Asia Pacific Focus
Latest Energy Efficient Developments from across the Region

Global Mission for Greener Buildings
Rick Fedrizzi, Newly Appointed President of the World Green Building Council

Seeing the Light of Day
Use of Natural Light in Buildings
Our specialists help clients to imagine how to move towards fully sustainable buildings, providing insight into how their buildings might be:

• Carbon neutral.
• Self-sufficient, by collecting and reusing water.
• Built using sustainable materials.
• Able to cope with climate change.
• A positive contribution to the community and built environment.
• Sustainable in operation.

We have a long track record of completed green buildings, and in achieving the highest green building accreditations for clients.

A key component of our review of the Zero Net Emissions by 2020 for City of Melbourne, was the implementation of the 1200 Buildings program which is aimed at reducing carbon emissions by 38% on a permanent basis.

Our Existing Buildings-Survival Strategies guides and online tool (developed in conjunction with PCA) provides clients with an easy step-by-step guide to define goals, specify targets and choose the right initiatives for their building to make it competitive in the market. The process was utilised to inform the 1200 Buildings program’s environmental upgrade financing approved measures study. www.yourbuilding.org/ebss/

Arup has pioneered many of the key ideas and strategies in sustainable building design.

We shape a better world | www.arup.com
Vanke Center, Shenzhen, China — as wide as the Empire State Building is tall, the Vanke Center is an example of sophisticated engineering and design. The perforated louvres provide extensive primary sun protection, with UH reducing up to 70 per cent of solar heat gain, yet still providing 15 per cent of light transmittance through the perforation.

GLENN PLATT

Glenn Platt leads the Local Energy Systems theme within CSIRO’s Energy Transformed Flagship, developing technologies for dramatically reducing our carbon emissions and increasing the uptake of renewable energy around the world. The theme’s work ranges from solar cooling, electric vehicles, smart grids and the integration of large-scale solar systems, through to understanding people’s response and uptake of particular low carbon energy options.

Glenn holds PhD, MBA and electrical engineering degrees from the University of Newcastle Australia, and is an adjunct professor at the University of Technology, Sydney. Prior to CSIRO, Glenn worked in Denmark with Nokia Mobile Phones on the standardisation and application of cutting-edge mobile communications technology. Before his time in Denmark, Glenn was employed in an engineering capacity for various Australian engineering consultancies, working on industrial automation and control projects.

STEVE KING

Steve King teaches architectural science, including thermal comfort and building services, in the Architecture program at University of NSW.

He consults to architects and engineers, especially in the area of effective natural ventilation. His experience includes many years of diagnostic monitoring of temperature and humidity performance, of both naturally ventilated and air conditioned buildings.

GRACE DING

Grace Ding is a senior academic at the School of the Built Environment, University of Technology Sydney. Grace has been involved in research projects and published widely in the areas of sustainability. Her research areas include life cycle analysis, life cycle costing, energy analysis, sustainable housing design, building performance analysis, sustainable management, multicriteria and carbon footprint analysis.
A building’s operational phase accounts for 80-90% of its total emissions (UNEP 2010).

That’s 2,276,400,000,000 black balloons!

That’s the level of greenhouse emissions facilities management has the ability to directly influence in Australia every year!

Where the manager reports a higher level of energy efficiency knowledge a building performs better by up to 1.3 stars under NABERS Energy (Warren Centre 2009).

From 1 November the full requirement for a Building Energy Efficiency Certificate under Commercial Building Disclosure comes into effect.

Do you have the knowledge and skills required to operate in this environment?

Training Opportunities

• **Diploma of Facilities Management**
  The benchmark qualification for facilities managers in Australia. Candidates will be guided through 18 units delivered in a fully self-paced online environment delivered by the Holmesglen Institute.

• **Vocational Graduate Certificate in Energy Efficiency for Facility Managers**
  Candidates will gain a strong grounding in where energy is consumed in buildings; how to measure, monitor and analyse energy use. They will evaluate operations and maintenance processes, develop operational and maintenance strategies. Armed with this knowledge candidates will then create and implement effective energy management programs.

• **Continuing Professional Development**
  Delivered throughout Australia to meet current and emerging industry needs.

For more information visit www.fma.com.au or call 03 8641 6666.

The Facility Management Association of Australia (FMA Australia) is the peak national body for facilities management, representing and supporting professionals and organisations responsible for the operational management of Australia’s built environments.
Steve Jobs and Mike Wozniak started Apple Computers from Wozniak’s garage. While still slightly smaller than Apple, Ilum-a-Lite, had similar beginnings in 1996.

Founded by Jack Rutherford and Vern Chamings the company was formed to commercialise an idea – “that energy could be saved on fluorescent lighting by reducing the power to the lighting after it had warmed up”. In its formative years the company literally designed and manufactured the now internationally successful Light Eco® range of lighting controllers in Vern’s garage, promoting energy efficiency when few thought it a priority and financial returns were hard to justify.

Since that time Ilum-a-Lite has gone on to pioneer T5 adapters, introducing Save It Easy to the market. Now a plethora of adapter products are on the market but Save It Easy remains unique as the only patented “in line” T5 product, independently tested by NATA labs to produce full T5 performance at a fraction of the cost of a new T5 luminaire. Ilum-a-Lite now offers a full range of lighting solutions and controls aimed principally at commercial, industrial and public buildings.

The company works closely with energy consultants, engineers, property managers, and sustainability managers responsible for improving the energy efficiency of such buildings. “Our clients indicate the energy and cost reduction targets they are trying to achieve and we put together a recommendation to enable them to meet this, often with very short payback periods,” said Mark Rutherford Ilum-a-Lite’s Managing Director.

Partnering for success

Earlier this year the company secured venture capital funding from clean technology specialist, Cleantech Ventures.

“We formed the view that energy efficiency solutions for the commercial and industrial markets are likely to grow rapidly in coming years,” said Mark Bonnar, Investment Director with Cleantech Ventures. “We went about identifying the best companies in Australia operating in this sector and that search lead us to Ilum-a-Lite.”

Ilum-a-Lite and Cleantech Ventures believe the future for energy saving solutions is bright. “Deploying new-build and retrofittable energy efficiency solutions in the built environment represents an enormous opportunity for companies and governments to save money on rising utility bills while simultaneously meeting their greenhouse reduction targets,” said Dr Bonnar.

More recently, Ilum-a-Lite, appointed former Chief Financial Officer and Executive Director of the Alinta Group, Peter Brook, to the Ilum-a-Lite board to help the company further capitalise on local and global opportunities as the energy savings industry continues to grow from strength to strength.

“We expect to be able to capitalise on international market growth, particularly in the US and Europe, while continuing our push into Asia, South Africa and New Zealand. We will be ensuring our local operations are primed to leverage this opportunity.”

Award winning technology and commitment to the environment

As well as supplying energy saving solutions, Ilum-a-Lite has a longstanding program of planting trees in recognition of the carbon savings achieved through clients’ use of their products. More recently a sponsorship was announced of the Will About Macadamia’s preservation program in south west Queensland and Ilum-a-Lite is now a sponsor of a major revegetation program to recover areas damaged in the Queensland floods.

www.ilumalite.com
1800 133 666

Contact Ilum-a-Lite today on 1800 133 666
As the evolution in energy smart buildings is rapidly developing, we are beginning to see the once aspirational idea that buildings can be carbon neutral, carbon positive and even restorative, is in fact becoming a reality.

This global ‘green’ evolution has created opportunities across Australia, and a recent report conducted by the Australian Property Institute (API), confirms that investors are starting to see the payback of greening their building. The report — which is the first rigorous assessment of energy smart office buildings across Australia — shows that office buildings with a 5 star NABERS energy rating (National Australian Built Environment Rating System) created a premium of nine per cent, while 3 to 4½ stars delivered a two to three per cent premium in value. The message is simple; the more energy efficient the building is, the greater its value. “The market has been looking for a confirmation that there was a better return on going green,” API fellow, Marcia Bowden said. “We expect this market to gain pace. As it does, if you don’t have an energy efficient building, you will be in a lot of bother.”

Although the report by the API shows that the demand for more energy efficient office space will continue to grow, it is yet to be seen whether the extension of the NABERS rating scale will affect the capital values of lower rated buildings. As we move towards this new 6 star NABERS rating, the benchmark for greening our buildings has been raised. Welcomed by most in the industry, the new six Star rating scale has caused controversy with the Property Council of Australia (PCA). Property Council’s CEO, Peter Verwer, has spoken out about the lack of consultation with industry and has strongly spoken about a review in the way NABERS is governed. The full interview with Mr. Verwer can be read in our Q&A feature on page 14.

As always your comments and feedback on this and on any other issues affecting you are always welcomed.

As we leave 2011 behind and move into the New Year, the team at EnergySmart Buildings would like to wish you every success for 2012. We hope you have enjoyed reading ESB over the last 12 months, and don’t forget that, from January you can now also check us out online at www.rala.com.au, as we continue to keep you informed and up-to-date with the latest news, commentary and developments on the evolution in energy efficiencies.

I would like to wish you all a very happy and healthy Christmas.

Suzi Heaton
Editor
E: suzi@rala.com.au
For example, if you consider an electricity savings project in NSW that would have taken eight years to pay back the capital invested in 2008 (and would have been discarded as uneconomic without review), the payback would be just three and a half years in 2012. If imported equipment is used the increase in the exchange rate may have reduced the payback to a little over two years!

This may be a short window of opportunity as grant funding is limited and competitive, the exchange rate may well deteriorate in future with reduced interest rates, and for gas consuming projects like cogeneration, the era of relatively low and stable price gas may only have a few more years to run.

You can evaluate your options using analytical tools such as Greenhouse Gas Abatement Analysis (to generate ‘MAC curves’), which provide a three, five or ten year (plus) view of the potential to improve energy efficiency and reduce emissions, and form the basis for target setting, investment planning and management programs.

With less than a year until the carbon scheme comes into effect, now is the time to begin preparations for the challenges and identify where the opportunities lie to achieve a competitive advantage.

At the centre of the Clean Energy Future legislation is the price on carbon which will have a cost and profit impact, as well as affect customers, supply chains and create shifts in competitive position. Many businesses are wondering where the upside lies for them. However, together with the carbon price legislation, a number of factors have come into play to create a vastly different financial landscape.

Companies need to go back to the drawing board, dust off energy efficiency project concepts and find many more that had been dismissed as not viable in the past. Cogeneration projects, more capital intensive energy productivity projects, extensions to heat recovery systems, and other energy savings investments that did not stack up in the past may well stack up now.

While the high exchange rate has been problematic for Australian industry overall, there is a big upside to investing in energy efficiency and on-site power generation projects, which largely use imported equipment. The exchange rate escalation from 78 cents in 2009 to around a $1 today has cut 20 per cent from the cost of energy saving capital equipment.

And there is some good news for business in the Clean Energy Future legislation, which includes about $200 million per year on a 25 per cent grant basis for energy efficiency projects. There is also funding through State retailer obligation programs like the NSW Energy Savings Scheme and Victorian Energy Efficiency Target scheme (which is being extended to business measures in the New Year). There are also financing opportunities from a range of sources, including Low Carbon Australia and, from 2013/14 the Clean Energy Investment Fund. Companies that grasp these opportunities could implement projects that drive step change improvements in their energy efficiency.

The first step for most companies is to identify the available savings projects. Even large companies who are required to do this under the Energy Efficiency Opportunities Act ought to review their savings’ potential. The business landscape for energy savings projects has changed so much in the last five years, because of escalating energy prices.
In my role as President, CEO and Founding Chair of the U.S. Green Building Council (USGBC), I’m inspired and honored to be a part of a global movement of people from widely different backgrounds, circumstances, countries, and industries who are uniting under a singular commitment to building sustainable communities and a sustainable world. The world’s most pressing issues — including climate change, habitat destruction, water and energy shortages, compromised human health, and social inequities — require international cooperation to solve.

For the past 10 years, the World Green Building Council (WGBC) has been helping Green Building Councils (GBC) across the globe realise their environmental and sustainable building goals, while helping transform the building market. In my new role as chair, I will help further the WGBC’s mission of globalising environmentally and socially responsible building practices by ensuring GBC’s — big and small — have the tools and strategies needed to establish strong organisations and leadership positions in their countries.

Part of my plan as WGBC chair is to heighten WGBC’s global profile; while at the same time amplifying the voice of each of the 89 GBC’s around the world. These GBC’s and their talented and diverse membership are a uniquely credible voice for policy and practice that will advance the health of people and our planet simultaneously.

I also hope to grow the number of mature individual green building councils across the globe by advancing the WGBC’s nascent mentorship program to help newly founded councils get off the ground. Australia’s GBC for example, did a wonderful job of mentoring the South Africa’s GBC. Now, South Africa stands as a model for other potential councils in Africa. We need to make these kinds of knowledge transfers more transparent so practical wisdom is accessible everywhere.

I have big shoes to fill — my predecessor Tony Arnel has worked tirelessly as WGBC chair for the past three years, in addition to his role as chair of the Green Building Council of Australia. But the work is of utmost importance, and as we all know, our work isn’t just about buildings. It’s about people and how green buildings can improve their lives and change the world. It’s about healthier schools, cleaner air, more productive workplaces, and stronger communities. It’s about the benefits that will accrue to all of us in a world in which sustainability is woven into the fabric of our societies, from Beijing, Belgium to Boston and beyond.

Rick Fedrizzi is the CEO and Founding Chair of the U.S. Green Building Council & Chair of the World Green Building Council.
Since the NSW Government launched the first environmental performance rating for offices 10 years ago, commercial buildings throughout Australia have become more efficient. Acknowledging this new standard of energy efficiency, the now mandatory disclosure of the NABERS rating scale for buildings with a Net Lettable Area of 2000m² or more has recently increased from 5-stars to 6-stars. This potentially allows for a further 50 per cent reduction in emissions and water use for those who move their ratings from a 5 to a 6-star rating.

Although this is a welcomed development in the industry, the Property council's chief executive officer, Peter Verwer, has spoken at the disappointment of NABERS failing to consult with industry, and believes it is time to reassess the way NABERS is governed.

Q&A:

1/ How do you feel now that the rating scale has extended to six stars?
The Property Council of Australia has made a huge investment in NABERS and has supported it from the outset. Industry is always been keen to see an extension of the rating scale because it provides proper measurement. The issue here is that it has an inadequate governance process.

2/ What are your main concerns with the way NABERS is being governed?
The problem is with consultation. Any consultation needs to be a considered process and all participants need to be able to consider the options from the outset. Any consultation should be modern, transparent and a mature process. It requires disciplined feedback and, importantly the stakeholder should know when process finishes; it’s not just last minute information.

3/ So you weren’t given plenty of notice prior to the announcement of the launch?
No, it felt very last minute. The companies who are most surprised are those who made the biggest investment of NABERS and who are the strongest supporters. They feel let down.

4/ How do you feel the consultation process could have been managed better?
Talking about green is not just energy efficiency, but also includes corporate governance. The irony is that greenness, transparency and the governance process are not to the standard of government guidelines. They (NABERS) seem to believe modern governance rules don’t apply to them. New measurements of governance need to be applied, full stop. We need to review the tool, review the resources and review governance.

5/ How is the Property Council addressing this issue?
The Property Council has commissioned Viridis E3 to foster an open discussion and to outline the issues associated with NABERS in their scope and method.

6/ According to the NABERS fact sheet, there will be no climate correction applied to a building with a rating of more than 6 stars; how will this affect rating of buildings across different climates throughout Australia?
This has been one of the issues with the new rating... there are a lot of problems (and) the whole rating system is due for a complete check. NABERS was initially designed as a voluntary tool, now it is being used as a requirement and so therefore more improvements need to be made so that we can get it right. We also have a lot more information available to us now, so other issues of methodology also needs to be reviewed.

7/ Do you think it is possible for us to see a change implemented in the near future or is this something which will take time?
There is no reason for this not to change within the next 6 months. Green Star did a good job of listening to industry views and in streamlining its Green Star suite and its administration. People told the Green Building Council what needed to be done, and then they (the GBCA) adopted it. They have good governance.

The Property Council of Australia is the leading advocate for Australia’s $600 billion property industry.
QUEENSLAND
SIGNATORY OF THE YEAR; UNDER 2,000 SQUARE METRES
Winner: Energetics

By installing energy efficient lighting and office equipment, changing to flat screen computer monitors and implementing occupancy sensors for lighting, Energetics have significantly reduced their carbon footprint. Environment, Parks and Sustainability Committee Chair, Peter Matic presented the award to Energetics and said, “Energetics is leading the way in reducing their carbon footprint by purchasing 100 per cent GreenPower and implementing an Energy Action Program”. He went on to encourage other office tenants throughout Brisbane to continue to reduce their carbon footprint, “we have the potential to achieve a reduction of 101,900 tonnes of greenhouse gas emissions annually... the equivalent of permanently switching off the lights in 1,777 offices”.

SIGNATORY OF THE YEAR; OVER 2,000 SQUARE METRES
Winner: ARUP

Matic also presented the award to consulting group, ARUP saying, “Arup has shown great initiative in reducing energy use by implementing an Energy Action Plan containing energy efficiency measures, developing a system to see real time energy use data, and trialing various lighting technology to find one that was the most energy efficient”.

Continued >>

WESTERN AUSTRALIA
SIGNATORY OF THE YEAR; OVER 2,000 SQUARE METRES
Winner: Lavan Legal

After achieving 2 star NABERS Energy Tenancy Rating (without green power), one star higher that its 2009 rating, Lavan Legal’s next goal is to achieve their CitySwitch commitment of 4 stars. Projects undertaken by Lavan Legal include the installation of after-hours lighting sensors and replacement of PCs and LCD monitors with ‘thin’ client machines and LED monitors. Part of their commitment is a desire to become a carbon neutral firm.

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Continued >>
CitySwitch Awards

South Australia
Signatory of the Year, Under 2000 Square Metres
Winner: South Australia Police Headquarters

Cundall is a great example of a small tenancy taking a proactive approach, constantly measuring and monitoring its energy consumption and changing its behavior to reduce its energy load. Adelaide City Council’s Lord Mayor, Stephen Yarwood, awarded Adelaide’s newest green building — the South Australia Police Headquarters with the award for excellence in office energy efficiency. “Design consultants, Cundall, and the Department for Community and Social inclusion (formerly Department for Families and Communities), have set a benchmark (for) energy efficiency improvements,” Yarwood said.

Signatory of the Year, Over 2000 Square Metres Category
Winner: The Department for Families and Communities

The Department has achieved significant cuts in energy use and expenditure through a variety of simple measures. It has undertaken regular energy ratings and made ongoing efforts to communicate its proactive approach to staff in smaller tenancies across the state.

New South Wales
Signatory of the Year, Under 2000 Square Metres
Winner: Knight Frank

The company improved the NABERS rating from 3 to 5 stars for their 135 office on King. The 148 square metre tenancy has reduced carbon pollution by 9.5 tonnes per year and saving $2,000 per year in energy bills.

Energy reductions were made with time controls and lighting upgrades, reducing personal computer sleep modes from 20 minutes to five minutes and fitting the kitchen sink hot water unit and chilled water bubbler with timers to halve operating time.

As part of a staff awareness campaign, the tenancy used CitySwitch Power-Mates (digital power meters) to demonstrate that energy savings of 10 per cent could be made by simply turning off CCTV monitors, desktop monitors and computers when not in use.

Signatory of the Year, Over 2,000 Square Metres
Winner: Norton Rose Australia

The firm reduced carbon pollution by 214 tonnes, saving $42,000 in energy bills per year. They sustained the four star NABERS energy efficiency rating at its Grosvenor Place tenancy, which accommodates approximately 400 staff in the 8,900 square metres, five level, office.

Energy savings were made through the installation of sensor and zoned lighting, improvements to desktop computer power controls and increased virtualisation of computer server hardware. Hardware virtualisation allows multiple operating systems to simultaneously share processor resources saving energy and improving processing speed.

Victoria
Signatory of the Year, Under 2,000 Square Metres
Winner: The Public Transport Ombudsman

The CitySwitch program began in Sydney in 2005 and was launched nationally in June 2008. It operates in every Mainland State and covers 330 signatories and 371 tenancies, occupying more than 1.6 million square metres of office space.

Signatory of the Year, Over 2,000 Square Metres
Winner: Ernst & Young

Ernst & Young, winners of both the over 2,000 square metres category and the newly introduced new signatory of the year award, saw its office fit out achieve a 4.5 star NABERS energy tenancy rating. Ernst & Young upgraded its office down lights to energy efficient globes and also have an energy saving lighting control system installed.

The national judging committee — which included representatives from the Green Building Council of Australia and Property Council of Australia — praised the commitments of Ernst & Young, “As a new signatory in Victoria, Ernst and Young has hit the ground running. With lighting upgrades complete, we look forward to seeing its energy action plan formalising next year’s efforts.”
ASIA PACIFIC FOCUS

This issue of ESB takes a closer look at the Asia Pacific region, to see how some of the world’s largest cities are adopting new technologies and using incentives to help reduce their energy consumption and cope with the growing urban population.

ROBIN MELLON,
Executive Director – Advocacy and International

MACRO & MICRO CHALLENGES IN THE ASIA PACIFIC REGION
MACRO & MICRO CHALLENGES IN THE ASIA PACIFIC REGION

The Asia Pacific region — the ‘engine room’ of world’s economic growth — is growing at an unprecedented rate. Currently, Asia holds more than half of the world’s cities of more than 10 million people, and that number is rapidly rising. In fact, nearly one million people across Asia are migrating from rural to urban areas each week.

At the ‘macro’ level, built environment professionals are dealing with the challenges of constructing the equivalent of a medium-sized city every seven days.

On a ‘micro’ level, this means learning new green skills and integrating green technologies into individual projects at a never-before-seen rate.

While the Asian region — particularly nations like China and India — has the scale, Australia has the capabilities to deliver leading-edge green building solutions. The Australian property and construction industry needs to scale up our capabilities, and the Chinese and Indians need to adapt their capabilities to their scale.

We have the micro, and they have the macro, if you like.

The Green Building Council of Australia is actively driving the World Green Building Council’s Asia Pacific Network program, helping other countries to embrace the concepts and practices of sustainable building.

The Asia Pacific Network is connecting individuals and organisations from countries throughout the region to provide support as they establish green building councils, develop rating tools and embark upon sustainability education programs.

While some countries in the region, such as Australia and Singapore, have well-established green building rating tools, others are in the process of developing them and some are just considering the process. The network has been established to ensure that knowledge is shared and support provided in order to accelerate the pace of change.

The Network is also engaged in a dialogue on the role of government and business-led initiatives to accelerate the uptake of green building in the region. Financial incentives, such as tax breaks, and non-financial incentives, such as ‘green door’ policies, are emerging as mechanisms to promote green building growth.

In Singapore, for instance, the government is looking to have 80 per cent of the building stock rated under the Green Mark green building scheme by 2030. As part of this, it has introduced the ‘Green Mark Incentive Scheme for New Buildings’ with cash incentives to private developers, building owners and project consultants whose new project achieves a Green Mark Gold rating or higher.

In India, the Indian Green Building Council (IGBC) is working closely with state governments to fast-track green building development applications. The Hyderabad Metropolitan Development Authority (HMDA), for instance, has introduced a ‘Green Channel’ program for all applications that are awarded with IGBC certification and meet specific green building requirements.

We’re also beginning to see a shift in thinking in the region, from viewing buildings as consumers of resources, to buildings as producers of resources. New technologies and approaches for producing energy — such as wind turbines, solar, PV, solar hot water — are being complemented with rainwater harvesting, grey and blackwater systems. And of course, we’re reconnecting with the idea that one man’s waste product is another man’s raw material.

Robin Mellon is the Executive Director — Advocacy and International for the Green Building Council of Australia. He is also co-chair of the World Green Building Council’s Asia Pacific Network.
TAIPEI 101 – WORLD’S TALLEST GREEN BUILDING

Taiwan’s iconic TAIPEI 101 building is a leading success story of the growth of energy smart buildings. Following this successful project, TAIPEI 101’s property owners, consultants and technical experts give their insights into what the LEED (Leadership in Energy and Environmental Design) certification means for TAIPEI 101, and predict the trends and developments across the Asia Pacific region.

What makes TAIPEI 101 so special?

HL: The design of TAIPEI 101 includes many eastern cultural inspirations and is a perfect platform to share Asian culture with the international community. TAIPEI 101 also includes 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 a few years of operation, we now hope to gain third 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 growth of the global green building trend.

What does TAIPEI 101 going for LEED certification mean for the market of energy smart buildings?

RW: 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 top level.

How do ‘megatrends’ affect cities such as Taiwan, and why are buildings important?

PW: Megatrends such as urbanization 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 76 per cent of the world’s energy consumption and 80 per cent of the greenhouse gas emissions. As an integral part of cities, buildings on average account for 40 per cent of the global energy consumption and 21 per cent of greenhouse gas emissions. Therefore, buildings play a key role for the sustainable development of cities.

What message would you give to others who may be considering an energy smart building project?

PH: From the sheer size and scale of this (TAIPEI 101) project, the most important lesson is that any building — new or old, compact or a skyscraper, in the US, Europe or Australia—is capable of becoming a certified green building.

Buildings account for 40 per cent of the world’s energy consumption and 21 per cent 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.

Turn to page 30 for the full case study on TAIPEI 101 asIA PacIfIc focus
INTERNATIONAL BUYERS GOING GREEN

More than 260 exhibitors from 17 countries and regions attended the Eco Expo Asia trade show in Hong Kong, which was held on 26th – 29th October. Organised by the Hong Kong Trade Development Council (HKTDC) and Messe Frankfurt (HK) Ltd, the annual programme is put on to deliver latest market intelligence and business opportunities in the growth area of energy efficient products and sustainable manufacturing.

Under the theme “Green Tech for a Low-Carbon Economy,” the sixth edition of Eco Expo included six thematic zones set up around the exhibitors hall, including: Energy Efficiency & Energy; Waste Management & Recycling; Eco-friendly Products; Green Building Solution & Service; Green/Transportation; and Testing, Inspection & Certification.

International exhibitors showed their latest environmental products, technologies and solutions for a low-carbon economy and a sustainable society. They include BYD, Canon, CLP, Hong Kong Science and Technology Parks Corporation, the Hong Kong Polytechnic University, SGS HK Ltd, Siemens, Sita Vaaste, Towngas, Volia and Yau Lee Holdings Limited.

SMART BUILDING DEVELOPMENT

The annual conference brought together overseas and domestic experts and academics to address latest developments in clean technologies and the current issues in energy efficiency and sustainability. Keynote speaker, Dr Thomas Tang — Director, Corporate Sustainability & Initiatives, AECOM Asia — spoke about smart building development. “Previously used for basic building management and monitoring, the smart building has become a fusion of fully integrated services that deliver key business benefits to the owner,” Tang says. “With the increasing levels of sophistication in technology, communications and connectivity, smart buildings will become an integral part of our lifestyles.”

GREEN TECHNOLOGY GROWTH

During the fair period, the HKTDC commissioned an independent company to conduct a survey on market prospects and product trends. More than 1,300 buyers and exhibitors were interviewed for their views on the electronics and lighting industries, including the impact of the volatile economy in Europe and the United States on Hong Kong exports.

The survey found that in light of the debt crisis in Europe and the US, payment risk is increasing, with more suppliers requesting full payment before delivery. Yet, the impact on sales volume and value has not been significant. Over two-thirds of the interviewed buyers and exhibitors expect a steady or better market outlook in 2012.

Electronics and lighting industry players believe the Chinese mainland has the biggest growth potential. “For the lighting industry, Europe and the US remain the key growth markets. This may be due to the ban of energy-inefficient incandescent lights in the EU, which leads buyers to source more eco-products such as LED lamps,” said Benjamin Chau, HKTDC Deputy Executive Director.

Almost all interviewed buyers said they were sourcing as much or more environmentally friendly products, and customers are expressing greater demand for green manufacturing. More exhibitors are being asked to obtain eco-certification, implement green manufacturing processes and provide more energy-efficient products and services.

About 90 per cent of the interviewed exhibitors said they have increased their efforts in green manufacturing. More than two-thirds of them will expand their investment in this area, installing energy-saving equipment in their production lines, developing more green products, and purchasing energy-saving equipment for office operations. The survey also found that the best-selling products were those with advanced technology and green features.

SMART BUILDINGS – KEY TAKEAWAY POINTS

Dr Thomas Tang

- Supported by smart technologies, green design will be a vital part of the new outlook on a building’s performance.
- Integrating smart technology into buildings during the initial design will reduce the cost of construction.
- Safe, secure and comfortable environment.
- Delivery of information to building users irrespective of their location in the building.
- Access control through user authentication services.
- Predictive logic.
- Reduced cost of design and build by 15 to 20 per cent compared to disparate traditional systems.

“…the smart building has become a fusion of fully integrated services that deliver key business benefits to the owner.”
TAIPEI 101
LEEDing Platinum Building Climbs Higher

With a height of 508 meters and 101 floors (plus an additional five floors below ground), TAIPEI 101 is Taiwan’s tallest energy smart building and the most prominent landmark of the capital city of TAIPEI.>>

“Owners or operators of green buildings can... substantially save costs over the entire lifecycle of the building.”

TAIPEI 101 is the world’s first building of its size to receive the LEED-EBOM Platinum certification (Leadership in Energy and Environmental Design for Existing Buildings: Operations and Maintenance). This recognition can only be attained by buildings which fully meet the energy efficiency and environmental sustainability requirements defined by the standard.

Pushing for Platinum

TAIPEI 101 was already a highly energy efficient building, and originally had a targeted Gold LEED certification in mind. Once the initial evaluation was complete however, it was found that the tower wasn’t too far off Platinum level. Harase Lin, Chairman of TAIPEI 101, says; “As our tower was already very energy efficient and with proper management systems in place, we had the confidence to apply for the LEED-EBOM Platinum Certification. We believe that this certification is meaningful, not only to us but to the entire real estate industry, as it shows that eco-responsibility can perfectly go in line with cost considerations and efficiency gains.”

Cathy Yang, Vice President of TAIPEI 101’s Tower Division added; “We now hope that other property owners will realise that if a huge building like TAIPEI 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.”

Energy Monitoring

TAIPEI 101’s energy consumption is now 30 per cent lower compared to average buildings. Siemens — provider of energy efficient solutions for buildings — played a major role in the LEED-EBOM application within two of seven categories; “Energy and Atmosphere” and “Indoor Environment Quality,” acting as consultants and implementing the strategies and engineering works needed for energy saving and for improving indoor air quality. The company collaborated with interior design firm, Steven Leach Associates and EchoTech International, one of the leading exerts in the international, high-performance ‘green’ building movement.

The significant reduction in energy consumption was achieved by using Siemens’ Energy Monitoring and Control System (EMCS) as well as through energy modeling, energy audits, commissioning services and the installation of additional sensors. The indoor air quality is now meeting the highest standards as laid out by LEED.

Minimal Energy Usage

To minimise the building’s use of electricity and its impact on the environment, TAIPEI 101 boasts the largest water-distribution system in Asia. Its temperature and climate is controlled by over 3,400 terminal box controllers, located throughout the building. At night time when the external temperatures are lower — and cheaper, off-peak power rates are available. The same system produces ice and stores it to reduce cooling-load during the day.

The lighting system — which is comprised of 126,000 fluorescent lamps, 3,800 energy-saving lamps and 2,400 halogen lamps — are centrally controlled by Siemens’ building automation system. For further savings, it interfaces with the air volume system so that when premises are not inhabited, air conditioning and lighting systems automatically shut off. The air volume itself, which includes 50 terminal boxes on each of the 101 floors, is set up to deliver an even distribution of air in the podium and office tower automatically. Tenants are able to adjust the temperature for their own location within controlled limits.

Large Scale Benefits

TAIPEI 101 is a multi-purpose complex of prestigious offices, retail shops and restaurants owned by the Taipei Financial Center Corporation (TFCC). It has a total floor area space of 397,721 m². The 198,348 m² office tower is designed to withstand typhoons and earthquakes.

Peter Halliday, Vice President of the Siemens Building Technologies Division in Taiwan, said, “Managing a building of this scale brings a lot of challenges to the building automation system. On the one hand it requires effective climate and lighting control, reliable safety protection, and efficient flow of visitors. On the other hand, all the systems and plants have to be fully integrated into a reliable, truly automated energy management and control system.”

Removing 239 Cars off the Road

In gaining LEED Platinum certification, TAIPEI 101 now achieves annual savings of 2,995 metric tons in reduced CO2 emissions — the equivalent of preserving over nine acres of woodland from deforestation, or 239 cars from being driven for the whole year. Power consumption is 4.8 million kWh lower than prior to implementing the measures required to meet the LEED criteria. Efficiency gains translate to cost savings of approximately NT$20 million or AUS$650,000 a year. “Buildings account for 40 per cent of the world’s energy consumption and 21 per cent of the global CO2 emissions,” explained Hubert Keiber, CEO of Siemens’ Building Automation Business Unit. “The energy and cost saving potential is substantial. Owners or operators of green buildings can not only generate a significant impact on environmental mitigation, but they can also substantially save costs over the entire lifecycle of the building.”

• Images courtesy of Siemens
Legion House is a 1902 heritage listed building to be given a new lease of life at 161 Castlereagh Street in Sydney where a premium office tower is being developed and built by Grocon for tenants ANZ and Freehills.

Legion House will be one of the most sustainable office buildings in the world, designed to be both carbon neutral and disconnected from the electricity grid with surplus power to be exported to the adjacent office tower.

A key feature of the proposal is that current tenant, the St James Ethics Centre, will be provided with a modern 6 Star Green Star open plan office, funded by Grocon. Grocon will also adopt Legion House as its own corporate headquarters in Sydney from 2013.

The Legion House team includes sustainability consultants Umow Lai and architects FJMT, investment partners GPT Funds Management and La Salle Investment Management. The work includes an extension incorporating two new office floors designed in consultation with heritage architects, Weir & Phillips.

Sustainability is a core value for Grocon in all facets of its business. This future proofed project suggests a sustainable solution to refurbishing existing building in what will become an increasingly carbon constrained economy.

On-site renewable power for the building will be generated through biomass gasification technology. That technology can use waste timber as a fuel source, although the current planning has extended that thinking to adopt waste paper from the office tower as the fuel to generate power.

GPT is a key supporter of the proposal to refurbish Legion House and, as market leading property managers and developers GPT acknowledges the project’s contribution to sustainability and social responsibility values.

The delivery of a truly green precinct, with the excess power generated being fed back into the commercial office tower, shows what is possible when innovative design and delivery is matched to innovations in project funding.
The floating buildings of the Vanke Center create a flexible area of shaded landscape underneath the building, allowing sea and land breezes to pass through the site. Hovering over an inventive ‘sea scribble’ garden, the collision of buildings appears as if they were once floating on a higher sea, which has now subsided, leaving them propped up on glass and white coral-like legs.

Key energy efficient issues implemented in this project includes; special geothermal-cooled waterscape in the form of radiative cooling lakes to create a microclimate, moveable facade screens made of special composites to protect the inner glass against high solar and typhoon, and renewable energy such as solar power and geothermal cooling.

SUNNY SIDE UP

Installed on the roof of the building were up to 1,400 square meters of photovoltaic panels, providing 12.5 per cent of the total electric energy demand for Vanke Headquarters. Each of the 26 faces of the building has been calculated based on solar heat gain throughout the year and its louvers are fine-tuned to the orientation of the sun. Some louvers are fixed horizontally, some have apertures of differing size, and some are dynamically controlled by sensors, opening and closing according to the sun.

The full height glass curtain wall brings daylight deep into all interiors spaces, and the latest high-performance glass coatings (double silver Low-E) are used throughout the project. These coatings have several advantages over conventional coatings because they have higher visible light transmittance, which ensures better natural lighting and extremely low solar heat transmittance, therefore saving energy by reducing cooling loads.

In addition to the high-performance coatings, a secondary layer of perforated aluminium louvers are hung from the glass to create a double skinned facade. The interstitial cavity created by these two layers creates a convective stack-effect, drawing cool air in through the underside of the building and hot air out at the top of the structure near the roof.

The perforated louvers provide extensive primary sun protection in closed condition. They reduce up to 70 per cent of solar heat gain at its peak load, yet still provide 15 per cent of light transmittance through the perforations.

Given the intensity of the tropical sunlight, field measurements have calculated that this 15 per cent light transmittance in closed mode is sufficient natural lighting to perform routine office functions without the need for secondary artificial lighting in most (75 per cent) of spaces.

In the office portion of the project the operation of the exterior louvers, interior shades, air conditioning and lighting systems are co-ordinated by a series of interior and exterior sensors which balance ambient light levels, solar heat gain and ambient temperatures for maximum energy efficiency. There are individual controls for lighting and shade operation in most offices. Individual task/spot lights are provided for off hour, additional use.

OCEAN AND MOUNTAIN BREEZE

The shallow floor plate of the upper building is organised in a branching pattern lifted high off the ground to allow for unimpeded views to the ocean, mountains and surrounding landscape. Prevailing ocean (day) and mountain (evening) breezes circulate underneath and through the building. Exceptionally large operable windows of two meters wide provide natural ventilation and generous cross breezes for the interiors during the cooler months of the year.

From November to March the outdoor conditions in Shenzhen are calm and window ventilation can take over the role of the mechanical ventilation in most of the building land in the condominium part completely. It is estimated that during this season mechanical ventilation systems can be switched off for at least 60 per cent of the time. This will reduce electric energy consumption annually by 5 kWh per square meter.

SUSTAINABLE SITE

The building is sited on reclaimed/stabilised land that forms part of the municipal storm water management system. The lagoon functions as bio-swale/retention pond connected to natural adjacent creeks. Part of the landscape architecture water edge proposal designed by Steven Holl Architects is the redesign the municipal hardscape bulkhead into a soft-edge planted estuary. As a restorative ecology, the Vanke Center landscape works to maintain native ecosystems minimise run-off, erosion and environmental damage associated with conventional modes of development.

The project is both a building and a landscape, a delicate intertwining of sophisticated engineering and the natural environment. By raising the building off of the ground plane, an open, publicly accessible park creates new social space in an otherwise closed and privatised community.

The site area is approximately 60,000 square meters, of which 48,000 square meters is planted. With the addition of the planted roof area of the main building (approximately 15,000 square meters) — the total planted area of the project is roughly equal to the site before development.

Images courtesy of Steven Holl Architects
The project is both a building and a landscape, a delicate intertwining of sophisticated engineering and the natural environment.

**ESD CHECKLIST**

**Renewable Materials – Vanke HQ wing**

- **Bamboo** – This highly renewable material, which is easily available in China, is used for doors, floors, and furniture throughout the Vanke Headquarters instead of using raw materials or exotic woods.

- **Green Carpet** – InterfaceFLOR Carpet tiles are used throughout the open office area. This carpet is a cradle-to-cradle product, meaning that it is not only produced from recycled materials, but that the manufacturer agrees to collect any damaged carpet and to recycle it into other carpet or products. This carpet contains a GlasBac® REbacking that has an average of 55 per cent total recycled content with a minimum of 18 per cent post-consumer recycled content. It uses recycled vinyl backing from reclaimed carpet tiles and manufacturing waste.

- **Non-toxic Paint** – All paint finishes, as well as the millwork and adhesives are to be low or free of V.O.C (Volatile Organic Compounds) – like phenols and formaldehyde – which can cause various health and environmental problems.

- **Greenscreen shading** – The Vanke Headquarters uses Greenscreen solar shading fabrics from Nysan – a PVC free product that contains no V.O.C (Volatile Organic Compounds). Not only does the product not “off-gas” during its life time, but it is also easier and quicker to recycle and divert to landfills.
Originally set as a 5 Star project, the Government Services Office (GSO) in Dandenong, has now achieved a 6 Star rating under the Green Star Office Design v3. In addition, a 5 Star Green Star rating for As Built and Interiors has been targeted, in addition to a 5 star NaBers energy and Water rating.

BEYOND 5 STAR

The project achieved a 6 Star Green Star Design outcome without the use of onsite energy generation and grey or blackwater treatment - the first time it’s been achieved outside the Melbourne CBD. “The project was not so much about problems faced but opportunities realised”, says David Waldren, Grocon’s National Executive Design Manager. Grocon and the project team set themselves the goal of outperforming the contractual obligation of a 5 Green Star outcome. “With hard work all round, and excellent management of resources and documentation, the project has achieved a 6 Green Star outcome without resorting to the more esoteric and expensive elements, such as black water treatment plants and co-generation systems (which can be connected into at a later date if the infrastructure is provided)” , he says. “This has been achieved within the original budget, which itself was modest given the suburban location in a developing area”.

The building has shown what a world leading sustainable outcome can be achieved if ESD principles are embedded from the outset, with Green Star energy and water requirements being implemented early in the design process.

REDUCING THE CARBON FOOTPRINT

Potable water consumption has been reduced and a 40,000L rainwater collection tank has been installed, with rainwater re-use for toilet flushing and landscape irrigation. “From an energy point of view, the base building is predicted to reduce greenhouse gas emissions to 44.7kgCO₂e/m²/annum, corresponding to 11 points under the Green Star Office Design v3 Ene-1 credit for greenhouse gas emissions”, says Beatrix Lehnert, Design Manager for Grocon.

The building has been designed with extensive shading features to control summer sun, and rainwater tanks which help address the issue of water scarcity. Outdoor garden terraces are provided as break out spaces so that occupants can take advantage of the pleasant summer and spring days that Melbourne’s temperate climate affords.

HEALTHY AIR

The project has an air conditioning system that comprises of three air cooled chillers and two heating hotwater condensing boilers. This equipment supplies all heating and cooling to the building via the 6 air handling units. The chillers are air cooled and there are no water based heat rejection systems designed anywhere in the project. On this basis, the proposed air conditioning and heat rejection system design eliminates the risk of Legionnaire’s Disease (Legionellosis).

The airconditioned ventilation system actively controls humidity to be no more than 60 per cent relative humidity in the space and no more than 80 per cent relative humidity in the supply ductwork.

BUSHFIRE TIMBER

Sustainable highlights on show in the project include the timber façade elements and the patterns on the glazing. Both the timber façade elements and the feature timberwork inside the building, use timber salvaged in a sustainable way from areas of Victoria devastated by the 2009 bushfires. Grocon participated in the Victorian Government clean-up of the bushfire areas and became aware of forest resources that had been damaged and where the owners and millers needed commercial support to overcome losses ensued. Grocon worked with the local communities in those areas to have the damaged timber logged, milled and made ready for use in the Dandenong GSO project.

INTERCONNECTING SPACES

The degree of communal facilities in this project is extraordinary for its size. At the ground level, three large double height foyer spaces create a very civic face to the building. Two of these foyers are for public interface for the two primary government departments, and are filled with greenery and lined in recycled timber salvaged from the devastating Victorian bushfires. Pocket atriums are designed in strategic locations around the perimeter to introduce natural daylight deeper into the floorplate, and also to connect staff vertically through open interconnecting stairs. At the top of the building, a communal roof deck, also lined in bushfire affected timber, overlooks the surrounding precinct.
Government Services Office, Dandenong

INTEGRATING THE COMMUNITY

The patterning on the glass is another community initiative, but of a very different kind. “In order for the building performance to be met from an energy point of view,” Waldren says, “it was important to block some of the load into the building through the glass and it was decided to do that by applying a “frit” pattern to the glass. This approach maximises day light penetration, enables the façade to have a lightweight appearance and yet still have very high levels of energy performance.”

The Government Services Office is part of VicUrban’s revitalisation of Dandenong and a critically important project as an indicator to the future of our cities. Beatrix says, “Consistent with the high quality aims and aspirations set for the project, Grocon set out to create a landmark building for this site and for our tenant, the Victorian Government.”

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David Waldren, Grocon’s National Executive Design Manager

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ESD CHECKLIST

- NABERS Water: The modelling for NABERS water predicts a performance benchmark of 5-star NABERS water rating with the addition of a 10 per cent buffer, which is above the project brief with a 4.5-star NABERS water rating.
- NABERS Energy: The results predict that the building equivalent CO2 emission is 45.8 kgCO2/m²/annum. It confirms that the proposed building meets the conditional requirement of the Ene –Conditional Requirements credit. In addition, it is claimed the proposed building has achieved 10 Points under the Ene-1 Greenhouse Gas Emissions credit. Within this modelling exercise, the NABERS energy rating has been predicted with 5-stars, which is above the project brief with a 4.5-stars NABERS energy rating.
- Timber: At least 95 per cent timber (by cost) of all timber used in the building and construction works is certified by a forest certification scheme. Bushfire timber (to the external façade and internal lobby areas) has been certified under the PEFC-accredited certification schemes and the remaining timber in the fit-out will be in compliance with the FSC certification program.
- Daylight glare control is achieved for the building by both fixed shading devices and internal blinds, with the result that for at least 80.5 per cent of the time during occupancy hours, the direct sun rays are shaded when measured at desk height.
- The energy consumption of the artificial lighting has been reduced in form of that the lighting power densities of 99 per cent of the NLA is less than or equal to 2 W/m² per 100 Lux.
- Individual comfort control, the building provides for individual users control of thermal comfort to each workspace at an average rate of at least 1 per 10m² of the NLA or part thereof, for greater than 90 per cent.
- The building includes a dedicated tenant’s exhaust riser that is used to remove indoor air pollutants from printing and utility areas.
- To improve the indoor environment quality, indoor plants have been planned to be incorporated to the open plan office and Ground Floor Lobbies.
The design aimed to provide occupants a connection to the external environment, by maximising the provision of glare free daylight and external views. Daylighting is a careful balance of solar heat gains through the facade, with glazing extent and performance. A high performance facade has been developed, incorporating low-e double glazing and good external shading, rejecting excessive solar heat gains while maintaining high internal daylight levels (using a Visual Light Transmission of 40 per cent).

A highly efficient lighting design and fully addressable lighting control strategy reduces artificial lighting energy consumption and allows maximum advantage to be taken of daylight. Individually zoned lighting banks are linked to daylight levels and dimmed accordingly. Daylight modelling has shown that 42 per cent of the NLA will have a daylight factor of at least 2.5 per cent, as a result of the building form and atriums.

ENERGEX HQ, Brisbane

Energy-saving features have been achieved through a combination of intelligent facade design and efficient building services. The opportunity for provision of individual air supply gives occupants control over their own comfort conditions and air supply rates via an occupancy controlled supply system built into the workplaces.

Through careful material selection, contamination of air by common indoor pollutants will be reduced, and 150 per cent fresh air will be supplied with no recirculated component, ensuring low levels of carbon dioxide in indoor air.

INDIVIDUAL COMFORT

Thermal comfort is affected by space conditioning and facade performance, as well as individual occupant factors. A high performance facade improves radiant comfort conditions at the perimeter, by optimising glazing and external shading elements. Chilled beam air conditioning paired with individual comfort control provides excellent comfort conditions for occupants and allow for widely varying perceptions of comfort between individuals.

DAYLIGHT

Energex HQ, Brisbane

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ESD CHECKLIST

- Chilled beam air conditioning with recovery of energy from conditioned air to temper fresh air supplied to the building, to reduce energy consumed in cooling and dehumidification.
- High efficiency water cooled chillers: Air circulation fans with variable speed control for efficient part load operation. Condenser water temperatures will also be monitored to improve the performance of the chiller /cooling tower interface.
- Variable speed drives for fans and pumps to reduce energy consumption.
- Car park ventilation which incorporates atmospheric monitoring of gaseous contaminants in order to modulate air quantities during system operation.

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Energy-saving features have been achieved through a combination of intelligent facade design and efficient building services.
It’s been standing for 25 years and now North Sydney’s 76 Berry Street will be taken off the grid after a radical retrofit, which will see the building outperform a 6 star NABERS rating, without the use of green power. Recognised by the federal government as an Exemplar project, 76 Berry Street is the only project of this status.

LOW EMISSIONS, HIGH ACHIEVER

The Australian superannuation fund Local Government Super (LGS) used the Australian Government’s Green Building Fund to support the $5 million retrofit of 76 Berry Street, North Sydney. Constructed in 1985, the building comprises two levels of basement parking, ground floor foyer/lift lobby and ten upper levels of office accommodation.

The aim of the project was to establish the most effective overall package of retrofit measures necessary to deliver the lowest emission commercial office building in Australia.

It now operates at 4.5 stars and Local Government Super has signed a commitment agreement for operation at 6 star NABERS Energy. It is the only existing office building currently under this type of commitment agreement. The project will have emission levels over 85 per cent lower than the average commercial office building. “We believe that it will be the lowest emission office building in Australia, possibly the world”, says Roger Walker, founder of Walker Eco Strategies.

HOME GROWN TECHNOLOGIES

A world first using Australian technologies and, with the upgrade being undertaken while the building was fully occupied, the project is truly unique.

LGS installed Victorian designed Bennett Clayton engine technology to drive a state of the art, low environmental impact trigeneration system for combined heating, cooling and power generation. This is the first use of Bennett Clayton ‘lean burn low environment impact’ engines in a building. They don’t just provide the carbon emission reduction capability for the site but they also provide undetectable levels of exhaust emissions in areas like sulphur oxides, nitrates and particulate matter. The engine system is 5 x 100Kw in size, meaning the five engines ensure redundancy and capacity.

The building can run at all times on gas as this strategy provides the capability to run the building at very low loads. This enables the building to not rely on the grid for power but can switch to the grid if ever needed.

The engines are multi-fuel capable so, if bioethanol or biomethanol becomes an available fuel source for the building, it can convert to these in the future.

The building also uses South Australia’s Shaw Method of Air-Conditioning technology, which recently won the Australian Clean Technology Ideas Competition, and were finalists in the Cleantech Open Global Ideas Competition in the United States.

These initiatives are complemented by innovative NSW designed “E1” lighting technology which reduces energy whilst improving tenant comfort. E1 lighting provides a better spread of light thus requiring fewer fittings to achieve a well-lit space with no glare.

WORLD’S BEST PRACTICE

“This is a great example of how the greenhouse gas performance of older buildings can be turned around by using innovative technologies,” Innovation Minister Senator Kim Carr said after the official launch of the building project.

It also demonstrates that world’s best practice can be achieved cost-effectively in a fully tenanted building using Australian technologies, which LGS confirmed were the leading sustainable technologies in cost, quality and environmental delivery — great news for Australia.

“I commend LGS for its commitment to best practice in environmental management,” Senator Carr continues. “This project was awarded $2.1 million in grant funding to take the building to world’s best practice and provide an industry exemplar in energy efficiency.”

“We believe that it will be the lowest emission office building in Australia, possibly the world”

Roger Walker, founder of Walker Eco Strategies
“LED technology has gone through something of a revolution over the last few years”

With the gradual phasing out of 50-watt halogen and incandescent lights over the next few years, business and commercial facility managers have begun to face the dilemma of finding a suitable replacement for the tried and tested 50-Watt halogen that falls in line with the Building Code of Australia’s new regulations of only 5-watts per square metre.

Compounding this situation is the fact that while the wattage per square meter has changed, the regulations for lux levels have not, and commercial properties are still required to meet the minimum lux levels based on the Australian Standards Lux Levels (AS 1680 series) for commercial settings.

**FINDING A SOLUTION**

Facility managers are going to need to find a solution to the problem of complying with the new energy efficiency codes as well as maintaining the required lux levels as part of their OH&S guidelines.

Lux standard levels, while legally required, are also a necessary regulation for your workplace, ensuring it is a safe environment to work in and also being a component of many facility’s insurance policies.

**LEVE L S OF L IGHT**

In general, good lighting should enable people to easily view their work and environment without the need to strain their eyes. However, different activities require different levels and qualities of light. The visual demands of the activity or task performed determine the lighting needs of an area. Activities that do not require a high level of visual acuity — for example, walking through a corridor — do not require high levels or an optimum quality of light.

On the other hand, tasks such as drawing or checking a document for errors involve fine and detailed work requiring a moderate to high level of visual control, and so greater levels and a higher quality of light are required.

Poor light levels can be an Occupational Health and Safety concern causing problems for workers. Eyestrain, general vision problems and headaches can all be caused from poor or defective lighting. One solution to this issue that has recently come to market is high quality Light Emitting Diode (LED) downlights.

**GROWTH OF THE LED**

LED technology has gone through something of a revolution over the last few years with many LED products now able to reproduce the same lighting quality as the common 50-watt halogen globe, effectively becoming a direct replacement.

LED’s have major advantages over halogens as they can produce high luminosity from a low wattage, easily complying with the new building codes and lux level standards. In fact some high quality LED’s can produce up to 720 lumens while only running off 10-watts of power, making them a direct replacement for 50-watt halogen.

**GETTING IT RIGHT**

With a flood of new LED products on the market, it is important to make sure you choose the right LEDs that meet the specifications you require for your commercial property. So as a facility manager, what is the best course of action?

One important specification in maintaining lux levels will almost always be the luminosity of the LED. A lumen is a unit of measurement that is used to express how much illumination a light source provides. An easy way to illustrate this measurement is to imagine a birthday cake with candles. A lamp that puts out 1 lumen of light is as bright as 1 birthday candle. A lamp that puts out 100 lumens of light is as bright as 100 candles. Thus, the higher the amount of lumens the brighter the light.

Most importantly, you should thoroughly read the specifications of an LED light to work out whether it meets your requirements. You should make sure that any LED you choose can produce a minimum of 720 lumens without exceeding 20-watts.

It is also a good idea to investigate the colour temperature and Colour Rendering Index (CRI) of the light; two important factors that determine how well the light is capable of reproducing vibrant colours. This is particularly important in workplaces where visual clarity is needed.
There appears to be a great deal of heat and very little light in the present acrimonious debate about the introduction into Australia of the Carbon Tax and Emission Trading Scheme. The discussion regarding alternative energy sources appears to be mainly about the pros and cons of wind power, tidal power, solar generators, hot rocks and solar PV generation and the consequential effects on coal and minerals exports.

But we hear little of the wide scale use of natural light — daylight and sunlight — in both commercial and domestic buildings. The May/June 2011 Newsletter of The Society of Light and Lighting (SLL) reported on an event conducted by the SLL on the 15th of March, 2011 in the Chamber of Shipping, London, UK, entitled Daylight: Are We Getting It Right?

Jill Entwhistle, the editor of the SLL Newsletter reminded us in her editorial that the so-called “ancient Greeks built solar cities” and that the “Romans legislated for the public right to sunlight” (not just as we have the right to daylight). She also reminded us that in his manifesto, The Athens Charter, Le Corbusier proclaimed, “To bring in the sun … is the new and the most imperative duty of the Architect.”

She also made the point which can be directed at all branches of the building industry, especially our own, “We turned our back on the sun, preferring to angst about glare and heat gain (as if it was beyond our engineering will to cope with these factors).”

The three speakers at the event were John Mardaljevic, Barrie Wilde and Anton Davies. Mardaljevic made the point that the daylight factor, (DF) was formulated long before we had our present computational capacity to handle complex situations: “What the DF communicates is in fact very different from the actual illumination levels that result from the full range of naturally occurring sun and sky conditions.” He concluded: “My conviction that daylight factor cannot be advanced incrementally means that truly meaningful daylighting evaluation for the purposes of compliance must be founded on the totality of sun and sky conditions.”

He also made the point: “Surely in this age of digital photography, computers and advanced rendering and visualization software we can do better than we are currently doing. At the same time we must start to change the analytical metrics and specification criteria. We must also bring this intellectual approach to all buildings, not just the newsworthy exemplars.”

It is now 20 years since the International Daylight Measurement Year was conducted by the International Commission on Illumination (CIE) and in which Australia played a significant role. It is also more than 10 years since the International Energy Agent (IEA), Task 21 produced its publication Daylighting in Buildings but we see very little of the application of these principles in Australia apart from the negative aspects of sun shading.

Where are the buildings with the advanced glazing techniques of light shelves, anidolic reflectors or even simple prismatic light deflectors to direct daylight much deeper into a floor space than just the perimeter zone?

One may argue that daylight and windows are the province of the architect and not the lighting designer; however it can also be argued that a holistic approach is required for the whole visual environment. With the possibility of research and development funds becoming available from the proposed carbon tax, should the Illuminating Engineering Society (IES) and the lighting industry be looking towards developing this more holistic approach? The integration of electric light and natural light is more than just a photocell switching the perimeter zone.

It seems absurd that Australia has poured millions of dollars into capitalising on its abundant resources of coal and minerals but almost totally ignored its abundant resources of daylight and sunlight as means of providing interior lighting. While we cannot export the “product” we could export the technology, if we had it? There is no reason why the lighting designer should not be able to give good advice to clients and architects given the level and depth of training that we have in this country. Likewise why could not lighting manufacturers expand their business into manufacturing windows that include some of these advanced glazing techniques?

Isn’t time the lighting industry re-invented itself again as it did in the post incandescent era in the 1950s? To adapt to a new light source — and I don’t just mean the fancy application of LEDs.
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