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Sustainable Cooling in Cities

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ABSTRACT

In Nov 24, the Executive Committee of the International Energy Agency's Technology Collaboration Programme of Energy in Buildings and Communities has started the preparation of a new research programme, Annex 97, on Sustainable Cooling in Cities. Furthermore, the programme will be conducted as Task 5 of the IEA Technology Collaboration Programme of Cities.

This programme is a thematic continuation to Annex 80, Resilient Cooling of Buildings, which have been conducted from 2019 until 2024. Already in Annex 80, there has been a fruitful cooperation with AIVC and INIVE. The new Annex 97, again, will touch many aspects of Air Infiltration and Ventilative Cooling. It is open to attendants from research as well as industry as well as governmental and interest bodies.

With this contribution to the AIVC-Fraunhofer IBP Workshop 2025 in Stuttgart we offer to present the core objectives and organisational framework of the new Annex and invite for cooperation.

Background: Climate Change hits the world, raising challenges to the built environment, in terms of quality of life, health and safety, energy consumption and CO₂ emissions. Cities are particularly affected. Annex 80 Resilient Cooling of Buildings, told us, that energy efficient and resilient cooling of buildings is bi-directionally connected to heat mitigation in cities. Therefore, the new Annex 97 will, amongst others, focus on the interaction between outside and inside environmental qualities, leading directly to questions in the field of Air Infiltration and Ventilative Cooling.

Objectives: The general objective of Annex 97 is to increase and spread knowledge about connected urban heat mitigation and sustainable cooling strategies. Emphasis will be placed on the interaction between heat mitigation in outdoor spaces and cooling of buildings. The aim of the project is to develop and support the application of measures that serve the health, safety, and wellbeing of people and that push energy efficiency and open the way to carbon neutrality.

Research Programme: The research programme is structured in sub-tasks:

Subtask A – Fundamentals: Develop a sound knowledge base of comfort targets, health needs and performance indicators, meant to improve effectiveness and precision in performance-assessments and developments of heat mitigation strategies and sustainable cooling applications.

Subtask B – Methods: Develop a set of connected methods for development and evaluation of cooling solutions and heat mitigation strategies, both experimental and numerical, meant to enable accurate planning and evaluation of measures of heat mitigation strategies and sustainable cooling applications.

Subtask C – Solutions: Review, compare, develop, and improve sustainable cooling solutions, together with heat mitigation strategies, meant to bring them into application and, thus, support energy and carbon efficiency of cooling as well as comfort and liveability in and around buildings.

Subtask D – Policy: Review and compare existing policies and standards. Strengthen networks and support implementation of policies, meant to spread best practice examples, and encourage their multiplication.

Conclusions and Offers: IEA EBC Annex 97 will establish a platform of international research and collaboration on Sustainable Cooling in Cities, including aspects of Air Infiltration and Ventilative Cooling. The programme invites colleagues from research as well as industry as well as governmental and interest bodies to participate. Terms of participation will be presented at the workshop.

KEYWORDS

Urban heat mitigation, sustainable cooling of buildings, indoor and outdoor environmental qualities