

Empire Building Challenge

Low Carbon Retrofit Project Summary



TISHMAN SPEYER



Empire Building Challenge

PARTNER

Reimagining Low-carbon Buildings

520 Madison Avenue

New York City

- 1,000,000 square feet
- 43 stories
- Built in 1982
- 2019 Energy grade: A
- 2019 EUI: 87.4
- Façade: double-pane windows with masonry exterior
- Heating: perimeter heating via steam-to-hot water heat exchangers
- Cooling: water- and glycol-cooled chillers

\$3 MILLION

NYSERDA investment

\$25.2 MILLION

total investment to install Empire Building Challenge retrofits



Tishman Speyer to drill for geothermal energy below Madison Avenue

Through their participation in Empire Building Challenge, Tishman Speyer will begin to implement their carbon reduction vision for 520 Madison Avenue – a comprehensive plan focused on decarbonizing heating loads. The roadmap includes investing in heat pumps, heat recovery, load reduction, as well as **thermal layering**, to achieve full decarbonization by 2035.

Central to the decarbonization plan is the installation of a **ground source heat pump system, which will provide simultaneous heating and cooling capacity** throughout the building. This system will incorporate innovative Swedish UrbanGeo drilling technology to drill boreholes in the adjacent lot, which will connect to a new ground source heat pump plant in the building's basement. Ground source heat pumps are an underutilized technology in New York City, and the use of this solution to support decarbonization of a high-rise commercial office building has never been implemented before.

In addition to installing the ground source heat pump system, an innovative thermal layering strategy will be integrated to meet daily heating demands. This strategy layers the heating capacity from various heating sources in the building in order of availability. As capacity is recovered and electrical sources reach their limits, fossil fuel sources are engaged to cover the remaining demand. This approach ensures that efficient heating options are prioritized over those that use fossil fuels. Use of these cutting-edge approaches at 520 Madison will set a new precedent that demonstrates one pathway to decarbonization of a fully leased, high-rise building in a dense urban environment.



NYSERDA

PROJECT TEAM:

- Tishman Speyer
- JB&B, LLP

SOLUTION PROVIDERS:

- Brightcore
- Watt Time

LOW CARBON RETROFIT MEASURES INCLUDE:

- Drilling of geothermal boreholes and installation of ground source heat pumps to provide heating and cooling
- Envelope improvements
- Installation of domestic hot water heaters for handwashing
- Installation of heat exchangers and condenser water pumps to capture rejected heat

About Tishman Speyer

Tishman Speyer is an owner, developer, operator, and investment manager of real estate, globally. Their vast portfolio includes iconic assets such as Rockefeller Center in New York City and The Springs in Shanghai. In the U.S., Tishman Speyer owns or is developing over 43 million square feet, with over 21 million square feet of commercial office and multifamily residential buildings in New York City alone. Tishman Speyer has committed to reach operational net zero carbon across their global real estate portfolio by 2050 or sooner.

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 nyscrda.ny.gov/EBC or email ebc@nyscrda.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.

