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Should All-Glass Skyscrapers Be Banned?

In recent months, the controversy over the global preference for tall buildings whose façades are predominantly glass curtain walls has reached a fever pitch. Institutions such as the Intergovernmental Panel on Climate Change (IPCC) have advocated banning “all-glass” skyscrapers, against the backdrop of a planet that has doubled the energy used for cooling in the past 20 years, and is on track to double this figure again by 2040. In light of this, CTBUH asked two leading experts, “Should all-glass skyscrapers be banned?”

✓ YES

Simon Sturgis, RIBA

*Managing Partner, Targeting Zero
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In the face of global warming, all-glass towers are obsolete; they exacerbate climate change issues.

The first issue is that all-glass, double-glazed façades have poor thermal properties and therefore require significant cooling and/or heating. The greater the area of glass in this type of façade, the greater the load on the air-conditioning/heating system and the greater the carbon emissions. To mitigate this problem, complex triple glazed/louvered façades have been developed to reduce heat transfer, thus reducing operational carbon emissions.

This leads to the second issue. Complex façades, often including laminated panes and deep aluminum sections, as well as electrically-operated cavity blinds, are a significant embodied carbon emissions cost. The costs result from material sourcing, transport, assembly, delivery, on-site construction, and lifetime replacements. The life of a laminated or double-glazed unit is 25 to 40 years (and usually warrantied for 25 years). For a tall building with an expected design life of 100+ years, this means three or four total façade replacements, at a very significant carbon cost. A façade that is 40 percent glass, 60 percent solid will only require a reduced area of regular double-glazed units to be replaced. This approach is much lower in both operational and embodied carbon emissions.

Consider also regulation and investment value. Regulation is very likely to significantly tighten over the coming decades making all glass replacement increasingly difficult. New York Mayor Bill de Blasio has already identified all glass buildings as problematic. Former New York Mayor Michael Bloomberg chairs the Task Force on Climate-related Financial Disclosures, part of the Financial Stability Board which is, as it suggests, advising global investors and insurers on climatic risk. Occupiers and investors will become increasingly wary of buildings that contribute to the climate problem.

All-glass towers have high operational or embodied carbon lifecycle costs, contribute to climate change, and are an investment risk. They are artifacts from the 20th century and have no place in the 21st.

✗ NO

Eik Bezzel

CEO, MicroShade

We build skyscrapers in order to counter scarcity of space in large cities, and to ensure that we have enough office space available for businesses to grow and flourish. For office spaces to deliver the ideal working environment and contribute to worker well-being, ample amounts of daylight, as well as views to the outside, are needed. This is recognized in many European countries, where working regulations demand each workspace meets certain criteria for both these parameters. Studies have also shown that these elements have significant impact on productivity, and that even small incremental improvements can deliver increased returns that far surpass the additional investment.

So, I do not believe that all-glass skyscrapers should be banned. However, this does not mean that we should accept the current performance of glass, or of skyscrapers in general. I fully support the view that energy consumption of most of today’s skyscrapers is not sustainable, and that something needs to be done. Instead of a ban, more strict requirements should be imposed on the construction and overall energy performance of buildings, and the industry should look towards alternative solutions that can help reduce the relatively high carbon footprint entailed by large glass surfaces.

This is where new technologies such as micro-angle chromatic solutions can contribute, with considerable savings in terms of energy consumption as well as long-term total cost of ownership. These solutions not only succeed in reflecting a high percentage of the heat from the sun—they are at the same time able to offer a view out, while bringing plenty of daylight to the building interior.

I firmly believe that the introduction of innovative shading solutions is a better alternative to single-mindedly pursuing the reduction of energy consumption and putting restrictions on the amount of glass used in skyscrapers. Such pursuits all too often end up negatively impacting other important factors—which then must be rectified at a later stage—again, to the detriment of not only occupants, but also to the overall economics of the building.