Water for Climate-Resilient Cities

Water

Expert solutions to climate induced risk and protection of critical water resources

Climate change has a direct impact on our water resources, in terms of increasing hazards and risks presented, as well as availability of water as an essential resource. Tractebel offers exceptional expertise in modelling hydro-meteorological conditions used to assess and analyse climate change risks and strategy proposals related to the design and realisation of sustainable water projects for climate-resilient cities.

Living with Water & Climate Change

For cities, infrastructures and networks situated next to or nearby water, the risk of damage by water related hazards is steadily increasing as climate change affects sea levels and the action of water, through tide, the hydrological cycle and hydro-meteorological phenomena.

At Tractebel, "Living with Water" means constantly looking at better ways to prevent or mitigate the risks related to water such as: flooding, including pluvial flooding, overflow or marine submersion by overtopping, failure of dikes, storm surges combined with spring-tide, as well as coastal erosion, bank erosion, mass movement, etc. all aggravated by sea level rise and dramatic changes in precipitation patterns.

Water as a Resource & Climate Change

Water is also a life necessity to economy, energy generation, agriculture, transportation, infrastructure, provision of services, human and ecological health, etc.

As a consequence of human-induced climate change, precipitation variability and seasonality, increasing average temperature and temperature amplitude are a reality. Effects such as increased evaporation, droughts, as well as heavy downpours capable of overwhelming infrastructures and causing pollution of water bodies, impact the guarantee of water supply on which modern urban societies rely.

Tractebel's expertise in this sector covers: water resources management, water supply, water treatment, navigation, hydropower, process (and cooling) water, drought and nature conservation and more.

Climate Change Adaption at City-level – the 3 P's

When working with water, at city-level, project goals typically fall into one of **3 targets: Preparedness; Prevention; Protection**
In all cases, Tractebel works closely with key stakeholders to develop a full sector or cross-sector vision as to how to tackle the issue, the possible project steps to take and at what cost.

Our Skills and Benefits

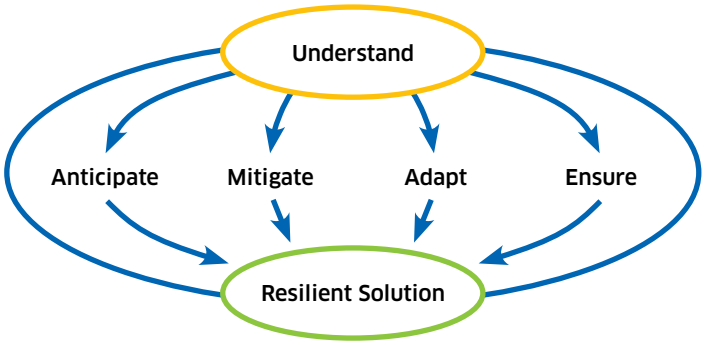
We bring extremely wide-ranging experience and expertise in water; from managing flood risk, to dredging and coastal protection, to hydropower, to water transfer and, inside cities, all important water networks, sanitation and more.

A particular strength, key in the design of resilient cities, is the digital modelling and mapping of water related hazards - vital to the multi-level risk analysis of urban populations, urban system functions and critical infrastructures.

Our experts are also leaders in the field of hydro-meteorological modelling and hydro-behavioural simulation – a requirement to perform the complex analysis needed to determine the probability of hazard events, their outcomes and potential solutions.

Key to defining master plans and stakeholder decision making, we are able to calculate the effects of a large combination of boundary conditions = hazards combined with consequences (financial loss, damage, economical loss, risk of injury, etc.) allows the mapping of risk and the development of cost functions to express loss/damage as a function of the occurring hazard.

Tractebel covers the full process-cycle both for sector-based and cross-sectorial analysis, planning, design and implementation of climate change adaption 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

Sigma flood protection plan

Objective: Increase flood protection and safety in the territory impacted by more frequent and intense storm surges around the Scheldt estuaries (Belgium, the Netherlands)

Result: The optimal solution was approved by the Flemish Government for development and construction.

West Africa Coastal Area (WACA) - Coastal Erosion Investment Strategy

Objective: Study for World Bank and the Nordic Development Fund on the Cost of Coastal Environmental Degradation, with end goal of defining investment strategy for its resolution

Result: Successful development of IFI approved Investment Strategy

Climate Change resilient water supply – Simiyu region, Tanzania

Objective: Implement a climate resilient water supply solution with sustainable impact on the economic activity and health of app. 300,000 rural/peri-urban and 95,000 urban population and their environment.

Result: The design of a bulk water supply scheme in combination with a smart-agriculture aiming at the improvement of living conditions will allow for a sustainable adaptation to the increasing impacts of climate change.

Amu Bukhara Irrigation System Rehabilitation, Uzbekistan

Objective: Rehabilitation of main pump stations (serving 315,000 ha irrigation, cities, industry – with population app. 1.8 million) to minimise future climate change risks, while considering increased sediment load of the Amu Darya River.

Result: A more energy-efficient pumping practise and an improved management of the available water resources including the execution of water conservation measures.