



Passive house: Gaining momentum

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The paradigm regarding energy efficiency in buildings is shifting from relative energy savings to absolute numbers, whether they are 2030 Challenge thresholds, New York City's Local Law 84, or Passive House targets. Building owners, investors and tenants are looking at performance beyond the LEED rating system and realizing that metrics-energy use intensity, operational carbon footprint-are critical to achieving energy and greenhouse gas targets required to mitigate climate change.

The Passive House standard, which sets absolute energy use targets, is a clear and direct pathway to achieve deep energy use reductions. The Intergovernmental Panel on Climate Change has identified it as among the few whole-building strategies that are capable of reducing building energy use sufficiently to help limit global warming. Stringent enclosure criteria and ultra-low energy targets make it highly favorable as a method to address both climate change mitigation and resiliency.

Though relatively new to the U.S., "Passivhaus" was developed in Germany in the early 1990s. It's based on using simple and primarily architectural solutions to create ultra-low energy buildings. The standard relies on an innovative combination of techniques that already exist. Thick thermal insulation, high performance windows, thermal bridge free details, and super air-tightness are used to deeply reduce energy losses through the exterior envelope. Mechanical systems are optimized through the use of energy recovery ventilators that provide required fresh air, and have energy recovery rates as high as 90%. As a result, mechanical heating and cooling systems are significantly downsized. Through all these means, Passive House can save up to 85% of heating and cooling energy.

To date, there are approximately 50,000 buildings globally that meet the standard. Despite its name, many large Passive House buildings have been constructed in Europe, including the first high-rise office building in Vienna. There are about 100 certified U.S. projects (mostly single-family houses) and hundreds more in development. A number of mid-scale multi-family residential buildings have been built or are in development in New York City.

The Urban Green Council recently published '90 by 50', a report on methods by which New York City could reduce its carbon emissions 90% by 2050. The report emphasizes that given 75% of GHG emissions in New York City stem from the built environment, very significant reductions in energy use in buildings must be achieved. Most of the report recommendations such as air tightness and super insulation are an intrinsic part of the Passive House standard.

Drastic reductions in energy and greenhouse gas emissions in buildings will go a long way to reducing CO2 concentrations to below 350ppm in order to stabilize the climate. The Passive House standard can get us there.

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