BUILDING GREEN ASIA

Special Advertising Section

China is accelerating efforts to save energy, sets new standards

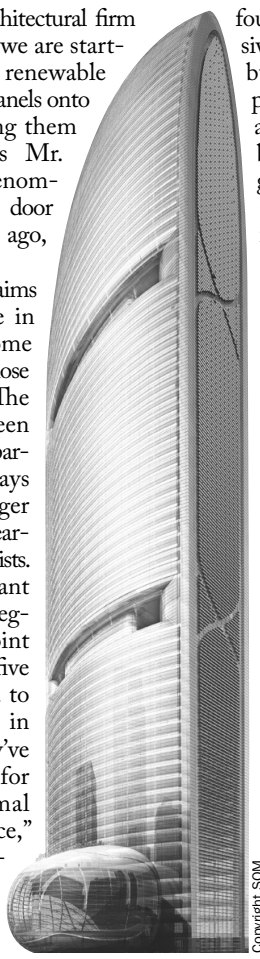
SUPER-EFFICIENT "green buildings" that save huge amounts of water and electricity have been near the top of the environmental agenda in the West for nearly a decade, and more recently, Asian countries including Singapore, Japan, India, and South Korea have adopted the idea. Until just a year or two ago, however, the world's most populous country had done little to increase the efficiency of its buildings. But suddenly, convinced by powerful economic and environmental arguments, China has embraced the virtues of building green.

In the past year alone, the government has accelerated the reviews of green buildings and the awarding of Green Stars for building efficiency, it has started to subsidize renewable power used in buildings, and it has set mandatory efficiency standards for all public structures, including schools, offices, hotels, and shopping centers. "You have to follow the new Energy Saving Code for Public Buildings, otherwise the building will not be permitted by the government," says Yingchu Qian, general manager, East China, for EMSI, a green-building consulting company based in Shanghai. Most of the new criteria, he says, set specifications for the "envelope" of the building, including type of glass, amount of insulation, and window-to-wall ratios.

Crack in the door

Incentives are also beginning to appear, says Raefer Wallis director of Shanghai-based architectural firm A00. "The incentives we are starting to see are for renewable energy, putting solar panels onto your building and tying them into the grid," says Mr. Wallis. "This is a phenomenal crack in the door because about a year ago, this was impossible."

Altogether, Beijing aims to reduce energy use in all new buildings some 60%, compared with those built in the 1980s. The new emphasis on green building is a sharp departure from the past, says James Brearley, manager of Shanghai-based Brearley Architects and Urbanists. "China has made giant leaps in architecture regulations, to the point where our projects five years ago didn't need to have any insulation in them, and now they've got high demands for insulation, or thermal efficiency performance," he says. The new standards, he says, will become even stricter next year.



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The urgent necessity of green building in China cannot be overstated. Buildings are the largest users of energy on the planet, consuming more than 30% of its energy every year, far more than the 20% used by cars and trucks. And they have long life spans — a poorly constructed building can waste electricity and water for half a century.

Wasted energy

In addition, China is home to a staggering amount of construction. The country adds almost two billion square meters of new floor space every year, accounting for nearly half of the world's new building, according to the Hong Kong-based Asia Business Council. Yet 80% of those new buildings are poorly built projects that use two to three times more energy per unit of floor space than those in developed countries.

That is set to change, in part because of the powerful economic arguments that lie behind the government's green building initiatives. A well-designed building can cut power consumption 40% or more, compared with a standard building, and the efficiency gains are relatively inexpensive. A modest investment that adds 2% a year to the cost of a building can cut energy use 30% annually, and pay for itself within five years, says Mr. Qian of EMSI.

Promoting efficiency is also less costly than building new power plants, another argument that is not lost on Beijing. According to the Asia Business Council, it is four to six times less expensive to construct an efficient building than to build a power plant to light, cool and heat an inefficient building. "In China, the government sees efficiency as an area of low-hanging fruit," says Janet Pau, program director of the Asia Business Council.

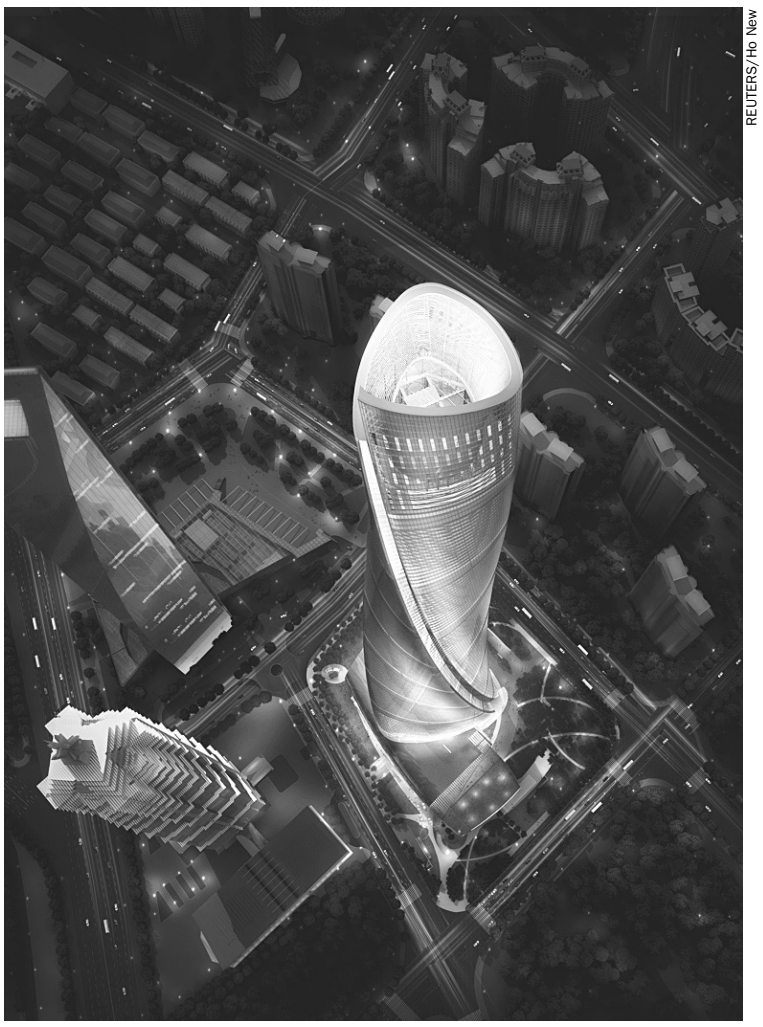
However, the private sector has been slower to embrace green buildings in China, despite the long-term savings they deliver. Private contractors tend to have a get-rich-quick mindset, and they are often reluctant to pay even a small premium to make their buildings more efficient. In addition, as is often the case in China, central government enforcement of the new green building regulations has been uneven, and it has not always extended to rural areas and small towns.

There are other problems as well. Because green building is new in China, materials and knowledge are in short supply. "You can make a building in China that is as good as in the Western world, but it is tough, because most of the material is not available on your front porch," says Pius Leuba dit Galland, an associate professor at Tongji University's College of Architecture and Urban Planning. "You have to import it and then it is hard to integrate, because the worker maybe doesn't know how to install it, and the builder also doesn't know how to deal with it. Green building in China is an emerging market with all the issues that go with it."

There is also a tendency among builders to stick with the tried-and-true, rather than experimenting with new technologies. "Although everybody likes the idea of sustainable building, nobody wants to be the guinea pig," says Mr. Wallis of A00, an architectural firm that has been pushing sustainable building in Shanghai for nearly a decade. "At the beginning we would tell people we were interested in sustainable design, and they would be too, but when it came time to test materials and so on, they would get cold feet and say, 'we want to use what everyone else is using.'"

A final hurdle is China's energy system. Power in China is heavily subsidized, which reduces the economic incentive for boosting efficiency. And companies like A00, which are installing solar panels and other energy-producing technologies, face hurdles when they try to add that power to the state electrical grid. The state grid doesn't want the extra competition, and it also doesn't want the technical problems associated with adding small amounts of power from local sources.

Despite the hurdles, green building is gaining momentum in China. Until recently, foreign companies spearheaded much of the green building. "All the Fortune 500 companies, which build a lot of building stock around the world, are going for these LEED-type [Leadership in Energy and Environmental Design] accreditations," says Mr. Brearley of Brearley Architects. A building that delivers a 30% reduction in electricity bills is obviously appealing to tenants, but equally important is the prestige associated with occupying an eco-friendly building, particularly if it has a high-profile accreditation. LEED certification, which is awarded by the U.S. Green Building Council based on six criteria ranging from energy and water efficiency to indoor air quality, is the most coveted of the international certifications.



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China's high-profile green buildings include the Shanghai Tower (top), National Aquatic Center (above) and Pearl River Tower (below, left).

High-profile local examples of green buildings are also beginning to appear. The National Aquatic Center in Beijing, site of the 2008 Summer Olympics swimming events, delivers a 30% reduction in energy, and it has a rainwater collection system that filters and re-uses 10 million liters of water each year. The nearby Olympic Village earned a LEED gold certification, its second-highest standard, and the Shanghai Tower, now under construction in Pudong, will have 54 energy-generating wind turbines and a rainwater collection system.

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Pearl River Tower

The most impressive of all, says Prof. Leuba dit Galland of Tongji University, is the 69-story Pearl River Tower, which is scheduled for completion in Guangzhou next year. The Pearl River Tower will display all the features of modern green buildings: a commuter-friendly site, state-of-the-art glass and insulation, super-efficient air conditioning and heating and rainwater collection systems, solar and wind turbine generators, and a design that reduces wind resistance and distributes sunlight in a way that maximizes its lighting potential, and minimizes the heat it generates.

Such giant leaps in technology, particularly in wind turbine technology, are unlikely to become widespread in China in the near future, says Ms. Pau of the Asia Business Council, but she believes that they will become more common in the major cities, while the simpler technologies, such as solar panels and more efficient exteriors and better heating, cooling and lighting systems, will filter into the countryside.

Increasingly, says Prof. Leuba dit Galland, as companies see the high rents, energy savings, and prestige associated with green buildings, they will be motivated to build them. "What is driving Chinese construction firms, is that they can smell that green building is going to sell," he says. "These companies are often able to sell their buildings more easily because they can advertise them as green or sustainable. This concept is going to mushroom very soon. There is no doubt."