CANARY MEDIA

Boston skyscraper named world's biggest 'Passive House' office

The building, which will use far less energy than a conventional design, is the latest example of the efficiency standard's growing popularity.

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Winthrop Center in downtown Boston is now the largest Passive House office space in the world. (Millennium Partners)

A new Boston skyscraper has a climate-friendly claim to fame. Last week, it became the largest office space in the world certified to the extremely energy-efficient "Passive House" standards – and the first skyscraper in the U.S. to earn the label.

The 812,000-square-foot area for offices at the Winthrop Center, a mixed-use commercial and residential building, requires significantly less energy than similar spaces. Comparable buildings in Boston consume 150% more energy than Winthrop Center's office space, according to the developer Millennium Partners.

To achieve Passive House performance, the design utilizes high-performing insulation, triple-pane windows and other construction techniques that improve airtightness and minimize thermal-energy losses. The nonprofit research organization Passive House Institute in Germany verified the building's performance.

The announcement is "fantastic news," said Ken Levenson, executive director of the U.S.-based nonprofit Passive House Network. "It's proof that Passive House [performance] is applicable to many, many" types of buildings – not just homes, as the name suggests. In 2022, the organization deemed the Winthrop Center design, which has taken six years to realize, a trailblazer.

Buildings consume – and waste – vast amounts of energy, making them responsible for about a quarter of emissions globally, according to the International Energy Agency. The trend has yet to improve; in 2022, buildings used about 1 percent more energy than the year before.

As U.S. cities and states pursue their climate goals, the Passive House approach is growing more popular as a way to deal with building emissions. In May, for example, the city of Boston voluntarily adopted Massachusetts' opt-in building code, which specifies that new large multifamily buildings must meet Passive House requirements to help the state achieve net-zero emissions by 2050. The rule takes effect January 1.

So what exactly is Passive House?

According to the institute, the Passive House criteria constitute the only internationally recognized, performance-based energy standard in construction. Certified buildings are precisely engineered to keep the outside weather out and the inside comfort in – all with minimal energy. Buildings designed this way use up to 80 percent less energy than similar structures, according to a July report by the Passive House Network.

Passive House design also prioritizes indoor air quality, Levenson said. Unlike most office buildings, Passive House constructions don't recirculate air. Instead, sophisticated energy-recovery ventilators filter and warm or cool incoming air using the thermal energy pulled from the outgoing stale air. That way, the air stays fresh while keeping out pollutants. It's a feature that's all the more important as a warming climate exacerbates wildfires and their smothering smoke, which since 2016 has been eroding decades of air-quality gains.

According to the Passive House Network, certified projects typically cost 3 to 5 percent more than conventional buildings. But with experienced project teams and careful attention to the design standards from the outset, the price differential can shrink. In the case of the $1.3 billion Winthrop Center, the office space cost just 2 to 3 percent more than a typical construction, according to the developer. Since Passive House buildings are designed to conserve so much energy, they're also cheaper to operate, delivering savings to owners and tenants over time.

Only a handful of multifamily buildings that meet the exacting standards existed in the country a decade ago. But today, 16,000 certified multifamily units have been built, or about 0.4 percent of multifamily construction in the last 10 years, the Passive House Network reports. According to the nonprofit, about half of the Passive House projects underway in the U.S. are affordable housing. One example is Chestnut Commons, a new 275-unit apartment building in New York City, whose energy costs are expected to be 70 percent lower than in typical constructions.

The growing momentum for Passive House designs suggests that while Winthrop Center may be the first skyscraper built to such lofty standards in the U.S., it's unlikely to be the last.