

In every new street and square, we try to add as much urban green as possible



Ronny Van Looveren is the project leader on climate adaptation for the city of Antwerp. He advises on climate change adaptation in all the city's plans, instruments, and projects. By profession, he is a civil engineer with a focus on hydrology. We were talking about how Antwerp is adapting to climate change.

What are the biggest climate change challenges the city of Antwerp is facing?

The city of Antwerp, like many other cities in the world, is confronted with the consequences of climate change. Temperatures are rising globally, and additionally, temperatures in a city during a summer night can be much higher than in rural areas due to the urban heat island effect. This causes health issues and even mortality. More intensive rainfall leads to more (pluvial) flooding, sea level rises lead to (fluvial) flooding, while longer dry periods lead to droughts and water scarcity.

As you mentioned, one of the major problems is also the urban heat island. Already today there are differences with the surrounding area of 4 to 9°C and by 2030 you predict an increase in the effect of up to 50%. How are you addressing urban heat island mitigation?

On a city-level, more urban green is essential. Trees and vegetation provide shade and cooling through evaporation and transpiration. To be able to do this, trees and vegetation need water, so climate problems of heat and water scarcity are also interrelated. In every new street and square, we try to add as much urban green as possible. This is not easy, as space in a city is precious and also claimed by mobility, residential, industrial, commercial, and recreational needs. Integrated and smart urban planning is key to optimizing the use of space.

Also, individual buildings can adapt to heat stress by incorporating shading devices and sun control, green roofs, and green facades. The city building code foresees a lot of these measures, and citizens are enticed to take measures themselves by raising awareness and providing financial incentives.

In 2019 The Antwerp Water Plan was approved. What is it about and why was it necessary to adopt such a plan?

To prevent pluvial flooding, the city has prepared a Water Plan because a new equilibrium had to be found between the three so-called water cities. The actual city is primarily artificial and consists of large (underground) sewer systems and pumping stations. This artificial water city is reaching its limits and is not able to adapt to climate change. The historic water city, with many spots for open water even in the city centre, has almost completely disappeared and the natural water city, with some open water and swamps, has been reduced to a minimum. In the vision of the Water Plan, the artificial water city is still important, but the historic and natural water cities are also revaluated. Water will become more visible, present and tangible.

Implemented water measures from the Water Plan are: water permeable parking spaces, infiltration zones, garden streets, green roofs, depavement of school playgrounds ...

What measures are you taking to adapt to sea level rise?

The city of Antwerp is situated at the borders of the Scheldt river. The Scheldt is the lifeline of the city and has helped ensure that a thriving port could develop. The tidally influenced river, however, also poses a threat to the city. Sea level rise is expected to reach 60 to 100 cm by the end of the century and could cause catastrophic floods. Therefore, the regional government of Flanders developed in the 70's a Sigma plan that was again updated in the beginning of this century. The original plan was primarily about strengthening and raising the level of all embankments. The Updated Sigma plan is more based on Nature-Based solutions with more space for the river. Protection of the city of Antwerp is now done by a combination of controlled flood areas and new embankments. The new embankments also come with the opportunity to create new qualitative public space along the river side.

On the other hand, in addition to flooding, the city faces drought and water scarcity. You are tackling it through efficient circular water vision, please explain more.

The city is using more and more circular water instead of drinking water. Circular water can be rain or grey water.

Rain falls everywhere, but not continuously. Therefore, reservoirs have to be built to store the water for the drier periods. In Antwerp, individual rainwater reservoirs are mandatory for new constructions and are promoted for existing constructions via subsidies. Also, collective reservoirs are constructed, with an example being the 'South Park.' A reservoir of 1,500,000 liters collects the rainwater of all surrounding roofs so it can be used for cleaning streets, irrigating urban green, and as circular water (toilet flushing) for a new building of 300 residents.

In contrast to rainwater, greywater (groundwater drainage, treated wastewater) has the advantage of being permanent but the disadvantage of not being everywhere available. Rainwater and greywater are therefore complementary. For reusing greywater, no reservoirs are needed, but pipelines have to be constructed between the water source and the user. The city has built a first one of these pipelines and is planning to build two more in the near future. These pipelines will play an important role in adapting to heat stress, which brings us back to the beginning.