

MICHAEL BRAUNGART, "BEYOND THE LIMITS OF SUSTAINABLE ARCHITECTURE"
EXCERPT FROM *BIG & GREEN: TOWARD SUSTAINABLE ARCHITECTURE IN THE 21ST CENTURY* (PRINCETON
ARCHITECTURAL PRESS, 2002)

During the last decade of the twentieth century the high-rise building trades were booming. The traditional leaders in skyscraper construction, the urban centers of Europe and North America, were erecting tall building after tall building, reshaping the cityscape in typically energetic fashion. But the real boom was happening elsewhere. In Asia, nearly 1,800 skyscrapers were constructed during the 1990s, making the region the busiest builder of large-scale structures in the world. In Shanghai alone, where in 1969 there were only a dozen high-rises, 138 steel-and-concrete towers transformed the skyline in a single decade.

One might applaud these stunning feats of engineering. The recent building boom in East Asia transformed hundreds of thousand of tons of raw steel into dozens of potent symbols of technology, prosperity, and progress, celebrating the dynamism – short-lived, it turned out – of a late-twentieth-century economic force, the so-called Asian tigers. Yet these new skyscrapers also symbolized many of the environmental problems that have come to define contemporary building design. And they are only a fraction of massive stock of large-scale buildings that grows daily in industrialized nations and at an ever-quickenning pace in the developing world.

So what's the problem with large-scale architecture? It's not just that buildings have gotten so big – it's more complex than that. We are quite capable of designing big, majestic, and inspiring buildings that celebrate human creativity and pleasure with enthusiasm *and* environmental sensitivity. Nevertheless, on a global scale, the physical impact of increasing building mass is undeniable. As we move into the second century of the skyscraper, the construction of buildings is consuming some *three billion tons* of raw materials each year. By most estimates, new construction accounts for 40 percent of the raw stone, gravel, and sand used each year; 40 percent of the processed materials, such as steel; and one-quarter of the world's wood harvest. Together, new and existing buildings account for two-fifths of the world's annual energy use, one-sixth of its water consumption and one-half of its waste stream. In fact, the construction and maintenance of modern buildings rivals the material and energy use of the entire manufacturing sector of the global economy.

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Do these approaches to sustainability – efficiency, recycling, dematerialization, lightness – signal the decoupling of materials from the economic growth that the World Resources Institute is hoping for? Perhaps. Does that mean we can now begin to feel more sanguine about architecture's effect on nature and human culture? Well, maybe not.

Each of these strategies has something to offer. Certainly, retrofitting an old building and reusing materials is a positive way to create new, pleasant spaces for office workers. And it's true that efficiently constructed buildings cut waste, and that light materials minimize resource consumption. But the overall design and material makeup of efficient building is very much like that of the skyscrapers of Shanghai and Berlin. While their designers may make materials substitutions – superglass, triple glazing, recycled plastic surfaces – the chemistry of materials in efficient buildings tends to be largely the same as that in both their predecessors and their more gluttonous contemporaries. The same carcinogens, the same toxic heavy metals, the same endocrine disrupters – only now more tightly enclosed. Are these the kind of buildings we want all over the world?

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Why not create buildings and systems that give more people more of that they want, need, and love? Cradle-to-cradle materials allow us to do so. And intelligent buildings allow us to leave an ever-larger-ecological footprint, an imprint on the world that we can delight in rather than lament. Ultimately, it will be the delight buildings inspire, the way they enhance our feeling for life, that will move ecologically intelligent design from the agenda of a few to the demands of many. Imagine buildings so delightful, so expressive of

the world's diverse interactions between nature and human culture, so comfortably affordable for so many, so able to inspire wonder in the living world, that the demand for them is driven by pleasure from the bottom up. Then perhaps, the newest skyscraper in Shanghai will be powered locally and remotely by the wind and the sun, and on a stroll down a wide, sunlit hallway you will feel a breeze from the East China Sea and know quite certainly just where you are and how it feels to inhabit that unique coastal land.