

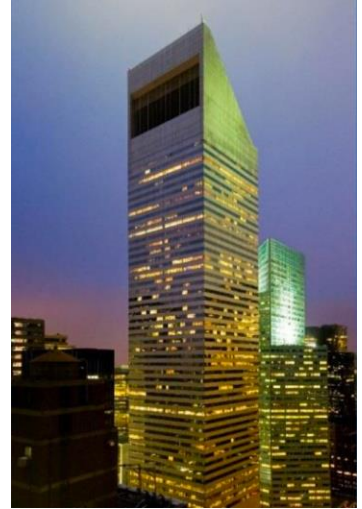
# 601 Lexington

- New York City
- 1.5 million SF
- 59 stories commercial
- Office building built in 1977



# Iconic midtown office tower modernizes by recycling heat

**601 Lexington Avenue** anchors BXP's Midtown Manhattan campus, and the skyline itself, with a globally recognized silhouette. The premier workplace building, with ground floor retail, was constructed in 1977. The building's infrastructure is typical of NYC commercial high-rises of its vintage. Heating is achieved with district steam and cooling is achieved by way of a central plant featuring electric chillers and rooftop cooling towers.



BXP strives to improve energy efficiency and has been minimizing the use of district steam at the property since 2010. This project demonstrates a replicable decarbonization solution in existing commercial high-rise buildings and joins a list of energy conservation measures already deployed at the property.

This project will deploy existing technology in a novel way, creating a thermal network that recovers and utilizes heat which would otherwise be rejected by the cooling towers.

The Empire Building Challenge is funding the demonstration of condenser water heat recovery.

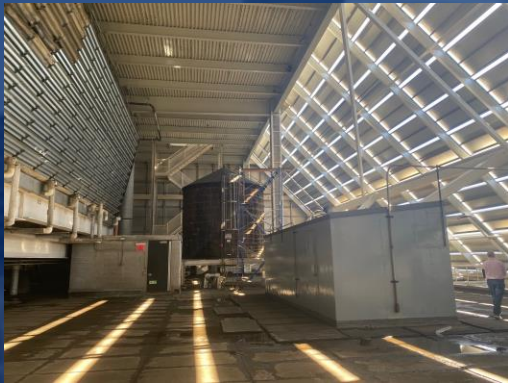
**Project Team:**



Disclaimer: The project plan outlined in this presentation is in its early design stage and can be subject to potential changes in the future.

NYSERDA Investment	EBC Funded Measure Private Investment
\$1.1 Million	\$2.5 Million

**BXP** deploys existing technology in a novel way to create a thermal network to re-use heat that would otherwise be discarded.



## Condenser Water Heat Recovery and Automated Bypass:

The building condenser water system carries heat from tenant supplemental systems to the cooling towers, where it is rejected to the atmosphere. Much of this heat is constant in commercial office buildings and available year-round for recovery. In the proposed measure, water-to-water heat pumps (WSHPs) will be installed. They will replace the function of the cooling towers during the heating season and will reclaim heat from the condenser water loop for beneficial use. An automated bypass valve will divert condenser water from the cooling towers, retaining as much heat in the building as possible for recovery by the WSHPs. The heat recovered will be reused in the building's heating systems and will significantly offset reliance on fossil fuel-based steam.

**These measures will reduce annual steam consumption by an estimated 30%.**

## Potential Future Electrification:

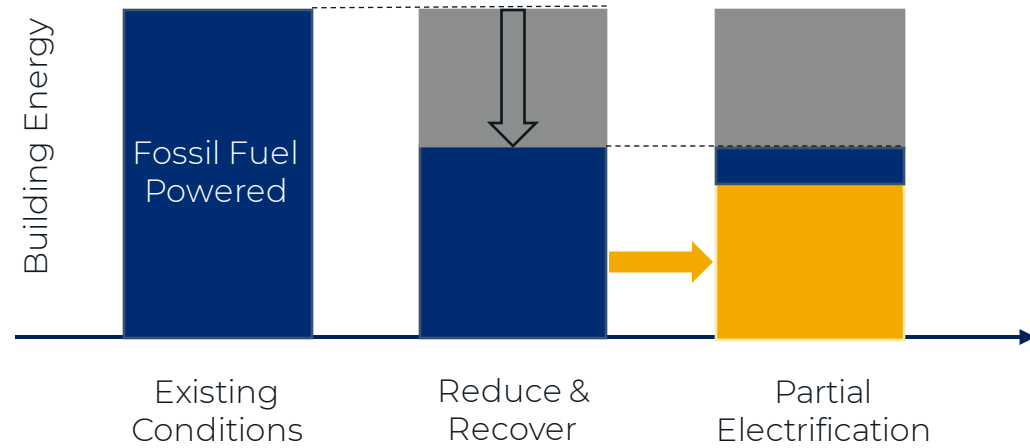
In addition to the WSHPs, air source heat pumps (ASHPs) will be installed to produce low-temperature hot water to cover some of the remaining heating loads. The project team plans to investigate ASHP infrastructure within the physical space constraints of this occupied building to minimize reliance on steam heating.

Current Baseline	Expected by 2035	
86.3 kBtu/SF/yr	73.6 kBtu/SF/yr	↓ 15%
69% Electricity + 31% District Steam	88% Electricity + 12% District Steam	
3,920 tCO2e/yr	2,899 tCO2e/yr	↓ 26%

# Resource Efficient Decarbonization (RED):

An incremental methodology and integrated design process combined with strategic capital planning creates a path towards carbon neutral buildings.

A holistic approach and phasing can make decarbonization technically and economically feasible.



**Recover Wasted Heat:**  
**EBC funded measure 2024**

- **Condenser Water Heat Recovery:** Install WSHPs to capture waste heat from the condenser water loop. The recovered heat will be reused into the building's perimeter heating loop, reducing district steam usage.

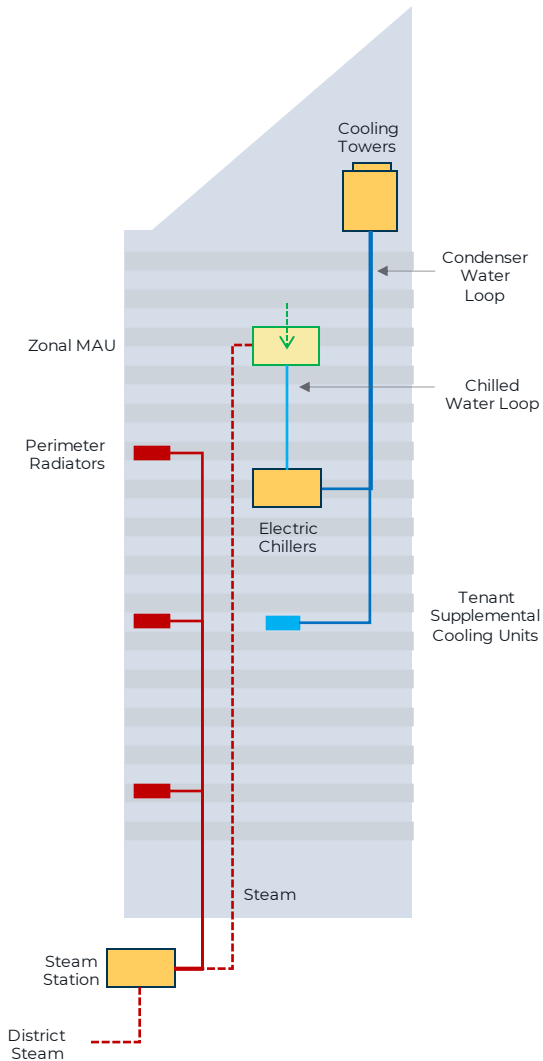
**Partial Electrification:**  
**Potential Future Measures 2034**

- **Hydronic Coils for Ventilation Preheat:** Low temperature hot water for preheating ventilation air at select AHUs
- **Air Source Heat Pumps:** Use ASHP to produce low temperature hot water to serve partial heating loads

# 601 Lexington Decarbonization Plan

**Key Takeaways:** Recycle waste heat from the condenser loop and minimize reliance on district steam. Provide a replicable model for waterside heat recovery industry-wide and integrate air-side heat recovery, where possible.

BEFORE



2024:

**Condenser Water Heat Recovery**  
Install WSHP to reclaim heat for re-use in the building's perimeter heating systems. An automated cooling tower bypass valve will retain heat in the building, maximizing heat available for recovery during the heating season.

2034-2035:

**Hydronic Coils for Ventilation Preheat**  
Install hydronic coils in select AHUs to supply low temperature hot water for preheating ventilation air, keep steam coils as back-up

**Heating and DHW Electrification: Air Source Heat Pumps**  
Install air source heat pumps. These will reclaim heat from the atmosphere, to produce hot water for the remaining heating loads.

AFTER

