

Dear reader,

the idea of Green Roofs is spreading around the world. Nowadays, green roofscapes can be found in nearly all major cities, benefiting the urban environment and their inhabitants. An international exchange of ideas and technologies within the Green Roof sector, therefore, is not only desirable, but simply a necessity with regard to efficient environmental strategies. Join the Green Roof network and get inspired by an architectural style which combines ecology, economy and aesthetics!

Aart Veerman
President IGRA

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World Green Roof Congress in Basel 2005: Green Roofs from Canada to "Down-Under"

More than 200 Green Roof specialists from over 21 countries met in Basel on the 15th and 16th of September. They gathered to talk about the current status of Green Roof technology and to discuss the recent trends in science, politics and research. The Swiss Association of Green Buildings (SFG), the International Green Roof Association (IGRA) and the organisation Green Roofs for Healthy Cities (GRHC) hosted the World Congress.



The attendees of the congress in Basel were offered a vast program. More than 50 presentations included a full range of Green Roof topics from biodiversity through to lifecycle costs, stormwater management and certification. Field trips and hands-on-sessions added variety to the program.

Stephan Brenneisen, Initiator of the congress
and keynote speaker Bernd Löttsch

For many years Germany and Switzerland have established Green Roofs as sustainable and economical building constructions, but also internationally, Green Roof benefits are becoming more well-known. Increasing urbanization leads to the same problems everywhere; lack of green space, air pollution, flooding and the Urban Heat Island Effect. As a result the urban population suffers from a dramatic decrease in the quality of life and housing atmosphere.

A journey around the world shows how multifunctional Green Roofs can be at reducing local environment concerns.

Air pollution: Investigations in Toronto, Canada show that Green Roofs can reduce the pollution levels of heavily contaminated urban air. This does not only apply to the sulphur and nitrate compounds and ozone, but even dangerous particulate matter can be effectively filtered from the air.

Environmental education: Mexico City with more than 22 million inhabitants, one of the largest metropolitan areas in the world, subsidises the greening of school buildings. The sealing of landscapes has reached such an extent that the additional green space on the roof is used as a "green" classroom for children to create environmental awareness of the natural areas.



Biodiversity: As early as 1996 Basel established a multimillion subsidy program for Green Roofs within urban areas. The program will be repeated again this year. Green Roofs play a major role for the establishment of biodiversity and the network of natural habitats for local flora and fauna.



Natural habitat on the hospital in Basel

Energy consumption: Similar to North American countries, the tradition in ecological and energy saving building constructions in Australia is not very old.

To create pleasant climates in living areas, a tremendous amount of energy is wasted for heating and air-conditioning. This often leads to power network collapses in hot

summer months. In Australia the potential for Green Roofs to provide thermal insulating and heat protection is extremely high.

The globalisation of environmental problems is only one of many reasons for the spread of the Green Roof idea on an international level. Prof. Bernd Lötsch, General Director of the Nature Historic Museum in Vienna, states in his presentation "The conflict about beauty – aesthetics between nature and architecture" that mankind was given in its evolutionary roots, emotions and needs for the beauty of nature. Thus, the widespread popularity of the natural aesthetics of Green Roofs is of no surprise.

Further information regarding the congress, program and speakers is available on the congress homepage under www.greenroofcongress.ch.

The International Green Roof Association: Bringing Nature Back to Town

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

IGRA's targets are:

- worldwide promotion of the ecological Green Roof concept as a tool for sustainable, regional and urban development
- international knowledge transfer in the field of Green Roofs
- sensitisation of the population, investors and political decision makers through publicity campaigns
- stimulation of international standards for good practices and reliable Green Roof technology
- promotion and active support of national Green Roof campaigns by IGRA members

IGRA's services include:

Networking: IGRA's international Green Roof platform facilitates the exchange of experiences among the members of the network.

Newsletter: A quarterly newsletter will present new developments in Green Roof technology, outstanding Green Roof projects, activities of IGRA members and a calendar of Green Roof events.

Initiatives for national Green Roof associations: IGRA advises and supports the creation of national Green Roof organisations.

Workshops: IGRA organises practical training courses and workshops for members. The trainings are coached by members of the IGRA expert group, IGRA members and/or third parties.

Conferences: IGRA initiates and promotes international conferences on Green Roof topics.

Public relation: IGRA supports local Green Roof campaigns of IGRA members for the public and political/business decision makers.



How to join IGRA?

IGRA is an international Green Roof network, whose members promote and support the ecological Green Roof idea in their home countries. Depending on the membership category the yearly membership fee is 80 EUR for individuals, 600 EUR for organisations and 1.000 EUR for companies. Apart from the network advantages, the membership benefits vary in accordance with the membership category and can include: promotion on the IGRA web site, discount for IGRA conference and seminar registration fees and more.

Please visit the website www.igra-world.com for more information.

Energy savings with Green Roofs



Green Roof system build-ups are not only installed on new buildings but also on refurbished buildings. By using special drainage elements with certified values for the thermal resistance ("R-values") the client can increase the energy balance of the building. This additional insulation is beneficial in reducing the energy consumption and, therefore, lowering CO₂ emissions.

Green Roof system build-ups with certified thermal insulation values

Refurbished roofs are, more or less, older roofs, which were planned and designed at a time when the reduction of energy consumption and CO₂ emissions were not an issue; however, the requirements for thermal insulation of buildings are now much higher.

In the case that the old thermal insulation is still functional it is possible to install a root resistant water-proofing and a Green Roof system build-up over top. Some Green Roof system build-ups have certified thermal resistance values and have already become available over the last few years. These build-ups can reach the equivalence of up to 100 mm of standard insulation.

A thermally insulating Extensive Green Roof can weigh as little as a gravel protection layer. If the load bearing capacity of the roof is high enough, an Intensive Green Roof system build-up is also possible.

Even roofs with low perimeters can be greened when using a slotted angle profile. The profile is used to retain the Green Roof substrate within the required area and away from the perimeter.

Using these tested and authorized system build-ups allows for an exceptional amount of energy savings – whether in summer or in winter.

Angela Beck-Møller, MDL, PLR, Danish landscape architect:

Traditional and modern Green Roofs in Denmark

Green Roofs have a very long tradition in Denmark. However, the development of modern Green Roof technology has been slowed down by minor ecological necessities. Consequently, the request for Green Roofs was very restricted. Within the last years, the wish for a better quality of life and more prestige causes a change of thinking and supports new Green Roof objects successfully.

Historical Green Roofs

The traditional "sod roof" in Scandinavia has a very long tradition and numerous well maintained and functioning examples still exist. The majority of the roof substructure at this time was made of birch bark and the building was integrated into the surrounding natural environment so that it became a part of it in a way. This was of great benefit for humans and nature; however, this tradition is diminishing.



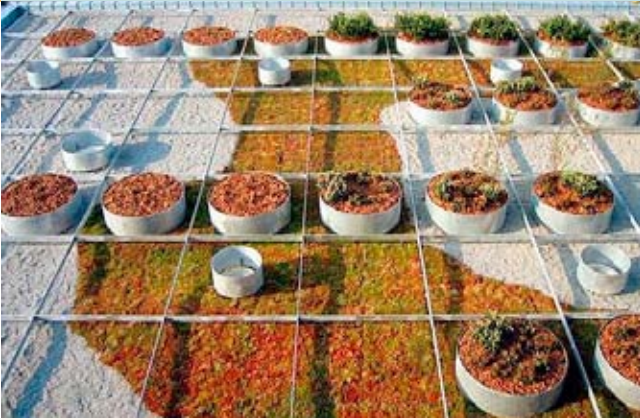
Current motivation for Green Roofs

Large cities and urban areas with little green space, as found in other countries, do not exist in Denmark. The virtually constant, intense wind allows sufficient air exchange and the term "sewage overflow" seems to be a foreign word. There is no town in Denmark which is further than 60 km from the coast; therefore, water can run off very quickly.

The motivation to build Green Roofs is based on the desire to invest in a conscientious and environmentally-friendly approach to life. In addition, exclusive roof gardens add prestige. Some companies from the green sector have included Green Roofs into their portfolio, which is, unfortunately, rarely noticed.

Possible extensive vegetation

The climatic conditions are approximately the same as in Germany and central Europe. However, the winds are much higher, which lead to a heightened drying-out-effect of the substrate surface. The precipitation of 600-900 mm per year is concentrated, depending on the region, within the early spring or late autumn. Instead of benefiting, the plants suffer from drowning during these periods.



Project Novo Nordisk: amoeba shaped sedum mat

Modern Green Roofs

Bruuns Galleri, Arhus (2003): A partial greened sector on the 1600 m² shopping mall roof in the city center of Arhus. The total area involves large sections for technical installations and skylights; therefore, the design of the area is kept simple. Two distinct bands alternate: coastal stones and granite chippings with sedum plants. Originally it was planned to install pre-cultivated sedum mats. Thanks to the initiative of a landscape contractor three alternating areas were planted with different coloured sedum plants.

To prevent the 10 m high roof from strong winds, as it is close to the harbour and adjacent to a 50 m building, the edge areas were secured with bigger granite and coastal stones. With this the edge solution was integrated within the total design. Originally the roof was not intended for use, however, various benches for people were eventually installed.

Novo Nordisk, Malmö (2003): The architects Dissing + Weitling designed the roof of the new Novo Nordisk building according to the design of the famous architect and designer Arne Jacobsen, the founder of the office. A large steel grid with a mesh size of 2.4 x 2.4 m covers the entire roof area on which an amoeba shaped sedum mat is installed. In the middle of the square grids round planters are installed with roses, *Prunus laurocerasus*, *Rhododendron* and *Amelanchier* species. The roof is a great success: it has a representative character and cooling benefits for the laboratories below and can be seen from the surrounding buildings.

The demand for Green Roofs in Denmark is slowly but steadily increasing, thus becoming a success story.

Benefits, engineering and architecture: The new IGRA website

The new website www.igra-world.com offers the platform for knowledge transfer and discussions in the field of Green Roofs. Visitors will find information about private and public benefits and basic Green Roof planning. Special constructions such as pitched Green Roofs, solar panels on Green Roofs and integrated walkways/driveways on Green Roofs are also presented. Further sections deal with the different types of Green Roofs and explain technical terms like Extensive and Intensive Green Roofs.

Check www.igra-world.com for an interesting and competent insight into all current Green Roof topics.



The next IGRA-newsletter will feature the following topics:

- The German FLL-Guidelines for the Planning, Execution and Upkeep of Green Roofs – a review
- Financial District "Banco de Santander" in Madrid, Spain – The largest Green Roof worldwide
- Green Roofs and air quality management: Special advantages of using plants to reduce air pollution

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