Eco-city 2.0
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As consultants in sustainable engineering and design in projects in Europe, Africa and Asia, Sweco has gained experience that has been utilised together with the Swedish government and Royal Institute of Technology to develop the SymbioCity concept – an integrated planning model that facilitates the conditions to reduce the impact of climate change, adapt society to a changing climate and achieve a sustainable eco-city.
SymbioCity in China

Sweco has been active in China for 15 consecutive years with the SymbioCity planning concept for Eco-city projects. All cities had the same overall goal of becoming an eco-city. But the challenges and therefore the solutions have not been the same in every city.
One important part of the SymbioCity integrated planning process is the eco-cycle model. The goal is to create synergies between materials, water and renewable energy by linking the flows of resources in the city into closed loop systems. The planning has been done in according to the unique conditions of each city.

One loop in the water cycle is the stormwater management. One example is Yinchuan New Town in China. Through integrated planning the stormwater combines with the blue infrastructure, water, and the green infrastructure (parks, trees). The street environment’s green infrastructure can be a part of the stormwater system, and achieve stormwater purification and at the same time irrigation of the planting in the streets. Using stormwater for irrigation in a city has enormous potential.
The EcoCycle model has been developed to version 2.0, in the planning of Stockholm Royal Seaport.

The district has been important as a source of knowledge and inspiration for international cooperation and export of environmental technology and expertise in sustainable urban development.

By 2030, Stockholm Royal Seaport will be a fossil fuel free city district, adapted to the effects of climate change and with the ambition to become climate positive and deliver energy through smart grid.

The EcoCycle model is being developed for more specific loops, such as nitrogen and carbon. The ambition is to create a digital model for annual measurements of the flows in these loops.
Never before have cities grown and new cities been created as rapidly as they are today. Changes in precipitation levels, rising temperatures and extreme weather are becoming more common. The cities generate better living conditions, which in turn leads to increased water use per capita. Water scarcity is a reality in many cities. Integrated planning becomes more crucial since the city systems and the inhabitants will need to be even closer connected to cope with the challenges. Here are some of the important trends we see that takes the eco-city to the next level, Eco-city 2.0.
Trends

“Mayors are the new prime ministers”

Cities compete in being the most livable - you choose which city to move to, not country. It is also in the cities that we experience some of the greatest effects of climate, such as flooding. The cities want to and must drive the development of the sustainable society.

Digitalisation (Smart Cities)

Eco-city 2.0 is a smart city. Once we have gathered and combined the information detected by sensors in the city, we make existing cities more efficient. For example, we can produce and then distribute large volumes of tap water to reservoirs when the energy production from renewable energy such as wind is high and the energy consumption is low. We can maintain constant control of the water quality and can avoid health risks with fast circulation of information to citizens. When we are able to make the cities more efficient, the focus on how we run a city becomes more important, and shifts from planning new to running what already exists in an effective way.

Climate adaptation

To manage heavy rains or high sea levels, climate adaptation plans are implemented throughout many cities. The main focus in these cities’ plans is often water and we have seen some major flooding events in large cities around the world. This has led to good understanding of the cost of flooding and cost-benefit analyses are a normal part of plans. One solution to achieve effective resilience is multifunctional areas for flood control. For example parks and recreational areas that can be flooded during heavy rains. These areas can also be used for the capture and storage of water for further use, e.g. irrigation in the city.

Circular economy

We create value from waste. We recognise the value of eco-systems. Urban mining is one example where the digitalisation of information makes it possible to “put on the x-ray specs” and follow the flows of the resources and to extract compounds and elements efficiently. This change in economy drives innovation and new technical solutions. When it comes to water, we are still waiting for the breakthrough. Freshwater as a resource is undervalued, and tap water is too cheap. At the same time, scarcity of water is increasing in cities.
Trends

These are trends with good potential. New economic systems such as circular economy and regulations/demands from nations and cities is a good basis for getting up to speed and moving forward from integrated plans to taking action through Eco-city 2.0.
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