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As the Climate Changes, Pressure Is Growing to Make Buildings More Efficient

Governments are weighing both regulations and incentives to cut emissions and energy use in new construction.



By **Debra Kamin**

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Charlotte the child is active: running, playing, giggling while she rides her bike. But her namesake, Charlotte the condo building, is passive. Its airtight rooms use a fraction of the energy required by the buildings around it, staying cool in the summer and warm in the winter, while light-soaked and quiet.

Buildings account for nearly 40 percent of global carbon dioxide emissions, and on a rapidly warming planet, the pressure on the construction industry to build more sustainably is mounting fast.

Governments are placing restrictions on buildings' energy use and greenhouse gas emissions while tech companies are tapping automation and robotics to build smarter and more sustainably. And architects are increasingly considering resiliency and efficiency in their designs. Reducing emissions is one of the topics that will be discussed by leaders in business, science and public policy during [The New York Times Climate Forward](#) event on Thursday.

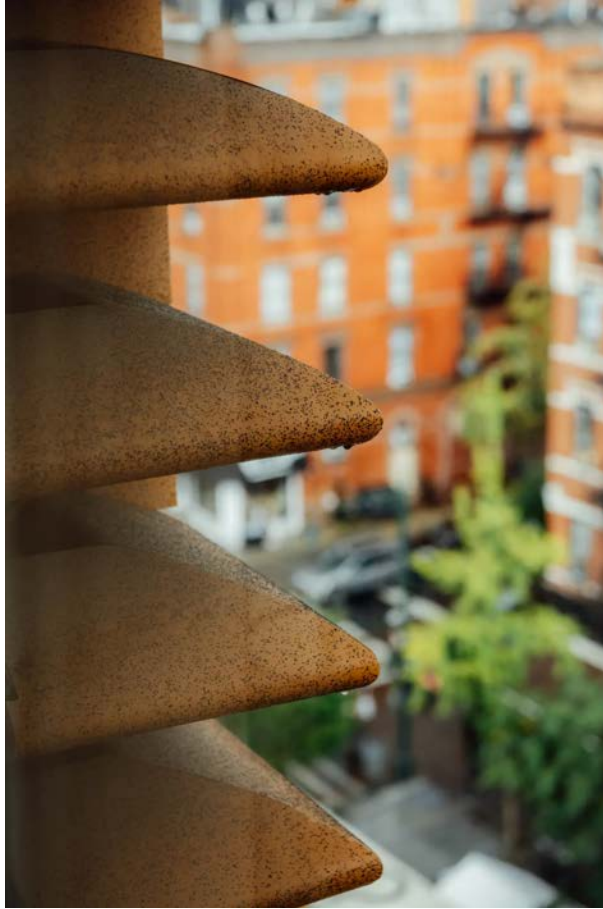
[Charlotte of the Upper West Side](#), an eight-story condo on Columbus Avenue in Manhattan, is an example of how emission reduction was incorporated from the start.

It is one of a growing number of residential projects in New York City to receive Passive House certification: a climate-focused stamp of approval saved for insulated buildings that slash their energy usage by up to 75 percent compared to those around them. The developer, John Roe, named it after his 4-year-old daughter, and he said he approached Passive House certification as the ultimate amenity.

“To achieve true wellness, you can’t do it without sustainability,” he said.



Charlotte of the Upper West Side is an eight-story condo on Columbus Avenue in Manhattan. George Etheredge for The New York Times



The building's facade is lined with terra-cotta baguettes — long, slender ceramic pipes stacked in neat vertical lines — that help regulate interior temperatures. George Etheredge for The New York Times

But Charlotte, one of about 65 Passive Houses in New York City, also will have a significant advantage next year when Local Law 97, a cornerstone of former Mayor Bill de Blasio's Climate Mobilization Act, goes into effect.

The law, part of a series of steps devised to shrink the city's carbon emissions by 80 percent by 2050, will require any building of more than 25,000 square feet in New York City to meet new energy efficiency and greenhouse gas emission standards or risk fines each year. The penalties are stiff: \$268 for every metric ton of carbon dioxide above the allotted limit, which studies estimate could amount to \$200 million per year in penalties for some buildings. And it's a two-tier process, with initial caps being rolled out in 2024 and stricter ones looming in 2030, when fines could jump to \$900 million per year for buildings that aren't in line.



Four panes of triple-glazed glass are used at Charlotte of the Upper West Side. George Etheredge for The New York Times

Bridget Gainer, a vice president at the risk management firm [Aon](#) who currently also serves as commissioner of Cook County in Illinois, said laws like this were crucial to encouraging more sustainable building. “Everyone is responding to some sort of incentive, be it negative or positive,” she said.

Besides government mandates, Ms. Gainer added, another force pushing the real estate industry toward sustainability today is insurance companies, which are increasingly [pulling out of areas](#) at risk of extreme weather and prompting home buyers to ask harder questions when considering properties.

“People are thinking, ‘Am I going to be able to get insurance?’, which is what allows them to ultimately get a mortgage,” she said. “They are demanding far more resilient rebuilds, or else no one will want to insure their house.”

Developers are increasingly looking for an overlap between building with resilience to extreme weather and building with more sustainable methods and materials, she said. And while new regulations are effective, Jeff Hendler, chief executive of the smart building software company [Logical Buildings](#), said incentives were having an impact, too.

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Todd Poisson of the firm BKSK Architects knew he would have to get inventive with his plans for the project, which he converted from a three-story commercial structure into a seven-unit, low-energy luxury condo building.

Now, four panes of triple-glazed glass act as a thermal cushion on the building's windows, while its facade, lined with terra-cotta baguettes — long, slender ceramic pipes stacked in neat vertical lines — that block the high summer sun while coaxing in extra light from the lower winter sun, regulate interior temperatures in even the most extreme weather.

"The thermal comfort inside is even, and the building doesn't need heating or cooling at the window wall as much as a typical building would," Mr. Poisson said. "Energy use is significantly less."

Mr. Hendler said he believed that creative ideas to combat climate change in the built environment were being rolled out largely because "younger people who grew up with climate change, who were little when Hurricane Katrina hit, are now the decision makers."

His company, Logical Buildings, is one of a handful that have created software to help buildings understand, then cut, their power usage.

Using a custom app and new smart meters from the local utility company, Con Edison, Logical Buildings works with owners of both private homes and multifamily buildings to lower energy usage. It's a service that comes in handy for those looking to enroll in programs like [Demand Response](#), in which energy suppliers pay customers a bonus when they use less power.

"Paying people to use less is an incredible accelerant to fighting climate change," Mr. Hendler said.

Offering a pathway to faster, more streamlined construction is another.



Veev, a building technology company, creates prefabricated closed walls with electrical, piping and heating and cooling elements already inside. Aaron Wojack for The New York Times

At least that's what Amit Haller, chief executive of the building technology company [Veev](#), believes.

In 2017 Mr. Haller, realizing that the process of erecting a single house was fragmented between carpenters, electricians, plumbers and builders, began exploring construction technology in a bid to offer a more efficient way to build a home.

At his company's factory outside San Francisco, he creates prefabricated closed walls with electrical, piping and heating and cooling elements already inside and delivers them to single-family home builders in Texas and California. Like life-size Lego pieces, they arrive ready to be assembled, cutting carbon emissions during the building process by as much as 50 percent.

"People don't think about the home as a product, but it's the most expensive product we'll ever buy in our lives," Mr. Haller said. "And there are so many inefficiencies with how they're built. We thought things should be done better."

They are part of a crowded new market.



Laurel Townhomes in San Carlos, Calif, were built with Veev technology. Aaron Wojack for The New York Times



The townhomes include composite wood floors and built-in lighting. Aaron Wojack for The New York Times

[Eco Material Technologies](#) and [HIVE 3D](#) are producing near-zero-carbon 3D-printed homes in Texas, using a proprietary cement mixture that they say can be produced with 92 percent lower emissions than traditional concrete.

[Plantd](#) is creating building materials using perennial grass; [Hempstone](#) is turning to the power of hemp, which has been popular in European buildings since the 1990s, to produce sustainable insulation for structures in New England with a combination of hemp and lime. And straw bale construction — which contrary to the tale of the Three Little Pigs, offers superior protection from fire damage than traditional materials and thermal insulation that can be three times more effective than other building methods — is gaining a foothold in California, where wildfire risk looms larger every season.

On a national level, the real estate industry has yet to truly respond to climate change, said L. Carl Fiocchi, a senior lecturer in the Building and Construction Technology Program at the University of Massachusetts in Amherst. But he's holding out hope for change at the local level.

At least 147 bills to cut carbon emissions from buildings have been introduced in 24 states just this year, according to the National Caucus of Environmental Legislators.

Cobble together the flurry of local regulations that are now forthcoming in cities across America, he added, and there is real potential for the industry's carbon footprint to shrink at last.

"The hope is that the silver lining in this enormously black cloud is that it drives states to start adopting these codes," he said.

<https://www.nytimes.com/2023/09/20/realestate/building-construction-emissions-climate-change.html>