

URBAN HEAT ISLAND Central Europe PROJECT

Development and application of mitigation and adaptation strategies and measures for counteracting the global Urban Heat Islands phenomenon (UHI)

The UHI project

The UHI project, starting from a deep **analysis of the phenomenon** (*WP3*) is designed to both develop mitigation and risk prevention, and management strategies.

The general objective of the project is to establish a **Transnational attention**, as well as policies and practical actions, for the prevention, adaptation and mitigation of the natural and man-made risks arising from the Urban Heat Island phenomenon (*WP2 & WP4*).

In particular, **mitigation strategies** consist in the adoption of urban and land planning models that prevent the establishment of UHI, while **adaptation strategies** aim at reducing the impact of phenomena related to UHI, such as summer bioclimatic discomfort (*WP5*). The innovative strategy of the UHI project is to interact two disciplines that traditionally don't communicate each other: **meteoclimatology** and **urban planning**. Through this interaction will be implemented particular strategies to guide the choices of development and urban renewal.

The UHI partnership

FRAMEWORK ANALYSIS (*WP3*)

WP3 considers two main scientific aspects: the **characteristics of UHI phenomenon** both in terms of causes and effects on environment and population, and its relationships with **climate change trends**.

Activities are focused on CE area, including an analysis of already existent UHIs, as well as a study of those situations that could constitute a potential for an increase of UHIs.

Additionally a list of existing **rules and legislation** toward UHI phenomenon in CE regions are prepared.

Actions are:

- **Act.3.1 - State of the art:** analysis focused on anthropogenic causes that generate the UHI phenomenon and the survey techniques used to study it.
Analysis is set up considering technical and scientific issues and urban planning and land use regulation.

1.a - Knowledge report

1.b - Scheduling of existing infrastructures to meteorological and environment data assessment in different project areas.

- ✓ [Municipality of Ljubljana](#)
- ✓ [ARPA Emilia-Romagna](#)
- ✓ [Institute of Geography and Spatial Organization Warszawa](#)
- ✓ [Environmental Protection Department \(MA22\) Wien](#)
- ✓ [Czech Hydrometeorological Institute](#)
- ✓ [Corila](#)
- ✓ [Polish Academy of Sciences](#)
- ✓ [NOFER Institute](#)
- ✓ [Hungarian Meteorological Service](#)
- ✓ [Czech Hydrometeorological Institute](#)

2.a. - [Review of different rules and regulation set up by involved local government](#)

2.b. - [Review of the main European legislation concerning urban and spatial planning and concerned issues.](#)

- **Act.3.2 - UHI vs Climate Change** aims to studying the interaction between UHI and climate change phenomena as well as understanding the influences and correlations between them.

Establishment of a UHI monitoring network (WP4)

In this work package a permanent **Transnational Network** among experts (scientific and institutional) involved in the project has to be set up. Transnational Network role is to support and improve the overall project system on technical, scientific and institutional aspects linked to the UHI themes. Then, it's forecasted to define a common and shared **methodology** to investigate the UHI phenomenon and to compare the characteristics of the different areas; moreover a **virtual database** has been structured.

- **Act.4.1. - [Transnational network](#)**: it has been set up a permanent Transnational Network (TN) among experts scientific and institutional involved.
- **Act.4.2. - Methodology and areas definition**: definition of sensible indicators, sampling procedures, and analysis tools are fundamental issues that need to be shared for a common methodology and compare different characteristics of urban areas. An [assessment manual](#) collecting the operative procedures for data sampling, accessing and processing has been developed. A **gold standard** in assessment of UHIs and in the respective data sampling, accessing and processing has been defined.
[Preliminary Recontition Action](#): a questionnaire was created to collect information related to the measurements of the UHI elements and also land-use data sets using by UHI project partners. In this short report the results of this survey will be presented containing of the measured UHI elements (meteorological and air quality measurements) and the features of measuring sites for eight studied regions of Central Europe.
- **Act.4.3. - CE UHIs web database and Atlas.**

Mitigation and adaptation strategies (WP5)

Starting from scientific and institutional framework and from assessment tools provided by previous WP3 and WP4, this work package focuses on approaches to models for long-terms mitigation strategies and short-medium-term adaptation strategies to encounter UHI.

- **Act.5.1.** - Extent of UHI effects and corresponding potential [Mitigation and Adaptation \(M&A\) measures](#).
- **Act.5.2.** - Establishment of an effective [UHI modelling environment](#).
- **Act.5.3.** - [Definition of mitigation and adaptation strategies](#): such M&A measures portfolio includes specific urban & spatial planning guidelines as well as risk management recommendations. Most of the actions that are commonly applied can be divided into three main typologies of interventions: buildings, pavements, and vegetation.

Pilot and capitalization actions for limiting UHIs effects (WP6)

Following the result of *Pilot actions* implemented in 8 selected urban areas within Central Europe, the main activity within WP6 is the UHIs simulation of future alternative scenarios related to the development and

renewal of urban areas. In particular, it is foreseen a progressive integration of mitigation and adaptation strategies in current urban planning tools.

- **Act. 6.1 - Decision support system**
- **Act. 6.2 - Urban plans feasibility studies**. The feasibility studies evaluate how a city's space could be developed taking in full consideration the adaptation and mitigation strategies defined in the previous WP.

Pilot actions have been implemented in 8 selected urban areas within Central Europe.

