

## **Green Roof Policies - an international review of current practices and future trends**

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**Green Roof Policies are one of the basic key factors for the successful development of a green roof market. Longstanding experiences and case studies from different countries and municipalities are creating a source of ideas that can be adapted and modified according to the needs of the local green roof stakeholders.**

Sustainable urban development is moving increasingly into the spotlight in towns and communities, especially where municipal strategies for protecting the environment and nature and the consequences of climate change are concerned. The balancing effect of urban green spaces plays a deciding role in this context. However, land for extra natural areas in urban centres is a rare commodity. Nevertheless, aerial images show enormous un-invested potential on the roofs of the towns which could be implemented for environmental protection. Green roof techniques, which have developed from an environmental experiment to a constructional standard in the past 30 years, are able to use this potential. The palette of environmental benefits of green roofs includes, apart from general air hygiene and microclimatic improvements, areas such as natural rainwater management and the creation of new flora and fauna habitats.

Various tools can be used to promote green roofs directly or indirectly at the municipal policy level. These include, for example, stipulations in new land-use plans or green roof statutes for whole urban areas. Direct financial subsidies and a reduction in storm water fees add to the instruments which, together with public relations, could provide ideal support. It is also important to act as a role model by making the roofs of municipal buildings green. These various instruments have been applied successfully in Germany for more than 30 years. Even if an exact transfer of the German experience is not possible due to differing laws, the current implementation of the municipal green roof initiatives on an international level is following a very similar pattern. The following shows examples of the instruments.

### **Financial Subsidies**

A number of municipalities are offering attractive start-up grants for those wishing to implement a green roof. The aim of the subsidies is to motivate owners of privately or commercially used properties to create voluntarily additional green spaces on the city's roofs. It is generally irrelevant whether the buildings are new or renovated. Green roofs that are required as a result of legal obligations (see below: regulations in land-use plans) are, however, very often excluded from direct financial subsidies.

### **Reduced Storm water Fees**

Charging separate fees for the disposal of sewage and storm water offers a second opportunity for financial incentives. The amount of the storm water fee is normally based on the total area of the plot and the proportion of the ground that is impervious. Green roofs differ from standard tiled or gravel-covered roofs in that they are able to store a large proportion of the water from precipitation and release any excess water gradually over time. These are recognised as unsealing measures and rewarded with a reduced storm water fee.

### **Regulations in land-use plans**

The possibility of incorporating green roofs as a condition in urban development plans or for new building constructions that require planning permission is an approach taken successfully by many local authorities. The stipulations concerning green roofs do not only apply to current construction projects but also to urban planning zones in which development is not due for a number of years. The aim of long-term stipulation is to guarantee that local authorities continue to develop their ecological concept throughout the subsequent years.

### **Ecological Compensation according to Nature Protection Laws**

In the context of sustainable town and country planning, green roofs can be regarded as a compensatory measure for the subjects of environmental protection, such as the climate, air, soil, water, flora fauna, and landscape. The particular advantage of this is that the ecological compensation is performed by way of the roof greening, directly at the respective location with the planning area itself. The minimising and balancing effects of green roofs on constructional interventions in the processes of ecological equalisation are undisputed.

### **Density Bonus**

Parameters such as the number of units on a piece of property and the floor area ratio regulate the level of use for building coverage. Often investors try to gain exemption from these specifications (e.g. through increased number of units or the addition of an extra

storey), in order to increase the marketability of the real estate. The Density Bonus includes the possibility of exceeding the footprint area of the surface area and/or the number of stories allowed if a certain environmental equalization is included (e.g. by installing a green roof).

**Public Relations:** Public relations in a community not only advocate green roofs in general, but also support the above presented instruments. The municipality should not, however, restrict itself to the role of advisor and promoter, but rather act as a role model and pace setter by landscaping the roofs of its own buildings and testing and developing new possible fields of green roof applications.

### **Case Studies from Europe, North America and Asia:**

**Munich:** The Bavarian regional capital Munich (Germany) is employing a wide palette of measures to promote green roofs. Some of the established instruments include regulations in urban land-use plans, grants for voluntary installation of green roofs, and a reduction in storm water fees. In particular, the obligation to landscape all suitable flat roofs with a surface area >100m<sup>2</sup> over the past 14 years has led to making green roofs in Munich a recognised construction standard.

**Copenhagen:** The Danish capital Copenhagen has just started to develop a green roof strategy in the past two years. The very promising approach is significantly due to the work of Dorthe Rømø (Project Manager, Parks and Nature Department), who was awarded the IGRA Green Roof Award at the International Green Roof Prize 2009. In future, all new roofs in Copenhagen with a roof pitch under 30° are to be landscaped, providing there is no structural engineering reason preventing it. The basis for the successful establishment of the municipal programme was a comprehensive information campaign including not only administrative workers but also politicians.

**Portland:** Portland, in the Northwest of the United States, promotes green roofs predominantly because of advantages for sustainable rain water management. The city's sewer system is stretched to the limit, so measures which relieve urban drainage are very welcome and are supported with grants. In order to establish green roofs firmly in the public mind, actions such as landscaping municipal buildings, introducing a Floor Area Ratio Bonus, and public events to be held on green roofs were used to promote a green roof strategy.

**Singapore:** Singapore has agreed on a comprehensive programme to promote rooftop greening in the past years in order to reach the ambitious goal of 50 hectares of new Skyrise Greenery Areas by the year 2030. Apart from the designation of green roofs as a measure of compensation for new building projects, a Gross Floor Incentive Scheme for roofs and municipal allotment gardens, as well as financial subsidies for sustainable landscaping of existing buildings in districts with especially large green area needs have been introduced. Technical consultation is also included in the programme.

The examples given demonstrate that each city is using an individual mixture of different measures to promote green roofs. Because instruments differ not only in their scope of application but also in their institutional allocation, and because the urban environmental functions of planted roofs have overlapping specialist divisions, a combination or collaboration is normally very sensible. The goal of municipal green roof strategies should be to develop the most possible positive effects of green roofs by making the most efficient use of financial and human resources available.

## References

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