

# Environment for Climate-Resilient Cities

## Environment

### Strategies & solutions to resolve and reduce environmental risk in climate change resilient cities

As much as increased urbanisation is a threat to the environment in terms of waste, pollution and increased greenhouse gas emissions, the resulting increase in climate change hazards also poses a threat to health, safety and quality of life in our cities. Tractebel's environmental team takes a special interest in addressing the issue towards the development of more resilient cities.

#### Environment & Climate Change

The most relevant environmental aspects for a city related to climate change are **waste water**, capacity to treat new flows, **waste management**, **air quality**, and **urban biodiversity**.

A resilient city considers all aspects in relation to social expectations as well as nature-based solutions, to optimise its resilience strategy.

#### Strategic Intervention

We are able to model and assess city system vulnerabilities to climate change impacts and have both experience and specialised expertise in the optimisation of infrastructure and systems related to waste and their protection, as well as solutions to improve air quality and increase urban bio-diversity.

We work closely with authorities and stakeholders at city and municipal levels to develop **policies and governance structures to support environmental strategies**.

When **adaptive pathways** call for major interventions, we can also recommend the services of specialist partners within the ENGIE Group.

In all cases, we accompany and guide the stakeholders in making choices and in defining concrete measures and actions to address the risk.

#### Waste Water Treatment

All cities, infrastructure, industrial areas, environmental functions depend on proper water management. Waste water collection and treatment, including collection of rainwater, is essential to this, to safeguard health and prevent pollution. Typical extreme weather event challenges include:

- Flooding due to the inability to collect rainwater during storms or over a long period of rain;
- Collapse of Waste Water Treatment Plants (WWTP) due to overflow or inability to retain water long enough for proper treatment;
- Collapse of WWTP due to lack of water in long periods without rain;
- Destruction of infrastructures due to excess polluted rainwater flow;
- Pollution of waste water after first rains following a dry period.

#### Waste Management

Climate change is impacted by waste management and will impact on future waste management. Improper waste management increases GHG emissions. Extreme weather events can lead to a dramatic increase of waste generation and pollution spread. Improper waste management systems, exacerbated by extreme weather events may have tremendous impact on living conditions and health.

#### Air Quality

When air quality decreases, peoples' health, many activities also suffer (transport and mobility, industry, electrical generation and

more). Smog, dust storms, mist, thermal inversion and raised air temperature are typical examples of lowered air quality cities can suffer -induced by city activity or aggravated by climate change events.

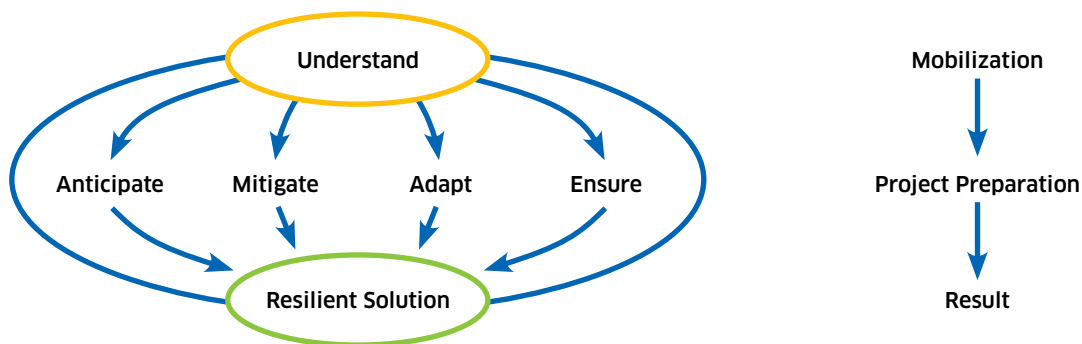
Strategies for cleaner industry, cleaner transport, cleaner energy production and distribution, will go a long way to reducing climate change and help improve air quality in our cities.

#### Bio-Diversity

Protection of biodiversity is now a global priority and climate change puts additional pressure on an already very sensitive area. Reducing ecological footprint and enhancement of urban biodiversity in all forms can increase the resilience of our cities to current stresses and future risks, often at much lower cost than a man-made solution. Integrated city forests, parks and lakes can indeed assist with temperature regulation, act as windbreaks, collect water run-off and provide storage, as well as improve the health and wellbeing of city residents. Other example, green spaces around no-go zones like airports, railway lines or on building rooftops (natural insulation) can also increase the biodiversity of food systems, food and nutrition security and help improve air quality.

Biodiversity projects in Tractebel are seldom standalone, but are integrated in adaptive pathways and solution alternatives of many sector projects (particularly site rehabilitation).

**Tractebel** covers the full process-cycle both for sector-based and cross-sectorial analysis, planning, design and implementation of climate change adaptation actions to help build the resilience of specific assets, sectors, areas or complete territories. Steps include stakeholders engagement, vulnerability and risk assessment, masterplanning and development of a resilience strategy, and finally the project preparation and implementation.



## Some of our References

## Urban Climate Resilience

### City Waste Water Management – Namur, Belgium

**Objective:** Proper management of Waste Water during heavy rain and storms to prevent city flooding, pollution of River Meuse and collapse of WWT plant.

**Result:** Tractebel developed an innovative concept based on the specificity of vortex and the rotation of the earth. The concept separates flood waters into two parts – one flow returning to rivers or reservoirs after a rapid cleaning by centrifugal force and a second flow still going to the WWTP.

### Supporting Beliris, (Brussels administration) in integrating EMAS in their infrastructure projects

**Objective:** Integration of climate adaptation measures in an Environmental Management System that can be applied to improve the environmental management of the city’s infrastructure projects.

**Result:** Examples of climate adaptive measures were integrated such as sustainable waste management systems, correct/safe storage of materials and equipment on site protected against bad weather conditions, closing water cycle - reduce water usage on site, managing flood risks, limiting rainwater run-off, use of rainwater for works, limited (ground) water pollution on location, protection of fauna & flora during construction works.

### Study on Air quality in urban environments in Africa

**Objective:** Define future evolution of air quality in various African cities, taking into account population evolution and displacement pattern, changing modes of transportation and climate change impacts.

**Result:** The studies carried out have given the cities a precise picture of what its inhabitants and future transport users can expect. The impact on health and wellbeing in future years were established. Action programs for the future have been drafted.

### Stiembeek Valley - City Park Rehabilitation - Genk, Belgium

**Objective:** Redevelopment of “lost” urban space to a city park with green/blue infrastructure to be a productive landscape: water management, biodiversity, food, renewable energy source.

**Result:** The development of a landscape in which a strong ecological dimension is combined with a diverse and dynamic public use.



Air quality



Biodiversity



Environment



Waste management



Waste water treatment