Talk of the Tower

Question and Answer session, during the filming of the Case Study movie: TAIPEI 101 – The World’s Tallest Green Building
TAIPEI 101 – the making of a green building

How can we make buildings more efficient, comfortable and environmentally friendly? How many resources do they consume today and what measures and strategies can we apply to ensure sustainability? Worldwide, buildings can play a major role in helping to substantially reduce the energy consumption. One of the success stories of the way to greener buildings can be found in the heart of Taipei, the center of commerce in Taiwan.

101 stories above ground and 5 stories below, TAIPEI 101 received Platinum level certification under the LEED for Existing Buildings: Operations and Maintenance rating system, making it not only a world-class commercial landmark, but also the world’s tallest Green Building.

We talked to the owners, consultants and technical experts about how they achieved these outstanding results.

TAIPEI 101

Harace Hong Min Lin (HL)
Chairman and President
TAIPEI 101

Cathy Yang (CY)
Vice President, Tower Division
TAIPEI 101

What makes TAIPEI 101 so special?
HL: The design of TAIPEI 101 includes many eastern Asian cultural inspirations and is a perfect platform to share Asian culture with the international community. TAIPEI 101 also uses the latest and best building technologies. It is this combination of our cultural heritage in the building design, together with the best and newest technology, that allows TAIPEI 101 to be so unique.

Why did you decide to apply for LEED Platinum certification?
HL: TAIPEI 101 was designed to be an environmentally friendly building since the very beginning, however at that time LEED was not very well known in Asia. After the few years of operation that are also very environment-minded, we now hope to gain 3rd party recognition for the positive results of our efforts to save energy and protect the environment. Thus, we applied for LEED Platinum certification.

What are your expectations with TAIPEI 101 getting LEED certification?
HL: Protecting the earth is the topic which has generated the most global attention. We hope by having TAIPEI 101 attain LEED Platinum certification, we
can encourage and motivate more people and buildings to join the Green Building family and drive the growth of the global green building trend.

Green buildings such as TAPEI 101 help to mitigate the ill-effects of global warming, allowing our future generations to have an even better world to live in.

**Why did you decide to apply for LEED Platinum certification and what are the benefits to TAPEI 101?**

**CY:** We started out by simply wanting to save energy costs. As our tower is already very energy efficient and with proper management systems in place, we had the confidence to apply for LEED certification, targeting at gold level. When initial evaluation was completed however, we found that we were very close to the Platinum level, so we decided to go for it.

It is of great value to our corporate image and demonstrates our commitment to corporate social responsibility.

We also believe that this will attract international corporations sharing the same belief in eco-responsibility to become our tenants and customers.

We believe it is very meaningful, not only to us but to the entire real estate industry. We hope that other property owners will realise that if a huge building like TAPEI 101 can achieve Platinum certification, then any building of a smaller size and with fewer tenants, should have no problem to get LEED or other green building certification if they commit to do it.

**What were the biggest challenges for TAPEI 101 during the project?**

**CY:** Firstly, we are applying the US Green Building Council (USGBC) LEED system, therefore the requirements for some equipment and materials are not available in Taiwan, which made it very difficult to obtain some credits we thought we could receive. Secondly, we are applying in the category LEED EBOM: Existing Buildings: Operations & Maintenance. As we are dealing with a building with 10,000 people in it, we needed to get all the tenants on board and committed, which was a lot of coordination and communication work. I am happy to say that most of our tenants agree with the good cause and worked with us without any reservation.

**What did TAPEI 101 look for in their partners for this project? What were your experiences with Siemens?**

**CY:** We wanted all of our partners on this project to be responsive, responsible and proactive. They needed to respond to our needs, fully deliver on their promises and take the initiative to advise us on relevant issues and others we did not think of. Siemens’ people in Taipei have been wonderful to work with. They are professional, ethical and efficient and we enjoy very much having Siemens as one of our most important service providers, and indeed a great partner to work with in running this huge tower.
What were the main challenges to make such an iconic building green?
DP: TAIPEI 101 is an iconic building that is recognized around the world. Not only is it iconic but it is BIG; conducting the Level I energy audit for example, took about one month. So, making the decision to go for LEED was not a simple decision; not a simple step. However once TAIPEI 101 management understood the long term benefits LEED could bring, they became fully committed.

There were 56 different steps that we undertook for this LEED process. The first step was to educate the facility managers about the interrelationship between these 56 steps. The biggest challenge that the entire LEED team faced was educating the tenants about the process that we were undertaking. Getting most of the building users to buy in and practice “Green” took a lot of time and effort to educate them.

The availability of affordable and qualified green materials in Taiwan also made the task of achieving Green Purchasing points extremely difficult.

How did you minimise the downtime and disruption for the building and its occupants during the works?
DP: With a goal set to receive LEED certification by mid 2011, the whole LEED team worked together to come up a plan to meet this very tight schedule. Most of the renovation and testing & balancing work were done out of hours or on weekends, and access to all the tenant spaces had to be arranged well in advance. Tracking of the existing utilities and the installation of new sub-meters for domestic water and electricity were carefully planned to minimize disruption to the building operation.

Which initiatives gave the biggest impact on energy efficiency?
SS: We know that the HVAC systems use more than 40% of the total building energy, which was why optimizing the HVAC plant operation became critical for the whole LEED process and became the key to making this building greener. The end-users also needed to know how to operate the different systems, so TAIPEI 101 identified every single thermostat with its variable air volume (VAV) box and informed the tenants exactly how to adjust the space temperature as and when required. Every time the space temperature setpoint is increased by one degree Celsius, can contribute up to 6% to the total energy saving, and this is a big impact to the building performance.

How important was the building technology and can you give some examples?
SS: Energy Monitoring and Control System (EMCS) allowed us to streamline the operation and control of the HVAC equipment throughout the tower and a good EMCS can optimize the entire energy usage. One of the successes to improve the energy performance involved changing the sequence of operation for the chiller plant, which considerably increased the cooling system efficiency.
What does TAIPEI 101 going for LEED certification mean for the Green Building market? What does it mean for the LEED rating system?

RW: The certification of TAIPEI 101 at the Platinum level - the first in Asia and the largest Platinum EBOM project in the world - will send positive shockwaves through the entire Asian building market. Where much of the market believes that green certification is only attainable by new buildings, the Platinum achievement of TAIPEI 101 demonstrates that not only can existing buildings certify to the highest standards in the world, but can do so at the top level. TAIPEI 101 signals the opening of an entirely new potential market for LEED, which is also the largest group of buildings in the world: existing buildings in Asia.

What were the greatest challenges you have faced during TAIPEI 101's certification process?

RW: Many of the credits required the participation of the tenants in order to achieve the performance levels required in LEED. Coordinating these efforts through many tenants was extremely difficult. Steven Leach Associates, Siemens and the TAIPEI 101 management team worked very diligently to explain the goals of the LEED certification process to the tenants and building management, and did a tremendous job in securing the participation of the tenants to achieve these goals.

What contribution did EcoTech International offer during TAIPEI 101's LEED Process?

RW: EcoTech International guided and coordinated the efforts of the consulting team that included Steven Leach Associates and Siemens. We also took the lead, interfacing with the Green Building Certification Institute and the US Green Building Council to ensure that the owner and our team fully understood the LEED certification requirements and the GBCI and USGBC understood the efforts our team and TAIPEI 101 were making to fulfill them.
How do “Megatrends” affect cities such as Taiwan, and why are buildings important?
PW: Megatrends such as urbanization, climate change and demographic change are threatening the sustainable future of the entire world. Cities play a crucial role in shaping a sustainable future as they account for 75% of the world’s energy consumption and 80% of the greenhouse gas emissions. As an integral part of cities, buildings on average account for 40% of the global energy consumption and 21% of greenhouse gas emissions. Therefore, buildings play a key role for the sustainable development of cities.

What contribution can Siemens make to sustainability?
PW: To date, Siemens has optimized over 6,500 buildings worldwide, which has substantially reduced CO₂ emissions and contributed to more than 2 billion Euros in cost savings. Such savings can be achieved by a relatively low investment in comparison to the total building costs. On average, intelligent building solutions can reduce the overall energy consumption of an existing building by 30%.

Siemens’ Total Building Solutions not only increase a building’s energy efficiency and reduce its CO₂ emissions, but they also provide additional comfort and safety to occupants and can even increase the value of the building.

What is the Siemens Green Cities Index?
PW: The Asian Green City Index is a research project commissioned by Siemens and performed by the Economist Intelligence Unit which compares 22 major Asian cities in terms of their environmental performance and policies. It is part of Siemens’ efforts in raising awareness among city stakeholders’ and decision makers regarding the importance of cities in sustainability. We want to enable Asia’s up-and-coming urban centres to achieve sustainable growth and a good balance among economic competitiveness, environmental health and quality of life.

What lessons did Siemens learn from this unique project?
PW: The cooperation and the team spirit for the TAIPEI 101 LEED project were excellent and we see great opportunities that such a spirit can be carried forward into other projects. More projects such as this will further help to prove the sustainability not only of Taipei City, but throughout the whole of Taiwan.

After our work to help TAIPEI 101 achieve LEED EBOM Platinum certification, other developers and building owners in Taiwan have approached Siemens and our LEED partners, showing great interest in how they can improve energy efficiency, save on energy costs, and achieve a faster
return-on-investment. TAIPEI 101’s project is certainly a best practice, motivating other building owners to follow in their footsteps to become a green and sustainable building advocate.

What message would you give to others who may be considering a Green Building project?
PH: From the sheer size and scale of this project, the most important message is that any building – new or old, compact or a skyscraper, in the US, Europe or in Taiwan – is capable of becoming a certified Green Building. TAIPEI 101’s decision to not only go green, but to attain the highest certification level under the LEED system, proves this by example.

Buildings account for 40% of the world’s energy consumption and 21% of global greenhouse gas emissions; we can bring great improvements to our world by focusing on greening our buildings. What makes Green Buildings such an ideal focus is that it is technologically feasible, in most cases it is fairly straightforward and the benefits are guaranteed and long-lasting.

How does Siemens contribute to the LEED certification of TAIPEI 101?
PH: Our expertise in building technology and energy efficiency helped TAIPEI 101 garner critical LEED credit points in the two largest credit categories: Energy and Atmosphere, and Indoor Environmental Quality. There are 110 points to the LEED certification criteria, and over half of those points are influenced by Siemens products and systems. We provided energy audits, commissioning services, products and engineering services to fine tune TAIPEI 101 so it runs like a Formula 1 racing car.

With 89 floors in operation and approximately 10,000 occupants, the greatest challenges the whole LEED team faced were generally premised on the sheer scale of each LEED task. For example, when we needed to update the building layout and equipment for energy modeling, we had to gain approval from all 89 tenants, and then schedule time with each floor to individually measure and verify equipment effectiveness, as well as document all the changes to each floor layout. But by supporting TAIPEI 101 in becoming LEED Platinum certified, TAIPEI 101 becomes 30% more energy efficient than the average building.

What do you envision as the “next frontier” for the building environment?
PH: A Green Building stands out from the crowd, quite simply because it is a better building. As Green Buildings gain more traction and become the standard, rather than the exception in the built environment, we will see Green Buildings becoming continuously more intelligent, setting the foundation for future smart grid integration.
About TAIPEI 101

Background Information
• Completed at the end of 2004
• 508 meters tall
• 101 floors
• Gross floor area over 2 million sq. ft
• Over 10,000 people in the building

Design Philosophy
• The building’s architecture is inspired by the traditional pagoda as well as the shape of the bamboo
• The office tower is divided into eight sections, each section comprised of eight floors—“Eight” is considered a lucky number and a symbol of prosperity in Chinese
• The exterior walls of each section are marked with a “Ruyi” design, which directly translates to “as you wish.” Ruyi is a Chinese hallmark of fulfillment and contentment
• 101 is a metaphor for continuously seeking perfection
• The “101” logo is derived from the shape of traditional Chinese coins, paying homage to Taiwan’s cultural heritage

World-Class Technology and Building Infrastructure
• Employs the Siemens Apogee Energy Monitoring and Control System, which manages 30,789 control points throughout the building
• Asia’s largest air distribution system: over 3,400 VAV boxes located throughout the building to control water distribution for air-conditioning
• The Siemens SiPass security system monitors 4,000 doors through 300 card readers
• The Tuned Mass Damper, suspended between the 87th floor and the 92nd floor, weighs 660 metric tons and reduces building lateral accelerations and vibrations, especially during strong winds. The Tuned Mass Damper is accessible to visitors.