives	292,700
Deferred Developer Fee	513,538



Strengthening Homes, Communities and Lives



*One of the most cost-effective ways to mitigate greenhouse emissions, **investing in home energy-efficiency projects**, is key to fighting climate change and increasing health co-benefits.*

Rochester, NY

- ▶ City Pop.: 205,000; County Pop.: 744,000
- ▶ KODAK employed 60,000 people in 1973; today they employ 1,700
- ▶ Rochester ranks 4th in overall poverty among the nation's 75 largest metropolitan areas and 1st in overall poverty, child poverty, and extreme poverty among comparably sized cities.
(ACTRochester, December 2017)
- ▶ 33.8% poverty rate; 50% childhood poverty rate
- ▶ Housing Stock: 67% singles or doubles, 57% built before 1939, 92% built before 1978



Who and what is RENEW?

- ▶ Rochester ENergy Efficiency and Weatherization (RENEW)
- ▶ Multi-year collective impact program.
- ▶ Seeded with \$1.0M in NYS Attorney General settlement funds; work continued through grants from ESL Charitable Foundation, Rochester Area Community Foundation, and individual donations.
- ▶ Housed at Rochester Area Community Foundation
- ▶ RENEW Partners include:

Action for a Better Community
City of Rochester
Coalition to Prevent Lead Poisoning
Common Ground Health
Heat Smart Monroe
Ibero American Development Corp.
Monroe Co. Dept. of Public Health

Monroe County Office on Aging
NeighborWorks Community Partners
PathStone Corporation
Rochester Housing Dvlpt Fund Corp.
Rochester Inst. Of Technology
Town of Greece
Town of Irondequoit



What has RENEW done?

- ▶ RENEW and community partners have invested over **\$4.9M** into the homes of **336 low-to-moderate income (LMI)** homeowners making them more energy-efficiency, healthier and safer.
- ▶ Majority of RENEW clients are women of color, head of household, with children, who earn an average of **\$29,000** a year.
 - ▶ Clients experience a **20% average savings on energy costs.**
 - ▶ Clients experience better physical and mental health outcomes. **100% with self-reported pre-existing respiratory conditions report reduced symptoms.**
- ▶ Estimates show that to date, RENEW's work will keep over **4,500 tons of greenhouse gas** from entering the atmosphere.

RENEW decision making process

Criteria:

- ▶ Homeowners must be working with a RENEW partner and meet partner eligibility criteria.
- ▶ RENEW funds energy efficiency, weatherization, and health and safety interventions—
 - ▶ OR, the removal of barriers that render the homeowner ineligible for energy-efficiency work including sewer line or electrical panel replacement, mold remediation, etc.
- ▶ RENEW is not a primary funder. Project proposals must be braided with partner funds and contain *at least* a 50% match.

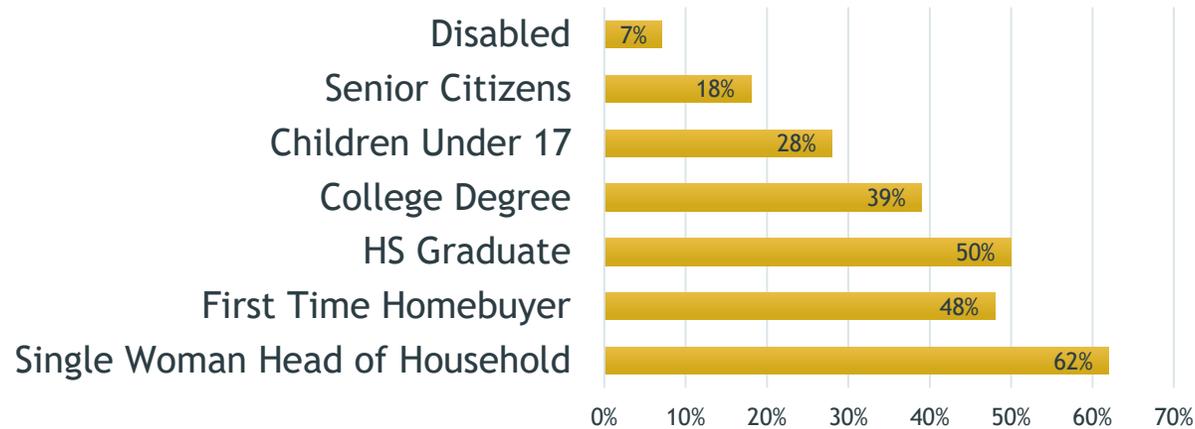
Priorities:

- ▶ No heat/hot water
- ▶ Homeowner is ineligible for HEAP or EARP
- ▶ Sewage in the basement

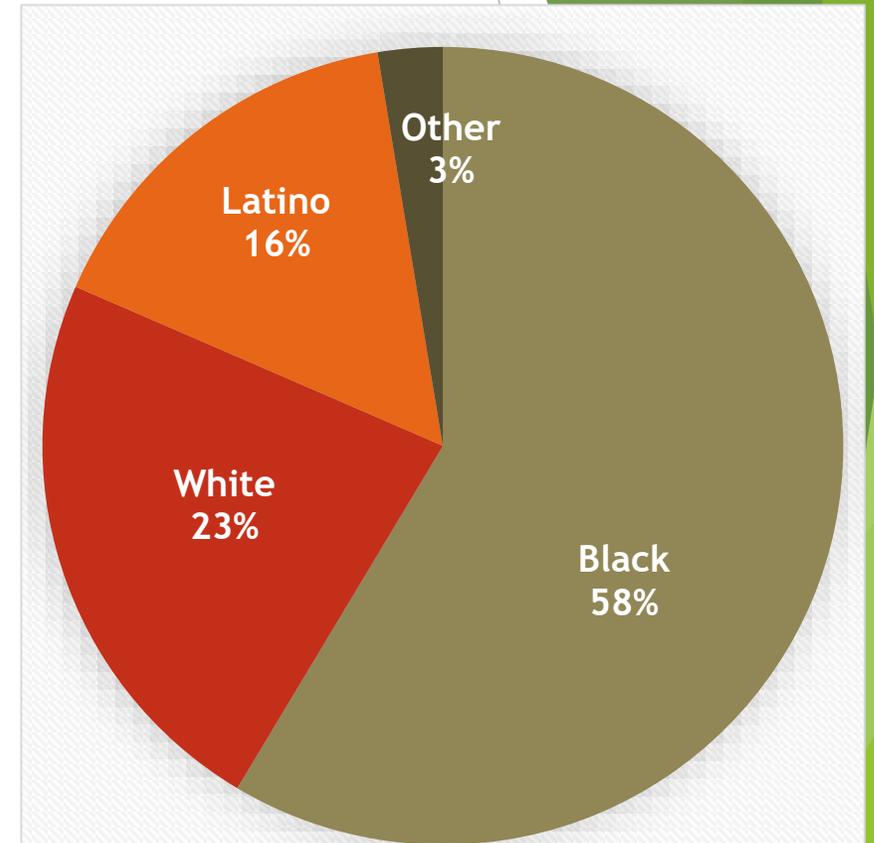


RENEW partners meet monthly to decide how to efficiently allocate grant funds to help LMI homeowners.

Who do we serve?



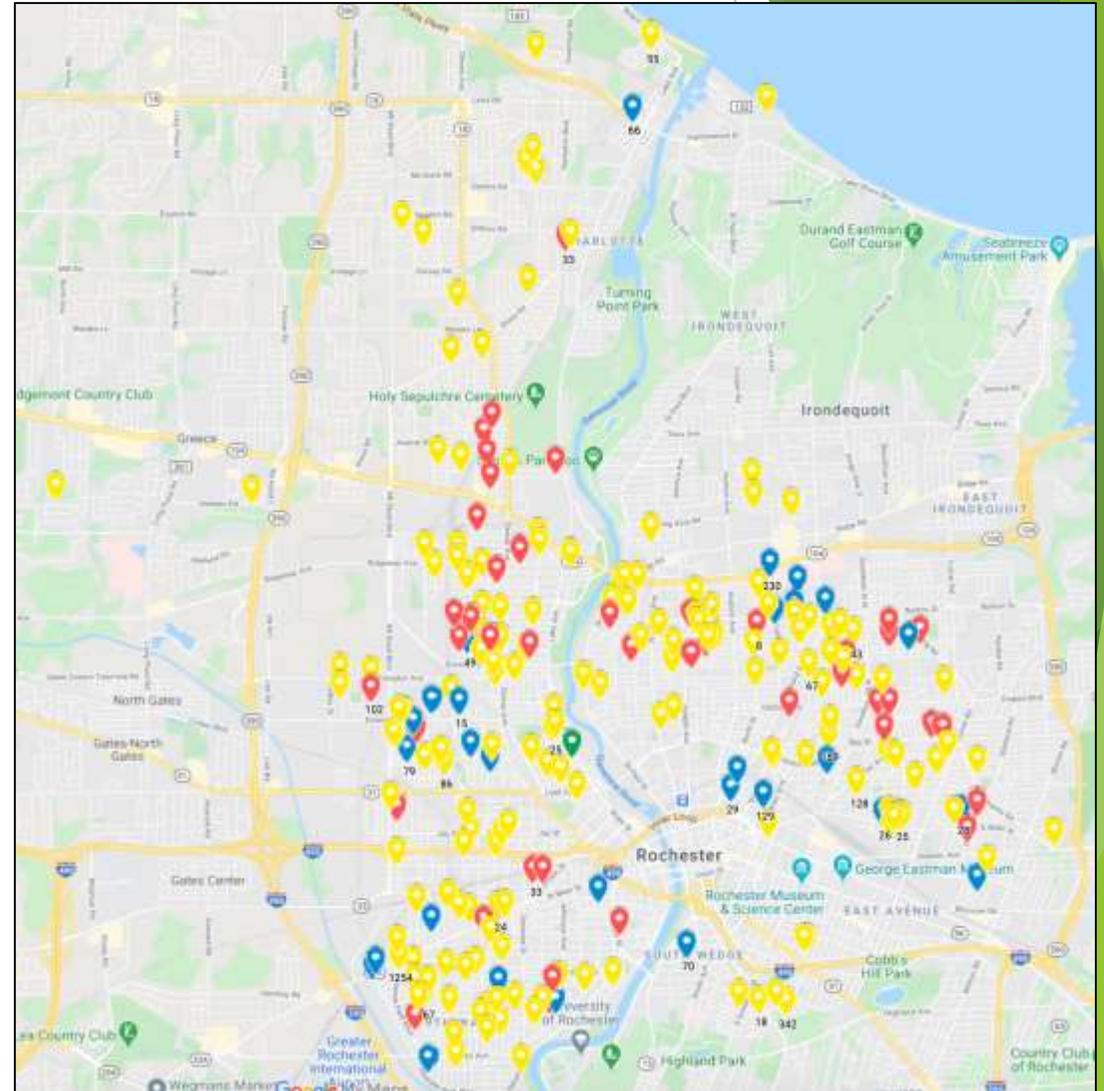
- Recent projects have included at six homeowners with overdue utility bills ranging in amounts from \$990.00 to \$3,583.00. 31% of current clients have a utility payment plan.
- Expanded into helping families in ring suburbs: Gates, Greece, Irondequoit, Penfield, and Webster.



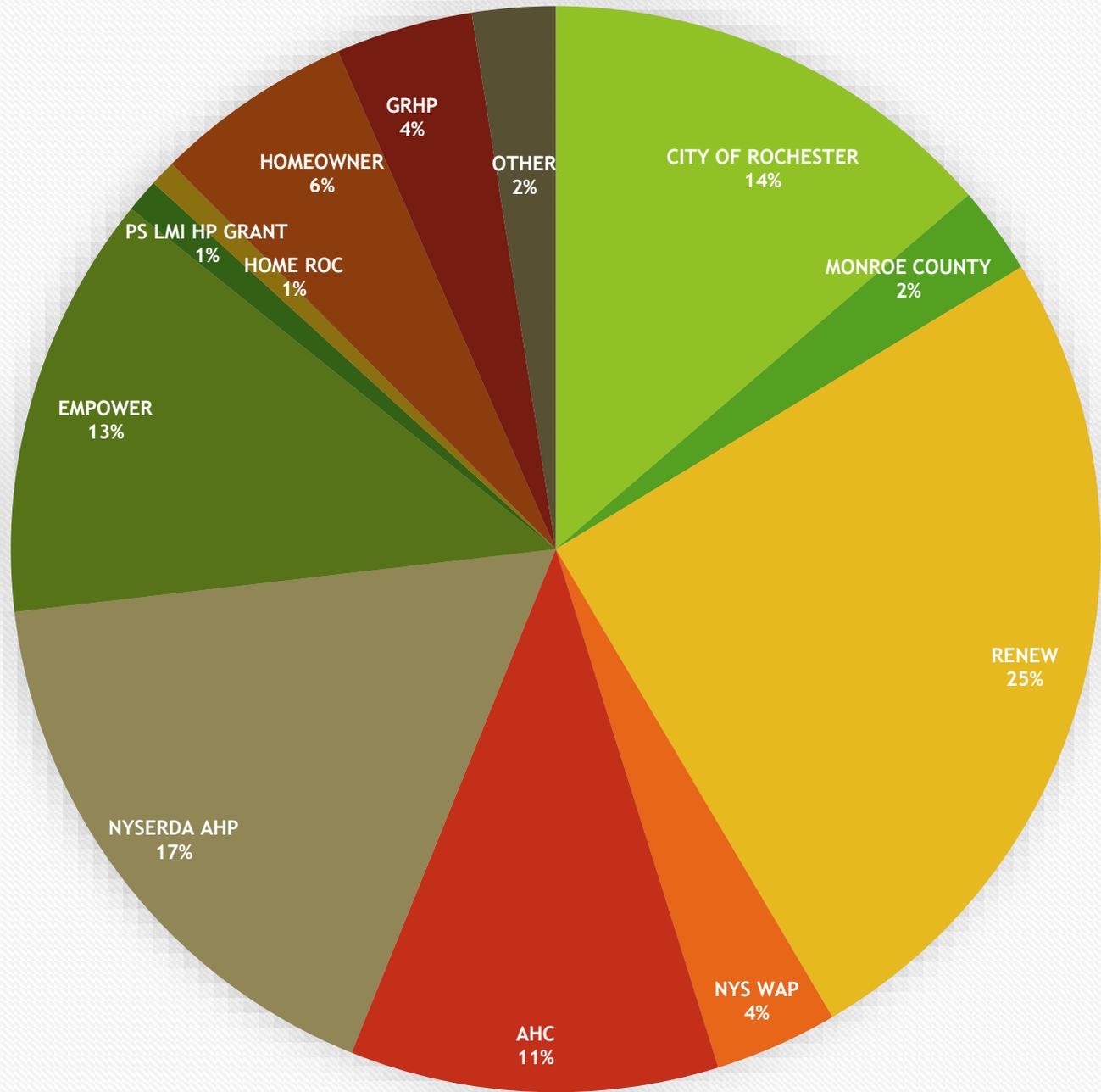
Progress as of Spring 2021

- ▶ 336 projects
- ▶ RENEW grants: \$1,239,256.00
- ▶ Partner dollars: \$3,656,396.00
- ▶ Average RENEW grant: \$3,732.00
- ▶ Total dollars invested in weatherization, energy efficiency, and health and safety interventions: \$4.9 million.

- ▶ 3:1 match. All donations to RENEW are matched 3:1 with partner grant dollars.



Braided Funding Streams



■ City of Rochester ■ Monroe Co. ■ RENEW ■ NYS WAP ■ AHC ■ NYSERDA AHP ■ EMPOWER ■ HOME ROC ■ PS LMI HP GRANT ■ HOMEOWNER ■ GRHP ■ OTHER

What kind of work happens during energy-efficiency, weatherization projects?

	June 2016- Sept 2020
Air sealing	142
Bathroom Vent	43
Boiler	19
CO Detector	66
Dehumidifier	5
Doors	16
Duct Cleaning/Sealing	20
Electrical Work	21
Furnace External Power Venter	3
Furnace (High Efficiency)	157
Gas Dryer Vent	63
Glass Block Windows (Basement)	21
Health & Safety Items	110
HEAT PUMP HOT WATER HEATER	20
HEAT PUMP FURNACE	10
Hot Water Heater	122
Insulation	140
Lead Paint Hazard Remediation	30
Lighting (install LED bulbs)	82
Mold remediation	2
Pest remediation	2
Programmable Thermostat	97
Roof repairs/tear off	11
Sewer/Water Line Replacement	5
Smoke Detector	57
Sump Pump & Gutters	2
Ventilation	8
Weatherseal Doors	37
Window Installation	55

Qualitative and Quantitative Data

- ▶ The next few slides share actual stories from RENEW clients.
- ▶ Pie charts show how funds from various agencies were braided to create a comprehensive approach to making homes **healthier, safer, and more energy efficient.**
- ▶ **Energy cost savings and carbon emission reductions** are noted in the starbursts.
 - ▶ The stories that do not include energy cost savings and carbon emission reduction data just mean that that data is not available at this time.

Joyce called NeighborWorks Rochester because her sewer line was broken. *“We couldn’t flush the toilet or take a shower. You can’t go to work if you don’t take a shower.”* NeighborWorks couldn’t do weatherization work without getting the sewer line replaced, but their funding did not cover that scope of work.

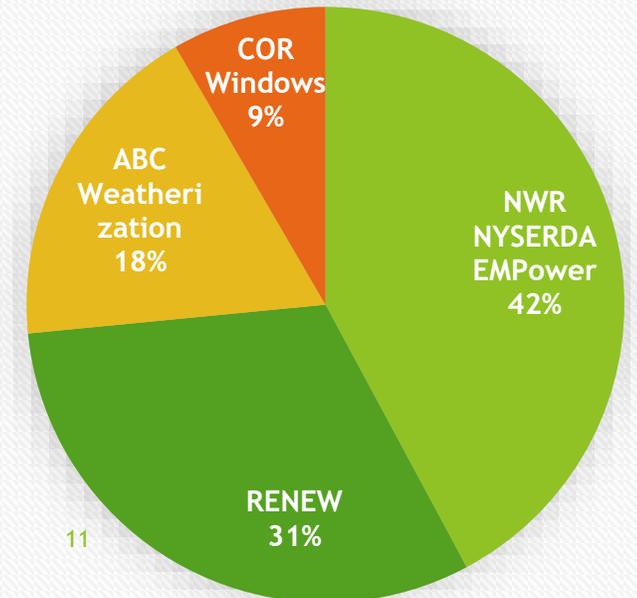
Joyce slept on the couch in the living room because the downstairs windows were not secure. *“If someone came in the house through one of those windows, I wouldn’t have heard them upstairs in my room...and I have two daughters!”*

Joyce and her family received a new sewer line, insulation, high efficiency furnace, air sealing, new door, AND eight new windows that close and lock. For the first time in years, Joyce is sleeping in her own bed.



30% energy costs decrease; 60.12 tons of carbon eliminated

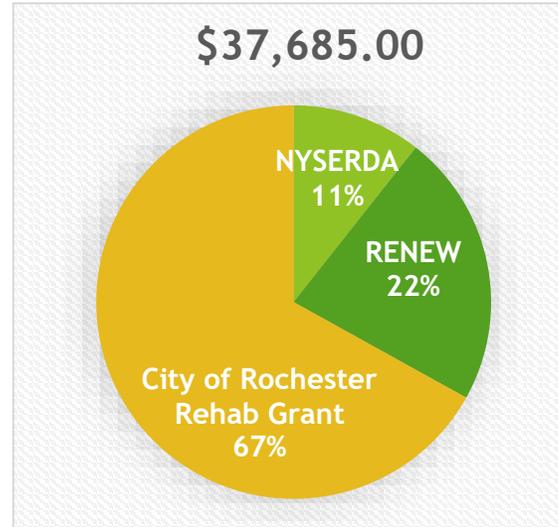
\$17,420.00



Bill is a 62-year-old veteran living in SE Rochester.

He told us he lives alone and struggles with depression. He was so *motivated by all of the improvements that he decided to make his own changes not covered by the grants.*

Bill talked about *how much better he felt after talking to the crew, getting help, and seeing how much nicer his home looked after all the work was completed.*



21% energy costs decrease; 33.89 tons of carbon eliminated



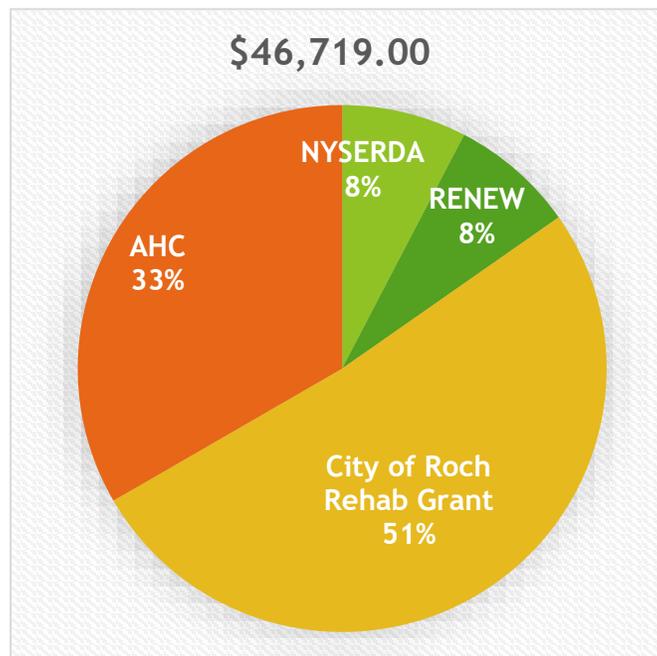
Three generations live under the roof of this home in the Holy Rosary Neighborhood.

Their home was always hard to keep warm. At one point, they did not have a working furnace.

Diagnosed with adult onset asthma, Pamela woke up coughing every night.

Now they have a new roof, hot water heater, furnace, and windows.

With the new furnace, Pamela sleeps through the night. Her husband is also sleeping better because she used to wake him with her coughing.



19% energy costs decrease; 23.8 tons of carbon eliminated

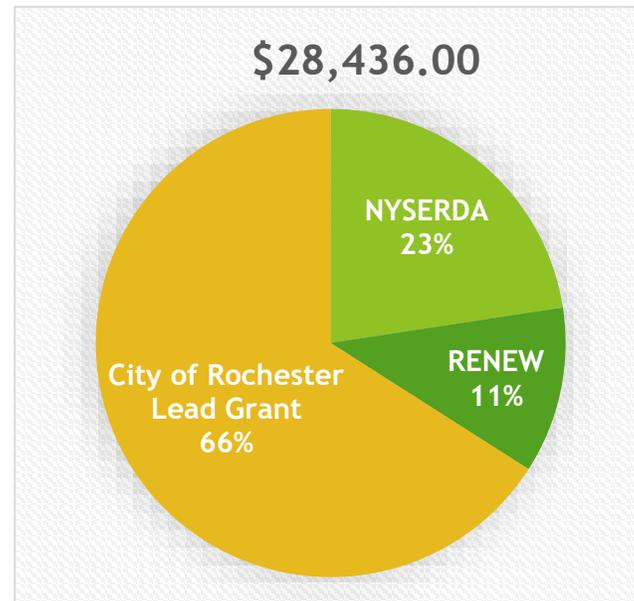
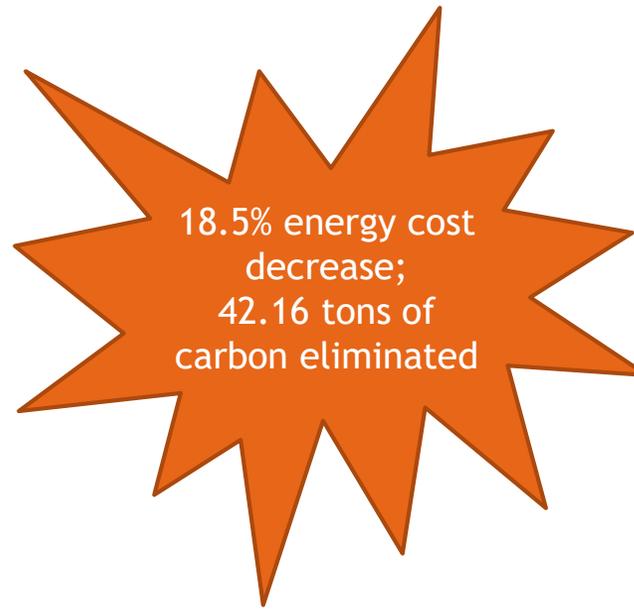


Inez lives in NE Rochester with her 4-year-old granddaughter. She is being treated for BOOP (bronchiolitis obliterans organizing pneumonia).

Mold in the home was identified as exacerbating her illness, but the cost to remediate was prohibitive. Her doctor at URMC referred her to Finger Lakes Occupational Health Services and they in turn connected Inez to PathStone.

She qualified for a City Lead grant, received insulation, windows, a hot water heater, a dehumidifier, and mold remediation.

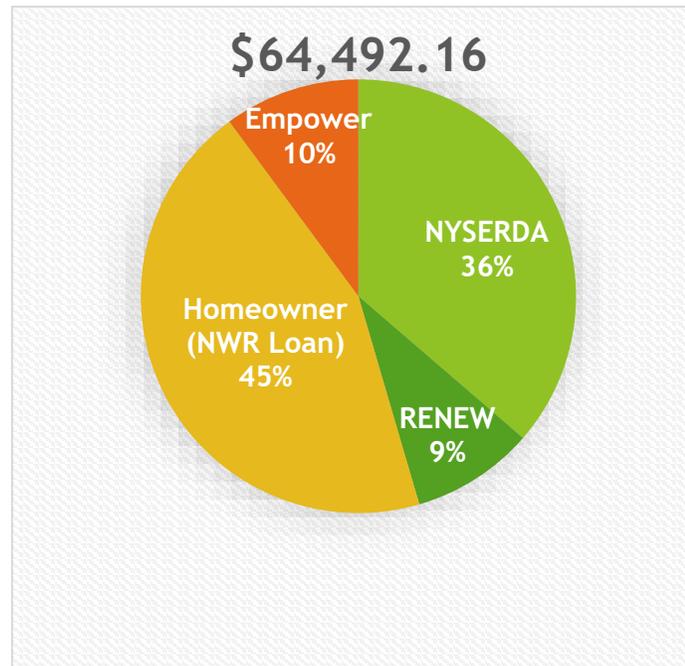
Most importantly, *Inez's BOOP has stabilized.*



Joanne, her husband, two children and four grandchildren live in Marketview Heights.

Joanne went to NeighborWorks Rochester (NWR) looking for a loan for a new roof. When Al from NWR met with Joanne and told her she could qualify for some significant home improvements, Joanne was skeptical. *“When Al started saying we could get a new furnace, a hot water heater, siding, windows, and insulation I was like ‘am I dreaming?’ and thought ‘I’ll believe it when I see it.’”*

Now the home is warmer in the winter and since they live on a busy street, Joanne has noticed that it is quieter.



Joanne says, *“Everyone is feeling much more comfortable and confident about our home. Especially the younger ones, they see that change is possible.”*

Joanne’s daughter and granddaughter made regular trips to the ED for asthma-related issues. They have not gone once since work was completed.

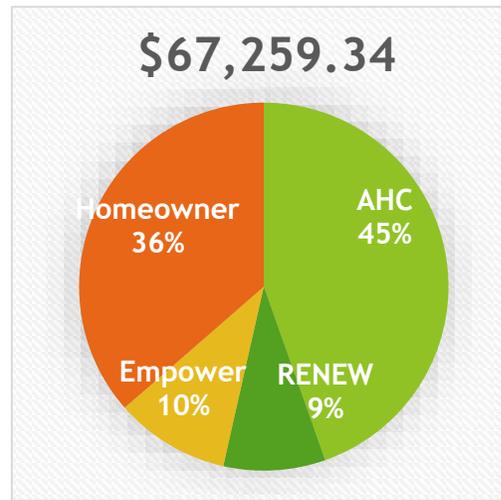


Patty grew up in Rochester. She lives with her husband, takes care of her grandchildren, and has Lupus.

Two years ago, they bought a foreclosed property in the northeast part of the city. Patty said, *“We needed a home. We were getting older and did not want to live in debt.”*

The house had no plumbing, bathroom, electricity, or floors. She received a home improvement loan through her credit union and made many repairs.

In May 2019, the family moved in. Shortly afterwards a pipe burst in the wall in the kitchen. They replaced the pipes from the second floor to the basement. Six months later the sewer line stopped functioning. After the investment already made in the home, replacing the sewer line was an impossible expense. They did not have the resources. Mold and mildew appeared and the basement sink would not drain.



“You would take a shower and see toilet paper floating up through the drain...it was really bad. If your sewer doesn’t work, you don’t have a home.” They put dryer sheets in the heat vents and burned candles to mask the overwhelming stench of sewage. Patty said, *“I was desperate. I was in the hospital with severe respiratory problems. I could not breathe.”*

RENEW worked with PathStone and Ibero and now the family now has a safe and healthy home with a fully functioning sewer line.



RENEW: more than a program to install hot water heaters and furnaces

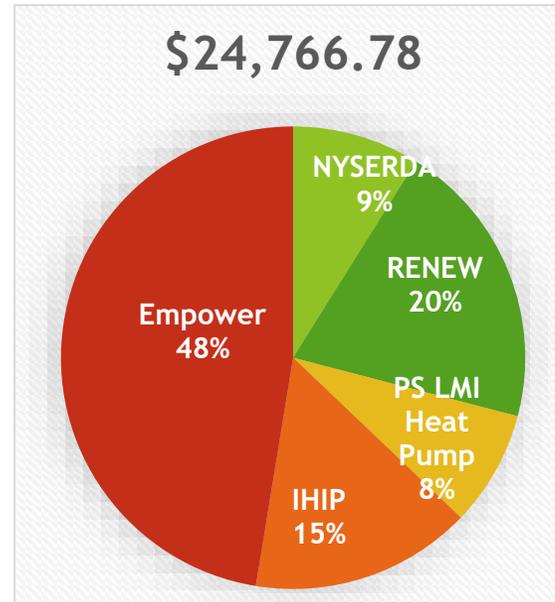
- ▶ Forward thinking. RENEW has progressively gotten more focused on clean heating and cooling technologies.
- ▶ Supported rehab of Rochester's 1st “near net zero” home.
- ▶ In the past 3 years, our partners have installed 34 heat pump hot water heaters, 8 heat pump furnaces, and 16 tankless hot water heaters.



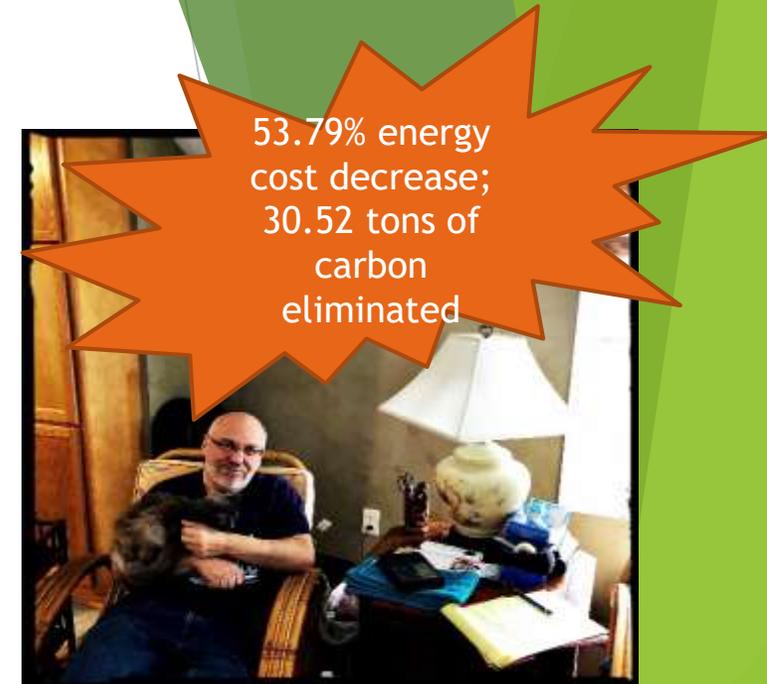
Rocco is in his 60s, a Kodak retiree, and has suffered three heart attacks. His home is a former vacation cottage converted to year round many years ago. He warmed it with a space heater.

During the winter, his cats refused to go into the bedroom because it was so cold. Rocco routinely dressed in many layers of clothing. He had great difficulty paying utility bills averaging \$300.00 per month.

RG&E suggested Rocco contact PathStone Corp. to schedule an energy audit. By working with the Town of Irondequoit, NYSERDA, a Heat Pump Grant through Pathstone, and RENEW, Rocco qualified for insulation, health and safety items, and a **heat pump hot water heater and furnace.**



Now, his home is much warmer and far more comfortable. Rocco recently received his first utility bill after the work was completed. *“My RG&E bill was \$15.00!? That can’t be right!”* Good news, Rocco. That bill is correct.



Heat Pump Hot Water Heaters Installed

43.81% decrease in energy costs; 33.38 tonnes of carbon eliminated; \$467.49 saved

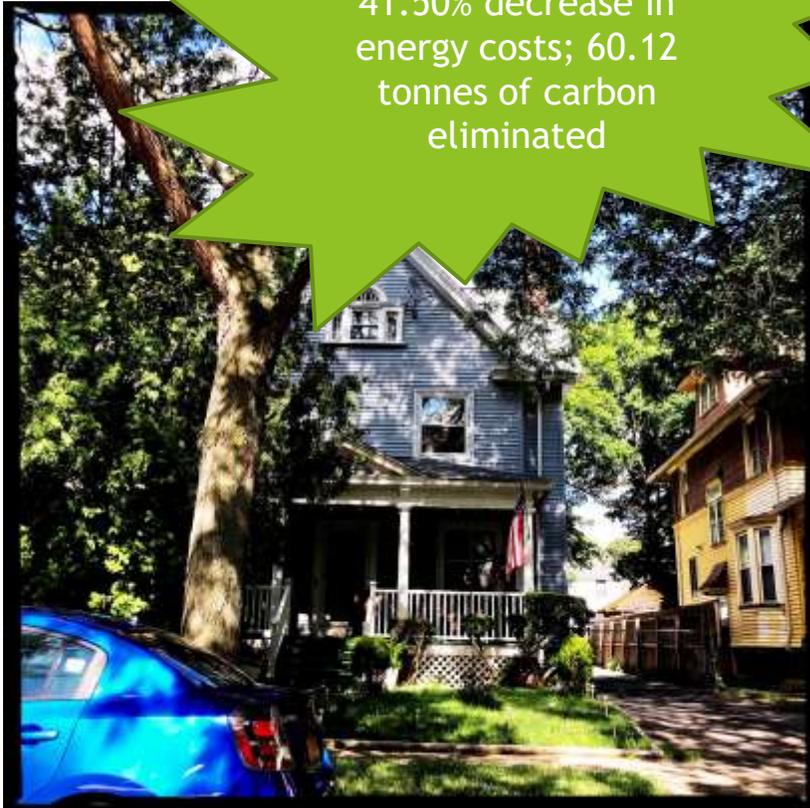


36.46% decrease in energy costs; 51.75 tonnes of carbon eliminated; \$576.35 saved



Heat Pump Hot Water Heaters Installed

41.50% decrease in energy costs; 60.12 tonnes of carbon eliminated



34.75% decrease in energy costs; 32.6 tonnes of carbon eliminated



RENEW considers how weatherization impacts the **wealth** of a family

- ▶ LMI households, on average, spend 7.2% of annual income on energy costs.
- ▶ That's \$2,088 out of the \$29,000/year average income of a RENEW client.
- ▶ 60% of RENEW projects have been evaluated and analyzed:
 - ▶ 20% average decrease on energy costs
 - ▶ 21% saw a >30% decrease on energy costs.

The image shows a utility bill for a residential profile. The bill includes a table of natural gas use history with columns for Read Date, Read Type, Use (therms), Total, and Total Tax. Handwritten annotations in black ink highlight a significant decrease in energy costs over two years. The annotations include: '925.2 therms' next to the 06/21/2018 entry; '27,196/6,223 = 4.370 (kwh)' next to the 04/02/2018 entry; '1,107.4 ~~therms~~' next to the 09/05/2017 entry; '33,554/5,627 = ~~5.963~~' next to the 03/01/2017 entry; and '26% decrease' circled at the bottom right. The bill also includes contact information for the utility provider.

Read Date	Read Type	Use (therms)	Total	Total Tax
06/21/2018	RGE	9.3	\$16.94	\$3.78
06/01/2018	Estimated	9.2	\$16.87	\$3.74
07/03/2018	RGE	8.2	\$16.50	\$3.75
06/01/2018	Estimated	25.7	\$50.00	\$1.57
05/01/2018	RGE	45.4	\$90.00	\$1.68
04/02/2018	Estimated	185.4	\$140.01	\$5.41
03/01/2018	RGE	73.1	\$69.96	\$2.83
01/01/2018	Estimated	239.9	\$175.14	\$6.88
01/02/2018	RGE	188.9	\$159.48	\$4.88
12/01/2017	Estimated	138.1	\$130.17	\$4.07
11/02/2017	RGE	29.9	\$32.17	\$1.44
10/02/2017	RGE	22.7	\$29.94	\$1.68
09/05/2017	RGE	8.2	\$16.50	\$3.73
08/02/2017	Estimated	13.4	\$19.22	\$3.87
07/03/2017	RGE	16.6	\$22.38	\$3.98
06/01/2017	Estimated	54.9	\$47.03	\$1.90
05/02/2017	RGE	102.9	\$91.66	\$3.70
03/01/2017	Estimated	174.3	\$159.99	\$4.73
03/01/2017	RGE	180.9	\$143.43	\$5.88
01/19/2017	Estimated	201.9	\$164.60	\$6.02
01/02/2017	RGE	222.5	\$148.63	\$5.92
12/01/2016	Estimated	110.2	\$80.20	\$3.36
12/01/2016	RGE	94.9	\$79.99	\$1.84

The image shows two years of utility usage from a RENEW client. We calculate energy costs using Heating Degree Day and Cooling Degree Day data.

RENEW calculates greenhouse gas (GHG) emission reductions

- ▶ To date, energy efficiency work in RENEW homes will keep over 4,500 tons (9,186,780 lbs.) of carbon out of the atmosphere.
- ▶ Imagine 450 football fields stretched end to end. Each football field is filled with 10 enormous balloons that are 10-yards around. That’s about 4,500 tons of greenhouse gas/carbon emissions.

The image shows handwritten calculations on lined paper and a printed energy audit form. The handwritten notes include:

- 2018 = 1200.1600
- Average HDD = 5910? (5916) = A
- 2016/2017 HDD = 5627 = B
- SAVINGS = S
- 2016/17 - THURS = U
- $\frac{B}{A} \times S(100) \times U = \text{Savings}$
- $.95 \times .20 \times 1000 = 190$
- 5627 / 5916 (NOMA)
- $.95 \times .255 \times 1,095.1 = 265 = 28.09 \text{ lbs carbon}$

The printed form is a 'Natural Gas Use Summary' with columns for Month, Fuel Type, and various energy metrics. Handwritten notes on the form include:

- 431.1 Therms
- $27,281 / 6.223 = 4.383$
- 71,095.1
- $33,181 / 5,627 = 5.896$
- 25.5% decrease (circled)
- $\frac{5627}{5916} (NOMA) \times .95 \times .255 \times 1,095.1 = 265$
- $\frac{A}{B} \times S \times U$
- 28.09 lbs carbon over 20 years

RENEW uses NYSERDA approved BPI (Building Performance Institute) and U.S. EPA standards for calculating energy cost savings and GHG emission reductions.

Why calculate greenhouse gas emission reductions?

- ▶ “Failing to curtail carbon emissions within 12 years will lead to catastrophic storms, irreparable damage to crops, and loss of human life.” [United Nations Climate Reports](#)
- ▶ Governor Cuomo’s Clean Energy Program has established the goal to **reduce statewide greenhouse gas emissions by 40% by 2030.**
- ▶ The [City of Rochester Climate Action Plan](#) aligns with NYS and plans to reduce greenhouse gas emissions by **40% by 2030.**

Co-Benefits of Carbon Emission/GHG Reduction

- ▶ Reduced air pollution
- ▶ Reduced “heat island” effects
- ▶ Reduced healthcare costs
- ▶ Neighborhood stabilization
- ▶ Monetized benefits 5-10 times larger than mitigation costs
- ▶ By implementing effective climate solutions, we can address many social and economic justice issues.

NEXT STEPS: RENEW Climate Fund



- ▶ Energy efficiency projects reduce the need to produce more energy now. One of the most cost-effective ways to reduce carbon emissions, *investing in energy efficiency*, is key to fighting climate change.
- ▶ Behavior change can be a challenge...
 - ▶ We need government, municipalities, educational institutions, industries with triple bottom lines, community organizations, and individuals to commit to environmental justice and making greenhouse gas emission reduction a critical priority.
 - ▶ How can we use our own choices to fight climate change, clean the air that we breathe, AND make a difference in the lives of our low to moderate income neighbors?

RENEW Climate Fund

RENEW's collective impact design serves as an exemplar for the significance and widespread economic and healthful impact climate smart initiatives have the potential to achieve:

- improved community health status,
 - transformed neighborhoods,
 - increased generational wealth,
 - foreclosure prevention and retained homeownership
 - and overall improved community-wide economic stability.
-
- ▶ Offsetting carbon emissions is not new, but investing those donations to help our neighbors as well as modeling a replicable program for other communities to implement, is a new approach.

Thank you!

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Instagram: @renewclimate

