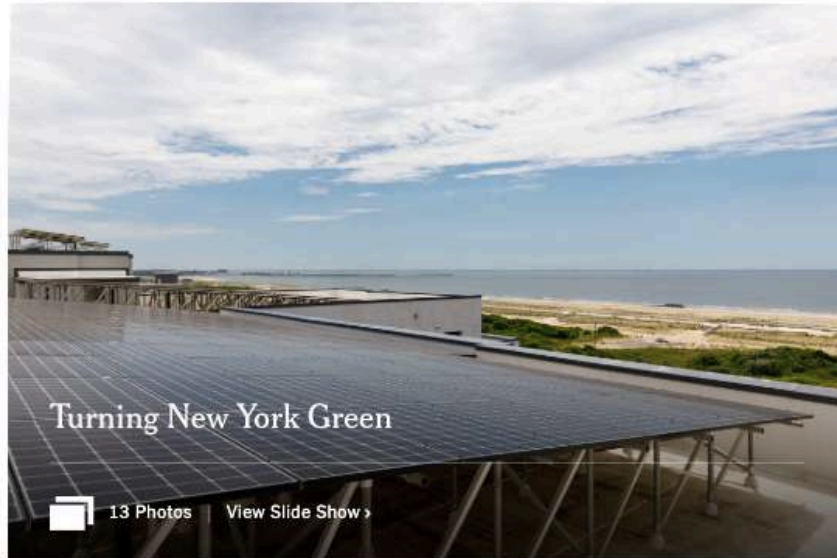


The New York Times

Counting Down to a Green New York

New York plans to be carbon neutral by 2050, and housing is one of the biggest polluters. Can this dirty old town clean up its act in time?

July 12, 2019



Stefano Ukmar for The New York Times

New York's ambitious plan to fight climate change by virtually eliminating greenhouse gas emissions by 2050 is underway — and the battle begins at home.

Two-thirds of the city's planet-warming pollution is produced by buildings, primarily residential ones, [according to a 2017 inventory](#). In spite of recent efforts, impeded in part by years of intense building, the city reduced greenhouse gas emissions by only 14.8 percent from 2005 to 2015.

But the aggressive new plans passed at city and state levels could mean a fundamental reimagining of one of the world's most recognizable high-rise cities. The changes touch every corner of the housing market, from affordable to luxury development and prewar walk-ups to glassy new towers.

"I look out the window of my New York office, and I get a little panic attack," said Lois B. Arena, a director at Steven Winter Associates, a design consultancy, about the scale of the new green mandates. "Oh, my God, all of those buildings?"

In June, state lawmakers [passed the Climate Leadership and Community Protection Act](#), which requires the state to reduce its greenhouse gas emissions to 85 percent below 1990 levels by 2050, and possibly offset the remaining pollution with carbon dioxide-removing strategies, like planting trees.

Similarly, a raft of New York City bills passed in April, [known as the Climate Mobilization Act](#), offers a road map to net-zero emissions, including stringent pollution guidelines for about 50,000 buildings that are 25,000 square feet or larger, with high fees for noncompliance; a loan program for renewable energy upgrades; requirements for some buildings to have "green roofs" covered in plants and solar panels; and new rules that could make rooftop wind turbines a common sight on the skyline.

The changes could affect not just what gets built in the city, but also how it is built, and for whom.

Affordable housing will likely be at the vanguard, because of government incentives and the cost-saving benefits of sustainable features. Luxury developers, too, will be compelled, by conscience or fines, to devise greener versions of high-rise towers. And thousands of older buildings will be required to make pollution-reducing upgrades.

Affordable Housing Leads the Way

In the Edgemere section of Far Rockaway, Queens, on the shoreline ravaged by Hurricane Sandy in 2012, stands a new seven-story building on the front line of climate change in New York.

The first phase of the project, called Beach Green Dunes, is a 100-unit affordable rental building designed with the latest in green engineering, with rentals ranging from \$653 a month for a studio to \$1,597 a month for a three-bedroom. The median asking rent in the borough was \$3,000 a month in May, according to a Douglas Elliman report.

“We’re looking at trying to make a building that is as cost-effective as possible, for everyone,” said Eric Bluestone, a partner at the Bluestone Organization, one of the developers.



Climate change is a real concern on the Queens shoreline that Hurricane Sandy ravaged in 2012. Beach Green Dunes will have resiliency measures, like an elevated patio that doubles as an emergency boat dock, and green energy features.

Stefano Ukmar for The New York Times

The site is on a stretch of formerly city-owned land that had been abandoned for decades, in a high-risk flood zone. So the builder devised several resiliency features, including putting the first occupied floor seven feet above the sidewalk and creating an elevated patio that doubles as a rescue boat dock, in case of severe flooding.

Energy-saving features are also crucial to the development. The project was funded in part through government subsidies and loans that prioritize or require green design. And utility costs, which can make up a third of an owner’s monthly expenses, can be drastically reduced with renewable energy and better-insulated design.

The project is built with [passive house](#) principles, a German standard that maintains a steady interior climate thanks to a nearly airtight building envelope and a system that exchanges indoor and outdoor air.

Passive designs vary, but tend to have more opaque surfaces and less glass than some new towers. These buildings also use about 60 to 80 percent less energy than conventional ones, which in Mr. Bluestone’s case translates to about \$25,000 a year in electrical savings.

“During the summer months, our meters are basically running backward,” said Mr. Bluestone, who supplements his energy needs with a combination of solar panels and a cogeneration system that makes use of otherwise wasted thermal energy to help heat the building’s water.

A second phase of the project, from L+M Development Partners and Triangle Equities, is expected to be completed in the fall. It will have 127 affordable units built to the passive standard, as well as a geothermal cooling-and-heating system drilled 450 feet below the parking lot.

There are 119 passive house buildings in New York City that have been completed or are underway, and the majority are residential, said Andreas M. Benzing, an architect and the president of New York Passive House, a nonprofit group that promotes the standard. While passive buildings are still a small fraction of the housing stock, Mr. Benzing said interest was growing, in part because the additional upfront costs — 2 to 5 percent more than standard building — are quickly recouped in energy savings. Others say passive house construction can cost close to 10 percent more than conventional techniques, depending on the project.

“There has been a passive house explosion in New York City,” said Jennifer Leone, the sustainability officer for the city’s Department of Housing Preservation and Development, adding that there were around 20 to 25 new multifamily projects, affordable and market rate, aiming for the standard.

A new 709-unit affordable apartment complex underway in East Harlem could be the largest passive house complex in the country. The project, on East 111th and 112th Streets, called Sendero Verde, was the first in which the city agency required passive house design. The initial phase will include two buildings rising nine and 14 stories, developed by Jonathan Rose Companies, L+M Development Partners and Acacia Network, that could be completed in 2022. The designer is Handel Architects, which also designed the 26-story passive-design student housing tower on the Roosevelt Island Cornell Tech campus developed by the Hudson Companies, one of the tallest passive buildings in the world.



A rendering of Sendero Verde, an upcoming mixed-use affordable housing complex that could become the largest passive house project in the world. The 709-unit project will have a school, community service space and public gardens. Handel Architects

The first tower’s heating-and-cooling system will be electric, with about 20 percent of the building’s common-area energy needs met by solar arrays. There will also be a school, a community services space and public gardens.

“Affordable housing has the largest penetration of greenness of any building sector,” said Jonathan Rose, in large part because developers are looking for ways to keep operating costs down, as they can’t substantially raise rents to cover those costs. All of the 360 units in the first phase will be reserved for residents making less than 90 percent of the area’s median income, or \$86,000 a year for a family of three. Almost a third of the units will go to extremely low-income renters, meaning a family of three making less than \$29,000 a year, with a share reserved for the formerly homeless.

Luxury Leaders and Laggards

The priorities of luxury developers often don’t align with climate concerns.

Floor-to-ceiling windows, the hallmark of many luxury apartment buildings, are far less effective at insulating buildings than solid surfaces, and require more energy to heat and cool. Extra-tall ceilings, cavernous amenity spaces and a tendency to pamper residents (at least those who actually live in the buildings) don’t help luxury developers’ situation.

“It’s like saying a 12-cylinder Ferrari is more efficient than it was yesterday — they still use a lot of gas,” said Stephen V. DeSimone, the chief executive of DeSimone Consulting Engineers, who has worked on several supertall and high-end buildings. Luxury and sustainability, he said, are “sort of at odds with one another.”

But the city's new emissions standards for buildings over 25,000 square feet could change that. In April, the City Council passed rules that require some 50,000 large buildings to reduce carbon emissions in aggregate by 40 percent by 2030 and another 40 percent by 2050; noncompliance could result in millions of dollars of annual fines. (Rent-regulated buildings will have to meet less stringent criteria.)

But the penalties should act as a deterrent, not a revenue source, said Costa Constantinides, a Queens councilman and chair of the committee on environmental protection.

"I don't want anyone's money; I want their carbon," he said, adding that the regulations, with the goal of becoming carbon neutral by 2050, are achievable.

Some have already embraced the idea of green design in high-end buildings. The 500-foot, 42-story mixed-use condominium now rising at 77 Greenwich in the financial district will be about 30 percent more energy efficient than the current code requires, said Dan Kaplan, a senior partner at FXCollaborative, the designer.

"Our going premise wasn't 'Let's make it all glass,'" which has become de rigeur in the luxury market, he said. (One-bedroom in the building start at \$1.78 million.) Instead, the project used glass "more judiciously," with the largest expanses overlooking the Hudson River. Elsewhere, more traditional windows are set in a stone facade. The building also has a heating-and-cooling system known as variant refrigerant flow, which is quieter, less conspicuous on the facade and twice as efficient as more common through-the-wall systems. The upgrade could cost about 20 to 25 percent more than conventional systems, Mr. Kaplan said.

Some of those efforts are lost on buyers. "Not everybody understands what we're doing," said Michael Namer, a founder and principal of Alfa Development, which is working on its fifth apartment building to seek at least silver certification through LEED, the widely recognized green-building standard.

The United States Green Building Council, a nonprofit group, established the LEED standard in the late 1990s. Certification is based on a point system that rewards various categories of green and healthy design, including building materials, energy efficiency, access to mass transit and indoor environmental quality.



The luxury condominium at 200 East 21st Street in Gramercy is the latest green project from Alfa Development. The 20-story, 67-unit building has high-performance glass to reduce solar gain, landscaped "green roof" areas and motion-controlled LED lights in the common spaces. Stefano Ukmar for The New York Times

Mr. Namer's latest building, 200 East 21st Street, a 20-story, 67-unit condo in Gramercy, will have solar arrays that help heat potable water; a rainwater-collection system that irrigates several landscaped "green roof" areas; LED lighting with motion sensors in common areas; and double-paned glazed windows that reduce heat transfer. There is also an agreement to source any additional electrical needs from an off-site wind farm.

These and other features added about 5 percent to the construction costs, Mr. Namer said, but could ultimately reduce utility bills by 20 to 50 percent. The building is about 60 percent sold, he said.

"You don't see it, because it's all inside the building," he said of the features, which may explain why the flashy luxury market has not adopted many of them. "But the aha moment is when they get the Con Edison bill."

One of the most high-profile luxury projects to tout its green bona fides is Hudson Yards, the sprawling mixed-use development on the Far West Side of Manhattan. Mayor Bill de Blasio in April [called for "a ban" on steel and glass skyscrapers](#) that contribute significant greenhouse pollution, and cited the mega project as "the wrong way to do things." (His office has since walked back the term "ban.")

The developer, Related Companies, countered that all of the buildings on the eventual 28-acre site will reach LEED gold standard or better. Geoff Hurst, a Related vice president working on sustainability, said the project's green measures include a storm-water collection system; computer programs to provide air where it is most needed; and on-site power-generating plants that save about 24,000 metric tons of carbon a year, or the equivalent of taking about 5,100 cars off the road.

Even so, the towers at 15 and 35 Hudson Yards are each about 50 percent glass, whereas more affordable towers might be only 25 to 30 percent. High-performance glass can help reduce heat transfer, but opaque surfaces are still three to four times more energy efficient.

Moreover, critics argue that too many luxury apartments remain empty or underused, because of the slowing sales market and the use of many units as pieds-à-terre. In Midtown, on a strip known as Billionaires' Row for its new multimillion-dollar apartment towers, about 40 percent of units [remained unsold in April](#), said Jonathan J. Miller, the president of the real estate appraisal firm Miller Samuel.

Hurdles to Clear

While developers consider how to build a way out of the climate crisis, the bulk of carbon emissions come from the city's existing building stock.

This year, the owner of Stuyvesant Town-Peter Cooper Village in Manhattan completed the installation of the [country's largest array of solar panels on an apartment complex](#). But even with efforts like that, New York still lags behind solar leaders like Los Angeles. And among proponents of solar, some question its potential in a city like New York, where there is sometimes limited rooftop area and shadows are cast by tall buildings.

Mark Chambers, the director of the Mayor's Office of Sustainability, estimated that retrofitting the city's existing buildings to meet the new standards would cost owners upward of \$4 billion.

"Quite honestly, a lot of people are less focused on green energy and more focused on putting food in their mouths," said Scott J. Alter, a founder of Standard Companies, which is renovating a 151-unit affordable rental building in Hell's Kitchen. He commended the city's goals, but is concerned that green updates, like new boilers and windows, can snowball into costlier projects because of the age of some buildings.

Other recent legislative changes could play a role. Some developers argue that the [major rent reforms passed](#) in June reduced incentives for landlords to make capital improvements to their buildings and will hamstring energy-saving goals.

"It will take them longer to do basic upgrades, much less transform into climate responsive buildings," said Mr. Rose, the developer.

And it could be years before the market catches up to some of the most progressive designs and their energy-saving potential.

“The banks are not quite ready to underwrite 75 percent savings,” said Spencer Orkus, the managing director of affordable housing at L+M Development Partners, about the potential utility cost savings at passive house projects like Sendero Verde. “So the goal is to take a few of these projects and see how they perform.”

The path to net-zero emissions by 2050 may be unclear, but there is a growing consensus: Time is of the essence.

“Everybody says 30 years is too long,” said Peter Iwanowicz, the executive director of Environmental Advocates of New York, a group that lobbied for the new legislation. “But 30 years is a snap of the finger.”



A rendering of 77 Greenwich, a 500-foot, 42-story mixed-use condo tower under construction in the financial district. It will be 30 percent more energy efficient than the current code requires, said Dan Kaplan, a senior partner at FXCollaborative, the designer.



The design used floor-to-ceiling glass “more judiciously,” Mr. Kaplan said, with more stone on the facade than some of the building’s competitors. The proportion of glass on towers is important, because even the most high-performance glass is less energy efficient than solid walls.

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