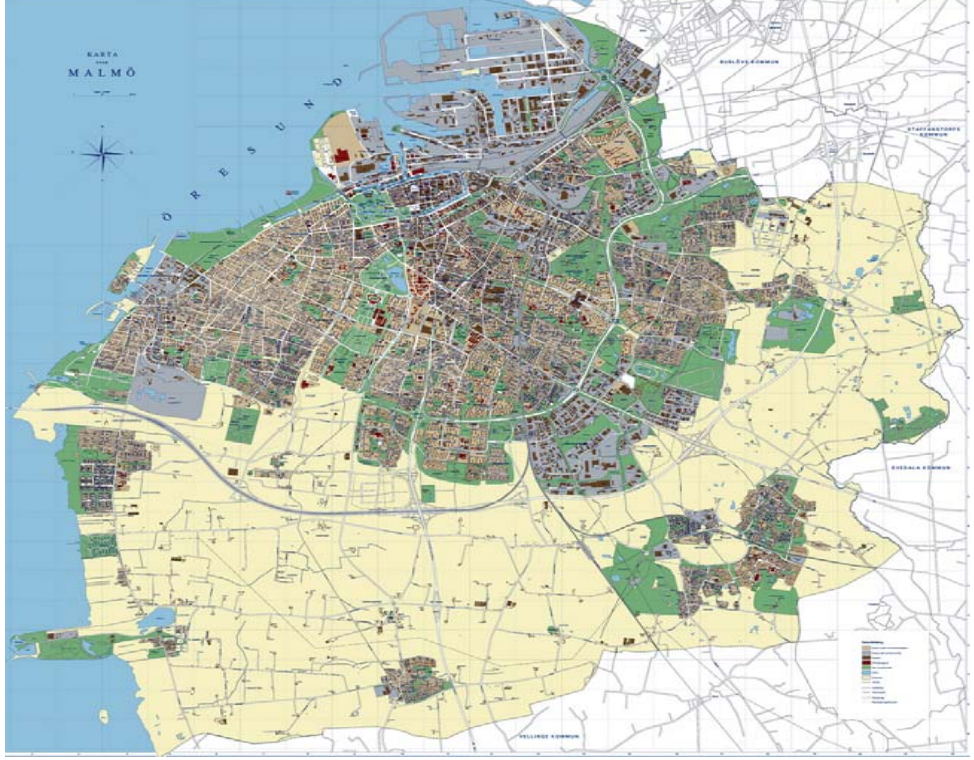

Transforming Augustenborg into an Eco-City. Malmö (Sweden)

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Malmö is a city familiar with the challenges, and opportunities, inherent to the urban condition. Until recent history, Malmö built its reputation and economic base around a heavy industrial core. Roughly 20 years ago, the industry collapsed and Malmö fell into an economic slump, suffering from high unemployment. In part because of this, Malmö engaged in a strategic transformation from an industrial city, towards a city centred on sustainability with a knowledge-based economy. Three major contributions to Malmö's transition include: a bridge, a university and a neighbourhood.

The Öresund's Bridge, between Copenhagen and Malmö opened in 2000. While the decision to build this bridge was taken by the national-level governments in Sweden and Denmark, it creates a physical and symbolic link between these cities, symbolising the growing cooperation in the transnational Öresund Region. Trains link the cities every 20 minutes, academic collaborations via the Öresund's University support the mobility of students and researchers, and the region's growing importance and rapidly expanding population attract public and private investments. For Malmö, this has also resulted in a new perception concerning its place in the world: from the south of Sweden to the centre of the Öresund.

Malmö University opened in 1998 and is today Sweden's eight largest university, helping the city to achieve its ambition to incorporate knowledge-led development. Malmö University, reputable for its practical application of learning, attracts students from across Sweden and abroad. ISU, Institute for Sustainable Urban Development, is a joint-venture between the city and the University of Malmö, linking research to reality.

In Malmö, an important part of creating a sustainable city is planning sustainable and attractive communities. The Western Harbour, the former brownfield turned eco-neighbourhood, physically demonstrates for Malmö citizens and international guests alike, the city's approach to sustainability. The Bo01 Housing Expo (2001) has become an urbanised district featuring 100% renewable energy, as well as a focus on energy efficiency, urban green and blue, sustainable transport, mixed-use and architectural diversification, within the larger city centre. Simultaneous to the development of the Western Harbour and other new neighbourhoods, Malmö also places a heightened attention on retrofitting existing neighbourhoods via engaging resident participation, greening communities and improving energy efficiency.

Such large-scale investments have led to a significant transformation of Malmö's economic base, its identity, and its reputation. Malmö aims to serve as an international example centred on sustainability – viewing it as a process of many parts. Many issues are addressed simultaneously: transport planning includes buses, trains and discussions to incorporate streetcars; infrastructure investments for electric vehicles; a green car fleet; and bicycling and bicycle infrastructure including more than 415 kilometres of bicycle paths which facilitate cycling as a main form of transport.

Malmö invests in renewable energy whilst concentrating on energy efficiency. It focuses on a system's approach which views waste as a resource: waste is used in waste-to-energy (incineration) to provide heat for the city's district heating system, to create biogas for city buses from food waste, as well as conventional recycling.

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.

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, much of this growth coming from students eager to study in Malmö, as well

as companies wanting to relocate in the city. Malmö is also an international city, with more than 30% of its citizens born abroad, coming from 170 countries and speaking 100 languages.

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 its public housing areas, including 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 retrofit of the Augustenborg neighbourhood is discussed below.

The transformation of Augustenborg into an eco-city

Augustenborg, built during Sweden's post-war prosperity in the early 1950s, is a neighbourhood of Fosie District in Malmö, encompassing 1800 apartments and nearly 3000 residents. At the time it was built 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 – all of which created pride in the community. 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. Additionally, the area suffered from unemployment, energy inefficiency in buildings, abandonment and severe environmental problems, particularly seasonal flooding from excess rainwater and run-over from sewage. Floating cars in basement garages, washing machines under water and the image of employees in small businesses rolling up their trousers and placing their shoes on their desk were a too frequent sight in Augustenborg prior to the programme's start just over 10 years ago. In addition to the costs associated with flooding, there were also significant health problems related to untreated wastewater.

Clearly, Augustenborg needed a new approach, to be viewed as a system of many parts to solve some of the greatest challenges in the area, including seasonal flooding, which detracted investments and interests from small businesses and residents alike.

In 1997 the local technical facilities were closed and several key actors discussed how to transform Augustenborg into an eco-neighbourhood. This included: Peter Lindhqvist, 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 Public Housing Company) in Augustenborg. The idea was to engage public and private sector actors and to incorporate citizens, in project development, as well as later implementation. Timing was right: MKB also had planned to retrofit Augustenborg's housing structures. A group of politicians and senior officers from city departments met, as well as area residents, all who wanted to turn the area into a sustainable city district.

Finances were secured from the Swedish Government's Local Investment Program (LIP). Following this, a steering committee was founded and in 1998, an area model with suggestions on how to make Augustenborg more sustainable, based on the desires of local stakeholders and residents, was presented. This included the inclusion of green roofs and an increase in urban biodiversity, a musical theme playground and an open storm water system to prevent flooding. In this first meeting, close to 400 people came. Trevor Graham, previously affiliated to Ground Work in England, was soon recruited as the project leader of Ekostaden Augustenborg.

Key features

Ekostaden Augustenborg developed as

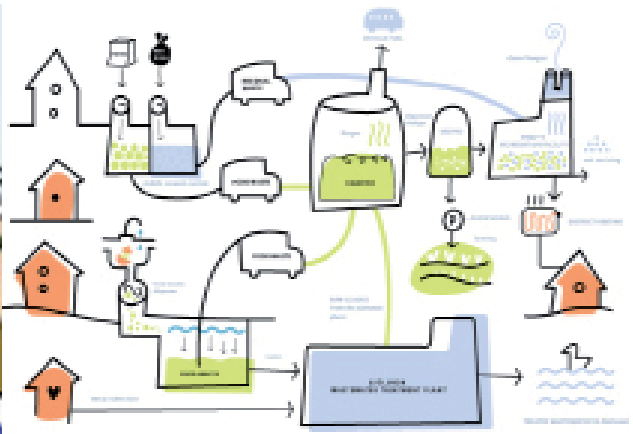
a process to integrate sustainable urban development, which incorporated a wide variety of hard and soft measures by which to transform the district. This included: local energy production and energy efficiency, improved facilities for waste separation, open storm-water treatment, a focus on urban green space, transport and citizen participation.

Concerning renewable energy implementation, Augustenborg produces solar energy for both heat and electricity, and in 2009 incorporated a small-scale windmill at the district school. Ideas from residents are behind the solar energy project, featuring 450 m2 solar panels in Augustenborg's former industrial area, which connect to the central heating system. Solar panels on the new school building, and a number of demonstration photovoltaic systems increase the renewable energy profile. The Augusten¬borg Solar Project was an important catalyst for the initiation of 'Solar Region Skåne' (a cooperation between the City of Malmö, the Region of Skåne and Lund University to inform and implement solar energy in the region).

Concerning energy efficiency, as apartments were renovated and old plumbing replaced, they were fitted with individual hot water metering. The possible energy saving is quite significant, as residents can understand and regulate their water use. Hence, they reduce their environmental impact, as a third of all heat goes to hot water. While a pilot project for individual measuring was conducted which found where gains could be made; it was concluded that a centrally-controlled system has greater efficiency.

Concerning housing, in addition to retrofitting existing buildings, MKB has also created two senior citizen facilities in the area: Oktagonen with 34 apartments and Sommaren with 77. Next to them there is a theme garden with raised flower beds and a greenhouse developed as a roof garden on top of a garage.

Concerning waste separation, Augustenborg has a high level of recycling compliance and is supported by 13 facilities (miljöhus) which house waste-separation services. In 2008, Augustenborg was chosen as a pilot project for separating food waste to make biogas used in city buses. Within the pilot



programme, a new information campaign took place, and following this, all waste flows in the neighbourhood were analysed. Augustenborg also has a collection of hazardous waste, electronics and fluorescent tubes, which has generated 3,250 kilograms in six months.

Concerning green space, Augustenborg hosts the world's first botanical roof garden, The Green Roof Institute, which features 9000 m2 of green roofs, providing habitat for flora and fauna and absorbing rainwater. MKB apartments also have incorporated 2,100 m2 of green roofs. In addition to green roofs, overall green space has increased 50% since project initiation, attracting birds, insects and small wildlife.

Concerning local flood management, Augustenborg has integrated 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 serves as an important asset for the area, improving the aesthetic value of the district, as well as supporting biodiversity. Many collection ponds now feature fish and other aquatic creatures. There are a total of 6 kilometres of water channels in Augustenborg. Today 90% of the storm water from roofs and hard surfaces leads into the open storm-water system. The project's original aim was 70% of all storm water – thus it has surpassed its goal.

Concerning transport, residents initiated a car pool in 2001, now a part of the regional not-for profit organisation – Skåne's Car Pool. The car, fuelled by ethanol or biogas, is parked close to the square and used by members in the area and other parts of Malmö.

Concerning traffic, tenants undertook a survey concerning the area's traffic and resident perceptions, which resulted in an overview of the traffic situation. Restructuring Augustenborg's main throughway has diminished traffic substantially and a number of measures were taken to increase safety at the school. A new exit to the industrial area is the next step, so that heavy industrial vehicles will no longer pass by the school entrance.

Stakeholder participation

Local community involvement has been pivotal to the successful transformation of 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 shape the process and direction of the development. Throughout Augustenborg's process of change, about one fifth of all residents have participated.

In Augustenborg School, students are active in waste separation, composting and have witnessed the 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 organic local food. Students have

been an important part of the process since the beginning, and Augustenborg's transformation is incorporated in their learning.

Resident involvement in Augustenborg's transformation has resulted in a more empowered community, as can be witnessed in the elections participation of local residents which increased dramatically during the project's initial stages: from 54% in 1998, to 79% in 2002.

A variety of projects were also initiated by community members, including: the development of Augustenborg's open-storm water system; 'Kaninhotellet' or Rabbit Hotel which teaches children how to take care of and respect animals; the Community Carpool; active engagement in recycling and composting as well as energy metering; and Café Summer which functions as both a café and meeting place for residents to exchange, interact and share ideas. The café is run by residents and has activities all days of the week and an open café twice a week. The residents have witnessed a profound change in their community; creating a sense of pride, as well as the desire to engage in the process of change. Augustenborg provides a living laboratory concerning what sustainable urban development can incorporate and students (from local school children to university students) have been involved in active learning, witnessing Augustenborg's transformation. The City of via Augustenborg becoming one of the most visited and referred to examples for urban transformation and ecological development in Europe. Additionally, MKB (Malmö Housing Company) and its related efforts in Augustenborg have lifted the company's environmental profile as well as supported long-term cost savings, particularly in relation to energy consumption.

As a result of the active partnership of different stakeholder groups, Augustenborg has become an attractive, multicultural neighbourhood in which the turnover of tenancies has decreased almost 50% and previously common environmental impacts (such as flooding, energy inefficiency, etc) have decreased significantly.

Sharing Augustenborg's example

One of the main objectives of Ekostaden Augustenborg was to create a platform to support the participation of all relevant stakeholder groups in order to transform the district into an ecologically, socially and economically sustainable neighbourhood which serves to lift Malmö's profile as a sustainable city – both for Malmö residents as well as internationally.

Locally, certain features first piloted in Augustenborg have since been applied in other areas of Malmö, including green roofs and related green points in urban areas; production of biogas to fuel city buses; open-storm water management; citizen-initiated carpools and an overall focus on renewable energy in Malmö.

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. In December 2009, during the United Nations Conference of the Parties on Climate Change (COP15) in Copenhagen, Malmö hosted study tours for conference participants, featuring Augustenborg as a case for urban climate adaptation – to manage changing rainfall patterns through a more 'natural' approach.

Summary and next steps

Some 10 years later after the initiation of Eco-city Augustenborg, the district has been transformed. Parks and traffic areas have been redesigned. The courtyards and facades rebuilt and renewed following resident input. New apartments for senior citizens were built, incorporating common spaces for resident activities. Green areas are enriched, without compromising the original style. Biodiversity has increased 50%, in part because of the inclusion of 30 green roofs which now attract birds and

insects, and the open storm water system provides a better environment for local plants and wildlife. Since the open storm water system was installed, flooding is no longer a problem. Augustenborg even managed well when large parts of Malmö were flooded in the summer of 2007. A large solar power station contributes renewable energy to the area; at the same time as energy efficiency is a priority. Heat and hot water consumption decreased 25%.

Perhaps the most apt indicator of success, however, is how the residents approach and interact with the changes. Quality of life in Augustenborg apartments has increased, with improved public spaces, increased urban biodiversity and reduced flooding. Apartment comfort has improved, as buildings were fitted with technical devises to improve efficiency as well as renovations and insulation changes. While these are welcomed improvements, the cost has not risen substantially and the area's former problem with abandonment has been replaced by a new pride of the residents, new and long-term ones.

Unemployment is still higher than Malmö's average, but has dropped about 15%. Residents have also initiated several small and medium sized enterprises, contributing to employment, as well as to specialise Augustenborg as a city-district renowned for sustainability. As a direct result from the Ekostaden Augustenborg project, three new local companies have started: Watreco (working with open storm water management), the Green Roof Institute and Skåne's Car Pool.

Key lessons of Eco-City Augustenborg:

1. Ensure a holistic approach to sustainable city development, based on many parts: social, economic and environmental;
2. Aim to incorporate broad-based participation from various stakeholder groups – from the beginning;
3. Support, enthusiasm and understanding from key politicians and decision-makers is vital;
4. Communication and access to information helps residents and other stakeholders understand the project's development;
5. Support local initiatives and small-scale businesses;
6. Test new innovations and process strategies, noting that timing is vital;
7. Seek funding streams from local, national and international (EU) funding mechanisms,
8. Create a project which can lead to up-scaling and mainstreaming and help redefine the city as a whole, by which it becomes interesting and attractive for visitors and study tours.

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 on rooftops, and passive houses (without energy for heating or cooling) incorporated. Residents are encouraged by changes in their city-district and hope new residents move into Augustenborg because they are attracted to the area's eco- and social profile. A current focus is related to local climate change adaptation (as Malmö is anticipated to have an increase in rainfall) as well as urban and organic agriculture, as a way to engage the area's diverse residents. While much has happened, the district continues to be a priority area in Malmö and an apt platform to test new ideas to raise Malmö's profile concerning sustainable urban development. Ekostaden Augustenborg is never finished, and that is just the way it is supposed to be.