

# 345 Hudson Street

- New York City
- 857,000 GSF
- 17 stories commercial
- office building built in 1931



# Nordic design principles applied to New York real estate

## Hudson Square Partnership:

Hines

TRINITY CHURCH  
WALL STREET

NORGES BANK  
INVESTMENT MANAGEMENT

## Project Team:

urbs.  
URBAN SYSTEMS

ENERGY  
MACHINES

JBB

**345 Hudson** is a commercial office building with a mid-tier energy rating of 75 kBtu/SF, an ageing heating system burning natural gas and recurring carbon emissions fines starting in 2035.

The Hudson Square partnership is committed to future-proof its flagship property by upgrading its building infrastructure while meeting the legislative climate goals and stay competitive in the commercial office market.

The HSP team brought together a consortium of global solution providers and engineering expertise to develop a long-term retrofit plan to minimize energy usage and carbon emissions.

The 345 Hudson EBC project provides a roadmap for sustainable practices by applying the Nordic design principles of holistic energy recycling and electrification.

As part of the overall decarbonization roadmap, the Empire Building Challenge is funding the measures to be implemented before 2025

**NYSERDA Investment**

**\$5 Million**

**EBC Funded Measure  
Private Investment**

**\$30 Million +**

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



**345 Hudson** will demonstrate the power of thermal networking and electrification



Learn more about the **345 Hudson project**

- [High Rise / Low Carbon Partner Profile: 345 Hudson](#)
- [Empire Building Playbook: HSP Case Study](#)

## Thermal Networks: enable heat sharing between spaces

Developing a hydronic loop operating at ambient temperatures by converting the existing condenser water riser. The ambient loop enables future optionality with the integration of different heat sources and takes advantage of simultaneous heating and cooling opportunities between spaces and floors to reuse otherwise wasted heat.

## Electrification: take advantage of high coefficient of performance

Leverage the high efficiency of heat pump technologies, enable grid interactivity, and take advantage of future low-carbon electricity production planned by the state.



Water Source Heat Pump by Energy Machines

Current Baseline	Potential by 2030*
75 kBtu/SF/yr	38 kBtu/SF/yr
24% Natural Gas + 76% Electricity	100% Electricity
4,999 Ton CO2e/yr	1,500 Ton CO2e/yr
\$204,000 /year of LL97 fines starting in 2030	\$0 LL97 fines through 2030

↓ 50%

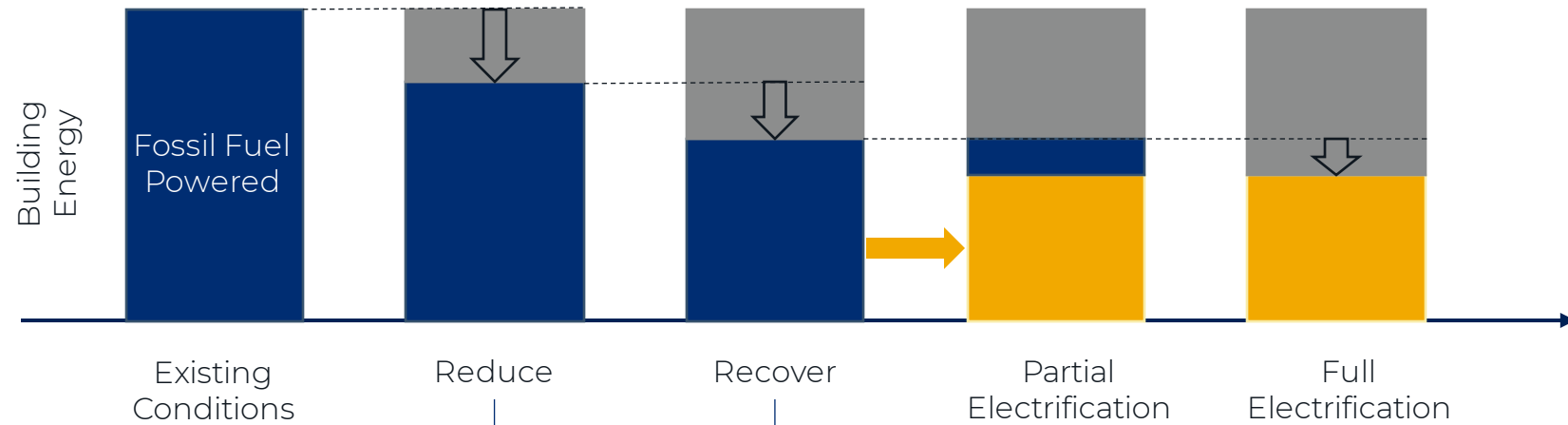
↓ 70%

\* These potential results are based on the best-case scenario but are dependent on tenant plug loads and tenant equipment fit-outs.

# 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.



**Reduce Energy Load and Recover Wasted Heat**

- **Ambient Loop Hydronic Spine:** high efficiency water-based distribution system, lower supply temperature and heat sharing between floors/zones
- **Dedicated Outside Air System (DOAS) with Energy Recovery Ventilator (ERV):** decouple ventilation from heat and cooling systems, and recapture exhaust air energy to reheat fresh air with 85% recovery
- **Tenant Conversion:** install floor-by-floor WSHPs and convert to hydronic low temperature heating and high temperature cooling
- **Window replacement** (provisional): reduce air infiltration

**Partial Electrification: right-size heat pump**

- **Central ASHP + Adiabatic Dry Cooler:** heat supply and heat rejection, maintain design temperatures for ambient loop

**Full Electrification: replace/remove peak load equipment**

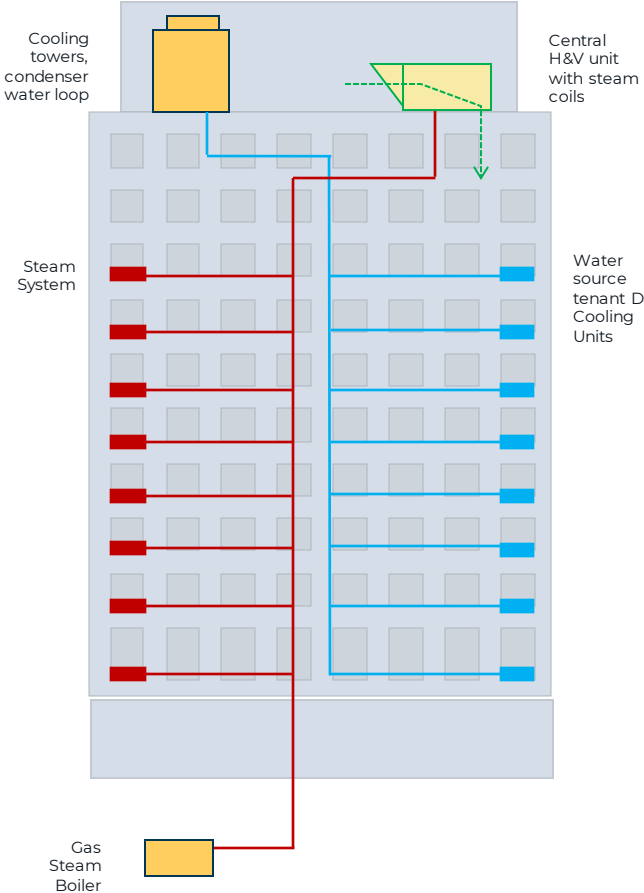
- **Thermal Storage** (provisional): leverage storage for peak load
- **Thermal network connection to neighboring building:** heat sharing capability and leverage geothermal pills in property next door
- **Decommission natural gas boilers**

# 345 Hudson Decarbonization Plan

Heating  
Cooling  
Ventilation

**Key Takeaways:** Eliminate on-site fossil fuel usage, phased-in implementation based on tenant turnover, lower distribution temperatures, minimize wasted heat, heat sharing

## BEFORE



- 2022: **Install Ambient Loop Hydronic Spine**  
Convert existing condenser water loop.
- 2023: **Tenant Conversion Phase 1**  
Remove steam radiators and water source DX cooling units  
Install 4-pipe hydronic, WSHP, fan-coil, radiant options
- Install Central ASHP and Adiabatic Dry Cooler**  
Central plant to maintain design temp. for hydronic loop
- 2024: **Install Central DOAS+ERV**  
Fresh air supply with minimum 85% heat recovery
- Provisional: **Thermal network connection to neighbor**  
new building with geothermal piles
- 2025: Provisional: Install rooftop **Thermal Storage**  
to supplement central plant
- Provisional: **Envelope Improvements**  
Replace windows to improve air infiltration and reduce load
- 2027: **Tenant Conversion Phase 2**  
Phase-in tenant floor work based on tenant turnover lease
- 2029: **Tenant Conversion Phase 3**

## AFTER

