

Empire Building Challenge

Low Carbon Retrofit Project Summary



VORNADO
REALTY TRUST



Empire Building Challenge
PARTNER
Reimagining Low-carbon Buildings

PENN 1

1 Pennsylvania Plaza
New York City

- 2,500,000 square feet
- 57 stories
- Built in 1972
- 2021 EUI: 166.5
- Façade: curtain wall
- Heating and cooling: district steam

\$1 MILLION
NYSERDA investment

\$4 MILLION
total investment to
install Empire Building
Challenge retrofits



PENN 1 innovates with cutting-edge heat recovery technologies to reduce carbon emissions

Through the Empire Building Challenge, Vornado Realty Trust has developed a roadmap to 100% carbon neutrality by 2030 at PENN 1, part of their flagship district – THE PENN DISTRICT. PENN 1 is a fifty-seven-story skyscraper located in midtown Manhattan, which encompasses nearly 2.5 million square feet of commercial office and retail spaces. Here, Vornado plans for advanced waterside heat recovery, which will recapture heat from the building's condenser water loop that would normally be rejected into the atmosphere and reuse it to reduce heating loads of the building. This heat recovery approach is essential to the phase-out of the existing cogeneration plant and allow for electrification via air source heat pumps and thermal storage.

The implementation of advanced waterside heat recovery at PENN 1 will showcase **the 'thermal dispatch model,' which highlights how carbon-free sources of energy can be optimally deployed to meet the heating and cooling loads of a large commercial building.** By utilizing available technologies in innovative ways, the Vornado team sets a precedent for decarbonization that can be replicated throughout the New York City building sector.

About Vornado

Vornado Realty Trust is a fully integrated real estate investment trust, with over 34 million square feet of owned and managed assets located across New York City, Chicago, and San Francisco. In New York City, Vornado's portfolio spans some 34 million square feet of office, retail, hotel, and residential spaces. As part of their Vision 2030, released in April 2020, **Vornado has committed to carbon neutrality across their portfolio by 2030, which includes a 50% site energy reduction.**



NYSERDA

PROJECT TEAM:

- Vornado
- JB&B

LOW CARBON RETROFIT MEASURES INCLUDE:

- Installation of water source heat pumps to recover condenser water heat

POTENTIAL FUTURE LOW CARBON RETROFIT MEASURES INCLUDE:

- Installation of air source heat pumps to electrify upper floor heating loads
- Replacement of constant volume perimeter induction units with modern variable volume units
- Installation of high-efficiency equipment, lighting, and lighting controls

The Empire Building Challenge

The Empire Building Challenge is a \$50 million investment by New York State to demonstrate different pathways for achieving carbon neutrality in tall buildings.

Through the establishment of a private-public partnership with leading real estate owners and their engineering experts, exciting approaches to cold-climate decarbonization are being tested in the New York market. With the potential to replicate these solutions across the expansive real estate portfolios of Empire Building Challenge partners and beyond, the impact of each project will accelerate New York's progress toward the Climate Leadership and Community Protection Act's (Climate Act) goal of reducing greenhouse gas emissions 85% by 2050.

Join the challenge

Visit nyserdera.ny.gov/EBC or email ebc@nyserdera.ny.gov for additional details on the Empire Building Challenge and to learn how to partner with NYSERDA, reduce carbon emissions, and get involved in the clean energy economy.

