

Background

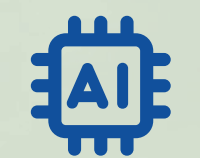
Rising temperatures, more frequent extremes and changing land use patterns intensify the **Urban Heat Island** effect, affect **public health**, and alter **urban carbon** dynamics.

Urban planners and decision-makers need high-resolution, reliable, forward-looking information to design resilient, climate-neutral cities.



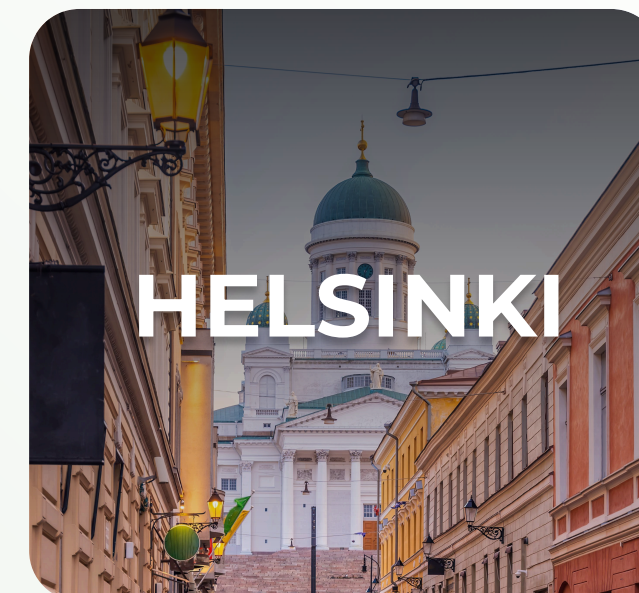
What the model delivers

The Urban Impact Model transforms km-scale climate simulations into decision-ready indicators for urban environments.

-  **Urban climate extremes module:** supports the assessment of human exposure to temperature extremes and contributes to understanding the Urban Heat Island effect under present and future climate scenarios.
-  **Carbon sequestration module:** estimates carbon dynamics in urban environments and evaluates the potential contribution of nature-based solutions to carbon neutrality and urban temperature regulation.
-  **AI/ML-supported modelling:** combines process-based modelling with AI/ML approaches, including the development of an ML emulator to support broader usability, scenario exploration and uncertainty assessment.
-  **Earth observation + in-situ data integration:** uses satellite-based products, climate reanalysis datasets and in-situ observations — including citizen-owned weather stations — for calibration, validation and robustness assessment.

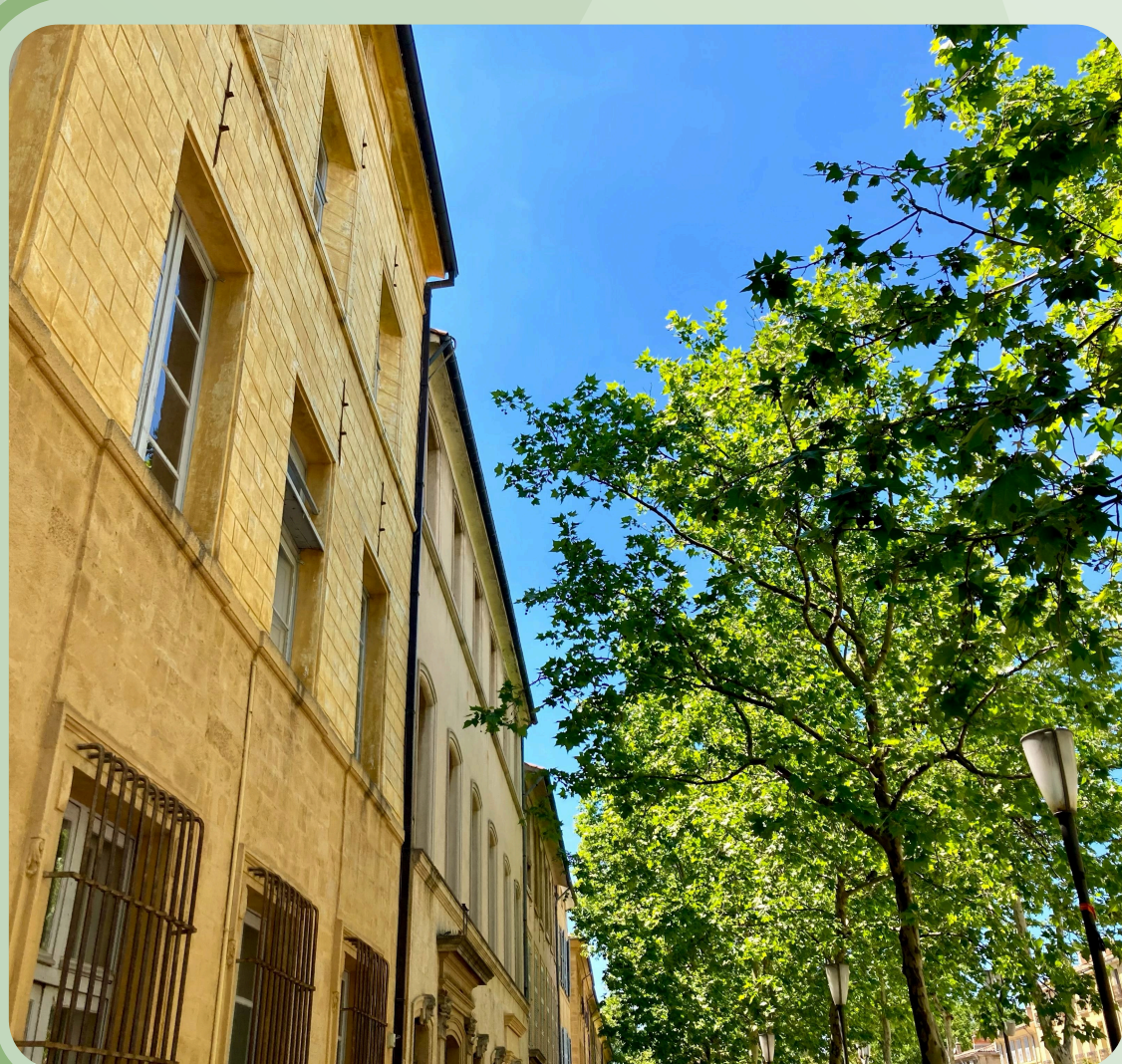
Our impact

The model progresses from proof-of-concept to operational readiness, enabling testing of alternative urban planning and climate scenarios in **6 target cities.**



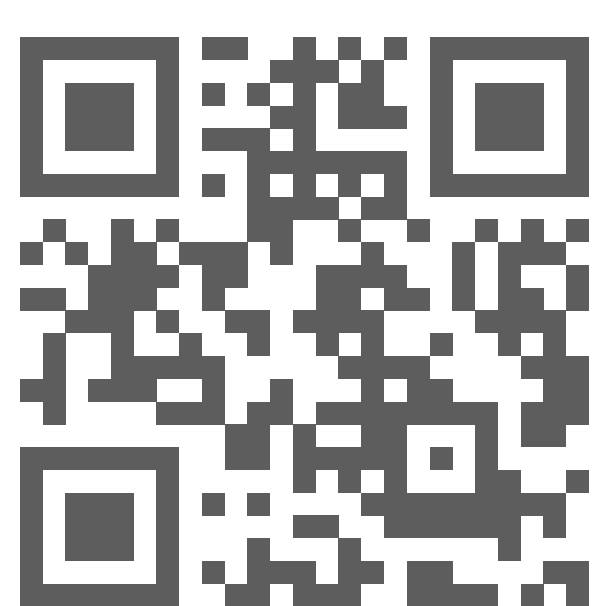
Who benefits

- Urban planners & municipalities
- Public health authorities
- Energy and infrastructure sectors
- Environmental agencies
- Climate adaptation practitioners



Which benefits

- Evidence-based climate adaptation planning
- Nature-based solution assessment
- Urban carbon neutrality strategies
- Heat risk mitigation and improved thermal comfort
- Enhanced situational awareness for local decision-makers



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