Climate-Resilient City Development

Urban Climate Resilience

Sustainable actions to step up climate change adaptability in cities

Making cities more resilient to climate change is vital to protect people, assets and services from natural and man-made stresses, but also to attract economic activity and investments. Tractebel supports city stakeholders around the world in the risk analyses and devising of multi-level, adaptive approaches needed to safeguard cities as safe, thriving and liveable environments.

Climate Change & our Cities

By 2050, with the global urban population predicted to double, two thirds of the world populace will live in urban areas. Such rapid urbanization will increase pressure on many urban challenges. While urban activities are major sources of greenhouse gas emissions, cities are particularly vulnerable to its effects.

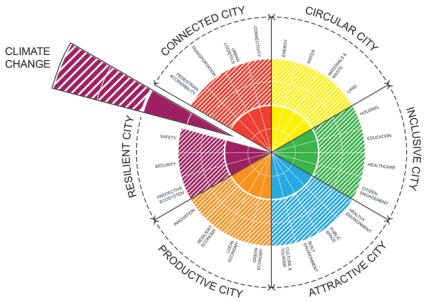
Aging, poorly conceived or overly-rapid developed urban systems are increasingly exposed to climate impacts and hazards such as extreme floods, droughts, storms, heat or cold waves wild fires, and more, grow in intensity and frequency, overcoming cities' original design capacities.

This can have a costly impact on city services, infrastructure, housing, people's livelihoods and health. Reliable energy provision, water supply, waste removal, information technology, transport, building security… are just some of the weaknesses most cities need to address in the face of climate change. But where there are challenges, there are also opportunities.

Climate Change Adaptation

Tractebel's multidisciplinary expertise in Water, Energy, Transport, Urban Space and Environment is an ideal fit to imagine and deliver viable, implementable and replicable, adaptive solutions to building urban resilience over time.

To facilitate holistic diagnosis of sustainable city development and support stakeholders in finding solutions that fulfil their needs, we have developed a state-of-the-art tool, the 360 City Scan ©



Our Skills & Benefits

Assessment of risks related to the magnitude, onset, frequency, duration, spatial coverage of hazard events, underlying social, economic and environmental conditions of a specific location.
Deterministic/ probabilistic risk and **vulnerability assessments** at national, subnational and community levels for both current and future climate trends.

Dynamic modelling allowing cross-sectorial and cross-dimensional analysis – evaluation of both the hazard and monetary impact of climatic change events and triggered event chains.

Strategies based on **adaptive pathways**, articulating uncertainty, defining under what conditions a solution becomes preferable.
State-of-art tools for analytics, mapping and visualisation of climate change vulnerability to facilitate decision making.

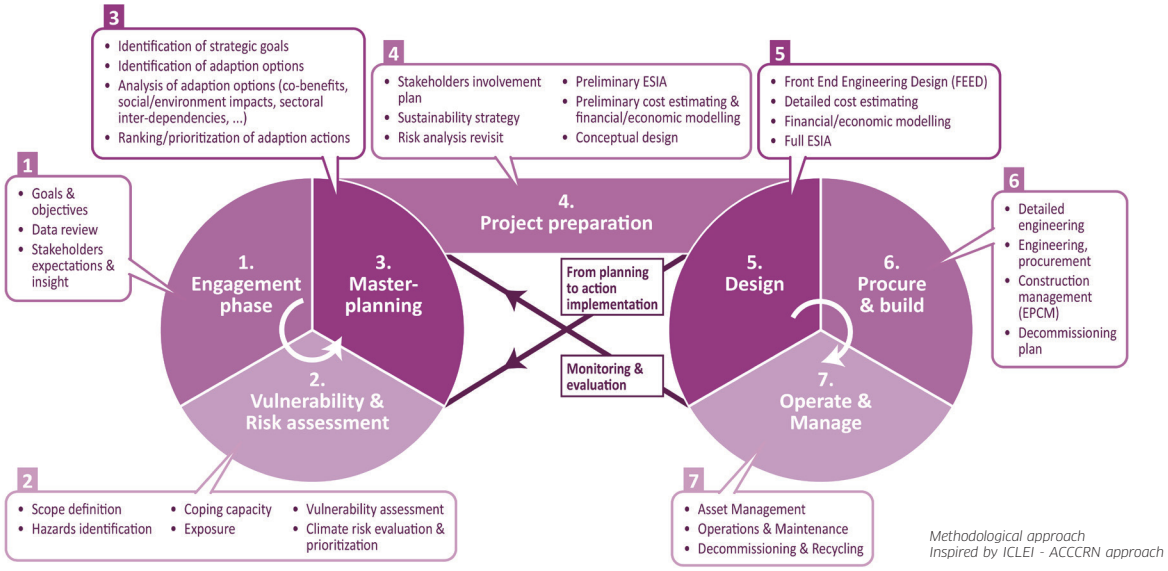
Financial Guidance

Transformation needs funds. We also conduct technical and financial studies and develop business plans, taking into account local institutional and legal context to help clients translate project ideas into bankable projects, build funding mechanisms or apply for support from Finance Institutions.

Governance Support

Tractebel is experienced in managing country-specific governance actions, legislation and providing policy advice. Examples include post-evaluation of current measures, ex-ante assessment of policy options, recommendations on policy options, long-term climate policies, specifications of the role of a government body, identification of relevant policy.

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.



Methodological approach
Inspired by ICLEI - ACCCRN approach

Stakeholders' Engagement

A shared vision of a project's approach and expected outcomes is vital to building resilient cities. Typical engagement actions include:

- Identification of key stakeholders and their role.
- Collection and analysis of information on the urban and climate context, the legal and institutional framework and existing and planned climate-related initiatives.
- Prioritisation of vulnerable people, services, environments, economic growth, disaster risk reduction and critical infrastructure.

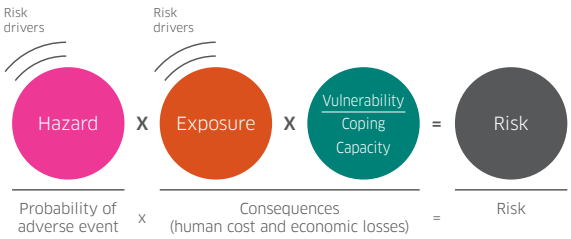
Using dynamic modelling, we will build the most likely futures to assess present decisions.

Vulnerability & risk assessment

At city level, decision-makers not only face the challenge of preparing for the risks due to single climate trigger events, but also to chains of events as a result of cascading effects of a hazard on the system. In a multi-level risk assessment; vulnerable areas, population groups, sectors, assets, etc. to alert stakeholders and prioritise "hotspots". Typical assessments include:

Qualitative high-level risk assessments, considering all possible climate-related hazards and the relationship between these and the performance, vulnerability, tolerance and flexibility of a system or cross-sectorial system being considered.

Quantitative risk assessments of main climate hazards on interconnected infrastructures aim to monetise the cost of climate impacts on core systems – taking uncertainty into account for accuracy. This is a requirement for financial planning and evaluation of resilience strategies and it gives opportunity to suggest additional adaptation actions at marginal cost.



In simple terms, loss or damage **Risk** assessment of potential climate-related hazard events is assessed by combination of the hazard event/s
= **'Hazard'** X **'Exposure'**
X **'Vulnerability'** ÷ **'Coping Capacity'.**

Masterplanning

As remains uncertainty how climate hazards will evolve in the long term, a multi-layered approach to resilience is considered the best way forward. Information collected and analysis conducted in previous phases provide a basis for a list of potential resilience interventions to develop.

These options will fall within broader **adaptation pathways**, with various methodologies used to appraise and prioritise adaption options against criteria such as resilience impacts, sectors' and systems' interdependencies, co-benefits, costs, political and social acceptance, etc.

Project Preparation

Expert project preparation with; qualitative feasibility and technical preliminary studies, preliminary costs, correct ESIA evaluation is crucial to foster project sustainability. Our goal is to develop **bankable project proposals** ensuring that project investment needs are properly identified, while respecting the standards of the institutions which will fund or implement them.

Design

This phase sees the conceptual design of approved projects taken forward to a detailed engineering design, with equally detailed associated costing, site and construction phase preparation executed.

Procure & Build

We have long experience in engaging with suppliers and construction parties as Owner's or Lender's Engineer. Site Supervision & Commissioning services are also available to help ensure that construction is executed according to expected standards and all elements are correctly in place ahead of operational start-ups.

Operate & Manage

Our aim is to ensure a project's long term optimal performance. Typical actions include operational optimisation of an asset as operation data becomes available over time, support via training or simulators to optimally operate/ manage a new build infrastructure and, decommissioning and site recycling towards more nature-oriented (Biodiversity) projects.