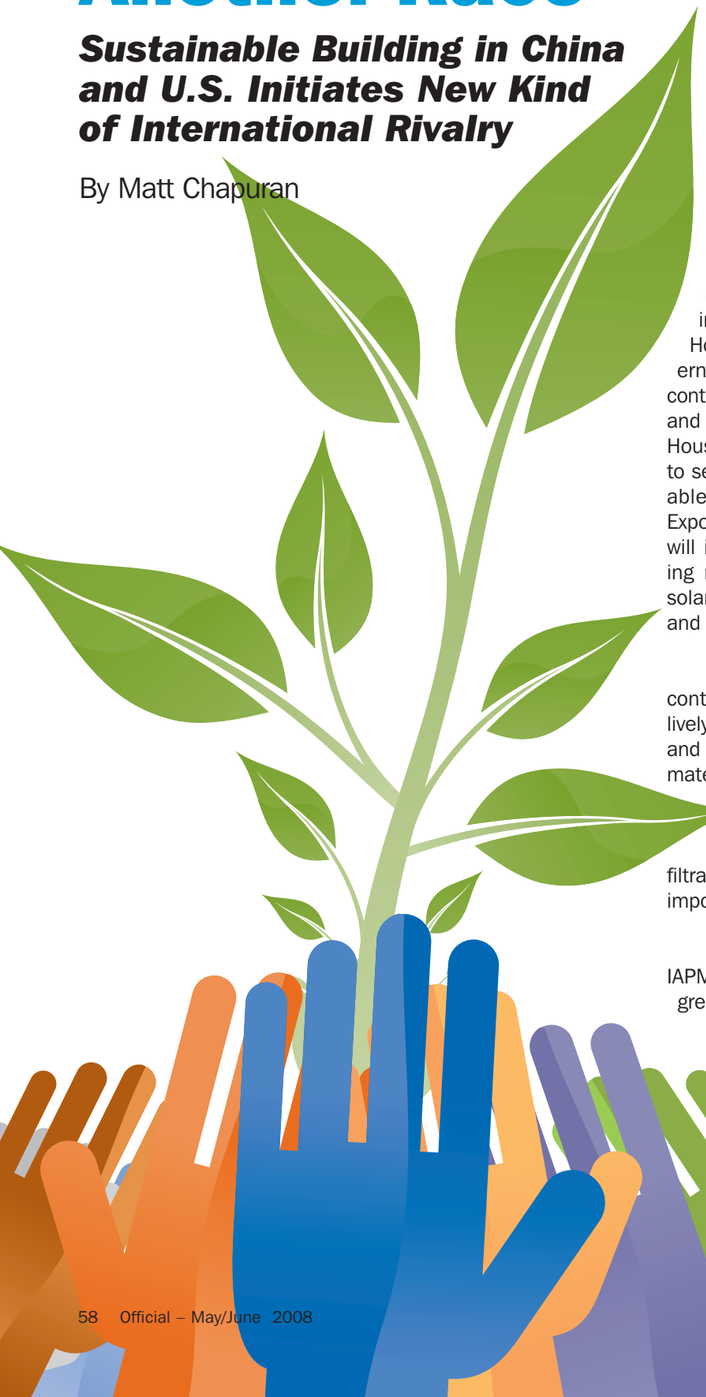
Green Signals Beginning of Another Race

Sustainable Building in China and U.S. Initiates New Kind of International Rivalry

By Matt Chapuran



The World Bank estimates that by 2015 half of all new building construction worldwide will take place in China. The economic impact will be considerable as will the opportunity to innovate with Green design and building practices. With a number of projects, the Chinese government has embraced this opportunity, while simultaneously some high profile projects in the United States have begun their own greening. In the 21st century, have we left the Space and Arms Races behind in favor of a more collaborative Green Race?

The Tomorrow House

"In some areas we are not as advanced as the U.S.," concedes Yang Yong, chief engineer from the Shanghai Research Institute of Building Sciences in China (SRIBS). However, the Chinese government has awarded a contract to SRIBS to design and construct the "Tomorrow House," a residential project to serve as a model of sustainable building and construction at the 2010 World Exposition in Shanghai. The multi-layered eco-residence will incorporate several cornerstones of the "green" building movement, including natural ventilation, day lighting, solar energy, 3-R materials, a changeable building envelope and indoor gardens.

While the project itself is exciting, it stands in stark contrast to China's overall infrastructure. "The market is very lively," Yong says. "So things must be standardized more and more." SRIBS is positioned strongly in the building materials market, but Yong sees room for improvement with regard to water quality and efficiency. "In the U.S., water can be consumed directly from the pipe or hose. This is not so in China. We must do more with filtration before drinking. Improving that quality is most important to our moving forward," Yong says.

To that end, SRIBS has begun a dialogue with IAPMO. "It seems like a natural fit as they're pursuing a greater understanding of water quality and the plumbing side of building construction," says Dave Viola, director of Special Services for IAPMO. "We look forward to sharing our knowledge of safe and sustainable plumbing while benefiting from SRIBS' expertise in building sciences and energy efficiency."

New Towns Today

The Tomorrow House is not the only project where China is showing its growing appetite for green construction, nor its willingness to partner with American firms. Virginia-based architecture firm William McDonough and Partners provided the conceptual design work for the Guantang Chuangye Sustainable Development project.

Although the project ultimately did not move beyond the development phase, its green attributes speak to the scale and methodology in China's new wave of green building. The project focused on emphasizing nearby parks and existing landscape as a backdrop to a community where commuting by means other than car is encouraged through bike paths and close proximity to public transit.

Even more groundbreaking was the intricate plumbing system, intended to direct water from bathing and clothes washing into low-flow toilets. Wastewater could then be converted easily into fertilizer for nearby fields or in creation of saleable electricity. Covering more than 5,000 acres, the astonishing breadth of Guantang Chuangye and similar new towns in China prompts questions as to why similar scale projects haven't been realized in the United States.

The advantage that China has is in its centralized government. For good or ill, the public comment process so familiar and occasionally derided by developers in the United States has a limited role in China, allowing projects to move more quickly and affording architects more freedom to experiment with progressive design.

"In the United States, the demand is driven much more by incentives," explains Joe Marcotte, program manager for the China-U.S. Center for Sustainable Development. Founded in 1999, the China-U.S. Center for Sustainable Development places its focus on identifying projects that, according to its Website, "by design enable commerce, communities and nature to thrive and grow in harmony." Like other projects in this current wave, the China-U.S. Center has participated in a sustainable village design project. Centered on the rural area of Huangbaiyu, near Benxi City in Northeast China's Lianing Province, the team's master plan emphasizes local, sustainable resources in construction and increased quality of life.

Marcotte explains, "Rebates or tax credits are the prevailing model" for green investment as opposed to government-developed conservation policies. Although Marcotte points to some progressive cities, such as Portland, Ore. — where REACH Community Development recently completed Station Place, a partially city-funded project that uses the rooftop to harvest rainwater and flush up to 75 toilets — green development in the United States is based in local municipalities rather than extending from a central government. "The advantage of a city like Portland," explains Laurel Lyon, REACH's manager of Volunteers and Public Relations, "is that it's small enough so that change can be noticed, but big enough so that change can be a model for the rest of the country." However, while American efforts at green building are not on the same scale as those in China, they are interesting in their own innovations.

ECHO Can Be Heard

www.echovermont.org

Situated in Burlington, Vt., the ECHO Lake Aquarium and Science Center is the first building in the state to reach LEED (Leadership in Energy and Environmental Design) Platinum Rating — a designation made by the United States Green Building Council — for attributes such as sustainable site, water efficiency, materials and resources. Like the designs for the Chinese new towns, ECHO reduces carbon emissions by encouraging alternative forms of transportation. Located close to a bus route, ECHO also has bike racks installed adjacent to the property. Showers are available inside the facility for bike riders. Three electric car charging terminals are on site and preferred parking is earmarked for carpools.

According to ECHO's Website, "Americans extract 3,700 billion gallons more per year than they return to the natural water system." In an effort to reverse this trend, ECHO's design includes a site that directs rainwater runoff to native plants, which are better suited to adapt to the local environment without need for additional irrigation. Inside the facility, waterless urinals and dual flush toilets — which provide users the option of a 1.6-gallon or 0.8-gallon flush — decrease water usage.

In Little Rock, Ark., one of the bastions of the West, the William J. Clinton Presidential Library and Museum has met with similar success in energy and water efficiency. Kara Jensen, program manager for Leonardo Academy, one of the consulting organizations employed by The Clinton Library to achieve its green status, reports that the Library received a

LEED Platinum Rating. The building received points for green cleaning plan and green purchasing, including using cleaning chemicals that are Green Seal Certified and adhere to EPA procurement guidelines. The performance period for green certification can be anywhere from three months to two years. Over the three months of its performance period, the Clinton Library used 99 percent green-certified chemicals.

Courtesy of William J. Clinton Presidential Library

The Building was designed with energy efficiency and water efficiency in mind. A water-efficient sprinkler system complements drought tolerant, low maintenance on-site vegetation with irrigation that uses a computer system to determine how much water is necessary based on moisture in the soil.

"The system cut by 20 percent the amount of water used before," Jensen says. The building also boasts a famously green rooftop, where trees and plants replace standard stone and rubber membranes. In addition to its aesthetic upgrades, the rooftop also helps in reducing energy costs by providing better insulation and captures rainwater for irrigation.

Like ECHO, the Clinton Library was designed with an alternative transportation plan that includes bike racks and showers for bike commuters. A preferred parking plan encourages carpooling, but as a further innovation, the preferred parking is offered to employees that carpool with employees from a neighboring building. "It's exciting because they're reaching beyond their building envelope," Jensen says.

Where East Meets West

"This isn't about China or the United States," Marcotte says, "or about conflict, tension or competition. It's about collaborating to develop innovative green technologies and design solutions." The vast rate of urbanization in China is the impetus for green design. The Central Government is finding pressure on existing large cities to accommodate the influx of new urban workers and, as a result, are finding the need to dedicate new towns, essentially suburbs, but with all the amenities of a fully functioning city.

Water is a huge issue in China, not just diminishing supply, but also because much of the water supply is tainted due to heavily polluted waterways from industry and agriculture. However, because some segments of the Chinese population are unaccustomed to technology that Americans take for granted, such as potable water in flush toilets, there is an opportunity to innovate with technology such as harvesting rainwater and grey water for waste plumbing.

As perhaps a definitive sign that this new collaborative development is working toward more peaceful goals, a stated goal of the Sustainable Village Design project is, "to provide a higher quality of life for the villagers and to exemplify a more hopeful future for the children."