Impetus4Change
Improving near-term climate predictions for social transformation

Impetus4Change (I4C) is a Horizon research project where climate, city and social experts work together to improve the quality and accessibility of climate information in cities and regions.

The overarching objective of Impetus4Change is to improve near-term climate information and services at local to regional scales where impacts are most keenly felt and on-the-ground adaptation is implemented. Further, Impetus4Change will strengthen and support the alignment of said services with end-user adaptation planning needs through improved accessibility and usability.

Despite the increased awareness surrounding the climate crisis, there is still an information gap regarding the time scales at which action must be taken in order to avert the worst impacts of global warming. Cities across the globe are currently facing many negative impacts due to climate change, namely extreme weather events and their aftereffects. This poses many risks as the extreme weather events combined with as densely populated areas can result in catastrophic population loss. Urban decision-making requires tailored science-based climate information and services at the local scale to support adaptation and planning efforts to deal with climate change impacts. In line with the EU's Mission on Adaptation to Climate Change for a "climate prepared and resilient Europe" by 2030, I4C aims to improve the quality, accessibility and usability of near-term climate information and services at local to regional scales.

Bridging disciplinary divides, I4C builds a close collaboration between research organisations in the fields of climate and social science. To help Europe accelerate the Green Transition to a carbon-free society by 2050, I4C aims to realise climate adaptation services for European cities.

Four Demonstrators Cities (Bergen, Paris, Barcelona and Prague) facing different climate adaptation challenges will provide the lens through which the I4C project will assess the potential of the improved I4C climate information to inform adaptation strategies. Working in collaboration with city experts, I4C will co-develop tailored climate services (hazard and risk assessments) to support adaptation planning.

In the frame of Impetus4Change, the regional climate model REMO is further developed to take into account specific land surface characteristics of urban areas in order to provide a more realistic representation of regional to local climate especially in the surroundings of cities. In the frame of

this modeling activity, REMO will be extended by the Town Energy Balance Model (TEB model) in order to incorporate a sophisticated representation of urban surfaces.

Using the improved version of REMO, non-hydrostatic long-term climate simulations will be performed over two selected regions in Europe which cover the four demonstrator cities. Project partners will perform non-hydrostatic model simulations over similar model domains in order to obtain an ensemble of climate simulations over the demonstrator cities which enables us to assess the bandwidth in climate change information due to different modeling approaches. These simulations will on the one hand be directly used in the co-development of climate services in the four demonstrator cities, on the other hand, they will feed into the projects machine learning (convection permitting regional climate model (CPRCM) emulators) activity, where the ensemble of climate simulations at convection permitting scale will be used as training data.

Detailed information about the project can be found on the project website:
https://impetus4change.eu