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CLARITY Climate Services - Supporting Urban Climate Change Resilience and Adaptive Planning through Modelling of Possible Climate Adaptation Strategies

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Urban areas and traffic infrastructure are especially vulnerable to climate change impacts. An example of this is the combination of urban heat island effects with those from heat waves, which under climate change are forecast to worsen. Such compounded effects represent a real concern for cities where the general trend is toward the densification of urban areas, vegetation loss, and an increase in the area of sealed surfaces.

The CLARITY project (EU-Horizon 2020, www.clarity-h2020.eu) aims to implement a climate service tool designed for (i) assessing climate change-induced hazards, and (ii) considering possible adaptation strategies in order to improve resilience measures at the urban level and to support urban infrastructure development. Using a dynamical-statistical downscaling approach, information on climate change and related climate extremes can be assessed on the urban scale by combining future climate projections provided by the EURO-CORDEX project with urban climate simulations.

Here, we use the dynamical urban climate model MUKLIMO_3, developed by the Deutscher Wetterdienst, to provide high-resolution (100 m) urban climate projections and climate sensitivity simulations for the city of Linz in Austria, based on high-resolution Urban Atlas land-use data and Copernicus topography data. The modelling methodology, as developed within CLARITY, is outlined. Furthermore, the current and future climate situations in terms of urban heat stress are analysed and possible climate adaptation measures, such as roof greening, increased albedo, decreased soil sealing, amongst others, are tested with respect to their efficiency towards resilient urban planning.