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Sustainable Solutions

As China gets serious about sustainable development, green building looks to take off

BY JUSTIN CHAN

Sustainable Solutions

China's environmental challenges are clear. Already the world's leader in carbon emissions, it is important for China to reduce the size of its multiplying environmental footprint. As the country tries to maintain its impressive economic expansion in a sustainable manner, green building will allow that growth to continue while looking out for Mother Nature.

Tall construction cranes across Beijing still stand idle, the effect of a two-month construction ban put in place ahead of the Summer Olympic Games. The steel struts of half-finished buildings are visible across the city's skyline, waiting for September 21 when construction sites reopen and workers can resume their work. The ban was implemented as a part of sweeping measures set forth by officials determined to ensure clean air and clear skies for the duration of the Games.

And on most days in Beijing during the Olympics, blue skies prevailed and the air quality was acceptable. Mostly short-term in nature, one must wonder why some of the policies implemented ahead of the Games cannot be maintained over the long term. In any event, China has demonstrated to the world that it is cognizant of its daunting environmental challenges and that drastic measures will be taken to reduce pollution and improve the environment.

With the city on display to the entire world, Beijing set a high bar in planning new venues for the Games. The National Aquatic Center, better known as the Water Cube, and its translucent bubble exterior stands out as an environmentally friendly venue with a series of energy efficient

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OLYMPIC GOLD:
The Beijing Olympic Village is the first international project to achieve a LEED-Gold rating under the LEED for Neighborhood Development program.

technologies that result in energy savings of 30 percent a year. A rainwater collection system can amass over ten million liters of water a year that will be filtered and used throughout the venue.

Even more impressive is the Olympic Village complex, home to 17,000 of the world's premier athletes during the Games. The Beijing Olympic Village is the first international project to achieve certification under the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) for Neighborhood Development certification program. The complex achieved LEED-Gold rating, the second-highest possible in a system that rates six sustainability characteristics ranging from water efficiency to indoor environmental quality.

The Olympic Village achieved this rating through implementing a series of green technologies and materials as well as sustainable design concepts.

Both the Water Cube and the Olympic Village exhibit the possibilities for what can be achieved through green building and serve as a model for future development in China, where half of the world's new building construction will take place by 2015, according to a World Bank report. If China is serious about growing in a sustainable manner, green building presents a distinct opportunity to develop while reducing the strain on the environment.

Call to action

China's 12th Five-Year Plan (2006-2010) establishes sustainable development as a key objective and moves away from pure growth strategies. In particular, the plan calls for the reduction of energy required to produce one unit of gross domestic product (GDP) by 20 percent as well as a ten percent cut nationwide in carbon dioxide emissions.

China has fallen short of those goals thus far and serious measures are needed if the goals are to be met by 2010. "China is much more serious about clean technology and sustainable development," says Paula Beroza, managing director with cross-border investment bank Sierra Asia Partners and former Greater China investment banking head for Merrill Lynch. "The problem is widely recognized and steps are being taken to overcome it."

With so much construction going on in China, Beroza believes that China could eventually leapfrog Western countries in implementing green technologies. "If China uses new construction materials that are more energy efficient, they can have a greater impact than in the West," adds Beroza. The installed base in Western countries is considerably larger, resulting in less incremental building and a slower rate of change.

Yet before China takes over the U.S. in green building, it must first catch up. To do that, strong building codes are the place to start, says Kenneth Langer, president of Environmental Market Solutions, Inc. (EMSI), a sustainable design consulting firm that is involved in LEED-registered projects totaling nearly 500,000 square meters.

"China made a giant leap forward this year, when it introduced its own Red Star green building rating system," says Langer. "But this needs to be promoted throughout the country and the government needs to make the process of getting certification transparent and as simple as possible."

China will soon launch its own Green Building Council that will be responsible for administering the new green building labeling system. The Chinese system is designed to complement international schemes like LEED and will evaluate a building on land use, energy, water, construction materials and indoor air quality.

Demand drivers

From the Five-Year Plan to the Energy Conservation Law, there is a fair amount of legislation concerning sustainable development in China. The Circular Economy Law that is widely expected to pass at the Fourth Session of the 11th Standing Committee of the National People's Congress will add to the list of rules governing green practices.

Circular Economy comes from the translation of the Chinese definition of sustainability. The law requires governments at all levels to establish energy use and pollution controls and fund environmentally friendly industries while also establishing the concepts of reduce, reuse and recycle.

Current minimum requirements on energy efficiency for newly constructed buildings in China use the average energy efficiency of a building in 1980 as the baseline and targets energy use decreases of 50 percent by 2010 and 65 percent by 2020. Shanghai and Beijing already require a minimum reduction of 65 percent, according to a white paper by Jones Lang LaSalle.

New laws are helpful but in order for them to have any effect, China needs to step up enforcement of building regulations, says Rob Watson, chairman, CEO and chief scientist of EcoTech International Group, a green building advisory firm. Watson founded the LEED rating system in 1994 and is considered a pioneer of the green building movement. "Because enforcement is spotty or non-existent, it results in a race to the bottom," he says.

The World Business Council for Sustainable Development (WBCSD) reports that China is adding two billion square meters of commercial and residential floor space each year. Globally, buildings account for 36 percent of total energy use, 65 percent of electricity consumption and 50 percent of carbon emissions, according to EMSI.

With such a strong impact on the environment, it is critical that green regulations are enforced and sustainable practices encouraged. "China has been raising the bar for energy efficiency, but could do more in the area of water efficiency," adds Langer.

Even with strong demand across most sectors of the real estate market, developers must continuously find ways to distinguish their offerings from those of their competitors. Creating certified, sustainable developments both achieves the goal of reducing the environmental footprint and creates separation from competitors.

"China needs to rely more on the market to spur further greening, and that means generating consumer demand for green buildings and sustainable products," advises Charles McElwee, counsel with Squire, Sanders & Dempsey in Shanghai and a specialist in environmental and energy law.

Consumers in China tend to be confused about sustainability issues and suspicious of green claims in general, says McElwee. Despite the LEED certification system, or other popular evaluation methods such as the UK's Building Research Establishment Environmental Assessment Method (BREEAM) or the National Australian Building Environmental Rating System (NABERS), certified green buildings are still not common in China.

"It is hard to sell something people don't want or don't understand. If you can create the demand, however, the supply will follow," adds McElwee.

LEEDing benefits

One reason why LEED has caught on as the leading green building rating system worldwide is its flexibility and room for interpretation. Instead of advocating particular technologies or concepts, the requirements evaluate the context of the element and its impact on the overall project. This has led to LEED's application in both developed Western countries as well as developing markets like China.

"In China, LEED offers both precedent, where lots of buildings have already been completed, and familiarity, where the requirements have already largely been interpreted for the Chinese market," says Andy Woodward, director with SIP Project Management, a planning, engineering and construction consultancy in Shanghai. "It also helps tremendously when you have some very high-profile multinational companies practicing what everyone else preaches on sustainability."

Leadership in Energy and Environmental Design (LEED) Green Building Rating System

Category	Possible Points
Sustainable Site	14
Water Efficiency	5
Energy & Atmosphere	17
Materials & Resources	13
Indoor Environmental Quality	15
Innovation & Design Process	5
Total:	**69**

Levels of Certification

Certified: 26 - 32 points
Silver: 33 - 38 points
Gold: 39 - 51 points
Platinum: 52 - 69 points

SOURCE: JONES LANG LASALLE, U.S. GREEN BUILDING COUNCIL

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"LEED certification resulted in an addition of less than than two percent to the overall construction cost, while on average, created a savings of 20 percent in costs over the lifetime of the building."

Although developers and investors who are promoting and implementing sustainability are often focused on differentiation, a LEED-certified project will have dramatic effects on energy consumption and pollution emissions. The rating categories of the LEED system reveal areas where demands on the environment are significantly reduced.

Energy efficiency can be improved through optimized lighting and air conditioning systems while alternative sources such as photovoltaic, fuel cell and micro turbine technologies can be used. These all contribute to reduced energy use for lighting, heating, cooling and ventilation.

In a place like China where the water supply is limited, water efficiency carries far reaching benefits. New water distribution systems and fixtures can significantly decrease usage as well as waste.

The building process and materials used in the project will also have an impact on the sustainability of a building. Green buildings will typically reduce resource consumption up to 70 percent while providing pleasing aesthetics, healthy conditions and ensuring a reduced life cycle environmental impact.

China Advanced Construction Materials Group (China ACM) is approaching construction in China from a green perspective by providing a customized concrete that uses at least 30 percent recyclable raw waste components. The company has provided technical services support on major projects such as the National Stadium and the Beijing Capital International Airport while supplying concrete for the National Center for Performing Arts and the new Beijing South Station.

"Our concrete products are certified for both product and environmental safety, with the environmental benefits being derived mainly during the building process," notes China ACM Chairman and CEO Xianfu Han. The company employs a sealed delivery method for the ready-mixed concrete, which minimizes worksite noise, dust, congestion and air pollution. It is also creating new concrete blends and mixtures that will enable the building of the latest and most creative architectural designs.

On top of the environmental advantages are the benefits for the end user. Sustainable buildings create a significant draw for tenants because of the internal environment they provide. Green buildings have over time shown to increase work productivity and decrease employee turnover by offering overall healthier surroundings.

Long-term mindset

Although most people are beginning to recognize that sustainable development brings tangible benefits, the concept has still been somewhat slow to pick up in China. A recent report by the WBCSD noted that although 79 percent of respondents in China were aware of the green building concept, only 28 percent had considered a project with green elements. For respondents who had been involved in an actual project, the figure dropped to 10 percent.

Some of the major deterrents to green building are perceived high costs, complicated requirements and delayed design and construction processes. The same WBCSD report found that respondents in China believe a certified sustainable building carries a cost premium of 28 percent relative to a normal building.

In fact, if the intent to create a sustainable building is built into the project planning process from day one and the design and engineering work is completed by LEED-accredited staff, the LEED certification process is more likely to go smoothly and cost just slightly more when compared to a standard design.

"We find that our projects typically cost only two to three percent more than the original budget," says EMSI's Langer, whose firm has worked on over 75 green projects in China. "And implementing LEED strategies need not cause any delays in the design or construction process."

"China is so hung up on the cost that they forget the benefit side of the equation," agrees Watson. He advocates using integrated design techniques, which allow higher quality, better performing equipment for nearly the same overall building cost. For example, investing in energy efficient windows could reduce costs in another area such as air conditioning.

A survey by the USGBC found that gaining LEED certification resulted in an addition of less than two percent to the overall construction cost, while on average, created a savings of 20 percent in costs over the lifetime of the building.

The cost reduction is partially based on utility savings such as energy and water consumption which are easily quantifiable. However, a significant portion of the savings is less tangible, in that a comfortable and productive environment is difficult to quantify and often less convincing from an economic standpoint.

That reasoning would explain why many in China still consider green building a public

relations sound bite. With the considerable growth of corporate social responsibility, it is important for companies to show concern for concepts such as environmental sustainability and employee health and safety, which being situated in a sustainable building would achieve.

But as true understanding of the sustainable development model spreads, both developers and tenants will recognize that the long-term benefits of green building clearly outweigh higher upfront costs.

Looking ahead

For so long, China sacrificed environmental conservation for economic growth. "The only way China's growth will continue is if it starts to develop more sustainably," says EcoTech's Watson. "I believe that the central government is fully committed to green growth, but there is a lack of knowhow at the local level that hinders its implementation."

The Chinese public is also becoming increasingly concerned about pollution. Air pollution is considered a big problem by 74 percent of respondents to the 2008 Pew Global Attitudes Survey in China, while 66 percent were concerned about water pollution. A staggering 80 percent felt that environmental conservation should be a priority, even if it means slower economic growth.

Watson also suggests incentivizing investments in green technology through demand-side management and other sorts of market transformation programs. This will facilitate investment in green technology by countering typically fast turnover in the real estate sector.

Education on sustainable development could still be improved, says Peter Bohlin, fellow of the American Institute of Architects and founding partner of Bohlin Cywinski Jackson, a U.S.-based architectural firm known for designing Apple stores around the world, including the new Beijing location.

Bohlin encourages utilizing sustainable concepts in public buildings, thereby increasing access to green technology and improving the understanding of society's impact on the environment.

"Building quality has the greatest effect on sustainability implementation. Making richer, more pleasing buildings assures that people will value and enjoy them," says Bohlin. "It is critical that we look beyond the currently fashionable trends and construct timeless buildings that will remain a source of pride for generations."


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FUTURE FIRST: Teaching the younger generation about sustainability early provides a foundation for green in the future.

Although the focus on green building is usually on new construction projects, EMSI's Langer notes that there is a significant stock of existing buildings in China that are highly inefficient and will soon move towards green retrofitting.

"Domestic and international pressures to save energy and reduce greenhouse gas emissions will result in a very large move towards LEED for existing buildings and, in general, building performance optimization, with or without LEED certification," says Langer.

All the pieces appear to be in place for green building to take off in China. The government is clearly supporting the movement towards sustainable development and as standards are developed, the next stage will be the implementation of green building practices. On the developer side, green designs will soon be a prerequisite for prime projects. Demand for green space, whether commercial or residential, will only increase as consumers learn the benefits and savings available from a green development.

The environmental challenges posed by the years of rampant economic growth must now be addressed. Green building provides a medium for significant growth to continue, while also reducing the demand on natural resources and the stress on the environment. It is no longer a question of why build green, but rather, why not?

Justin Chan is Editor-in-Chief of *Insight*. He can be contacted at justin.chan@amcham-shanghai.org.