

Dear Reader,

The UN Climate Change Conference in Copenhagen has demonstrated that the work of Non-Governmental Organizations is still of vital importance for the environmental sector. We are running out of time while waiting for an international treatment to stop environmental degradation. IGRA's mission is to create awareness at grass root level and to expedite the process of information exchange in the field of green roofs. Please feel free to support our work by forwarding this newsletter to your friends and colleagues.

The current issue of "Green Roof News" deals with projects in Asia, Europe and the Caribbean. The upcoming trade fairs and conferences in India, Great Britain and Singapore are also previewed.

Discover the beauty of nature in modern architecture!

Wolfgang Ansel
Director IGRA

Contents

Fusionopolis (Phase 2A), Singapore: A Green Roofer's Perspective

A Visit with Wolfgang Ansel (IGRA): Green Roofs of Plenty in Stuttgart, Germany

Pathbreaking: A Native Green Roof in the Centre of Athens

Green Roofs in the UK: Environmentally Sound Solutions

Green Roofs in Puerto Rico and the Caribbean

Successful National Green Roof Strategies: Case Study Denmark

Upcoming Events: India, Great Britain, Singapore

Recommended Literature/Preview

Fusionopolis, Singapore (Phase 2A): A Green Roofer's Perspective

Designed by renowned architect, Dr Kisho Kurokawa of Japan, Fusionopolis Phase 2A is a 560 million Singapore dollar (approximately 255 million Euros) complex that conceives 3 high-rise towers (one being 22 floors and two being 24 floors) and a podium occupied a land area of 12,000 square metres providing a total gross floor area of 103,600 square metres.

One of the highlights of Fusionopolis, and the main topic of this paper is the thematic sky gardens or intensive green roofs, 13 of them to be exact, located on the 5th, 17/18th and 21st/22nd floors of the complex. They were installed alongside dozens of small "balcony gardens". The highest sky garden is located at the large balcony of a fitness centre on the 24th floor, some 80 metres above ground!



Sky Garden Tour with Ho Wan Weng



Photo shows the 3 towers of Fusionopolis



The roof gardens serve as the green lungs and social pockets for the office and lab staff



Landscape design

The green roof landscape was designed to contribute to Fusionopolis in 2 main ways:

1. "Green lung" – By being the "green lung," it provided cooling effects throughout the height of the complex in the tropical climate such as Singapore. It is one of several contributing components that make Fusionopolis a world-class eco-friendly development. Dense vegetation comprising 4–5 metre tall trees and palms, and shrubs of up to 1.5 metre tall was planned at major gardens located on strategic floors, with many smaller and exposed gardens at small balconies outside each office dotting the entire height of the complex. These serve to counteract the heat build-up brought upon the complex by the greenhouse effect arising from the substantial use of glazed facades. Rather than containing the cooling effect to within these "strategic floors" that operate as micro-climates, the shape and position of the 3 towers of the complex were designed to facilitate the flow of the resultant cool air currents to other parts of the complex so as to reduce the overall ambient temperature in the vicinity of the complex.

2. De-stress & social integration – The green roofs are also meant to serve as a stress-relieve and social focal point for the occupants. Placed in a fast pace society such as Singapore where every second counts, and work in a high-stress environment such as the Fusionopolis, it is more efficient to bring nature to the offices rather than vice-versa. Hence, at the Fusionopolis, occupants have the opportunity to de-stress and enjoy nature right outside their offices at these strategic floors where the main gardens are located; and do not need to descend to the ground level to do so. In so doing, these gardens serve a higher call – social integration. At the extreme, the small gardens that are also installed at the exposed balconies of each office to provide an alternative avenue for a moment of inspiration or relaxation.

Installation operations of green roof system

The installation operations typically followed the work flow as listed below:

1. Pre-propagation of vegetation.
2. Site preparation
3. Waterproofing works
4. Laying of protection screed and wall plaster
5. Laying of the moisture retention and protection mat
6. Laying of sub-surface cables and pipes (if any)
7. Laying of the drainage cum reservoir panel
8. Laying of the filter sheet
9. Laying and spreading of stone chippings
10. Laying and spreading of substrate
11. Installing other fixtures and inspection chambers
12. Planting works
13. Installing irrigation system



Special feature – vertical greenery

There were 2 main types of vertical greenery implemented at the Fusionopolis:

1. Single cable type

Here, the vegetation was climbers, such as *thunbergia grandiflora*, that was allowed to cling onto a single cable (made of stainless steel) from a typical planter below. The length of climb is typically 4 to 5 metres in an upright orientation; but on certain floors, the climb extended to 2 floors or about 8 metres.

2. Mesh type

Especially at the 17th floor, rectangular planter boxes made of fibre-glass reinforced polymer were placed adjacent to a series of S-shaped steel mesh and located at various heights above the floor slab but along a common wall. There, climbers were used again to cover the mesh fully in due course.



Photo shows the most impressive mesh type of vertical greenery, and it was installed on the 18th floor. The entire structure straddled 3 floors or 15 metres between floor and ceiling.

Special feature – water

Whether or not it is due to good “feng shui”, water features are very important elements of good landscape design in Asia. At the Fusionopolis, water features came in 3 distinct characters: stream, pool and pond.

Lessons learned

At least 25 % of the original plant species selected by the landscape consultant were replaced after the establishment period of 3 months. The main causes were light deficiency (where the set-back between the planter and the building edge exceeded 10 metres) and wind effects (causing quick drying-out and constant swaying at the top floors).



Photo shows a pond on the 22nd floor in an exposure environment

The lesson learnt was that the prior work of blending in of plant choice with the final micro-environment ought to be done more thoroughly. While horticultural knowledge and considerations for climatic conditions are important factors in any landscape designs, they have to be converged into the actual planting site at the micro-level so as to fully bring forth the landscape intent unblemished in anyway. As the world is getting smaller, landscape professionals are no longer limited to projects within their own native countries. There are many Singapore-based landscape architects who are designing landscapes in the Middle East, China, India and other parts of Asia, where the climatic conditions, vegetation, culture and customs are very different. In all these, we always advocate that there is no short cut to doing a great job, the locals need to be engaged right from the working level; and there is no better way of engagement than to be and mingle with the locals. Finally, I like to end my article with our slogan for Asia, “We make life at the top ... beautiful!”. So let us all embrace and protect this beautiful world by bringing nature back to town.

Ho Wan Weng, Managing Director ZinCo Singapore Pte Ltd

*(Abbreviated Version of the Article: Fusionopolis (Phase 2A), Singapore – A Green Roofer’s Perspective. In: Green Roofs – Bringing Nature Back to Town, Proceedings of the International Green Roof Congress 2009)

A visit with Wolfgang Ansel – International Green Roof Association: Green Roofs of Plenty in Stuttgart, Germany

While on leave from my job at the Audubon Society of Portland the last nine months, I have had the opportunity to meet with some of the leading advocates and designers of ecoroofs in Great Britain, Switzerland and Germany. In December I traveled to Stuttgart, Germany where I met with International Green Roof Association (IGRA) Director Wolfgang Ansel and learned about the policies and programs that promote green roofs in Germany.



On site experience in Schopfloch: Wolfgang Ansel (left) and Jim Labbe (right)

The emergence of modern green roof design and installation in Germany has its origins in the growth of the environmental movement in the 1970s. Today some estimate that about 10 % of all roofs in Germany are now landscaped. Stuttgart has been leader in implementing policies encouraging and requiring green roofs since 1986. As Wolfgang explained, the legal framework for this progress was established in the Federal Nature Protection Law and Federal Building Codes. Both create the mandate for environmental improvement and mitigation for which green roofs are one solution. However, a mix of regulatory policies and incentive programs at the municipal level that has been instrumental in fostering the green roof building boom in Stuttgart and elsewhere in Germany.

Wolfgang summarized this mix of policies as follows:

1. Direct financial subsidies by government in the form of start-up grants can amount to 10–20 Euros per square meter of green roof. The grants motivate some owners of private or commercial properties to voluntarily install green roofs. The grants are awarded to value-added projects and cannot fund green-roofs which are required as a condition of development. In recent years funding for green roofs has also come from state funding to reduce CO₂ emissions and reduce energy consumption, two of the benefits of

green roofs. In Stuttgart, city staff provide free consultation for green roof development and interest and demand is high; in May of 2009 there were funding applications pending for 4,000 m² of green roof.

2. Reduced stormwater fees are provided to those who install a green roof. Depending on the prevailing fee, this can amount to savings of 1 euro per square metre of green roof. Over an average 40-year lifespan of a green roof, in many cases this is enough to pay original installation costs.

3. The Federal Nature Protection Law includes provisions for ecological compensation that require that new greenfield development replace greenspace and associated environmental values lost to development. Green roofs are often a cheaper option than greenspace protection and provide multiple social, ecological, and financial benefits in greater proximity to the original environmental impact. Some local governments have set up banking or eco account systems similar to wetland mitigation banking in the United States wherein ecological compensation credits for green roofs can be pooled and leveraged for greater public benefit.

4. Local regulations in many larger German cities like Stuttgart require the installation of green roofs as a condition of development where technically feasible. In most cases that means roof with a gabled roof angle of less than 20 degrees. These requirements apply to a lesser and greater degree to current building construction and to larger urban planning zones. Stuttgart has provisions for new urban planning areas that call for over 1.5 million square meters of green roof.



Pleasant and attractive – green roofs are part of the advertisement campaign for the new residential area

Our first stop was an example for a new residential subdivision where most rooftops including homes, carports, and outbuildings were landscaped.

Wolfgang emphasized that a mix of tools – regulatory and non-regulatory has been key to Stuttgart's success. The number and size of green roofs in Stuttgart grew quite slowly until the 1990s when planning mandates and regulations were added to enhanced incentive programs.

The impact of this policy change was illustrated in our second stop at a solitary hill outside of Stuttgart rising some 400 feet above the valley floor. The hill was partially forested and topped with a single tri-blade wind turbine typical of those found throughout Northern Europe. Apparently the hill was a former landfill some time ago but had since become a popular local natural area

But Wolfgang took me to the top of the hill to illustrate a different point relating to the more intentional cultivation of nature by humans. From the top of the hill we looked south across a large commercial-industrial area flanked by farmland, arterial streets, and rail lines. With the sun shining in our faces, the mix of warehouses and office buildings initially looked like any other you might see in the United States excepting. But looking closer, I could see that all the buildings to west of a certain point and a good portion of the newer ones to the east were topped with red and green-tinged roofs. Wolfgang pointed out that the older buildings to the east that lacked green roofs were built before the adoption of Stuttgart's requirement that all new buildings with roof angles less than 20 degrees install green roofs. Most of the others had been built with green roofs since.



Industrial estate with green roofs in Stuttgart

The view from the hill in Stuttgart is an amazing demonstration of a local government's success in implementing green roof policies. Germany clearly has exceeded spectacularly in increasing the volume of green roofs in their urban landscapes.

Wolfgang did not only share Stuttgart's success stories. We also toured sites where project design and installation fell far short of its original aspirations demonstrating that even Germany has plenty of room for improvement and progress in the international movement of improve and expand green roofs.

Our last stop took us to the Naturschutzzentrum Schopfloch, the Nature Center for the Swabian Alb Biosphere Reserve located outside of Stuttgart. There we met the director Dr. Wolfgang Wohnhas and toured two green roofs on site, including a marvelous 13 year-old roof atop of an equipment shed, built with volunteers as a demonstration. Even in the dead of winter, the beauty of this roof was evident in a diversity of mosses, lichens, herbaceous plants, forbes, and dormant wildflowers. The green roof is a magnificent example and inspiration to local residents interested in installing green roofs on their property or in their local communities.



Summer look of the biodiverse roof in Schopfloch

My visit with Wolfgang Ansel in Stuttgart left me very impressed by what is achievable in terms of green roof development with the right set of public policies. Portland and other cities in the United States have a lot to learn from the German experience in promoting the development and design of green roofs.

Jim Labbe, Urban Conservationist, Audubon Society of Portland

A Native Green Roof in the Centre of Athens

Total Surface:	409 m ²
Location:	Greece, Athens, Philopappou Hill
Architect:	Eleanna Horiti
Green roof consultant:	Grigoris Kotopoulos

The project was to adapt a large portion of a small apartment building into a single living unit, while the building was under construction. In order to adjust to each level's "limited" surface, the space was divided into sections, according to time and type of use:



Green roof (housetop), "Day" (3rd floor), "Night" (2nd floor), and Services (basement).

The site is located at the foot of Philopappou hill, which is one of the few green areas in the centre of Athens. The green roof concept stemmed from the conviction that it is not enough to expect the city's green zones to be protected and preserved by the state; individual action also needs to be taken in order to enlarge them.



The way to "enlarge" the hill's footprint is to ensure a visual continuity between the building and Philopappou Hill, by creating a green roof on the rooftop, which is designed as an extension of the surrounding natural environment. The green roof is planted exclusively with indigenous flora, using vegetation grown on the hill and common weeds as an alternative to imported types of grass.

ation grown on the hill and common weeds as an alternative to imported types of grass.

The concept can, however, only be achieved if this trend takes off fully in the neighbourhood with a significant area being covered, thus creating a "green blanket" over the buildings surrounding the hill.

Apart from the purely aesthetic criteria, sustainability is also enhanced:

- top floor insulation is improved
- environmental temperature is lowered by 2–3° locally
- rain water is relied on as much as possible for plant growth
- sensible weed growth is encouraged and the use of weed killer is discouraged

The Green Roof

The construction of the green roof followed the German FLL Guideline for the Planning, Execution and Upkeep of Green Roof Sites (2002). Regional conditions, i.e. climatic factors, building tradition, local flora, as well as legal and planning aspects were all taken into account. Establishing a multilayered system build up is the key to success and sustainability for the green roof in Mediterranean climatic conditions since it provides the appropriate drainage, good aeration and reliable water holding capacity.

The green roof build up has a water storage capacity varying from 35 lt/sq.m to 70 lt/sq.m. Plants are irrigated through drippers and sprinklers, only during the dry season (June, July and August). Drought tolerant plant species such as Schinus mole, Ballota pseudo-dictamus, Spartium junceum, Phlomis fucosa, Cistus laurifolius, Arbutus unedo, Sarcopoterium spinosum, Laurus nobilis, Olea eurorea, Punica granatum etc. give the impression of a continuation of the maquis vegetation from the opposite hillside. The combination of green roof technology with selected drought tolerant plant species aims to minimize water demand during summer.

It is a fact that green roofs can play a key role in sustainable urban planning. They can maximize environmental and energy saving benefits with up to date technological solutions. Green roofs should be adopted in Greece as a means of green policy. It is of outmost importance to set regulations for green roofs in Greece. The Ministry of the Environment together with local authorities should promote a framework for green roofs providing initiatives through funding programs which allow green roofs to be implemented on a larger scale to account for green sustainable development.



Green Roofs in the UK:

Environmentally Sound Solutions

High Scoring Roofing Solutions for New Low Carbon School

Hetton Lyons Primary School is part of a major commitment from Sunderland City Council, to reduce carbon emissions across all of its operations by the year 2012 and they were keen to work with Alumasc for their ability to provide an environmentally sound product package and unrivalled technical support.

An extensive ZinCo green roof system was specified to complement the sustainable design of the building which also included a wind turbine, a wood burning boiler and rainwater recycling, earning the scheme a BREEAM rating of "Very Good".

Installed by the Approved Contractor Roofclad Systems of Durham, the extensive green roof is designed to evolve and flourish over the coming years, helping to combat a number of climate change issues facing the next generation. All types of green roof offer notable ecological benefits, providing a natural habitat for plants and wildlife, while helping to reduce air and noise pollution, cutting carbon emissions and assisting with rainwater retention and attenuation.



Green roof chosen for UK's longest golf course

Rockliffe Hall is a listed building set in 375 acres of preserved countryside in Hurworth, just outside Darlington in the North East. The new facilities will form an extension to the 19th century estate which will comprise a luxury 5-star hotel, the UK's longest golf course (also one of the longest in Europe) and the newest spa facility in the North of England.

The green roof for the new clubhouse presented a challenging design brief to architects Browne Smith Baker of Newcastle, who worked closely with Alumasc's Technical Support Team to ensure the most suited solution. The location for the new clubhouse building was carefully identified to ensure it sat low down in the landscape, with the green roof blending seamlessly into the countryside, making the clubhouse almost invisible from the hotel.

1,600 m² of extensive green roof was installed by using a variety of wild grasses to harmonise with surrounding plant species and to complement the natural timber profile of the clubhouse facade. Requiring only a shallow growing medium, the green roof offered a much lighter option than turf, which in turn enabled the specification of more cost effective materials for use in the underlying roof structure, which, as a result, would not be required to support as much weight.

Karen Walters, Alumasc Exterior Building Products



Green Roofs in Puerto Rico and the Caribbean

One would not expect to find a large variety of green roofs examples in the Caribbean. But the green roof market in Puerto Rico has seen a steady increase (25% annually) over the past years.

A pioneer of green roof practice is David Aponte CPG, founder of the company PR Green Design. His expertise has grown since his master thesis project on green roofs where he studied stormwater and thermal mitigation for green roof installation in sub-tropical regions. As a green roof installer he also understands the intricacies of installing a green roof in the diverse microclimates of the island. Rain forests, coastal lowlands and karst areas with an astonishing diversity of native plants and animals glamorise "The Island of Enchantment". Although the island has a Tropical Marine climate the annual precipitation can vary between 5,080 mm (mountainous interior) and 101 mm (costal regions).

In the past few years PR Green Design has completed several green roof projects which include residential, commercial and industrial buildings. Apart from the actual green roof design, construction and maintenance the service also includes green walls, ecological restoration, energy modeling and hydrologic design. Demonstration projects like "Techo Verde Anexo, Guaynabo" have pushed the envelope in the green roof installation for stormwater management. The intensive green roof of this building has the ability to manage nutrient leaching and stormwater discharge at the same time. Together with his business associate Ing. Francisco Rodriguez Ema, P. E., David has been able to start changing the perception of the roof space from a concrete desert towards a living space for plants, animals and people.



Masterpiece: Plaza del Mercado in Bayamon



Green Roof enthusiast by heart
– David Aponte



A speciality of PR Green Design: sophisticated plant mix



Fancy location: the green roof bar at Caribe Plaza

Case Study Denmark:

Successful National Green Roof Strategies



Rigsarkivet, Copenhagen



Underground garage, Holbæk



Mountain Dwellings – Best Housing Project

CPH CO2009

THE COPENHAGEN CLIMATE EXCHANGE 2009

A very common question is “What does it take to make green roofs work in a country which has just begun to explore this sustainable building concept?” The answer is quite simple – if the governmental sector, green roof industries and environmental NGO’s join forces and start a green roof campaign the success of a national green roof market is only a matter of time. Information from other countries and cities can help to speed up the process.

In Copenhagen the Danish Society for Nature Conservation used the United Nations Climate Change Conference (COP 15) as a trigger for their Climate Exchange Exhibition in December. The well attended exhibition had a special focus on environmentally friendly technologies and the “Green Breathing Spaces on City Rooftops”. IGRA was present with a trade booth and deepened the information flow with a green roof seminar for architects, municipal delegates and interested visitors. The combined seminar by IGRA the local member ZinCo Denmark and the City of Copenhagen attracted more than 100 visitors. The speakers presented the possibilities and advantages of modern green roof technology. It became apparent that a lot of basic information is already available and just needs to be adapted to the Danish green roof market. It is therefore not necessary to reinvent the wheel.

Signs for the green roof market in Denmark are quite promising. The municipality of Copenhagen is going

to develop a climate adaptation plan to ensure that the city is ready for the weather brought about by climate change. This plan includes as "adaptation initiative 2" additional green areas, pocket parks, green roofs and green walls to slow rainfall run-off, thus reducing the risk of flooding. In addition the city realised that green roofs not only capture 60 % of rainfall, but also improve air quality, vegetation and wildlife habitat, while also reducing urban heat-island effects. The dedicated work of Dorthe Rømø, project manager at the Parks and Nature Department in Copenhagen is bearing first fruits (see also: “Development of Green Roofs in Copenhagen under the Auspices of Public Management”, in: Green Roofs Bringing Nature Back to Town, Proceedings International Green Roof Congress 2009).

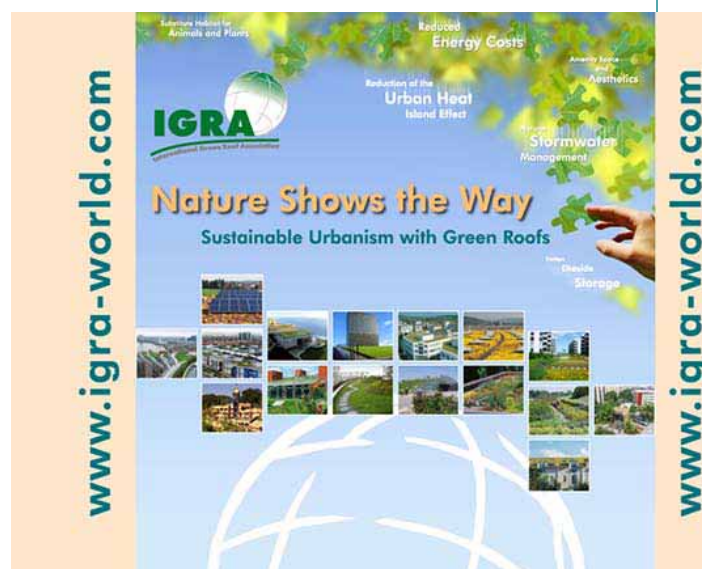


From left to right: Klaus Bondam (City of Copenhagen), Wolfgang Ansel (IGRA) and Finn Hansen (ZinCo Denmark)

What is more, amazing green roof projects already exist all around the city and an ambitious demonstration roof will follow soon. Finally the green roof company ZinCo Denmark is also doing its share by setting up training courses for landscape contractors and launching information campaigns at universities and schools.

So it is time to go to the next level. Copenhagen`s largest development area "North Harbour" offers an enormous potential to include green roofs right from the start. The new district will provide housing and work places for up to 40,000 people. The former Lord Mayor of Copenhagen, Ritt Bjerregaard, stated that "North Harbour will put Copenhagen on the world map as a shining example of how to found a sustainable city". North Harbour could also be a showcase that Denmark which is still very famous for its traditional style of green roofs (the so called sod roofs) is catching up with modern green roof technology.

Wolfgang Ansel, IGRA



Nature Shows the Way – The new IGRA-Display

Upcoming Events

23–25 April 2010 Roof India



Asia`s Largest Roofing & Allied Technologies Event – will be held during 23–25 April 2010 at the Chennai Trade Centre, Chennai (INDIA). The 3-day event will feature over 120+ national & international companies

showcasing the latest in Roofing Systems, Architectural Cladding, Metal Building Systems/Pre-Engineered Buildings, Tensile Architecture, Spaceframe Structures, Green Roofs/Roof Landscaping, Waterproofing, Roof Insulation, Roofing Machinery, Roof Fastening System, and much more. A two day high profile concurrent conference will also be held on 23 and 24 April 2010 at the same venue.

ROOF INDIA 2010 introduces the ROOF INDIA Design Awards for Tensile Structures. The competition will be open to architects, designers, engineers, companies, institutions and shall judged by eminent industry professionals and awarded for excellence in design, construction and application of completed Tensile Structures projects in India.

Green Roofs – a relatively new "segment" in the building/construction & landscaping industry in India has immense potential for growth in India and hence its inclusion as a new segment. Companies providing technologies, products, services, consultancy and solutions for roof landscaping will be exhibiting at the event.

For more details of the event, please log on to:
www.roofindia.com

15–16 September 2010 World Green Roof Congress London

CIRIA and Livingroofs.org are pleased to announce the next World Green Roof Congress (WGRC) will take place on 15-16 September 2010 in London.



The WGRC brings together leading green roof experts from across the world, providing a platform for communicating the latest case studies, research and policy initiatives.

This exciting and respected Congress drives the uptake and implementation of green roofs, providing a greater understanding of their benefits and stimulates innovation. The previous WGRC held in London, in 2008 attracted over three hundred delegates from around 15 countries and numerous exhibitors.

The Congress provides great opportunities for learning about research and leading edge applications with plenty of time for networking and promotional opportunities. This stimulating Congress drives green roof implementation, allowing different sectors and disciplines to share an appreciation of their benefits and improve delivery.

To find out more about the Congress please visit:
www.worldgreenroofcongress.com



01–03 November 2010: Skyrise Greenery Conference 2010 Singapore



The National Parks Board Singapore and the Centre for Urban Greenery and Ecology, in collaboration with the International Green Roof Association (IGRA) are organizing the Skyrise Greenery Conference in Singapore.

The three day event will serve as a surface and space where international urban greenery experts from various disciplines will come together with the academia, architects, landscape architects, landscape contractors, policy-makers and stakeholders to discuss the present and future trends of this growing sector.

Just to name a few the impressive list of speakers features such world-renowned names as Dr Ken Yeang, (Llewelyn Davies Yeang, UK), Emilio Ambasz (Emilio Ambasz & Associates, Inc., USA), Patrick Blanc (French National Centre for Scientific Research), Dr Tan Puay

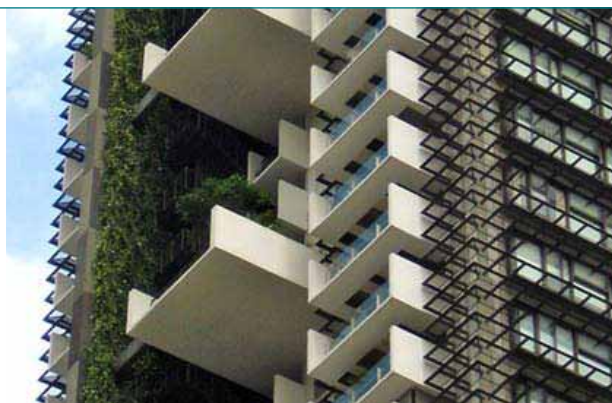
Yok (National Parks Board, Singapore), Roland Appl (International Green Roof Association, Germany), Dr Nigel Dunnet (University of Sheffield, UK), Susan Weiler (olin partnership, USA), Kai-Uwe Bergmann (Bjarke Ingels Group BIG, Denmark) and Prof. Wong Nyuk Hien (National University of Singapore).

Topics will include various essential aspects of skyrise greenery such as specifications and installation of green roofs and vertical greenery systems, technical studies (eg. heat shield and thermal aspects, integration of skyrise greenery with sustainable eco-processes) as well as the sharing of the experience garnered from global political incentives and guidelines.

The interactive style of the conference with lectures, practical workshops and excursions featuring the city's green roofs and vertical greenery celebrates the creativity in greening urban surfaces. Seen together, Surfaces of Creativity: Spaces of Delight creates a platform for the holistic exchange of ideas in the new innovations of urban greenery and its potential to transform our cityscapes and the lives of the people.

For more information please visit:
www.skyrisegreenery.com/conference/





Worth visiting – the “Lion-City” has a large number of fascinating green roofs and outstanding green walls projects to show.

Recommended Literature:

Green Roofs – Bringing Nature Back to Town

Within 190 pages, the elaborately designed book contains contributions from the specialists, architects, planners, and installation companies demonstrating how green roofs can be safely planned and implemented today, using concrete object examples, from the simple garage greening to the 30,000 m² landscaped park. The section “Funding support for green roofs” offers a full over-view of municipal green roof support in Germany and internationally.

For the first time the vast knowledge and experiences of German landscape architects, engineers, researchers, landscape contractors and urban planners are made accessible to an English speaking readership.

The proceedings of the 2nd International Green Roof Congress are available in English or German language and can be ordered for 39,80 Euro + shipping.



The website www.greenroofworld.com contains an order form as well as the list of authors and some extracts.

“The proceedings from this congress are stunning not only in the thoroughness of documentation (all papers available in full length, English or German), but also in the quality of the colour print and binding.” (Christine Thüring, Reporting on the 2nd International Green Roof Congress 2009 – Bringing Nature Back to Town).

The next IGRA-newsletter will feature the following topics:

- Innovative: Green Roof in Berlin provides a Win-Win Situation for Tenants and Investors
- Competitive: Stormwater Management with Green Roofs vs Conventional Methods
- Fascinating: Green Roofs in Mediterranean Climates

Publisher

International Green Roof Association (IGRA)
Office Nuertingen
PO Box 20 25
72610 Nuertingen – Germany
e-mail: info@igra-world.com
phone: +49 (0)7022 7191980
web: www.igra-world.com

Editor

Wolfgang Ansel
ansel@igra-world.com

The International Green Roof Association (IGRA) is a global network for the promotion and dissemination of Green Roof topics and Green Roof technology.