

Background: Malmö, sustainable on many accounts

Already for more than 10 years, Malmö has actively taken a holistic approach to sustainable city development, investing in new developments centred on sustainable development (such as the Western Harbour and Hyllie); retrofitting existing areas (such as Augustenborg and Sorgenfri); whilst investing in centres of learning surrounding urban sustainability (including *ISU, the Institute for Sustainable Urban Development*, a joint venture between the city of Malmö and the University of Malmö). The city has become reputable on the world stage for its innovation, its dedication, its creativity, its practical application, and its sincerity in terms of infrastructure investments, its clean tech profile, its focus on resident participation and information access, as well as a wide array of environmental programmes and strategies.



Malmö addresses many environmental issues simultaneously: holistic transport planning including collective transportation, as well as investing in alternative fuel vehicles and increasing bicycling and bicycle infrastructure – Malmö has more than 410 kilometres of bicycle paths. Malmö invests in renewable energy whilst concentrating on energy efficiency. It focuses on waste management by improving recycling, invests in waste to energy and creates biogas for city buses from food waste. Malmö also has a green plan, which ensures close proximity to green space and city parks, whilst investing in green roofs on new buildings. In addition to green, Malmö incorporates open storm water management to reduce urban flooding whilst providing habitat and improving aesthetics.

Malmö has a strong focus on education for sustainable development, hosting *RCE Skåne* (Regional Centre of Expertise on Education for Sustainable Development supported by the United Nations University), *SEA-U* (Malmö's Aquatic Education Centre which links the city to its aquatic surrounding) and related organisations. *Solar City Malmö* is supported by the City of Malmö, the Region Skåne and Lund University, in an attempt to improve the visibility and implementation of solar energy in the region. Several Malmö schools now feature solar and urban wind installations; helping reduce the carbon footprint, save on energy costs, whilst creating an interactive learning environment.

Particular to 2009, Malmö is running a campaign focused on climate information and interaction, '*Climate Malmö*'. With COP15, the next United Nations Conference on Climate Change to take place in Copenhagen in December 2009, the eyes of the world will closely watch the direction international policy discussions lead. Located 30 minutes from Copenhagen, provides Malmö a strategic opportunity to highlight its own efforts to address mitigation and adaptation. Accordingly, the campaign builds greater awareness amongst Malmö residents. Furthermore, it will display Malmö as a resource city during COP15 to conference participants interested in Malmö's local level efforts to address climate change.

For more than 20 years in a row, Malmö's population has grown, in part because of its attentive and holistic approach to sustainable urban development and eco-cycle thinking. Presently, some 290,000 reside in Malmö, with an increase of 50,000 inhabitants over 20 years, many of this growth coming from students eager to study in Malmö, as well as companies wanting to locate in the city. Together with Copenhagen and surrounding urban areas, the Öresund Region represents one of the fastest growing urban districts in Europe. To accommodate rapid population growth in Malmö, targeted expansions are planned in particular neighbourhoods including, the Western Harbour and North Sorgenfri (both former industrial areas), as well as in Hyllie (where a new city tunnel will pass through) in order to densify specific districts of the city. Whilst investing in large scale (new) developments, Malmö also focuses on retrofitting existing areas, such as Augustenborg and Rosengård. In Malmö everything is connected; it is not one strategy, but many complementary strategies that ensure a holistic approach to sustainable urban development. Further detail concerning the Western Harbour and Augustenborg (as examples of Malmö's approach to new building and retrofitting) are discussed below.

Description of the initiative of project

Malmö's Western Harbour

Malmö is a city familiar with transition and prides itself on its heritage and its future. Until recent history, the city built its reputation around a heavy industrial core with large-scale manufacturing facilities in its Western Harbour (WH). Less than 20 years ago, the city fell into an economic slump and was forced to transform its employment base and its identity from an industrial city towards the current sustainable city of today, with a more knowledge-based economy. Amongst the greatest hit was Kockums ship-building industry located in WH. The closure of the shipyard presented a need and an opportunity to transform. Following a structural facelift of the district, the city has renewed its physical link to the sea.

WH has become an urbanised district focused on energy and environment, mixed-use urban planning and architectural diversification integrated within the larger city centre. The initial stage was completed in 2001, opening as the Bo01 housing exhibition featuring private dwellings, offices and services, as well as parks and open spaces. Bo01 and WH continue to receive significant international attention. In the *"European Campaign for Take-off"*, Malmö placed first of 800 projects for its efforts in energy diversification: *"City of Tomorrow: 100% Local Renewable Energy"*.



Since the launch of Bo01, WH leads the way in environmental planning, building upon lessons learned and further exploring how to craft a sustainable district. Newer neighbourhoods in the district (Flagghusen and Fullriggaren) aim to move sustainability from pilot to mainstream. As part of this process, the city has engaged in the *"building and living dialogue"* – a platform for the City of Malmö, building firms and architects to discuss common themes concerning sustainable city development. Expectations are clear from the start and partners learn together how best to incorporate sustainability in the built

environment. To facilitate dialogue, Malmö also hosts the *Helix Centre*, a physical location providing urban actors a tangible meeting place to discuss information and ideas concerning sustainability. Helix links Malmö municipality, institutions, regional authorities and private sector actors that are active in sustainable urban development, leasing office spaces and meeting rooms to ensure further idea generation.

Throughout the progression of WH, information, participation and dialogue were essential means to engage interest and enthusiasm. Campaigns utilise various forms of media and site visits build curiosity and learning amongst students, as well as international and local guests. Malmö has become a leading international example of urban sustainability and hosts a biannual Sustainable City Development (SCD) Conference to accommodate interest in its urban transformation. This conference centres on methods to make sustainability attractive, whilst building cooperation with partners, cities and other actors to learn and to share.

In its commitment to knowledge-based development, WH hosts one of Sweden's youngest universities which continues to attract a growing number of students, as well as technology and communication firms eager to cooperate. Technology and knowledge-based businesses have turned the old wharf into Malmö's new IT hub. In early 2009 Sweden's Television (SVT) moved its regional headquarters into Kockum's former machine hall.

The Western Harbour has become an important flagship for the city. It inspires creativity and serves as a catalyst, building upon its experience in terms of the process of sustainable city development, whilst serving as an international example of how to incorporate technical development, renewable energy, energy efficiency and biodiversity within a densely populated urban neighbourhood. It generates and builds upon knowledge, partnerships and stimulates economic growth. More than just an international success, it has become a popular destination for a diverse span of residents: the most vital indicator of accomplishment. While Malmö admittedly faces challenges concerning social segregation; open parks and walkways in WH provide attractive spaces for interaction, making it one of the most popular locations for all of Malmö's residents. In warmer months, young and old, student and professional, immigrant and Swede, and everyone in between can be seen. WH aims to achieve sustainability in its three pillars, engaging innovation, facilitating social integration whilst creating an attractive environmentally-sound neighbourhood.

Augustenborg

Augustenborg, a city neighbourhood in Malmö, was built during Sweden's post-war prosperity in the early 1950s. At the time it was one of Malmö's first public housing areas and energy-independent from the rest of the city, supported by its own coal-fired district heating. The district featured an overall layout designed to ensure optimal conditions for sunlight and apartments were spacious by a 1950s standard. Despite original enthusiasm, by the 1980s it was a very different city district: numerous residents had moved out to more modern flats leaving unoccupied apartments, and the area suffered from unemployment and environmental problems, particularly seasonal flooding.

In response to such challenges, in 1997 several key municipal and related actors began to discuss how to transform Augustenborg into a local eco-neighbourhood. The local technical facilities were closed and plans were drawn up to incorporate eco-tech facilities, green space

and improved storm-water management. In 1998, Malmö applied to Sweden's Environmental Protection Agency and received funding from the Local Investment Programme (LIP) to finance some of the related initiatives in the area. A steering group was assembled, including resident participation and a vision created as to what the new Augustenborg would include.



Ekostaden Augustenborg developed as a *process* to integrate sustainable urban development, which incorporated a wide variety of both hard and soft measures to transform the district. Key features include: local energy production and energy efficiency, waste separation, open storm-water treatment, a focus on urban green space, transport and citizen participation.

Concerning energy, Augustenborg produces solar energy, and small-scale wind. It also featured a pilot project to test Malmö's production of biogas from food waste. In addition to renewable energy, Augustenborg focuses on energy efficiency. Behaviour programmes, including individual metering of apartments to reduce energy consumption, as well as upgrading building façades to improve energy efficiency were included.

Concerning waste separation, Augustenborg has a recycling rate of over 70% compliance and is supported by 13 facilities (miljöhus) which house waste-separation facilities. The district also is active in food composting.



Concerning green space, Augustenborg features the world's first botanical roof garden which features a demonstration area of some 9000 m² of coverage, providing local habitat and helping to absorb rainwater. In addition to green roofs, overall green space has increased 50% since project initiation, attracting birds, insects and small wildlife to the urban community.

Concerning local flood management, Augustenborg has incorporated a unique open-storm water system designed by local residents. This concept incorporates natural principles as to water flow and collection. Rainwater no longer causes flooding, but instead is an important asset for the area both improving the aesthetic value of the district, as well as supporting biodiversity – many collection ponds now feature fish and other aquatic creatures.

Concerning transport, Augustenborg residents have initiated a carpool in which residents can use local community cars, all of which run on environmentally-friendly fuel alternatives.

Concerning citizen participation and learning, Augustenborg residents and the local school have engaged in a variety of initiatives. In Augustenborg School, students are active in waste separation, composting and can watch the process of change in their community – their school features a green roof, solar water heating and a local windmill and their lunches are

prepared to a great extent with local organic food. Students have been an important part of the process from the beginning and Augustenborg's transformation is incorporated in their learning. Additional resident-initiated programmes include the Summer Café, which serves as both a locally-run café open several times a week, but also acts as a meeting platform to launch related citizen initiatives.

Main Partners

Western Harbour

Partnership and cooperation amongst local authorities, businesses, researchers and citizen groups lay at the core of the WH's success. These include various municipal offices (The City Planning Office, the Environment Department, and the Real Estate Department) as well as cooperation with local area universities, research boards and Boverket (the Swedish National Board of Housing). In terms of energy, E.ON developed a unique concept based on 100% locally renewable energy (over the course of a year), making Bo01 Sweden's first climate neutral city-district. Homes receive energy from renewable sources catered to local conditions, including solar, wind and water – the latter via a heat pump extracting heat from seawater and an aquifer – a natural water reserve in the bedrock facilitating seasonal storage of heat and cold water. Energy efficiency and reduced consumption are incorporated within the district's quality programme.

Augustenborg

Ekostaden Augustenborg was initiated originally by the collaboration of three key actors: *Peter Lindbqvist*, of Malmö's Service Department; *Bertil Nilsson*, the previous rector of Augustenborg School and coordinator of the development project in the local city district, as well as *Christer Sandgren*, the previous head of MKB (Malmö's Municipal Housing Company) in Augustenborg. The idea was to engage actors from both the public and private sector and particularly to incorporate citizens, both in terms of project development, but also in later implementation. Following original discussion, residents were also involved in the process. *Trevor Graham* (previously affiliated to Ground Work in England and now Head of the Division for Sustainable Development at Malmö's Environment Department) was recruited as the project leader of Ekostaden Augustenborg.

Local community involvement has been a key factor in the process to develop Augustenborg into an ecological city district since the beginning. Residents were invited to participate in a dialogue process first to be informed about the plans for Augustenborg, but more so, to help shape the process and direction of the development. Throughout Augustenborg's process of change, about one fifth of all residents have participated in the related dialogue process.

Impact

Western Harbour

The Western Harbour's development aimed to create a healthy environment, incorporate mixed-use, whilst providing attractive meeting spaces to support cultural stimulus, leisure, sports and interaction. The planning efforts and persistence has paid off: up to 3000 international visitors and locals visit the area to explore its holistic strategies, and on warm

days it is the most popular place in Malmö. Approximately 7000 persons are employed in the district, roughly 5000 students study there and an estimated 6500 persons are expected to live in the district by 2013. Furthermore, youth are important actors, involved in the development of Stapelbäddsparken's Skate Park and other recreational areas by which to stimulate the growth of social capital.

Importantly for Malmö residents, the project is able to create a common space by which to integrate various social groups which are traditionally are separated. The development has created a location in which all Malmö residents can easily access the sea, and in the warmer summer months, the waterfront is full of young and old, students and professionals, immigrants, foreigners and Swedes, from all parts of the city swimming, sitting or listening to the various summer concerts in its public spaces.



Augustenborg



The main beneficiaries are primarily the related groups involved in the process. First, the *residents* have witnessed the profound change in their community which has created a strong pride, as well as the desire to engage in the process of change. Secondly Augustenborg provides a living laboratory concerning what sustainable urban development can incorporate and consequently the *students* (from local school children to university students) have witnessed the process of change as part of their learning and are able to take part in an active learning. Thirdly, the *Malmö Municipality* has benefited as Augustenborg has become one of the most visited and referred to examples for urban transformation and ecological development. And finally, *MKB* (Malmö Housing Company) has benefited as its related efforts in Augustenborg have lifted its environmental profile as well as supported long-term cost savings, particularly in relation to energy consumption.

Sustainability

Western Harbour

The general objectives for the long-term development of the Western Harbour are to be 1) a national example of sustainable city planning; 2) to lead the city in its quest to become a knowledge city; 3) to create attractive and inspirational meeting places; 4) to develop a mixed city in which residences, offices, cafés and recreational activities can coexist within the same building and 5) to stimulate surprise and attractiveness to engage residents. These overarching objectives are supported by particular strategies related to social sustainability, ecological sustainability and economic sustainability. In order to accomplish the long-term objectives of the development, the city incorporates various projects which support the short-term development of the city district.

The entire district is divided into theoretic 'neighbourhoods' by which different goals of sustainability are facilitated. First came Bo01, which incorporated energy and environment, whilst creating a city quarter to reconnect Malmö's harbour to the sea and create interaction amongst residents. Following Bo01 numerous studies were conducted by NGOs, monitoring firms, researchers, as well as university students. In general, the neighbourhood was perceived to achieve its mark as an overall sustainable city district. However certain targets were not achieved. For example, the energy consumption of many buildings was higher than previous estimated. While this was a low point in Bo01, it provided an important lesson for proceeding developments.

Stage 2, the development of Flagghusen (or Bo02) 'mainstreams' sustainability, by incorporating similar environment and energy goals, whilst also centring on affordability and safety. Stage 3, Fullriggaren (or Bo03) attempts to further incorporate sustainability goals whilst testing a new programme, the Environmental Building Programme for Southern Sweden. Both Flagghusen and Fullriggaren participated in the *Building-Living Dialogue* to engage stakeholders, such as developers and municipal departments, to agree on sustainability criteria for the district.

Augustenborg

The transformation of Ekostaden Augustenborg is a *living process*, and thus while many important initiatives are implemented; new ideas are underway. When asked, in 10 years the residents of Augustenborg would like to see small windmills located on rooftops of Augustenborg buildings, and passive houses (built without energy for heating or cooling) incorporated in the area. Residents in Augustenborg are encouraged by the process of change in their city-district and hope new residents move into Augustenborg because they are attracted to the area's eco- and social profile. One of the most recent focuses in Augustenborg is related to local climate adaptation (as Malmö is anticipated to have an increase in rainfall) as well as the production of urban and organic agriculture. While much has happened, the district continues to be a priority area in Malmö and an apt platform to test new ideas concerning Malmö's attention to sustainable urban development.

In addition to the mentality and behaviour change of local residents, a variety of projects were initiated by community members. Some resident programmes include: the development of Augustenborg's open-storm water system; the Community Carpool; active engagement in recycling and composting as well as energy metering; and Café Summer which functions both as a café and a meeting place for residents to exchange, interact and share ideas.

Transferability and Up scaling

Western Harbour

The Western Harbour is a living city district; incorporating new ideas and innovations, whilst learning from mistakes, and attempting to 'mainstream' sustainable city development. In the design of Bo01, there was a strict energy standard and quality programme to which all buildings were to adhere to. Despite the estimated energy goal in Bo01, it later proved to ambitious as many calculations were overly ambitious. In fact many homes consumed far more energy than had been anticipated. Despite this 'failure', this provided an important lesson in terms of energy planning for the later developments. Already within the next

large-scale development (Flagghusen) two passive houses were built without energy to heat and cool the buildings. In Flagghusen all buildings were measured via a common calculation system and have qualified within the allotted energy target. Such examples demonstrate that while the Western Harbour can build on its successes, importantly the City and related stakeholders also learn from mistakes. It is just this that makes WH a global success: not only its accomplishments, but more so, its approach to learning and developing a process for sustainable city development.



The Western Harbour continues to serve as an international example of sustainable city development, attracting more than 800 study tour groups a year that come to explore the district and take home similar ideas concerning Malmö's holistic planning approach. An important strategy which has facilitated its success is linking urban environmental planning to a dialogue process. Information is shared with Malmö residents and global visitors, and public and private actors work together, motivated by a common

vision to develop a city quarter centred on sustainability. Communication and dialogue are the cornerstones upon which the project stands in order to create common enthusiasm amongst all involved.

Augustenborg

One of the main objectives of Ekostaden Augustenborg was to create a platform to support the participation of all relevant stakeholder groups (including local residents, as well as municipal and other actors) in order to transform the district into an ecologically, socially and economically sustainable city district which serves to lift Malmö's profile as a sustainable city – both for Malmö residents as well as internationally. Augustenborg now attracts visitors from all over the world who are interested to learn what methods can be applied in like-neighbourhoods to incorporate sustainability in terms of policy, planning, participation and application.

After 10 years, Ekostaden Augustenborg has become a local and international success, and is one of the farthest reaching programmes of ecological transformation in an existing neighbourhood in Europe – with more than 15,000 study tours.

In terms of local replication, certain key features first piloted in Augustenborg have since been applied in other areas of Malmö, including the application of green roofs on new buildings and related green points in urban areas, production of biogas to fuel city buses,



incorporation of open-storm water management, citizen-initiated carpools and an overall focus on sustainable energy in Malmö as a whole (with numerous installations of solar, wind and related renewable energy).

Internationally, Augustenborg serves as an example as to how various urban actors can transform existing neighbourhoods into more eco-friendly alternatives. Visits to Augustenborg's Green Roof Institute, in particular, has influenced roof design and demonstrated possibilities for architects and development firms the world over. Finally, with the next climate change conference, COP15, coming to Copenhagen in December 2009, Malmö will feature Augustenborg as a case-study for urban climate adaptation – specifically open-storm water, green roofs and related urban green points.

Innovation

Western Harbour



Malmö's attention to sustainable city development in the Western Harbour first launched with Bo01 in 2001. Bo01, with its energy sources coming entirely from renewable sources became Sweden's first climate neutral district, demonstrating its early attention to innovative planning. Beyond an eco-village, the Western Harbour lifts sustainability to the forefront, combining environmental living together with comfort and quality. The entire district is designed around principles of eco-cycle thinking in order to reduce, reuse or recycle raw materials. This is visibly apparent within the Western Harbour which focuses on minimising raw materials, waste separation and recycling, as well as producing biogas from food waste. Streets and sidewalks are paved with removable tiles which can be easily lifted and replaced as needed. Rainwater is integrated as a resource, facilitating habitat and filtered in an open storm water management system.

To reduce fossil fuel consumption, the City of Malmö and E.ON entered into an effective partnership to facilitate energy provision. Delivering 100% renewable energy was an underlying goal and albeit, a challenge – but it worked. A basic concept was that energy should be derived of commercially accessible technology. This included wind power, solar cells and solar collectors and an aquifer system that works with heat exchange. Natural gas is distributed by E.ON and used in city buses and taxis, offering an alternative to diesel. Financial, aesthetic and environmental innovations work together to achieve the greatest possible results. E.ON and the City of Malmö have learned a lot that can be applied to further joint projects. Effective and active cooperation makes for excellent results and provides valuable experience to incorporate in future developments of Malmö.

Augustenborg

The heightened level of participation throughout Ekostaden Augustenborg's development, as well as the means by which it was incorporated was one of the key elements of 'process' innovation. Additional innovations include the world's first botanical roof garden and a locally-crafted solution to improve storm-water management which takes its inspiration from

the natural flow of water: rainwater seeps slowly off of green roofs and then drains into small open channels that fill larger channels and ultimately feed a number of small ponds in the area supporting local habitat.

Recognition of the initiative

Press

Malmö is widely recognised for its holistic approach to sustainable urban development and featured in global, national and local media sources – in Swedish, French, Spanish, Chinese, Japanese, Russian and other languages. Included is an assortment of English press.

- *Eco-guide for the Baltic Sea Region* (Augustenborg, included as an attachment)
- *Baltic Cities Environmental Bulletin* (Western Harbour, included as an attachment)
- *Building for a Future Magazine: Eco-Malmö* (Western Harbour, included as an attachment)
- *Financial Times: Grand Plan for Green Design* (Western Harbour, included as an attachment)
- *The Guardian: lessons from Elsewhere* (Augustenborg, included as an attachment)
- *UK Housing Cooperative: Up on the Roof* (Augustenborg and Western Harbour included as an attachment)
- *WUF Formas: Sustainable Building as a driving force* (Western Harbour, included as an attachment)
- *Seattle Post Intelligencer: [A dash of Copenhagen, a little Malmo in Seattle](#)*
- *Fast Company: [Fast cities, Malmö](#)*
- *Urban Ecology: [Towards a Sustainable City](#)*

Information and Promotion Materials produced in Malmö

Malmö also makes access to information and learning a high priority. Listed below are links to a variety of PDFs produced by the city that can be easily accessed online concerning Malmö's holistic approach to sustainable development, as well as detailed explanations of Malmö's Western Harbour and Augustenborg neighbourhoods. Additional materials, not yet available on the internet are included as additional attachments).

- PDF Archive on [Malmö's various sustainable development efforts](#)
- Green Strategies in Malmö Stad (Attached in Zip File)
- [Malmö: Making Sustainability Reality](#)
- [Climate-Smart Malmö \(2009\)](#)
- [Guide: Western Harbour](#)
- Western Harbour: [Goals and Design Principles](#)
- Western Harbour: [The Bo01 Area – A city for people and the environment](#)
- Western Harbour: Flagghusen – The Creative Dialogue (Attached in zip file)
- Ekostaden Augustenborg – On the Way Towards a Sustainable Neighbourhood (Attached in Zip File)
- [Augustenborg Botanical Roof Garden](#)
- Augustenborg: [Echoes of Tomorrow](#)