

# "BiodiverCity"

## - green city project

Malmö, Sweden 

### "BiodiverCity" - demonstrations of innovative solutions for urban green areas

The project "BiodiverCity" was carried out in Malmö in 2012-2014. The project aimed to increase urban biodiversity by creating new products, services and processes for greener cities. The project's goal was to create permanent demonstrations for the dissemination of innovative solutions for urban greenery. The project budget was 9.995 million SEK (~1.18 million USD)<sup>1</sup>, funded by the Swedish innovation agency VINNOVA [4]. The project included green yards, roofs and walls in different locations around the city, some including edible plants and some aiming to restore the plants and biodiversity that existed in the area before it was covered by buildings. One key to success in the project was the multi-disciplinary approach with ecologists, landscape architects, scientists, entrepreneurs, developers, etc., all of them working closely together in realizing individual greenery projects.

### Country/ City Profile

		Country		City	
	Population (2014)	9.747 million [2]	Population (2013)	313 000 (metropolitan) [2]	
	Land & water area (km <sup>2</sup> )	528 447 [2]	Land + water area (km <sup>2</sup> )	157 + 177 (metropolitan) [2]	
	GDP per capita (2014, US\$, at purchasing power parity)	45,143 [8]	GDP per capita (2014, US\$, at purchasing power parity)	45,000 [9]	
	Region	Northern Europe/Scandinavia	Region	Coastal (Skåne)	
City's physical geography	Location	<ul style="list-style-type: none"> <li>✓ Located on the southwest coast of Sweden</li> <li>✓ Low altitude</li> </ul>			
	Climate	<ul style="list-style-type: none"> <li>✓ Tempered climate (average temperature: -1 to -6°C in winter and 11 to 13 C° in summer) [7]</li> <li>✓ Around 670 mm/year annual rainfall (Swedish average) [2]</li> </ul>			

### Initiating context

The project "BiodiverCity" in Malmö has gone from words to action. It has induced the establishment of green roofs, vertical gardens, mobile vegetation, etc., pursuing the goal of creating a healthier and more attractive city. In doing so new products, services and processes have been created, all of them sellable on the market.

### Project description

Green roofs are popular, but the uniqueness of "BiodiverCity" is to create green roofs with greater biodiversity than is common today. On the roof of the apartment building "Klippern" in the Western Harbour e.g., many local plants like viper's bugloss and thyme have been planted, thereby attempting to recreate the habitat that existed on the site before the house was built. This type of roof greening has also proved better at taking up water and reducing noise, thus in comparison to usual types of roof greening currently available on the market.

Several different types of vertical gardens/green walls have also been built in residential areas in Malmö, in some cases including edible plants. Clearly not many plants are able to survive the climate all year round in modules on the walls of Sweden, but during the project the Swedish University of Agricultural Sciences [3] has been able to document some 20 plants that can. The project has also been based on conditions at the site. Wire systems ready to be covered by climbing plants, different methods for planting trees in streets and mobile gardening areas at pre-

<sup>1</sup> Rate of exchange, August 2015

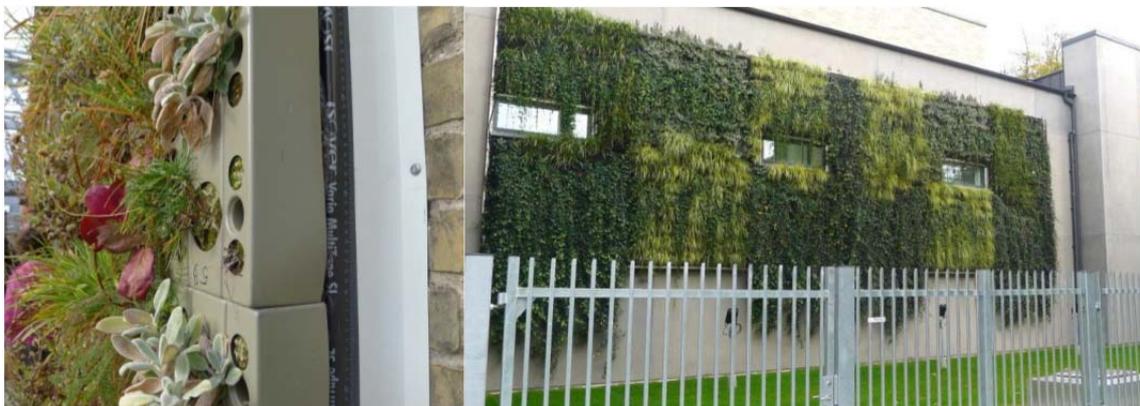
schools have also been tested in the project. Yet another example is a forest habitat with trees, ferns and other typical woodland plants created in a residential yard. The results were greatly appreciated by the inhabitants of the area.

A strength of the project was to work in groups with a wide range of stakeholders from many sectors including ecologists, architects, landscape architects, scientists, entrepreneurs, developers and more. As a result habitats have been created that not only meet the ecological requirements but also requirements with regard to operation and maintenance, installation costs, aesthetics, customer friendliness etc.

In autumn 2014, the project organized a final conference. They had counted on 100 visitors, but 160 people came. In addition to selling the already developed products, next steps will also include enhancing some of the projects performed.

### Projects implementation details [1,5,6]

Process/ Leadership	Malmö municipality
Financing	The project budget was 9.995 million SEK (~1.18 million USD) <sup>2</sup> , funded by the Swedish innovation agency VINNOVA.
Involved stakeholders	Sixteen partners, including academia, building companies, ecologists, architects, entrepreneurs etc. were involved in the project. For details, see project description [5]



Examples of green walls (photo by IVL)

### Results

The 17 different green areas created during the project are listed in the table below:

Project demonstration areas	Responsible project partner
1: Meadow, Ystadvägen 56	Scandinavian green roof
2: Biodiversity roof, Augustenborg square	Scandinavian green roof
3: Stormwater management, Klostergränd	hauschild+siegel
4: Sea beach, Fregattgatan	MKB
5: Green roof, Bomgatan 11	Diligenta
6: Chalk biotope, Hyllie	Skanska
7: Green roof, Klippergatan	ByggVesta
8: Procurement innovation, Södervärn School	Malmö city
9: Forest biotope in residential area, Fregattgatan	MKB
10: Biotopes in pre-school yard, Tornkammaregatan	Malmö city
11: Biotope at elderly home, Amiralsgatan 82	Malmö city
12: Edible green wall, Jespersgatan 2A	Odlä i stan
13: Green wall, Varvsstaden	Peab & SLU Alnarp

<sup>2</sup> Rate of exchange, August 2015

Project demonstration areas	Responsible project partner
14: Green balconies, Lilla Varvsgatan	Briggen
15: Mobile planting areas at pree-school, Hammars park	Malmö city
16: Trees in street environments, North harbour	Malmö city
17: Street plantations, Nordenskiöldsgatan	Malmö city

## Lessons learned

The variation of projects tested have resulted in many learnings regarding which kinds of plants and solutions work under which specific framework conditions. Also, a lack of knowledge of and experience with living walls has been identified within the performance of the project, both in particular in regard to the the public and potential new customers as well as in the industry. This lack of knowledge impedes with the development of living walls in Sweden. When interviewing the actors of selected projects, they also stressed the importance of more good examples/demonstration projects as a source for enhanced knowledge and experience. The project "BiodiverCity" also shows the importance of good cooperation and communication between the stakeholders involved. A mainly important stakeholder in guaranteeing the survival of green areas, is in particular the organization responsible for maintenance of the plants. Complex irrigation systems have proven to be a specific challenge that requires specialist knowledge [6].

## References

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## Author/ Contact



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Aschebergsgatan 44  
411 33 Göteborg, SWEDEN  
Tel. +46 31 725 62 00  
info@ivl.se  
<http://www.ivl.se/>