LEED-CERTIFIED BUILDINGS REDUCE ENERGY USE BY AN ESTIMATED 25%, WHICH MEANS LESS ENERGY CONSUMED, HARMFUL EMISSIONS REDUCED AND A BETTER FUTURE FOR CHINA.
ON THE COVER
Tengwang Pavilion

The Pavilion of Prince Teng, or Tengwang Pavilion, is located in the north west of the city of Nanchang, in Jiangxi province, China, on the east bank of the Gan River. It is an example of magnificent ancient Chinese architecture.

Photo: hxdyl/shutterstock

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President and CEO, USGBC & GBCI

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GLOBAL LEED STATISTICS AS OF SEPTEMBER 2017

- Total commercial LEED projects globally: 91,195
- Certified: 39,176
- Currently registered: 52,019
- LEED for Neighborhood Development Certifications: 194

Gross square footage of LEED projects*: 19.335 Billion

LEED for Homes Units: 414,066

*Excludes ND and LEED for Homes

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- Solid Waste Saved: 24,140 lbs.
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Tell us what you think. We want to hear from you. Please submit letters to the editor to editor@usgbc.org.
The exponential growth of green building in China and across the globe is a remarkable achievement, and the positive effects benefit us all. Leaders of the green building movement are helping mitigate climate change, positively affecting the health and well-being of millions of people, using fewer resources than ever before and reducing the impact of buildings on the environment. The U.S. Green Building Council’s (USGBC) Leadership in Energy and Environmental Design (LEED) and other green building programs have created a path forward for this market transformation, changing the way buildings, communities, and cities are planned, constructed, maintained, and operated.

Green building has also been identified as a critical component in meeting the goals of President Xi Jinping’s 13th Five-Year Plan for Economic and Social Development of the People’s Republic of China. The Five Year Plan not only forms a detailed blueprint for China’s development and evolution over the next five years, but it also reinforces the need to contribute to China’s vital environmental and sustainable building efforts.

One of the most inspirational takeaways from the Five-Year Plan is its focus on the people. The plan’s success is dependent on the people’s involvement … and the fruits of these efforts will, in turn, be shared by all of China. This style of national leadership not only engages and benefits China’s citizens; it also inspires green building leaders worldwide, encouraging the advancement of a sustainable built environment for all.

As a global leader, China’s involvement in a sustainable built environment is essential, and the nation is rising to the task. In the last several years, I have personally witnessed the rapid expansion of China’s commitment to green building and the important accomplishments the country has made.

According to the Dodge Data & Analytics World Green Building Trends 2016 SmartMarket Report, global green building is expected to double every three years and emerging economies like China will be engines of green growth, with development varying from two- to six-fold over current green building levels.

China has shown great determination in promoting sustainability on a global scale and, in the process, has better secured the health and well-being of billions of people. Those ambitions are noble, and our organization is honored to continue contributing to the challenging task at hand.

As China becomes more urbanized, as the population continues to flow into cities; as the nation continues to address environmental challenges involving air, water, and waste; and as the government and the people continue to build new homes, factories, technology centers, schools, offices, mass transit systems, and more; LEED and other green building rating programs can play an important role and contribute greatly to the implementation of China’s ambitious Five-Year Plan.

It’s my deepest hope that together we will continue to lead in sustainable building and that LEED will play an important role, contributing ideas and strategies that show respect for the environment, that help businesses and people live more economically, and that honor countless generations of new citizens yet to be born.
Global Leader

China’s green building industry takes root and flourishes.

As China’s population density shifts from rural to urban, city planning and development will become the keys to creating more sustainable places to live, work, and play. China’s sustainable future will rely on its cities to be more energy efficient, produce less waste, conserve natural resources, and supply clean water and clean air—and just as importantly, China’s cities will need to be places where people want to live, have families, and engage with their communities. The following consultants, investment firms, developers, manufacturers, builders, interior designers, and architectural firms are dedicated to creating a more sustainable environment across this country. These companies are the true leaders in the growing movement toward China’s sustainable future.
Bisagni Environmental Enterprise (BEE)

In China, a knowledge gap exists between the engineering and design teams introducing sustainable solutions and the construction teams in charge of bringing these solutions to life. During the implementation process, the sustainable goals of a project often get lost.

Bisagni Environmental Enterprise (BEE) brings together design and engineering know-how, construction expertise, and materials specialization to provide the missing link that enables a project to truly achieve its sustainability objectives. BEE’s ultimate goal is to improve a project’s social, environmental, and economic impact—thus making the venture a quality investment.

BEE has worked on more than 150 projects across 25 countries pushing companies in China to exhibit leadership in the green building industry through the pursuit of LEED certification. It participated in some of the first LEED v4 projects in the world—the Haworth Beijing Showroom, which achieved LEED Gold in 2013; and the Naked Stables Resort, which achieved LEED Platinum in 2013.

BEE is the only LEED Proven Provider headquartered in China, and the company actively volunteers its time to ensure LEED’s success in this region, participating on the LEED Steering Committee, LEED International Roundtable, and LEED User Group: Retail and

Below: Naked Stables is the first resort in China to achieve LEED Platinum. All buildings were designed to minimize the environmental impact and blend with the natural surroundings—not just with regard to materials used but also with regard to the orientation of each building.
Restaurant; staff have also chaired LEED professional groups in Taiwan (“Seed”) and Hong Kong (“Platinum”).

To ensure that sustainability targets envisioned at the design phase are ultimately realized for its LEED projects, the company implements an intelligent building management system called QLEAR. QLEAR aggregates building performance data, including energy, water, and gas consumption, together with health and wellness metrics, such as indoor air quality, acoustics, light quality, and occupant movement. This aggregation helps monitor, analyze, communicate, and derive strategies for optimizing building operations, identifying cost savings, and maximizing occupant health. QLEAR also provides direct integration with Arc (which allows any project to measure improvements and benchmark against itself and projects around it) and contributes to LEED credits.

BEE believes that intelligent building management is the future of green building, and that real-time performance monitoring is the next frontier for the green building industry. It will transform the way we design, build, and manage buildings to maximize efficiency and occupant health and well-being, and help push China to achieve its green building vision.

BlueScope

BlueScope is the world’s largest manufacturer of coated and painted steel products for the building and construction markets, and is also a world leader in custom-engineered metal buildings through its BlueScope Buildings business.

BlueScope is dedicated to the development of sustainable buildings and continues to research and develop green products, adopt green techniques, and cooperate with partners to realize sustainable development. To date, BlueScope has completed nearly 20 LEED-certified projects, including the LEED Platinum BlueScope Xi’an plant in China. LEED continues to enhance the leadership of BlueScope in the building and construction industry.

China’s 13th Five-Year Plan proposes to build green supply chain systems. BlueScope’s coated and painted steel products are green building materials. Clean COLORBOND® COOLSMART® steel is an ideal cool roof material that performs with a (Solar Reflectance Index) SRI of 94—the requested heat reflection roof parameter in the Material and Resources credit category of LEED. During one year of operation, the BlueScope Xi’an plant saved 7,360 tons of water, 1,562,815 kWh of electricity, and 76,072 cubic meters of gas.
Bureau Veritas

Founded in 1828, Bureau Veritas is a global leader in testing, inspection, certification, and technical consulting, delivering high-quality services to help clients meet the growing challenges of health, safety, environmental protection, and social responsibility. As a trusted partner, Bureau Veritas offers innovative solutions that go beyond simple compliance with regulations and standards; it reduces risk, improves performance, and promotes sustainable development. Bureau Veritas has more than 70,000 employees in 1,330 offices and laboratories located in 140 countries. Currently, it has more than 15,000 skilled employees in 110 offices and laboratories located in 55 Chinese cities.

The company’s sustainability efforts in China are numerous. It actively participates in the validation and verification of Clean Development Mechanism programs in China and has helped Chinese enterprises successfully register more than 340 Clean Development Mechanism programs in the United Nations.

Bureau Veritas actively and vigorously advocates for green buildings in China and has provided technical consulting services for more than 100 domestic projects aiming to achieve LEED certification. For large domestic enterprises, it provides a sustainable development consultation service and helps prepare strategies and specific implementation plans. It has also reviewed the annual sustainable development reports of more than 50 large enterprises.

Bureau Veritas provided more than 4,000 high-energy-consuming enterprises with energy management lectures and more than 50 large domestic projects with energy auditing services.

In the energy sector, Bureau Veritas assists Chinese enterprises in providing clean energy and securing energy safety. It actively participates in domestic ecological and environmental protection, and has provided nearly 1,000 domestic enterprises with Forest Stewardship Council (FSC) Chain of Custody (CoC) certification. Bureau Veritas has a strategic global partnership to review LEED projects in China, Brazil, and India for conformity with Green Business Certification, Inc.’s (GBCI) strict standards for certification.

Project Spotlight:
The Hefei Unilever Distribution Center

Constructed in 2017, the Hefei Unilever Distribution Center is a 117,371-square-meter campus located in suburban Hefei, China, with four warehouses and one administrative office building. The campus is owned and managed by Unilever (China) Limited. The management team was eager to highlight the facility’s green components and management practices, with LEED providing a recognizable metric.

In August 2015, Unilever invited Bureau Veritas to perform a sustainability assessment to explore what would be needed to meet sustainability requirements under each of the LEED certification levels. After an integrative process, the project team targeted LEED Platinum. The LEED certification effort began in September 2015, and the building achieved LEED Platinum on April 20, 2017.

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Below: Bureau Veritas performed a sustainability assessment on the Hefei Unilever Distribution Center to see what was needed to achieve LEED Platinum. In 2017, Bureau Veritas helped Unilever achieve its sustainability goal.
Das Daring Energy Technology Co., Ltd. (TopEnergy)

Das Daring Energy Technology Co., Ltd. (TopEnergy) started its green building certification services in 2005. Since then, TopEnergy has served clients on more than 300 projects in 30-plus cities throughout China, completing more than 100 green building projects in its 12-year history.

In 2012, it became a subsidiary of Das Intellitech Co., Ltd., which is based in Shenzhen and focuses on intelligent systems and energy conservation for buildings. Its clients include multinational and domestic enterprises, real estate developers, universities, and government agencies.

As one of the leading green building consulting companies in China, TopEnergy insists on exploring the new fields of green building development to bring creative ideas and innovations into the industry, and is determined to perform beyond its clients’ expectations.

Below: Das Daring Energy Technology Co.'s goal is to explore sustainability opportunities in China's urban areas through consulting services, as well as building and operating green buildings and creating green communities for future generations.
Project Spotlight: DoBe WE” International Hub @ Temple of Heaven
DoBe WE” International Hub @ Temple of Heaven is being built on a seven-acre lot in Beijing, half a mile east of the Temple of Heaven. The project site was once China’s first tramcar factory, built in 1921 by the French as a diplomatic courtesy. When the factory shut down a few decades later, it was then run as a seafood market and later as an antique market. The nine buildings remain as they were since 1921, and one was even turned into China’s Museum of Tramcar and Public Transportation to honor the building’s history. In 2015, the French government sent a letter expressing its desire to see the buildings renovated for architectural stability and a willingness to fund the renovation.

As the developer, DoBe Group was determined to revive the nine buildings and turn them into an upscale office park. The renovation entirely preserved and reused the original architectural structures—beams, pillars, classic French arches, and window frames—and incorporated modern and Western design elements in the renovation.

Sustainability drove every design decision with the goal of bringing the community closer. Gardens were reclaimed to create leisure zones for occupants and to reduce runoff, giant glass houses were added in parts of the buildings’ exteriors to create an artistic setting for people to relax in and to help climate-sensitive plants grow. Modeled on the traditional Chinese glass courtyards, there is access on all sides to create a shared experience for the community and to increase natural daylight in the building.

EMSI
EMSI (Environmental Market Solutions, Inc.) is an international leader in energy-efficient and sustainability services for buildings and communities. Offering a wide range of services, including green building certification consultation, buildings analysis, sustainable design support, commissioning, retro-commissioning, energy auditing, and energy management, EMSI tailors its services to customers’ needs. EMSI is a part of UTC Climate, Controls & Security, a unit of United Technologies Corporation (UTC), a leading service provider to the aerospace and building systems industries worldwide.

As a leading consultant in the green building industry, EMSI is committed to using LEED. In 2014, EMSI became the first company to reach 100 LEED project certifications in China. By May 2017, more than 170 LEED projects had been completed, and with over 150 more in progress, EMSI expects to deliver its 200th LEED-certified project in 2018.

Looking at current industry trends, Chinese building developers and owners are expected to become increasingly sophisticated, taking a more holistic approach to address the pressing needs of lowering their carbon footprint, improving indoor air quality, and offering a healthy occupant experience. Moreover, developers and owners are interested in cost-effective solutions throughout their buildings’ life cycles. With a long and successful track record in China, EMSI continues to work with customers across China to achieve positive environmental, economic, and societal results.
Faithful+Gould
Faithful+Gould is a leading cost and project management practice employing 2,000 people worldwide.

Its sustainability team is a specialist group created in response to demands for sustainable solutions in the built environment. Each sustainability solution represents an entire life cycle that covers the planning, design, and enabling stages.

Faithful+Gould refines designs through the analysis of building physics, expert construction that assures quality, and a focus on operational performance. As a cost expert, the company always optimizes the balance between sustainability objectives, whole life costs, and affordability in each of its sustainability solutions.

Project Spotlight: Bund Finance Center (BFC)
Bund Finance Center (BFC) is a fully integrated mixed-use real estate complex located in the heart of the Bund Financial Belt in Shanghai. It is one of the representative masterpieces of Fosun Property’s “Hive City” project.

The project covers approximately 420,000 square meters, bringing together finance, commerce, tourism, culture, arts, and other areas, and will include four major business components: office buildings, a shopping center, the Fosun Foundation, and Wanda Reign on the Bund Hotel. Standing 180 meters tall and spanning 418 meters along the Bund waterfront area, BFC enjoys the best views, including a panoramic view of the Huangpu River. BFC breaks into new heights among skyscrapers on the Bund.

Below: Bund Finance Center’s international office buildings consist of 180-meter high twin towers and three independent buildings. All buildings have achieved LEED BD+C: Core and Shell.
With an area of approximately 190,000 square meters, BFC’s premium international Grade A office buildings consist of 180-meter-high twin towers and three independent buildings with signage rights. All buildings have achieved LEED Gold for Building Design and Construction and China Three-Star Green Building Certification.

Some of the main green strategies are:

- Sufficient daylight and open views: a column-free design with pillars spaced 9 meters apart along the periphery of the glass curtain wall and precision construction creates a highly efficient office space, allowing for an open view, sufficient daylight, and the flexible spatial needs of various businesses.

- Improved air quality: a central air conditioning system with centralized cooling and heating source and two modes of ventilation—a Fan Coil System and Variable Air Volume System (VAV)—effectively remove airborne particulates (PM2.5 removal up to approx. 90 percent), thereby increasing the oxygen capacity of indoor air to create a more natural and healthy office environment.

- High-speed and energy-efficient elevators: BFC office buildings are equipped with Schindler S7000 passenger elevators allowing for Grade A energy efficiency and outfitted with Schindler’s PORT Destination Control System to ensure the safest and most efficient working environment for tenants.

Johnson Controls

China is the largest building construction market in the world, with up to 2 billion square meters constructed annually.

This rapid growth has obvious implications on China’s infrastructure and demographic spread, but it also impacts carbon emissions levels across the country. In 2011, buildings accounted for just 28 percent of China’s energy consumption but urbanization, economic growth, and rising population could increase this number by as much as 40 percent over the next 15 years. China has put a series of aggressive goals in place to reduce greenhouse gas emissions and promote sustainable building construction and renovation. Specifically, China’s 13th Five-Year Plan includes a requirement that 50 percent of all new urban buildings be certified as green buildings.

Smart, safe, and sustainable buildings are at the core of Johnson Controls, a Platinum-level member of USGBC. Since its entry into China in 1916, the company has been building healthier, more productive environments for customers, including providing green consulting and commissioning services for more than 60 LEED-certified buildings in China, as well as HVAC equipment and controls for many more. This amounts to more than 2.4 million square meters of high-performing, sustainable space.

Johnson Controls believes that being involved at the design phase of a new building is critical to maximizing its green potential. The integration of a building’s
architectural design with sustainable building technologies and solutions can achieve up to a 50 percent reduction in energy and resource use.

**Project Spotlight: Johnson Controls Headquarters**
The Johnson Controls Headquarters Asia Pacific, which opened in June of 2017, demonstrates the savings potential when a building is designed for sustainability up front. The LEED Platinum building was designed to achieve energy cost savings of 49 percent annually. It features Johnson Controls’ own chillers, heat pumps, and air distribution systems—all of which are controlled by the Metasys Building Management System. Industry partners in the U.S.-China Clean Energy Research Center–Building Energy Efficiency (CERC-BEE) consortium provided key features, such as intelligent lighting and shading, energy harvesting elevators, and solar PV panels. By connecting building, business, IT, and specialty systems, Johnson Controls created an innovative, efficient, and sustainable environment for 1,200 employees.

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**L GEES & Shanghai Zhijie**
Four years ago, Lili Pan founded L GEES and Shanghai Zhijie. Since then, the company has become the first independent USGBC education partner and completed several pioneer projects, such as the SAIC General Motors Administration Building in Wuhan, the first LEED Platinum and China Green Building Label Three Star certified project in central China; the Hong Kong Exchange Data Center, the first LEED Gold project for operations and maintenance and BEAM EB Plus 2.0 project in Hong Kong; and Beijing Parkview Green, the first LEED Platinum project in Asia Pacific. In June 2017, Shanghai Zhijie announced an additional service—healthy building consulting focused on the mainland market.

Below: Johnson Controls Headquarters Asia Pacific houses more than 1,200 employees and has achieved China’s Three Star rating and LEED Platinum.
Mi2

Mi2 is a Beijing-headquartered interior design and fit-out firm with offices across Greater China and the Asia-Pacific region. It is guided by the belief that the surrounding environment directly influences the quality of existence—and the lives of future generations.

As the global benchmark in green building, LEED certification closely aligns with the company’s mission and beliefs. Mi2 was among the pioneers of LEED-certified projects in China and remains one of the few design firms in China that has mastered the methods and materials needed to create an environmentally sustainable, LEED-certified office.

LEED certification ensures that designs and practices are not only as green and sustainable as possible but are also cost effective by using less water and energy. LEED certification is an increasingly important selling point for clients, ensuring that their workplaces align with their sustainability policies and core values.

Certification also demonstrates alignment with the Chinese government’s 13th Five-Year Plan, which advocates a cleaner, greener economy, with a stronger commitment to more sustainable development and growth, environmental protection, and emissions controls.

Mi2 currently has 20 LEED-certified projects in China, including five LEED Gold projects. One is the Shanghai offices of the mining and resources firm BHP Billiton, which, when certified in 2007, was the second project in China to attain this status. Other LEED Gold projects are the Beijing offices of DNV GL, the world’s leading ship and offshore classification society, and offices for the Malaysian sovereign wealth fund, Khazanah Nasional Berhad.

By adopting the leading global green building benchmark, Mi2 continues to lead the way in green and environmentally sustainable development in China.

M Moser Associates

M Moser Associates has valued sustainable design as a key criterion for many years. Since 2008, M Moser has become a recognized expert advisor in sustainability (especially in LEED for Commercial Interiors certification). This growth was the result of developing in-house expertise, and to date, M Moser has developed a full team of sustainability specialists that actively engages in sustainable design and project coordination. Various sustainability-minded designers, engineers, and project managers from other M Moser offices around the world also support this team. The company’s sustainability commitment touches on the lens of people (health), profit (efficiency), and planet (responsibility). At M Moser Associates, sustainability has transitioned from an added service to an integral part of design and construction best practice.

As of May 2017, M Moser’s portfolio includes 13 LEED Platinum, 86 LEED Gold, 16 LEED Silver, and 10 LEED-certified projects worldwide. In China, M Moser has a portfolio of 97 LEED projects, including 9 LEED Platinum, 69 LEED Gold, 12 LEED Silver, and 7 LEED-certified. The company has certified more than 445,900 square meters of space in the last nine years, spanning 24 international
cities, including 11 Chinese cities. It has 37 in-house LEED APs throughout the company. To recognize its contributions to the growth of LEED worldwide, the firm was named a LEED Proven Provider in 2014.

A sustainable project is most successful when there is true integration of sustainability into project procedure, design, and construction. To maximize outcomes through LEED certification for clients, M Moser offers LEED certification services in conjunction with M Moser interior design and construction. Having LEED, design, and construction experts under one umbrella working on the same project offers an enormous advantage to both LEED professionals and clients.

M Moser’s multi-expert approach offers a deep and accurate understanding of LEED requirements, provides sustainable solutions to clients rather than just LEED guidelines to various design and construction parties, presents high-quality LEED submissions and a faster LEED certification schedule, and optimizes investments and strategy to achieve LEED certifications. Moreover, its expertise creates measurable savings and benefits during occupancy and develops a healthy and high-performance working environment.

Parkview Group

Humanity and sustainability have always been the fundamental design concepts for every project created by Parkview Group. Parkview prioritizes sustainability from inception to design to project construction and daily operation. Parkview’s vision is to pass on the concept of sustainability to every staff member, client, and partner.

Parkview Group was established by the Hwang family and is headquartered in Hong Kong. The Group is active in project development in Asia and continental Europe. Its commitment to excellence is characterized by its global perspective, contemporary real estate developments, and leisure industry developments focused on a finer quality of life. For more than half a century, the Group has upheld its people-first philosophy; committed itself to innovative, unique designs and a green philosophy; and relentlessly pursued detail while creating iconic, landmark buildings.

Project Spotlight: Parkview Green

One of the company’s projects, the Parkview Green, has devoted itself to becoming a landmark that brings together green living, environmental protection, and art. Having achieved a LEED Platinum certification, it constitutes a good example of the Group’s brand commitment: “Always Fresh.” In the future, Parkview Group will continue pioneering practical energy and environmental design, construction, and operation, challenging itself to create better projects.
POSITEC

As a cross-national enterprise, POSITEC defines its corporate mission as being dedicated to continuous innovation, the revolution of power tools, and the promotion of social progress. POSITEC implements its mission and responsibility as an enterprise member by applying “green” strategies throughout product R&D, manufacturing, and office activities.

When developing its products, POSITEC pays close attention to the relationship between users and their working environments. It emphasizes technological innovation and develops revolutionary technologies and products such as Vibrafree, Mute technology, Zero Pollution DC mowers, robotic lawn mowers, and Advanced Intelligence Drills. With these advanced technologies, POSITEC has not only enhanced product performance and reduced energy consumption, but also improved the work environment of the users.

Sticking to the concept of “lean and green manufacturing,” POSITEC utilizes advanced eco-friendly equipment and implements clean manufacturing methodology. It controls the use of toxic materials from the source and reduces the discharge of the three main types of waste (waste gas, waste-water, and waste residues) so as to reduce energy consumption.

POSITEC’s head office building integrates advanced energy-saving technologies and reinforces the harmony between people and nature. Designed to conserve the natural environment, it also creates a healthy and comfortable office environment. In 2017, the building achieved LEED Platinum.

POSITEC promotes the culture of a “green enterprise.” It encourages green commuting and a low-carbon office, pushing forward the idea of sustainability into daily administration.

The company advocates the idea of sustainable development and promotes it to its community. Overall, POSITEC is dedicated to accomplishing economic growth while simultaneously sustaining social and environmental harmony.

Shanghai Expo Group

Since the Expo Shanghai China was held on the banks of the Huangpu River in 2010, the site’s redevelopment has attracted widespread attention both at home and abroad. The Shanghai municipal government attached great importance to it and established the municipal development entity, the Shanghai World Expo Group, to implement the park’s construction and management.

Since its inception, the Shanghai Expo Group has ensured the high quality and efficient completion of tasks assigned by the municipal government; at the same time, it has also striven to expand its business and has achieved success.

Formally registered in July 2011, the Group has accumulated valuable experience in developing and constructing the site, keeping the project people oriented but also committing to energy conservation and environmental protection.

Shanghai Expo Group first applied a number of low-carbon environmental protection and energy-saving technologies to the city’s best practice area. An old industrial site, the best practice area suffered from serious soil pollution that required remediation. Protecting and utilizing the original buildings, including an existing plant, was required as well.

In rebuilding the park, Shanghai Expo made full use of renewable materials, renewable energy sources, and
implemented a variety of environmental protection technologies and energy-saving facilities. These include but are not limited to: rainwater collection and utilization (to ease pressure on the municipal pipe network), significant greening for increased organic cohesion, energy-efficient light schemes, integrated solar power, optimized construction practices to reduce energy consumption, and active encouragement of low-carbon travel such as bicycles.

**Shanghai Kekun Energy Technology (KKECO)**

Shanghai Kekun Energy Technology (KKECO) is a leading sustainability educator, consultant, and contractor that promotes and creates healthy and green interiors. The company delivers solid technical support through years of LEED AP and WELL AP training, as well as SITES education. Headquartered in Shanghai with a branch office in Beijing, KKECO works toward building a healthy sustainable environment for the future.

**Project Spotlight: Shanghai Electric Puyi Building**

The Asia Realty Co. building was designed by Lester, Johnson & Morris in 1921 in the neoclassical style. It was designated as a heritage architecture site by the Shanghai municipal government in 1999. This building is located within Shanghai’s Bund building complex, which has eight floors and offers scenic views of the Huanpu River from the rooftop.

Since 1953, the building was operated by a Shanghai housing agency, and then used as an office building by the Shanghai Electric Group Co., Ltd. (SE). In 2011, SE planned to renovate, but due to the historic building’s registration, they could not alter its original architectural appearance.

However, SE proposed a renovation to achieve a China Green Building Label and LEED certification. Because of the historic registration’s limitations, the project team faced great challenges—especially regarding strategies around window design, a fresh air system, roof garden, lighting, and rainwater collection. For each of these measures, three to five solutions were proposed, and the project team discussed the feasibility one by one, determining the best solution.

KKECO participated in renovation discussions in relation to water-efficient sanitary fittings, energy/water submetering and display systems, FSC wood flooring, high-efficiency HVAC equipment, a heat exchange system, high-efficiency irrigation system, and an intelligent system. Once completed, the classical yet modern structure achieved both LEED Gold and the China Green Building Label 2 star certification in 2013.
Right, top and bottom: The Knowledge and Innovation Community is a city development designed to catalyze the transformation of Shanghai’s Yang Pu district from an old industrial zone into a thriving knowledge-based economy.
Shui On Land

Established in 2004, Shui On Land Limited is the Shui On Group’s flagship property development company on the Chinese mainland. Headquartered in Shanghai, Shui On Land has established a solid foundation on the mainland and has a proven track record in developing mixed-use, sustainable development communities.

Shui On Land develops and operates high-quality residential, office, retail, entertainment, and cultural properties. It applies its hallmark approach of master planning to all projects to ensure that developments are fully consistent with government objectives in economic development and urban planning. Simultaneously, it incorporated local historical and cultural characteristics into its designs and planning. Manifesting the total community concept, its projects provide a unique environment enabling “live-work-play.”

Project Spotlight:
The Knowledge and Innovation Community (KIC)
The Knowledge and Innovation Community (KIC) is a city-core development designed to catalyze the transformation of Shanghai’s Yang Pu district from a dilapidated industrial zone to a thriving, knowledge-based economy. Realized over the last decade through an investment of $1.6 billion USD from Shui On Land, KIC is inspired by the synergy of academia, industry, and culture driving California’s Silicon Valley.

KIC employed three strategies for success in this live-work-play-learn community. KIC’s master plan, which is registered under LEED for Neighborhood Development, leverages the district’s unique assets—10 universities and a historic stadium—and weaves together the isolated campuses with a walkable, connected community crafted to attract top talent and businesses and foster their success. Through its pioneering mixed-use, land-use plan and development products, KIC establishes a dynamic community in which the spirit of knowledge-based entrepreneurship infuses day-to-day life.

KIC has created a collaborative ecosystem. KIC’s incubator program, entrepreneurs’ club, collaborative hub, industry events, and social scene bring together a potent mix of academics, researchers, entrepreneurs, investors, and business resources to ignite KIC’s creative synergy.

KIC incorporated innovative operations by creating leasing strategies to attract top companies while an extensive program of entrepreneur events and community activities fosters knowledge sharing and enhances KIC’s high quality of life. The project has three office buildings, which all achieved LEED Platinum, while the master plan was awarded an MIPIM Asia Gold Award in 2016 for Best Mixed-Use Development.
Swire Properties

Founded in Hong Kong in 1972, Swire Properties is a leading developer, owner, and operator of mixed-use, principally commercial, properties in Hong Kong and mainland China. Swire Properties also has a significant presence in Miami, Florida, and has offices in Singapore and Indonesia. The aggregate gross floor area (GFA) attributable to Swire Properties at the end of 2016 was approximately 2.73 million square meters.

Swire Properties’ business comprises three main elements: property investment, property trading, and hotel investment and operations. Its Sustainable Development (SD) 2030 Strategy—to be the leading SD performer in the industry globally by 2030—is organized around five pillars.

At the heart of the strategy is the creative transformation of places into vibrant, high-quality, sustainable communities. This is achieved through proactive investments in Swire Properties’ people, and long-term, mutually beneficial relationships with partners. Importantly, Swire Properties is committed to delivering a positive contribution to its communities through sound environmental performance while ensuring that it delivers sustainable economic performance, combined with good corporate governance and high ethical standards.

Swire Properties has 14 projects that are either LEED Gold or LEED Platinum in Hong Kong, mainland China, and the U.S.

Swire Properties will continue to implement the LEED Sino-Ocean Taikoo Li Chengdu program across its portfolios, with a long-term, company-wide plan to evaluate building performance. The company has begun extensive recommissioning work for existing buildings to maximize energy efficiency, and has launched various tenant engagement programs to prepare for upcoming green building assessments. For tenants who are not familiar with LEED but are willing to explore the possibilities during the fitting-out stage of construction, Swire Properties offers a fit-out guide, which provides a high-level overview of best practices.
Wanda

Green and sustainable development has always been the corporate core value and development strategy of Wanda Group. Wanda explicitly incorporates this vision into its corporate 10-year strategic development plan and regulations, and conducts an annual check, which has led to great achievement. Wanda Group issued “Wanda’s Energy Conservation Guideline (2011-2015)” in 2011 and “Wanda’s Energy Conservation Guideline (2016-2020)” in 2016. The guideline is a five-year plan that specifies the target of green building practice, the guarantee system, and the technical and management process.

As the most prominent green building rating system in the industry, LEED is widely used in Wanda’s overseas and domestic projects. Wanda integrated those applicable green building technologies and strategies from LEED and the China Green Building Label System into its internal design standards. In this way, its objective of sustainable development can be better fulfilled.

Wanda is the leader in China’s green building industry with the largest number of certified green building projects. Using LEED to guide the design, construction, and operations of its projects not only guarantees sustainable development but also makes the buildings more environmentally friendly and healthier for the occupants, and demonstrates Wanda’s commitment to social responsibility.

Left page: Swire Properties mall in Guangzhou, China, has achieved LEED Platinum under LEED for Existing Buildings.

Top: Wanda Group has the largest number of certified green building projects in China. The company uses LEED as a guide in the design, construction, and operations of its projects.
BIG
IN BEIJING
The tallest building in China’s capital—a beacon of sustainability—is symbolic of a green building renaissance in the world’s largest country.

**WRITTEN BY CALVIN HENNICK**

The China World Trade Center, a massive, multi-phase development in Beijing’s Central Business District (CBD), is known colloquially as “the place where China meets the world.”

The first phase of the 42-acre development—the largest in Beijing—opened in 1990, and since then, the China World Trade Center has introduced the capital to its first Starbucks, among other Western and international shops. The site is home to hotels, apartments, office space, an exhibition center, and a luxury mall, and many tenants are non-Chinese companies. But the project’s global flair goes beyond Seattle coffee and designer handbags. The China World Trade Center—and, in fact, the entire CBD—is a hub of China’s burgeoning green building industry, with Chinese and international companies alike eager to demonstrate their commitment to sustainability.

“Many of the tenants are foreign companies, and those companies want a [Leadership in Energy and Environmental Design] LEED building,” says Charlie Zhu, a board member and project director at the Beijing green building services firm Das Daring Energy Technology Co. “But there are also many Chinese companies that want to be involved with LEED projects to show their international sensibilities. There are many companies in China who go to American exchanges like NASDAQ to go public and to raise capital. These companies often use LEED for their headquarters, and it’s a way to show their shareholders and others that they’re committed to sustainability.”

Nellie Cheng, managing director for Greater China at the U.S. Green Building Council, says that, in addition to the economic and environmental benefits of LEED certification, businesses in China are attracted to the designation because it helps to identify them as global players. “The [CBD] has a very high reputation for sustainability. From the CBD administration to the level of the building owners, they all want to strive for sustainability, and LEED, as a brand, is a very strong indication of sustainability. That’s why they go for it,” Cheng says.

Cheng says that LEED certification can stir natural competition among business managers. “It’s usually, if Company A got LEED, then Company B will think, ‘Oh, they got this, we must also go for this,’” Cheng explains. “It’s competitive.”

Das Daring Energy Technology Co. served as LEED consultants during the construction of two major recent buildings at the China World Trade Center site. China World Trade Center 3A, a 330.0984-meter skyscraper, opened in 2010 and achieved LEED Gold in 2013. The mixed-use skyscraper is the tallest structure in Beijing and is considered by many to be the centerpiece of the CBD. China World Trade Center 3B, which stands at 288.036 meters, was completed this year, and is LEED registered. Phase 3C of the China World Trade Center
Top three photos: China World Trade Center 3A has fritted glass and metal fins on the tower’s facades to help mitigate solar heat gain while maximizing daylight. Bottom: China World Trade Center 3B has an exterior curtain wall that is slightly tilted to decrease glare and solar heat gain in the warm summer months—it also makes the façade self-cleaning. Photos: SOM
development, which will introduce a civic green to the area, is currently in the design phase.

“‘China World Trade Center’ isn’t just the name of this development,” Zhu says. “It’s also become a nickname for this entire area of the city. The metro station is called the ‘China World Trade Center.’ In Beijing, if you tell someone that’s where you’re going, they know what you mean. The name is very famous in the city.”

“It’s like the slogan says,” Zhu adds. “The China World Trade Center really is where China connects with the rest of the world. And I think that LEED is a big part of that.”

In recent decades, China has been known for rapid industrialization and a growing economy. Because China’s economy was still catching up with the rest of the developed world’s, the thinking went, stakeholders in the world’s largest country would be focused more on spurring that economy than on environmental concerns—the same as has been the case for other countries with rapidly expanding industry.

While it’s true that Chinese cities have struggled with air quality and curbing large amounts of emissions and pollutants from factories and cars, the country in recent years has adopted a more aggressive stance on environmental issues. In 2013, the government issued an air pollution action plan, with the goal of reducing particulate matter by 10 percent. The country’s Ministry of Construction established its own green building certification code—Green Building Evaluation Labeling (GBEL), also called China Three-Star. And in June, Time magazine even wrote that China had “wrestled the mantle of leadership on climate change” away from the United States after the U.S. pulled out of the global Paris emissions-reduction agreement.

The percentage of firms expecting to have more than 60 percent of their projects certified green is anticipated to grow from 5 percent currently to 28 percent by 2018.

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Green Building in China: Looking Toward the Future

Chinese firms expect to significantly increase their work on green projects in coming years, according to survey data. Firms were asked to report both their current levels of green building projects, as well as their expected levels of green building projects three years into the future.

<table>
<thead>
<tr>
<th>Current Level</th>
<th>Future Level</th>
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<tbody>
<tr>
<td>No Green Building</td>
<td>8%</td>
</tr>
<tr>
<td>1 to 15 Percent</td>
<td>10%</td>
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<tr>
<td>16 to 30 Percent</td>
<td>5%</td>
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<td>31 to 60 Percent</td>
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<td>More Than 60 Percent</td>
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PERCENTAGE (%) OF GREEN PROJECTS

These developments have also coincided with a marked spike in LEED development in China. In 2014, China became the world’s second-largest market for LEED projects, behind the United States. In March of this year, the country surpassed 1,000 LEED-certified commercial projects, with approximately 3,000 LEED-registered projects in the pipeline.

“The exponential growth of LEED in the global marketplace and in China drastically helps mitigate climate change and positively affects the health and well-being of millions of people through our built environment,” Mahesh Ramanujam, president and CEO of USGBC, said in a statement in March. “LEED has created a path forward for market transformation while changing the way we think about how buildings, communities, and cities are planned, constructed, maintained, and operated.”

According to “World Green Building Trends 2016,” a SmartMarket Report from Dodge Data & Analytics, global green building is expected to double every three years, with emerging economies like China, India, and Brazil driving much of this growth.

Survey data from the study shows that China, in particular, is primed for an even larger green building boom than the one the country has experienced over the last several years. Currently, one third (33 percent) of Chinese respondents report that green buildings make up 15 percent or less of their total projects. By contrast, only 15 percent of firms say that green projects will make up such a small portion of their work three years from now. Similarly, only 5 percent of respondents say that green projects currently make up the majority of their work, but that number jumps to 28 percent when firms are asked to project three years into the future.

Das Daring Energy Technology Co. has been involved with a number of notable LEED projects in China, in addition to the China World Trade Center development. Sino-Ocean Taikoo Li Chengdu, for example, is a low-rise, mixed-use project with shopping, dining, entertainment, office space, and hotel accommodations. The site was previously developed, and has historical buildings on site. During the design stage, three historical buildings were carefully examined, and the retrofit design was crafted to respect historic elements and comply with redevelopment regulations. A computer model of airflow helped designers to determine the buildings’ orientation, improving natural ventilation and optimizing a passive-solar design. A graywater system harvests rainwater, which is used both for irrigation and to flush toilets.
Top and above: During the design stage of Sino-Ocean Taikoo Li Chengdu, three historical buildings were examined, and the retrofit design was crafted to respect historic elements.
In addition to raising their international profile, Cheng says, there are three chief reasons that Chinese companies opt to pursue LEED certification, and these reasons largely mirror the drivers for U.S. companies. “First of all, there’s the sustainability value—the energy you save, the water you save, the carbon footprint you reduce,” Cheng says. “Then, the second part is the business value, meaning, ‘How much does this actually save the owner in operating the building?’ And the third one is the corporate value. The corporate value is, once they do this building, how that influences their corporate culture, and how that contributes to their corporate social responsibility efforts.”

In surveys, Chinese companies report a number of top triggers driving green building activity. Most of these closely reflect global trends, but health concerns appear to be an especially important driver in China. Globally, just 15 percent of respondents cited “healthier neighborhoods” as a top motivation for green building. In China, that number doubles to 30 percent.

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The drivers for the China World Trade Center LEED certification, however, largely reflect the broader trends. “The owner thought that pursuing LEED certification for the project was a good way to show its corporate social responsibility, sustainable development and meet their potential tenants’ demands,” Zhu says.
At the China World Trade Center, sustainable features include energy-efficient lighting fixtures, a state-of-the-art ice storage system, a variable air volume (VAV) system, a low-e glass curtain wall, carbon dioxide sensors, ultraviolet germicidal irradiation (UVGI) systems, a graywater system, and a building design that maximized daylight.

“The whole development lasted for more than eight years, to track and inspect all the green building features that were implemented,” Zhu says. “The project team consisted of more than 30 companies from different professions, which made the coordination and communications very challenging.”

China World Trade Center 3A, also known as China World Tower, creates a pedestrian-friendly and urban environment through public garden spaces, walkways, protected courts, and retail frontages. The skyscraper is a slender column layered with fins that provide shade and present a changing view as visitors move around the building. The façade of the building covers 112,000 square meters—the same as 16 football fields.

China World Trade Center 3B, by contrast, is wrapped in horizontal bands of canted glass. The exterior curtain wall is 3 degrees off vertical, which makes the façade self-cleaning, decreases the glare for occupants, and results in an 8 percent reduction in energy load.

“The form is evocative,” Brian Lee, a design partner at Skidmore, Owings & Merrill, the architecture firm for the project, has said. “It could be a bamboo shoot or a pagoda, but it’s driven by practical issues.”

The practical benefits of sustainability features, Zhu predicts, will become more and more apparent to prospective commercial tenants in China as time goes on. When the developers of the China World Trade Center buildings applied for LEED certification, Zhu says, tenant demand was third on the list of reasons, behind company policy and corporate responsibility. “I think the demand is emerging,” he says.

As in other markets, Cheng says, LEED certification gives project developers a way to hold themselves accountable for meeting those demands. She likens green building to a cake, saying that LEED standards are the “recipe,” ensuring that bakers don’t skip steps for the sake of expediency.

“We always say LEED is a movement,” Cheng says. “The reason why LEED is a movement is because of an increased awareness of the importance of sustainability. But simply raising awareness is not enough, because people need a tool to say, ‘Yes, I’m inspired to reach for sustainability, but how do I get there?’”

“LEED provides inspiration,” Cheng adds. “But LEED, more importantly, provides the way to actually achieve that goal.”
SUSTAINABILITY IN SHENZHEN
Almost 40 years ago, Shenzhen City was a rustic fishing village in China’s subtropical Pearl River Delta. Located just north of Hong Kong, the 790-square-mile region was known as Baoan County and was home to just 30,000 people. But in 1979, former Chinese President Deng Xiaoping established Baoan as China’s first Special Economic Zone. Along with the name change, the move opened Shenzhen to capitalism and a torrent of foreign investment. Today, some 12 million residents live in Shenzhen, one of China’s largest and wealthiest cities. Its financial sector boasts the Shenzhen Stock Exchange, and its factories make an estimated 90 percent of the world’s electronics. The city also attracts prominent hi-tech companies and business travelers from across the world.

Shenzhen’s rapid development is awe-inspiring, but it comes with familiar challenges faced by much older cities: urban sprawl, construction waste management, and pollution. Enter Raffles City Shenzhen, a new 2.5 million-square-foot, multi-use commercial, retail, and residential development that has achieved the U.S. Green Building Council’s (USGBC) Leadership in Energy and Environmental Design (LEED) certification for Building Design and Construction (v3 2009). In April, Raffles City Shenzhen unveiled the first phase of the project, a six-story, LEED Gold shopping mall with space for 200 tenants. The mall is already anchored by high-end cinema chain Palace, gourmet supermarket chain Taste, and international restaurants including Singapore’s Putien, Europe’s Blue Frog, and Enmaru Izakaya from Hong Kong.

The mall spans 750,000 square feet and is seamlessly connected to a LEED Gold commercial tower and the Ascott Raffles City Shenzhen, a LEED-certified, fully serviced luxury hotel. Both are scheduled for completion in September. Together with CapitaLand’s nearby residential towers, Raffles City Shenzhen will reduce urban sprawl by creating what the developer calls a “city within a city”: a multi-use urban center that is transit friendly, energy efficient, and sustainably designed.

“We considered the sustainability strategy from the very beginning of the design, identifying opportunities to minimize the carbon footprint during each step of the development,” says Yuanguang Li, the project’s LEED consultant and spokesperson for its developer, Singapore-based CapitaLand. Li is also head of sustainability and energy in China for WS Atkins, the UK-based design, engineering, management, and consulting firm that led Raffles City Shenzhen’s sustainability efforts.

The Shenzhen project is CapitaLand’s eighth Raffles City and part of a $78 billion portfolio of multi-use developments, shopping malls, serviced residences, commercial buildings, and homes across more than 140 cities and 30 countries. Other Raffles Cities can be found in Beijing, Shanghai, Bahrain, and Singapore, where...
CapitaLand opened its flagship Raffles City in 1986. The developer locates its Raffles City brand in what it calls “global gateway cities”—modern urban centers where young IT, high-tech, and financial professionals from around the world come to work, live, and play.

LEED certification and sustainable design “have always been a key focus in CapitaLand’s approach to development,” says Li, and about 60 percent of the company’s projects in China are LEED certified or seeking LEED certification. That includes the recently completed, LEED Gold Raffles City Chengdu, 1,100 miles north of Shenzhen. The company has committed to certifying all projects using LEED, BCA Green Mark (Singapore’s green building certification), or other regional sustainable certification guidelines. It’s part of an effort to create what Li calls “vital cities,” where downtown commercial districts mitigate the effects of urbanization by serving as one-stop dining, shopping, and lifestyle destinations.

CapitaLand’s extensive portfolio of LEED-certified projects provides useful lessons in building designs that meet their energy- and cost-savings potential. A holistic approach is essential, bringing together planners, designers, sustainability experts, and builders long before a project breaks ground.

“By thinking about sustainability from the design phase, you can select the best green strategy based on the region’s weather, its overall climate, and the requirements of the project,” says Li. “And during construction, we need a deep sustainability team to monitor the construction program and make sure all green building requirements are adopted and all high-performance systems are tested and commissioned. That’s how we make sure our projects are green in terms of actual performance, not just certification.”

To begin that process in Shenzhen, CapitaLand and WS Atkins collaborated with Benoy, the renowned design and architectural firm based in London. Since 1947, Benoy has made its mark in 80 countries around the world, from a six-district master plan to revitalize Cali City, Colombia, to the architecture, masterplan, and interior design of Ferrari World Abu Dhabi, the carmaker’s space-age indoor theme park (and the world’s largest) in the United Arab Emirates. All of Benoy’s designs are guided by principles of sustainable urban development, and LEED-certified projects comprise 25 percent of its Hong Kong office’s work.

In Shenzhen, the firm designed Raffles City’s master plan and spearheaded the architecture, interior design, and façades for the mall and IGA office building. In fitting with the city’s character as a young, global hub, Benoy’s team was comprised of young designers and architects from across the world: New York City, London, Sydney, Hong Kong, and Beijing. Together, they brought worldly
design perspectives to Raffles City’s unique vision of sustainable urban development.

“Raffles City Shenzhen is one of many projects that are new to Shenzhen, because the city itself is relatively young,” says Billy Yu, associate director at Benoy and design architect for the Raffles City Shenzhen project. “But while some projects in Shenzhen aim for height as iconic towers, and others aim for size, we wanted to plan for a well-connected and integrated destination for local residents. From the office and residential towers to the retail area, into the parkland, we and CapitaLand tried to make an impact and influence the city in a sustainable way.”

According to Yu, Shenzhen’s future depends on this new way of designing and building. Although the city has only been around for 40 years, he says, “It will not survive another 50 years without sustainable development. We all know and believe that sustainability is the only way to go.”

To that end, Benoy sought to fit Raffles City Shenzhen within the existing cityscape while adding sustainable elements to the surrounding downtown. The site is located in Nanshan, the city’s creative district and a popular destination for tourists and business travelers. So, Yu’s team began with the site’s footprint, designing a subterranean roadway that now runs along the spine of Raffles City and diverts traffic and pollution from the pedestrian-friendly layout. The underground road integrates reflect-and-diffuse skylights to reduce the consumption of artificial lighting.

The buildings are oriented to be self-shading, with the 17-story commercial tower and hotel shading the mall. They’re also situated close to public transportation—the subway is just a five-minute walk and a future stop will connect directly to the mall—and 287 bike racks and onsite showers are available across the development. These sustainable features earned LEED Sustainable Sites credits for alternative transportation–public transportation access (SSc4.1) and bicycle storage and changing rooms (SSc4.2), and workers, residents, and shoppers can now easily choose healthier transportation for themselves and the environment.

Resurrecting some of old Baoan’s rustic past, Benoy designed the complex around a central green and a new 1.6 million-square-foot park, enhancing the city’s landscape and providing green space for nature-starved urbanites. The designers also added rooftop Sky Gardens on the mall, which are accessible to hotel guests and commercial tenants.

The façades and interiors of Raffles City Shenzhen’s buildings complement Benoy’s site plan, using passive and active designs to reduce energy use and earn LEED Energy and Atmosphere credits for optimizing energy performance (EAc1). Double glazed low-e windows
and shade fins on the commercial tower reduce the energy required to cool the buildings. An ice storage air conditioning system, variable air volume (VAV) system, and efficient chiller plant control reduce the development’s energy load and provide thermal comfort in South China’s warm, humid climate.

The hotel’s 182 luxury serviced apartments benefit from rooftop solar panels, which are used to heat the units’ water. And a building automation system integrates and controls all of the building’s energy-efficient heating and cooling technologies.

Across the entire campus, rainwater recapture, graywater recycling, and condensed water reuse systems compensate for the landscape irrigation, floor washing, and sewage demand. The office building alone will reduce nonpotable water consumption by 60 percent and potable water use by 45 percent. Together with efficient water-saving fixtures, these features earn nearly every available LEED Water Efficiency credit for water use reduction (WEc3).

But Benoy’s designs go beyond energy and water efficiency, aligning with USGBC’s emphasis on improving the living experience, health, and well-being of residents, shoppers, and tenants. The first floor of the mall is underground, so Benoy designed a sunken plaza to introduce natural daylight into the space (saving energy, too). A window-to-wall ratio of 40:60 provides abundant natural light above ground and visual access to the development’s surrounding park, and many windows open for natural ventilation. At the hotel, sensible depth rooms allow more natural light to reach living spaces, and high-efficiency LED lighting is used throughout. A fitness center will be located atop the commercial tower, providing more opportunities for healthy lifestyle choices.

When it came to building Benoy’s designs, CapitaLand tapped Shenzhen Huajian Construction Group Co. to build the mall and Josef Gartner Curtain Wall (Dongguan) Co., which is building the commercial tower and the Ascott Raffles City Shenzhen hotel. The contractors used locally sourced, recycled, and sustainable materials, offsetting the development’s carbon footprint and earning LEED Material & Resources credits for recycled content (MRc4) and regional materials (MRc5). More than 30 percent of the materials used to build the office building and mall are locally sourced.

Perhaps most importantly, the builders exceeded LEED benchmarks for construction waste management (MRc2) by diverting leftover materials from landfills. The project recycled or salvaged 82 percent of its
nonhazardous construction waste, an impressive feat and an ongoing challenge in a city that has seen a 40-year construction boom.

According to Nicole Tang, procurement manager at Josef Gartner’s Dongguan firm, efforts to integrate sustainability into Shenzhen’s construction industry are part of a shifting nationwide strategy. “China cares more and more about environmental protection,” says Tang, “so the government is now looking for long-term, sustainable development strategies.”

On the Raffles City Shenzhen project, Tang oversaw Josef Gartner’s technical documentation, something she and the company are well accustomed to. The firm is part of Italy’s Permasteelisa Group, a global leader in engineering, project management, and manufacturing and installing sustainable building envelopes and interiors. Its work can be seen across Europe, the Middle East, Asia, and North America.

While sourcing sustainable materials for the buildings’ façades was integral to achieving LEED Gold certification at Raffles City, Li’s team also worked closely with contractors to make sure the buildings’ interiors contribute to a healthy environment for occupants. Everything from ceiling panels to flooring to paint is part of achieving certification, and Raffles City Shenzhen’s buildings earned LEED Indoor Environmental Quality credits (IEQc4.1 and IEQc4.2) for low-emitting paints, adhesives, sealants, and coatings.

So, what are the results of Raffles City Shenzhen’s designs? When it comes to energy use, the project’s buildings will save almost 2.4 million kWh per year, the same amount used by more than 220 typical American homes. While those savings will significantly reduce the environmental impact of Raffles City Shenzhen, they also translate into big cost savings: nearly $500,000 annually for CapitaLand.

Raffles City Shenzhen will also save 1,076 metric tons of carbon dioxide each year compared to a non-LEED-certified development. And passive and active water conservation will save more than 5 million gallons of water every year.

But Raffles City Shenzhen’s influence on the city’s ongoing development may be just as significant. In a city trying to balance progress with environmental concerns and human health, Raffles City Shenzhen and other LEED-certified developments are catalysts for a sustainable path forward.

“Just like in New York City and London, Shenzhen’s residents want their city to last for centuries,” says Yu. ⭐️
ADVOCACY

Advocating for Change
China makes its mark on the world of sustainability.

By Elizabeth Beardsley

From our origins two decades ago, the U.S. Green Building Council (USGBC) has aimed high: to leverage the value of green construction to transform the market. What we’ve accomplished so far is nothing short of transformational: Our flagship rating system, Leadership in Energy and Environmental Design (LEED), is used in over 165 countries and territories, and we certify more than 1,425,000 square meters every week.

Nowhere is this success more apparent than in China, which had the largest amount of LEED-certified space than any country outside of the United States in 2016. For those of us who work with international partners, this is no surprise. We have seen the surge in interest from Chinese companies and government bodies alike in seeking the best in technology and in leadership distinctions—and LEED hits both marks.

LEED is in its fourth iteration and continues to push the envelope as the global symbol of the most sustainable building that supports the health and productivity of its occupants, and helps reduce the impact of the built environment on the climate.

Consider this: A full 45 percent of LEED credits are related to health and wellness—and LEED building owners in China increasingly seek ways to improve their indoor environment. For example, LEED encourages strategies to ensure healthy air quality by designing for actual conditions and balancing energy, ventilation, and filtration needs. The rating system also includes design strategies that promote occupant well-being by addressing thermal comfort and access to daylight. Beyond the indoor environment, LEED encourages building owners to consider locating their buildings in areas that provide opportunities for increased physical activity and interaction with nature, both of which contribute to overall health.

Climate change is another critical concern for Chinese developers—at the building, district, and city scale. Here too, LEED delivers. High-performing green buildings, in particular LEED-certified buildings, provide the means to maximally reduce the climate impacts of buildings and their inhabitants. Numerous studies have documented the energy savings of LEED buildings, which reduce reliance on and consumption of fossil fuels for heating, cooling, and power. LEED establishes minimum energy performance as well as optional credits for optimizing performance, and research has shown that projects certifying to LEED since 2009 overwhelmingly elect to pursue energy efficiency well above and beyond LEED’s minimum requirements. A 2014 research study at the University of California found that LEED buildings offer quantifiable benefits to the climate well beyond the energy savings. By building with LEED, the buildings in the study emitted, compared to conventional construction, 50 percent less greenhouse gases (GHGs) due to water consumption; 48 percent less GHGs due to solid waste; and 5 percent less GHGs due to transportation.

Moreover, green buildings are designed and built to actively influence inhabitants in ways that support the climate—such as taking sunlit stairs instead of the elevator. They also:

• Enable alternative transportation;
• Direct inhabitants to non-energy using alternatives; and
• Encourage retention and creation of natural vegetated land areas and roofs.

LEED also rewards thoughtful decisions about building location, with credits that encourage compact development and connection with transit and amenities, serving to reduce building and inhabitant carbon impact. Providing occupant feedback with systems like Arc, a dynamic platform that showcases a building’s environmental efforts and performance, can drive further reductions.

It isn’t by accident that LEED supports the climate; rather, reducing the building sector’s contribution to climate change was a core focus when we developed the latest version of the system, and our advocacy work aligns with this goal as well. USGBC is proud to be a part of the We Are Still In statement of leading global and American corporations and organizations committed to continuing to support climate action to meet the Paris Agreement.

In fact, our team at USGBC is working every day on strategic international initiatives advancing a green built environment. Through partnerships with national and global organizations and governments, we actively engage in market transformation around the world. Increasingly, governments recognize that public–private efforts are critical to attaining the world’s Sustainable Development Goals, a UN initiative comprised of 17 goals with nearly 170 targets covering a broad range of sustainable development issues, as
well as their greenhouse gas emission reduction targets under the Paris Agreement.

Through projects like the Building Efficiency Accelerator of the UN Sustainable Energy for All program, USGBC shares best practice policies and ideas with interested city governments throughout the world, leveraging our extensive experience in the U.S. working with cities, states, and federal government agencies on incentives and leadership policies. For example, members of USGBC’s Advocacy team have met one on one with representatives from a number of cities as diverse as Bogota, Colombia; Santa Rosa, Philippines; and Tshwane, South Africa; to help them develop energy-efficient, green building initiatives.

Our team works with business members and partners to provide technical advice and resources to government entities seeking to ramp up private sector engagement and investment. In June, CEO Mahesh Ramanujam was an honored participant in the high-level building efficiency roundtable at the Clean Energy Ministerial 8 (CEM8) in Beijing, an international conference important to China and attended by the Chinese Minister of Science and Technology, Wan Gang. The Clean Energy Ministerial (CEM) is an annual, high-level event open to 24 of the world’s largest countries and the European Union that together account for around 75 percent of global greenhouse gas emissions. Eight CEM countries were represented at the national, state, or local level, with the Shanghai Hongkou District People’s Government participating...
from China. This roundtable dialogue highlighted national governments, local governments, and participants calling for more national leadership to provide clear long-term targets and implementation frameworks to support building efficiency. Notably, Mahesh and others shared insights on the importance of the current opportunity of connected and smart buildings to enhance transparency of building energy performance through data collection and monitoring and verification. USGBC will continue to work with the U.S. State Department and the CEM Secretariat to support the newly launched campaign for energy-efficient buildings through policy expertise and tools such as Arc.

USGBC is proud to be a partner in the U.S.-China Clean Energy Research Center (CERC)’s Building Energy Efficiency Industry Advisory Board. This critical collaborative of businesses in the U.S. and China works to advance technology with a focus on the early commercializing stage to bring solutions to market. Complementing the joint leadership of the U.S. Department of Energy on the U.S. side and the Ministry of Housing and Urban-Rural Development (MOHURD) on the China side, USGBC members including Johnson Controls, United Technologies Corporation, Disney, Dow, Saint-Gobain, and Citibank are members of CERC. An example of one of the exciting projects being facilitated through CERC is testing of next-gen architectural precast insulated walls, which uses 3D printing techniques to enable precast panels to be used in more complex buildings, and to achieve significant energy and financial savings with the enhanced insulation offered. Another project looks at advanced air cleaning materials and building simulation tools to support integrated building systems that use these materials for both energy savings and indoor air quality improvements. Other technology-focused research projects involve integrated sensors, direct current power and smart grids, electrochromic glass, and others, while the Natural Resources Defense Council is heading a policy project, seeking to bring building benchmarking to China. USGBC continues to engage with the CERC and supports its U.S.-China mission in a variety of ways such as sharing policy experience with MOHURD and publicizing results of
these important technology advances in China through briefs and media.

Through the CERC and other efforts, the USGBC Advocacy team works with the China team at Lawrence Berkeley National Laboratory (LBNL). We see huge potential for China to implement its own version of the successful U.S. Better Buildings Challenge—a program our members have championed across the U.S. We are eager to help China benefit from this form of collaborative competition.

Our LEED Platinum headquarters office in Washington, D.C., provides us many opportunities to support the work of Chinese government and businesses. We have hosted distinguished visitors from the Chinese embassy, several districts in China, groups such as the China State Construction Engineering Corporation, China Real Estate Association, China Green Building Council, Green Building Research Center of China Society for Urban Studies, Tongji University, Nanjing University of Technology, Vanke, many Chinese study tours throughout the years, and more. We are pleased to share our experience in using policy alongside private sector motivations to achieve more rapid market transformation as well as government and business goals.

Our experience is that national, state, and city governments can successfully attract private investment and create jobs by modeling leadership with green building—that is, when they put LEED into practice in their own buildings. In a study by Boston University and Harvard University, researchers found that such leadership-by-example policies not only provide public structures the many benefits of green building but also valuable spillover effects, such as serving as an important demonstration of what is possible; creating jobs; increasing the availability of sustainable materials and products in the market; and supporting a skilled green building workforce. Governments can go beyond public building policies by offering various incentives to promote private sector use of LEED. We are excited that leaders in China, such as Wuxi Industrial District and the Chaoyang District in Beijing, offer financial incentives for buildings that achieve LEED certification. These leading districts understand that leveraging the proven success of the global benchmark, LEED will help support their goals for the climate, the health of their workers, and lend distinction to their city.

From educating leading companies and organizations on policy, to partnering on key bilateral government programs such as CEM8 and U.S.-China CERC, there’s never been a better time for USGBC to contribute to the productive actions taking place in China. We’re thrilled to bring Greenbuild to China and to accelerate our collective work until every building—in China and in the U.S.—is a green building.

Left and above: Duke Kunshan University is a state-of-the-art campus located in Kunshan, China. It is the first Chinese university campus to be LEED certified—with all five campus buildings LEED certified.
LEED: A LEGACY
Leaders across the globe have made LEED the most widely used green building program in the world. Leave your legacy today.
#LEEDlegacy
LEED-CERTIFIED BUILDINGS OFFER FRESH AIR FILTRATION, TEMPERATURE CONTROLS AND APPLY GREEN CLEANING TECHNIQUES, WHICH MEANS A HEALTHIER INDOOR SPACE, AND A BETTER FUTURE FOR CHINA.