

We are now very much into the single-digit monthly countdown to 2025, the year the United Nations set as the deadline for global greenhouse gas emissions to peak. Then, GHG emissions are to decline 43 percent by 2030 to meet the Paris Agreement to limit global warming to 1.5C.

Being responsible for an estimated 37-43 percent of the world’s annual GHG emissions, the property and construction sectors are in the environmental crosshairs. Consequently, the ‘Buildings Breakthrough’ initiative was launched at COP28 in Dubai last December, “with a view to making near-zero emissions and climate-resilient buildings the new normal by 2030,” as per the launch announcement.

In order to trim buildings’ annual GHG emissions from 10 gigatonnes of carbon in 2021 to 4Gt by 2030 in accordance with the UN’s objectives, the real estate sector would have to innovate at an unprecedented level. An annual GHG emissions decline of at least

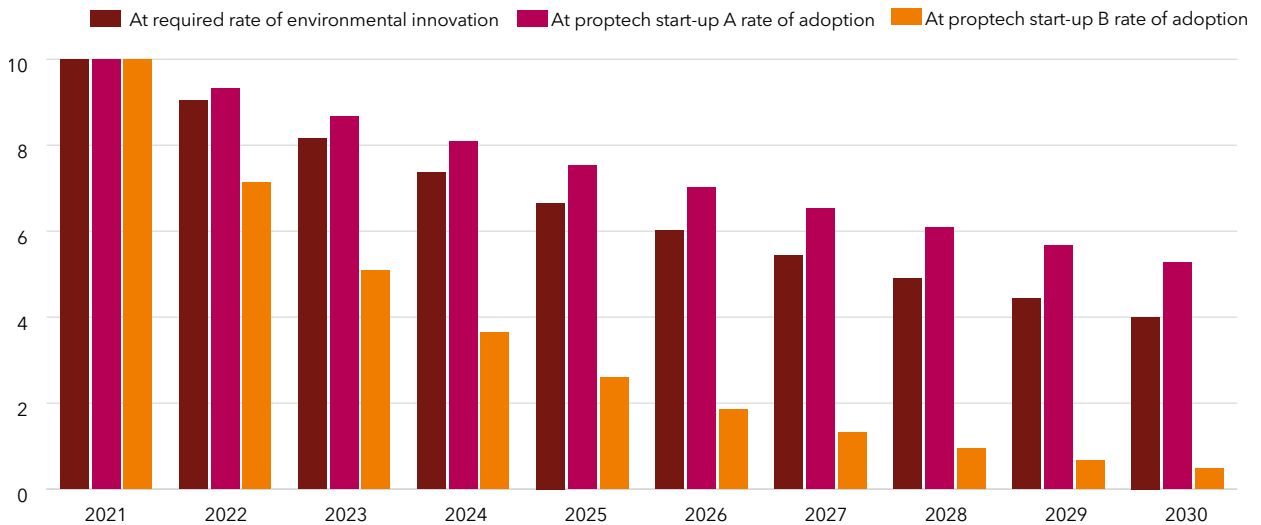
A start-up mindset is needed to achieve net-zero real estate on time



Expert analysis by **Luke Graham**, head of research at Pi Labs

Carbon emissions can be reduced at a substantially faster rate with proptech adoption

Applying start-up innovation adoption rates to the decarbonization of buildings (annual CO2 emissions, gigatonnes)



Source: Pi Labs, United Nations Environment Programme: 2022 Global Status Report for Buildings and Construction

9.675 percent over the period would be necessary. This is quite a task, particularly when the world's building stock is reliably expected to continue to grow over that time and well into the longer-term future, as the global population hurtles toward 10 billion.

Given the overall slowdown in real estate, a rate of 9.675 percent has become increasingly scarce in most markets and sectors. Where we do tend to find it is in the entrepreneurial world of proptech and related innovations, where Pi Labs' analysis identified highly divergent annualized growth rates of proptech adoption within the real estate sector. Among the known causes of this divergence are the caliber of founders, timing and competition.

The "hardware is hard" mantra speaks to another – it is more straightforward to scale a web application than it is to scale construction robots, for example. In the case of higher-growth early-stage real estate software, technology adoption growth can average up to, or even exceed, 54 percent annually – meaning if a product was being used for 10,000 square meters of real estate in year X, it would be deployed on an additional 5,400 sqm in year X+1). The problem? Decarbonization cannot be achieved with rapidly scalable software alone.

Annualized rates of innovation adoption growth around 54 percent are unlikely for technology products that are less easy to scale. However, design, construction, occupier behavior, maintenance and material reuse practices will need to change en masse, requiring industry-wide adoption of a suite of innovations along the real estate value chain in a timeframe of years rather than decades.

For these more operationally complex use cases, Pi Labs data indicates that a sample of successful proptech start-ups have been deployed within the real estate sector at annualized rates ranging from 6.87 percent (start-up A) to 28.64 percent (start-up B). Within



this range sits the required 9.675 percent annual rate of building decarbonization from 2021 to 2030, as can be seen in the chart.

Double benefits

A common challenge real estate faces in adopting proptech is cost perceptions, particularly in these economically uncertain times. Real estate industry sensitivity to cost serves as a strong differentiator for many environmentally oriented proptechs, as they

usually reduce resource consumption, whether it be energy, plant machinery, construction materials, water, labor or others. Simply put, it is possible for the sector to meet ambitious net-zero requirements and improve the bottom line with the same tech.

Many providers will be able to offer evidence of both environmental and economic benefits of adopting their product. During Pi Labs' recent analysis of environmental use cases for artificial intelligence in the built environment, four were chosen for a greenhouse gas total addressable market calculation.

Based on data collected from academic and in-house research on technology deployment outcomes, a 5.81 to 6.46Gt annual GHG reduction opportunity for the 2030 calendar year emerged. To put this into perspective, the total 2022 GHG footprint for the US was 6.02Gt.

Due to the growing prevalence of proptech solutions over recent years, a second challenge facing real estate firms is knowing where to start. Conducting similar analyses of a portfolio will shed light on the most relevant technology use cases that align assets with 2030 targets, helping apply a strategic approach to innovation and refining the search for technology providers. ■

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