retrofit guide

Commercial Buildings with Decentralized Cooling & Steam Heating

Is this guide for me?
These types of buildings use district steam or steam boiler heating, and may have a variety of decentralized cooling systems, ranging from window A/Cs to multi-split heat pumps. They can vary widely in design, occupancy type, and use, ranging from offices lightly occupied for 40 hours a week, to those with 24/7 energy-intensive operations.

Maximize occupant comfort, save energy, and get your building climate-ready with high-performance upgrades. The recommendations in this guide can help you meet Local Law 97 emissions limits and prepare for New York City's carbon-neutral, climate-friendly future. By planning for upgrades today, you can align projects with capital improvement cycles and phase them in at the pace that works for you, minimizing costs and tenant disruption.

typical building systems

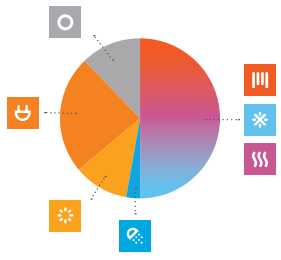
heating & distribution
district steam or on-site steam boilers with steam distribution

cooling
through-wall A/C, window A/C, or PTAC units; single- or multi-zone mini-split heat pumps; split system central air

ventilation
rooftop exhaust

domestic hot water
steam heat exchanger or hot water boiler

building GHG distribution



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building energy exchange

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moderate retrofit

Moderate decarbonization improvements include upgrading boilers, modernizing controls, installing high-efficiency lights, appliances, and fixtures, and implementing relatively minor insulation and air sealing measures. Combined, these improvements can reduce greenhouse gas (GHG) emissions in a typical commercial building with decentralized cooling and steam heating by as much as 25%.*

deep retrofit

Deep decarbonization improvements typically involve comprehensive, whole-building upgrades, in addition to some items from the moderate decarbonization list. Key measures include replacing fossil fuel-based heating and cooling systems with electric-powered heat pumps, installing energy recovery ventilation, upgrading insulation and windows, and integrating controls with real-time building management systems. Combined with renewables like on-site solar, deep decarbonization measures can reduce GHG emissions by as much as 55%.*

BUILDING SYSTEMS	GHG SAVINGS	ENERGY CONSERVATION MEASURES (ECMS)	ADDED BENEFITS	GHG SAVINGS	ENERGY CONSERVATION MEASURES (ECMS)	ADDED BENEFITS
envelope	1	■ Increase roof insulation		1	■ Increase roof insulation	
		■ Weatherstrip windows, exterior doors, and through-wall air conditioning units			■ Upgrade to high-performance windows	
					■ Overclad building with a Passive House standard façade system like EIFS	
HVAC	2	■ Install boiler controls with indoor temperature feedback		3	■ Install heat pumps for heating and cooling	
		■ Install boiler and pipe insulation			■ Install an energy recovery ventilation system (ERV)	
		■ Upgrade to ENERGY STAR® A/C units			■ Install demand controlled ventilation (DCV)	
		■ Install or commission an economizer			■ Integrate controls with a building management system (BMS)	
		■ Install variable frequency drive (VFD) exhaust fans			■ Optimize setpoints and schedules for occupied hours	
domestic hot water	1	■ Install dedicated 10-year boiler prior to electrification		1	■ Upgrade to dedicated heat pump with hot water storage tank	
		■ Install pipe and tank insulation			■ Install pipe insulation	
		■ Install low-flow fixtures			■ Install low-flow fixtures	
lighting	1	■ Upgrade to LED lighting with vacancy sensors and controls		1	■ Upgrade to LED lighting with vacancy sensors and controls	
		■ Set scheduling timers for common areas and exterior			■ Set scheduling timers for common areas and exterior	
		■ Delamp overlit spaces			■ Install automated daylighting systems for lights and shades	
plug loads	1	■ Install plug load controls and timers, and use sleep modes for IT		1	■ Install plug load controls and timers, and use sleep modes for IT	
renewables					■ Install ballasted rooftop solar PV system	

legend

emissions reduction from baseline

- 1 — ≤5% savings
- 2 — 6–10% savings
- 3 — 16–20% savings
- 4 — 26–30% savings
- 5 — 36–40% savings

added benefits

- **operations & maintenance** — Keeps building performing optimally and reduces maintenance time and/or costs
- **health & comfort** — Enhances indoor environmental quality and advances occupant wellbeing
- **marketability** — Improves aesthetics and upgrades occupant spaces, increasing appeal to potential tenants
- **future-proofing** — Puts building on a path for long-term emissions reduction and regulatory compliance

* Baseline building emissions, recommended upgrade measures, and GHG savings estimates are based on analysis of NYC Local Law 84 benchmarking data and Local Law 87 energy audit data.

What is Local Law 97?

NYC Local Law 97 (LL97) was passed in 2019 as part of the Climate Mobilization Act (CMA), a package of ground-breaking legislation that addresses New York City's largest source of greenhouse (GHG) gas emissions – our buildings. LL97 establishes annual GHG emissions limits on buildings greater than 25,000 sf. Beginning in 2024, buildings that exceed their annual emissions limits will face financial penalties that can total millions of dollars each year that the building is out of compliance. Emissions are calculated based on tons of CO_2 equivalent per square foot, and the annual penalty is equivalent to $268 per ton over the limit:

(actual emissions – annual emissions limit) x $268 = maximum annual penalty

What can you do?

1. **check**
   the building's compliance status

   Use NYC Accelerator's Building Energy Snapshot tool to gauge carbon emissions and potential LL97 fines: www.accelerator.nyc/snapshot

2. **assess**
   the need for building upgrades

   Work with an NYC Accelerator Account Manager to assess building portfolio and upgrade needs

3. **prioritize**
   applicable energy conservation measures

   Determine your LL97 compliance pathway and set an implementation timeline.

4. **implement**
   your building upgrade plans

   Get connected to vetted service providers, lenders, and financial incentives through your NYC Accelerator Account Manager.

We can help.

NYC Accelerator offers free advisory services to help your building navigate compliance. Here's how we can help:

Peace of mind
We confirm compliance requirements, emissions caps, and estimated penalty amounts if steps are not taken to reduce greenhouse gas emissions.

Lower costs
We provide technical assistance to help you identify opportunities to reduce your building's carbon emissions and operating costs.

Financial options
We connect you to financial incentives and financing products, including NYC Housing Preservation & Development financing programs, NYC Accelerator PACE financing, and vetted lenders.

Trusted providers
We help you find vetted service providers and contractors to solicit project proposals.

Get started today. Contact NYC Accelerator.

visit www.accelerator.nyc/ll97
call (212) 656–9202
email info@accelerator.nyc