

# Take the Heat! Part 1: Geo & Wastewater



31 Chambers Street  
New York, NY

November 15, 2023  
9 to 10:30 am

In this new two-part series focused on building decarbonization, NYSERDA and BE-Ex have called upon industry experts to highlight projects deploying breakthrough heat recovery solutions across the commercial and multifamily buildings sector.

opening remarks:

Molly Kiick, Project Manager, NYSERDA

presentations by:

JP Flaherty, Managing Director, Global Head of Sustainability and Building Technologies, Tishman Speyer

Ed Yaker, Amalgamated Housing Cooperative

Mariel Hoffman, Director of Energy Engineering, EN-POWER GROUP

moderator:

Greg Koumoullou, Project Manager, Customer Energy Solutions, Con Edison

panelists:

Mariel Hoffman, Director of Energy Engineering, EN-POWER GROUP

Jay Egg, President, Egg Geo

JP Flaherty, Managing Director, Global Head of Sustainability and Building Technologies, Tishman Speyer

Ed Yaker, Treasurer, Amalgamated Housing Cooperative

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# *Breaking New Ground with Geothermal*



TISHMAN SPEYER



# About Us

*At Tishman Speyer, we are building for the future.  
We provide exceptional spaces and destinations for  
approximately 1,900 customers across 30 key markets.*

**1,900**  
**CUSTOMERS**  
**WORLDWIDE**

**\$67.1B**  
**AUM**

**82M ft<sup>2</sup>**  
**OWNED & OPERATED**

**NORTH AMERICA  
EAST COAST**

**BOSTON, MA  
GREENWICH, CT  
NEW YORK, NY  
NORTHERN VA  
PHILADELPHIA, PA  
PITTSBURGH, PA  
WASHINGTON, DC**

**NORTH AMERICA  
WEST COAST**

**BOULDER, CO  
LOS ANGELES, CA  
SAN DIEGO, CA  
SAN FRANCISCO, CA  
SEATTLE, WA**

**NORTH AMERICA  
MID WEST**

**CHICAGO, IL**

**NORTH AMERICA  
SOUTH**

**AUSTIN, TX  
NASHVILLE, TN**

**BRAZIL**

**BELO HORIZONTE  
RIO DE JANEIRO  
SÃO PAULO**

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**AMSTERDAM, NL  
BERLIN, DE  
FRANKFURT, DE  
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PARIS, FR  
VIENNA, AT**

**INDIA**

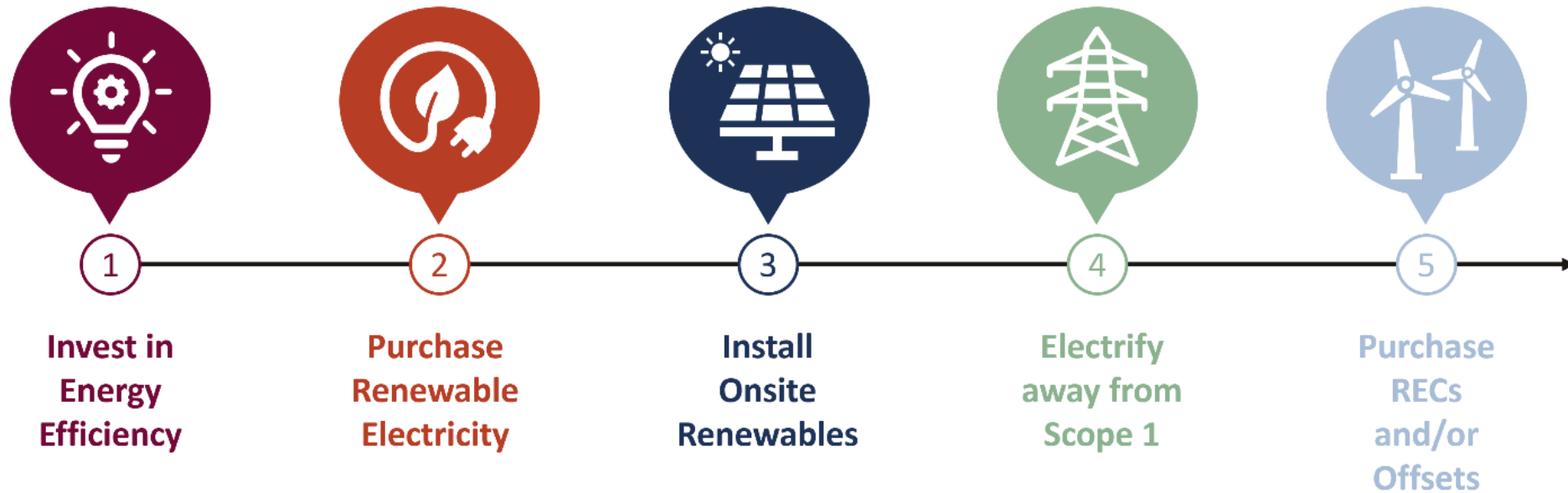
**PUNE**

**CHINA**

**BEIJING  
SHANGHAI  
SHENZHEN  
SUZHOU**

# *Tishman Speyer's Net Zero Commitment & Roadmap*

**In June of 2021, Tishman Speyer set a goal to reach operational net zero carbon across its entire global real estate portfolio by 2050 or sooner.**

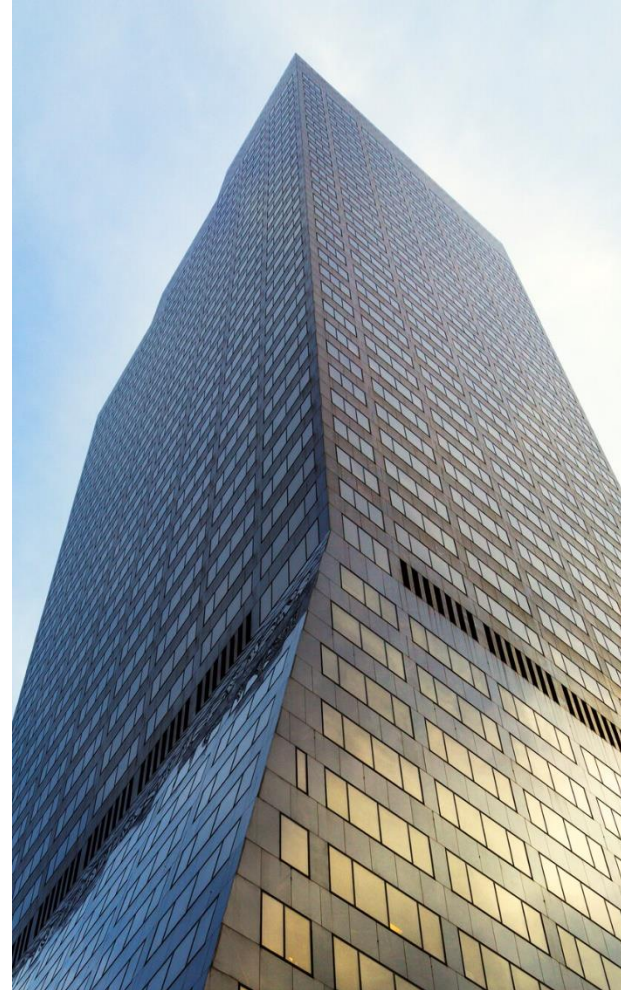


# *Empire Building Challenge – 520 Madison*

**520 Madison Avenue, built in 1982 by Tishman Speyer, is a 44-story office tower in the heart of Midtown Manhattan, home to major financial services firms like Jeffries, Citadel, and Davidson Kempner.**

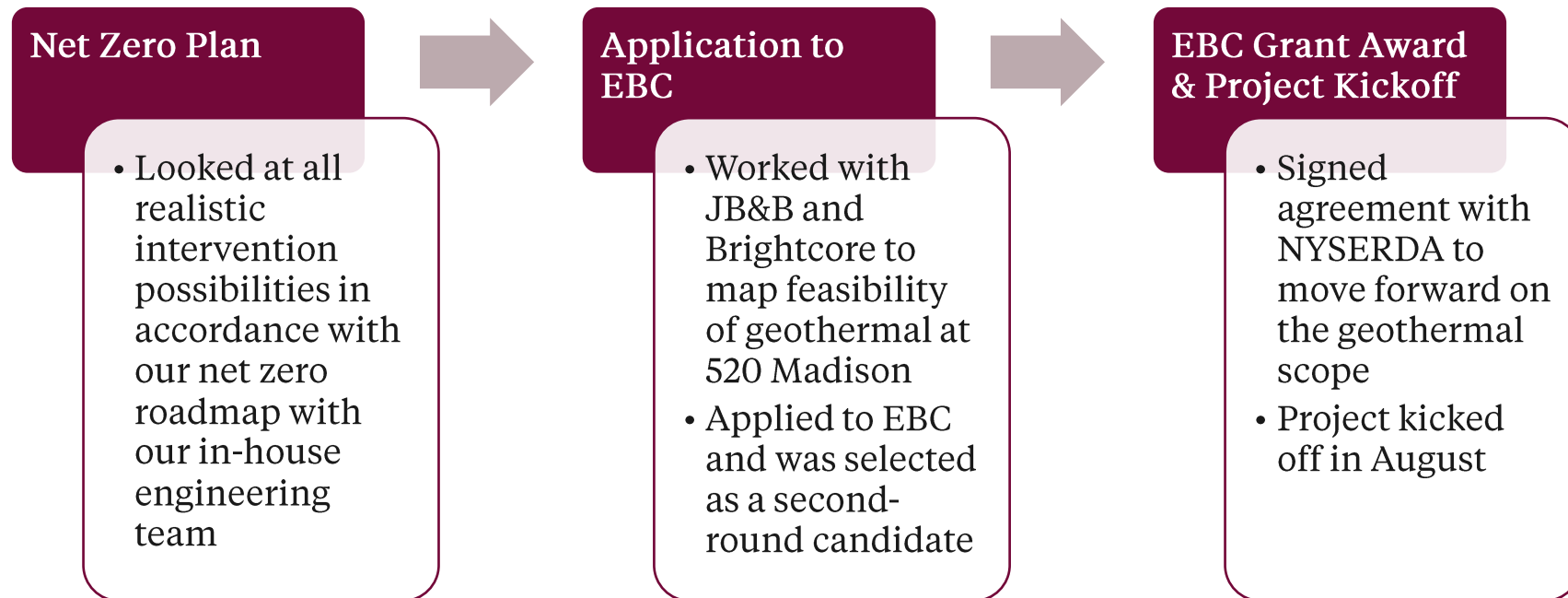
## **Building Characteristics:**

- Façade: granite stone attached to steel framing
- Heating: ConEdison steam
- Heat Distribution: Two steam heat exchangers (upper and lower zone) for hot water perimeter radiators
- Cooling: Chilled water system and 6,600-ton onsite ice plant
- Cooling Distribution: Chilled water fed to six central building fans, two condenser water loops (main and tenant)
- EUI: 172 kBtu/ft<sup>2</sup>
- Carbon Emissions: 2,034 mtCO<sub>2</sub>e



# Empire Building Challenge – Project Process

In 2022, NYSERDA put out a call for the second round of the Empire Building Challenge – Tishman Speyer saw an opportunity to apply with 520 Madison Avenue.



# Constraints and Challenges



## Geothermal + Operating Property: Let's Make it Work

Logistical constraints of drilling in an existing building with limited space, building undergoing other major capital work, incorporating the business plan and rent roll



## How We Fund This: Looking Beyond the Capital Stack

Utilizing clean heat incentives from local utility (ConEdison) as well as the geothermal credit from the Inflation Reduction Act



## Forging a New Path: We Need the Right Partners and Equipment

Not many examples of this project in the real world, gathered a team of experts to create a roadmap for this unique opportunity

Wednesday, Nov 15th

# AMALGAMATED HOUSING COOPERATIVE: THE ROAD TO DECARBONIZATION

**EN-POWER**  
GROUP



**AMALGAMATED HOUSING COOPERATIVE**







## AMALGAMATED HOUSING COOPERATIVE

## About Amalgamated

- AHC is the oldest affordable limited equity housing cooperative in the nation built in 1926.
- AHC has about **1,500 apartments** across **thirteen buildings**.
- Asset value under AHC ownership and management is \$650,000,000.
- We aim to maintain AHC as an affordable housing COOP.
- AHC is an early adopter of energy efficiency





## AMALGAMATED HOUSING COOPERATIVE ——— Background

Two AHC buildings, **Tower 1 and Tower 2**, will participate in EBC. The Towers share many characteristics:

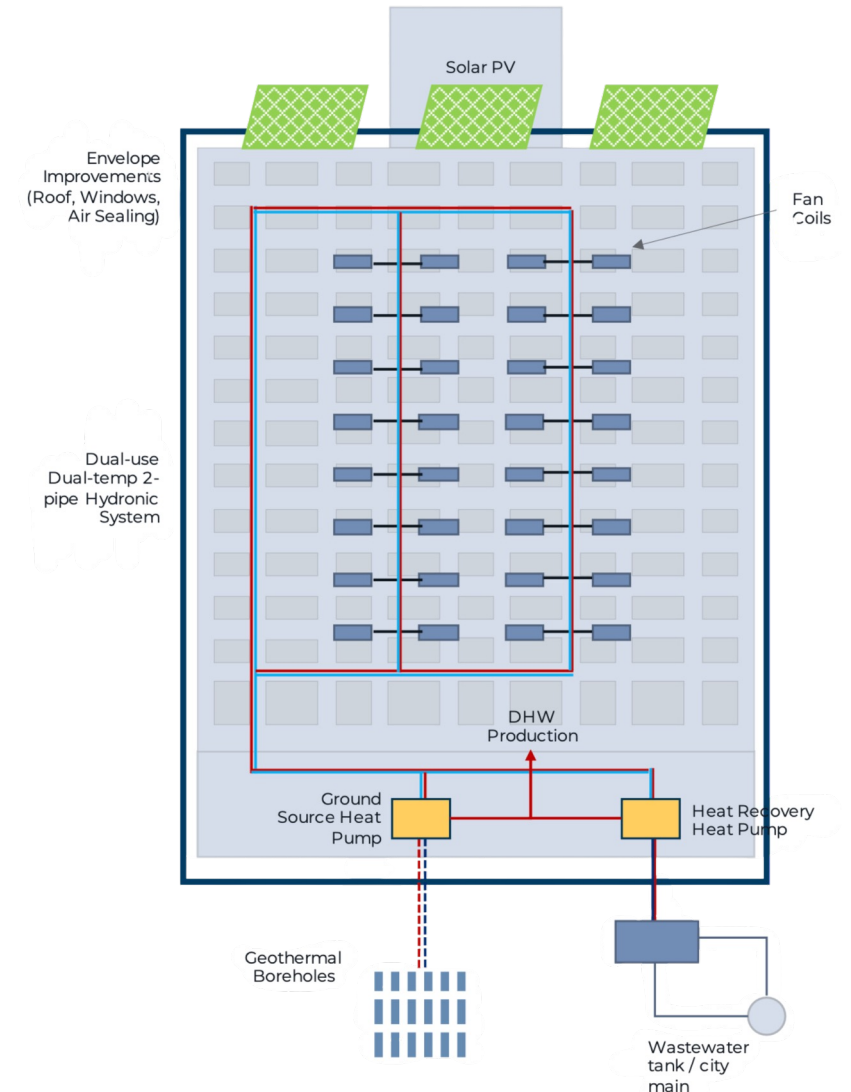
- Built in 1968 (Tower 1) & 1971 (Tower 2)
- 20 Floors
- **Heating:** High-pressure steam from the complex's dual-fuel boiler plant
- **Cooling:** Single-stage steam absorption chiller
- **Distribution:** Dual temperature loop

**Tower 1**



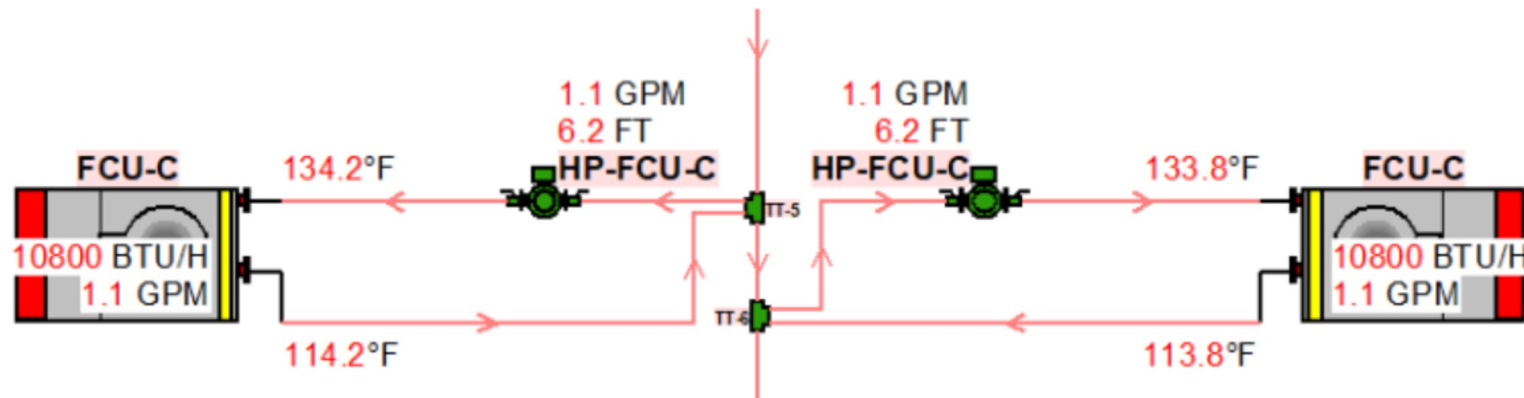
**Tower 2**

1. **Retrofit Heating & Cooling Distribution System (Piping and Fan Coils)**
2. **Install Wastewater Energy Transfer System**
3. Upgrade Ventilation & Lighting System
4. Upgrade Envelope
5. **Install Ground Source Heat Pump System**
6. Install Control System & Variable Frequency Drives
7. Install Submetering & Solar PV System
8. Electrify Appliances (Laundry & Stoves)



## System

- **Replacement of 1,200 fan coil units (FCUs)**, which have outdated permanent split capacitor (PSC) motors, with high efficiency FCUs with electronically commutated (EC) motors.
- **Innovative method for re-piping** includes installing 2-pipes in a shared configuration, allowing for the benefits of a 4-pipe system, by using a single pipe distribution with individual FCU circulators.



## Benefits

- Lower cost
- Improved efficiency
- Reduced carbon and energy consumption
- Less maintenance
- Lower heating distribution temperature of 140F from 160-180F
- Heating & Cooling
- Increase in resident comfort & satisfaction
- Critical step for future GSHP

## System

- **Extract heat from the wastewater** to preheat hot water in The Towers.
- Will be used initially for DHW production and **be an enabling step to reduce heating/cooling loads** for the later ground source heat pump (GSHP) system.
- Then integrated into the GSHP system in order to **provide additional energy for heating and cooling loads.**

## Benefits

- Modular design to allow for redundancy and resiliency in case of equipment failure
- Enabling step for GSHP
- Reduces geothermal boreholes from 300 to 220 (~ 27% load), saving at minimum over \$500,000 in drilling costs
- Allows for elimination of fossil fuels
- Example case for other buildings at AHC



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President

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# Con Edison Thermal Energy Network Proposed Pilots

Design engineering to commence in January 2023 and construction tentatively scheduled for Q1 2025



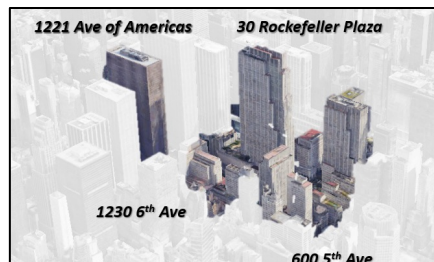
## Chelsea

- Multifamily NYCHA buildings in Manhattan in a disadvantaged community
- Tests use case of data center waste heat
- Retrofits existing buildings, with the opportunity to connect to new construction upon rebuild of the Fulton Houses campus (see Appendix for details)



## Mount Vernon

- Up to 76 buildings in a disadvantaged community including small residential, commercial, and community buildings
- Uses heat from geothermal borehole fields
- Potential to retire leak-prone gas pipe



## Rockefeller Center

- 3 high-rise mixed-use buildings in the heart of Manhattan
- Tests sharing of multiple waste heat technologies (cooling towers, ice storage, and steam condensate) through an inter-building “marketplace”

# Con Edison Incentive Programs – Heat Recovery

Con Edison provides *installation incentives* for Heat Recovery projects which result in energy savings.

## C&I – Energy Efficiency Program

Incentives	Incentive Rate <sup>1</sup>	Heat Recovery Technologies Incentivized
Electric	\$0.45/kwh	<ul style="list-style-type: none"> <li>• Systems that beneficially reuse waste heat for space conditions or DHW</li> <li>• Heat recovery ventilators (HRV), and energy recovery ventilators (ERV)</li> </ul>
Gas	\$8/therm	
Steam	\$80/Mlbs	

## C&I and MF - NYS Clean Heat Program

Systems Incentivized	Ground Source Heat Pumps Incentives <sup>1</sup> <i>Existing &amp; New Construction</i>	All Other Heat Pump Technologies <i>Existing Buildings</i>	Heat Recovery Technologies Incentivized
<ul style="list-style-type: none"> <li>• Full Load Space Heating</li> <li>• Full Load Space Heating + Envelope</li> <li>• Partial Load Space Heating</li> <li>• Custom Hot Water Heating</li> </ul>	\$100-\$225/MMBTU	\$70-\$200/MMBTU	<ul style="list-style-type: none"> <li>• Heat Recovery Chillers</li> <li>• Heat Pump Chillers</li> <li>• HRV/ERV</li> <li>• WSHP</li> <li>• Waste to Energy Technologies</li> </ul>

<sup>1</sup>Project incentives cannot exceed 50% of the project cost for eligible measure(s) or 100% of each measure cost. Total incentives are capped at \$1,000,000 for all projects, per account per year.

Visit [www.coned.com](http://www.coned.com) for more information on Incentives & UTENs

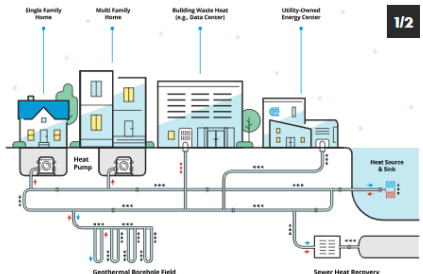
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## Thermal Energy Networks

We're connecting communities throughout our service area to shared thermal resources that provide clean, renewable heating, cooling, and hot water.

Feedback



1/2

**Thermal Energy Network Heating in Winter:** Heat pumps transfer heat into buildings from an underground loop of pipes.

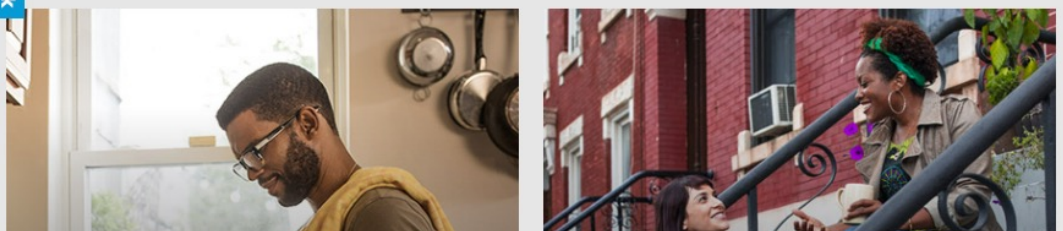
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## Save With Rebates and Energy Saving Incentives

Whether you're a renter, homeowner, or business owner, you'll find easy, energy efficiency incentives that are good for the grid, and great for your wallet.

Feedback



# discuss.

## moderator

Greg Koumoullou, Project Manager, Customer Energy Solutions, Con Edison

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thank you.

