

New York's Real Climate Challenge: Fixing Its Aging Buildings

Nearly 70 percent of the city's total carbon emissions come from buildings. A project to retrofit nine buildings with green technology is pioneering a new solution.



The Casa Pasiva retrofit project is the first of its kind in New York. The city and New York State have zeroed in on buildings in pursuit of meaningful cuts to carbon. John Muggenborg for The New York Times

By Patrick Sisson

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A plan to upgrade a cluster of nine unremarkable apartment buildings in Brooklyn typically would not merit a second look. But this isn't a quick fix; the project, called Casa Pasiva, aims to be a new model for the sustainable transformation of the city's housing stock.

Sleek new skyscrapers that incorporate the latest energy-efficient building materials like [mass timber](#) may look impressive, but when it comes to solving the climate crisis in New York, the real challenge lies in the city's decades-old structures.

More than [90 percent of the buildings in New York](#) today will still be standing in 2050, and [nearly 70 percent of the city's total carbon emissions come from buildings](#). Taken together, these facts suggest that the fate of those nine nondescript Brooklyn buildings, and others like them, is essential to cutting emissions.

Instead of demolishing older buildings, owners and developers are devising ways to retrofit them with the latest green technology.

Casa Pasiva, a \$20 million retrofit project in the Bushwick neighborhood, aims to be a pioneer. The developer behind the project is pushing an aging collection of buildings to the cutting edge by essentially turning them inside out, all without tenants needing to relocate. Interior pipes, radiators and heating ducts will be removed or sealed, and a new facade on each building will cover a new all-electric heating and cooling system.

The project is being overseen by the nonprofit RiseBoro Community Partnership, which owns the structures. When Casa Pasiva is finished next summer, the buildings will meet a strict passive house standard, a modern building convention that substantially reduces heating and cooling costs, thanks to their airtight exteriors. The fading brick and concrete walls of the Casa Pasiva buildings will be buried under a white, sculptural surface that will help slash energy costs by 80 percent, according to RiseBoro.

“Our mission is long-term affordability, and low energy use is a stabilizing force,” said Ryan Cassidy, director of sustainability and construction at

RiseBoro. He estimates the retrofit project, which is the first of its kind in New York, will cut energy costs by \$180,000 a year. “It’s good for the environment, but it’s also good for our budgets.”

Casa Pasiva received \$1.8 million in financing from RetrofitNY, a program funded by the New York State Energy Research & Development Authority. The agency is investing about \$30 million in RetrofitNY projects. The effort to help kick-start the development of low-cost, scalable retrofit technology and build a market for energy efficiency upgrades comes as strict city and state laws trying to reduce the carbon emissions in buildings go into effect.

“Fundamentally, what RetrofitNY is about is developing a more streamlined, more modular, more efficient way of achieving deep decarbonization in housing,” said Janet Joseph, senior vice president of strategy and market development at the agency.

The city and New York State have zeroed in on buildings in pursuit of meaningful cuts to carbon, like the state’s goal to slash greenhouse gas emissions [by 85 percent by 2050](#).



The apartments of Casa Pasiva will have heating and air-conditioning units connected to a system of ducts and refrigerant lines that snake up the walls and connect to a rooftop ventilator. John Muggenborg for The New York Times

A measure passed last year [as part of the city's Climate Mobilization Act](#) requires owners of structures 25,000 square feet or larger to make often sizable cuts in carbon emissions starting in 2024 or pay substantial fines. The legislation affects 50,000 of the city's roughly one million buildings, including a substantial number of residential buildings.

“There is a laser focus now on reducing carbon emissions from the built environment in New York unlike ever before,” said John Mandyck, the chief executive of Urban Green Council, a nonprofit advocacy group.

The council estimates that the cost of bringing all buildings in New York into compliance with the law will reach [\\$20 billion](#), creating a huge market opportunity for contractors and trade unions and potentially 141,000 jobs, and fostering the development of new technologies and business models for building upgrades.

Affordable-housing providers are exempt from the emissions requirements until 2035, but a low-cost way to raise energy efficiency and cut costs would be welcomed by owners looking for more financial stability, said Jolie A. Milstein, president and chief executive of the New York State Association for Affordable Housing, a trade group.

“Everyone is looking for new ways to upgrade the affordable housing stock,” she said. “Our goal is to make everything carbon neutral.”

Casa Pasiva was the brainchild of the architect Chris Benedict, a longtime partner on passive house projects with RiseBoro. She drew inspiration from [Energiesprong](#), a Dutch process that uses standardized, premade building panels with built-in heating and cooling systems to upgrade older buildings. In the United States, and New York in particular, the wide variety of housing types, as well as differing climates, makes the standardized Dutch approach unfeasible.



“When I first looked at how to design the wall, it was like a big puzzle,” said Chris Benedict, the architect who designed Casa Pasiva. John Muggenborg for The New York Times

Ms. Benedict had to design the Casa Pasiva system from the ground up. Each of the 146 apartments will have a wall-mounted electric heater and air-conditioner connected to a system of ducts and refrigerant lines that snake up the walls and eventually connect to an energy recovery ventilator, a rooftop machine that purifies and circulates air.

The new facade, layered up to eight inches thick atop the existing exterior, will consist of a barrier to prevent airflow; rigid insulation panels; stucco; and a self-cleaning finish, [Lotusan](#), designed to whisk away water by mimicking lotus leaves. Ms. Benedict successfully lobbied for a change to the city’s building code to allow additional exterior cladding.

“When I first looked at how to design the wall, it was like a big puzzle,” she said.

Tenant benefits go beyond energy savings. The facade is thicker, airtight and watertight, which means improved air quality — it’s constantly

recirculated because of the tight external envelope — less noise from the outside and fewer pest and mold issues. Electric induction stovetops will cut interior air pollution, and the apartments will gain extra space from the removal of radiators.

The incoming administration of President-elect Joseph R. Biden Jr. has made clean-energy retrofit projects a centerpiece of its \$2 trillion climate plan, with a goal of retrofitting four million buildings in four years. But even that aggressive pace wouldn't curb emissions enough to meet the goal of the Paris climate agreement to hold temperature increases under 1.5 degrees Celsius, said Martha Campbell, buildings principal at the Rocky Mountain Institute, an organization in Colorado focused on sustainability across the globe.

The nation would need to retrofit three million homes a year to reach the carbon mitigation goals of the Paris agreement, she said. To give a sense of the labor and scale of such a feat, [about 900,000 new homes a year are built in the United States](#).

The Casa Pasiva approach is one of many that builders and engineers are examining through larger efforts like the [Advance Building Construction Collaborative](#), which Ms. Campbell called “an opportunity to address deferred maintenance issues without digging deep into those buildings.”

Energy retrofit projects have become the focus of many climate plans, but funding for such projects has not always followed. Landlords and building owners support reducing emissions, but the approach taken by New York's Climate Mobilization Act, for example, can come off as punitive and somewhat confusing, said Zachary Schechter-Steinberg, vice president for policy at the Real Estate Board of New York, a real estate trade association.

Ms. Campbell fears that some frustrated owners may simply pay the fine and skip the renovation, essentially throwing away capital that could be steered to energy efficiency investments.

To solve the issue, Urban Green Council and other groups have proposed setting up a [carbon trading scheme](#) that would let owners parlay large

finances into investments in energy efficiency for other buildings, especially affordable housing. Technology, like that being pioneered at Casa Pasiva, could be one way to fix the disconnect.

“We need to get 100 more projects underway and 100 more Chris Benedicts working on them,” Ms. Campbell said.

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