



A stakeholder view on the SCORCHIO (Sustainable Cities: Options for Responding to Climate Change Impacts and Outcomes) research project

The SCORCHIO project is developing tools that use the latest forecasts from the UK Climate Impacts Programme (UKCIP) to help planners, designers, engineers and users to adapt urban areas to the additional heat burdens anticipated with climate change.

The output from SCORCHIO is a prototype tool (suite of models) designed to operate at a range of scales (building to city) and assess areas at risk from climate change with respect to energy, emissions and human health and comfort.

The research topic directly addresses the need for the built environment. The research tried to balance two different focuses: from policy making and from a designer perspective.

Throughout the three to four years, AECOM attended many stakeholder workshops as well as had some detailed technical discussions with the research team. One of the examples of the workshop and discussion topics that AECOM contributes is the identification of key design parameters and how the end users may use the tool for decision making. AECOM welcomes the opportunity presented by the BKCC initiative to establish a window for dissemination of the knowledge we learnt and feedback we have during the course of this project. It is no doubt that the impact of climate change and implementation of sustainable urban design will influence the scale and the adaptation strategies promoted.

During the course of the project, feedback from different stakeholders has been invaluable. It has been very useful to participate the project as a stakeholder. In particular, learning the research results from all technical aspects of the project has been good opportunity. Drawing these aspects of technical themes under a framework of tool is certainly very challenging and the research team has produced excellent result. These technical themes include:

- Downscaling of climate variables for urban areas taking into account changing land cover and anthropogenic heat sources on the urban climate, producing a database of spatial distributions of temperature for Manchester and Sheffield and methodology for generating future scenarios of urban temperature;
- Developing a building classification methodology for urban land cover;
- Modelling impacts and adaptation of the built environment;
- Developing vulnerability index for rapid assessment of urban areas on the basis of building classification and urban climate scenarios

These technical themes are also inter-connected to each other and output from a theme is the input to the other. A suite of models are the results of these technical themes. As the outcome of the project, the SCORCHIO project has developed a prototype decision tool SCHEEME (Sustainable Cities: Heat, Energy and Emissions Evaluation), based on GIS framework as proof of concept.

The project also undertook a number of case studies using real development project examples to demonstrate the potential climate change adaptation strategies that can be adopted.

The SCHEEME tool successfully provides a framework of the decision tool giving users an overview of the impact of the projected climate scenarios, and subsequent possible solutions of mitigating the negative impact.

There have been substantial achievement and detailed technical information embedded in the suit of the models. It is no doubt that a number of excellent research papers would be produced and disseminated by the BKCC as output from these technical themes.

The GIS based SCHEEME model, is somewhat at an infant stage. The tool is ready to be enhanced further to provide different functionalities to suit different end-user requirements including policy making and for real world urban design. The proof concept model of SCHEEME model is more focussed on city scale demonstrating projected climate risk and associated vulnerability. At present, the building scale model is very much focused on buildings. Follow-up work is recommended to enhance the analysis and facilitate decision making on a neighbourhood scale, where potential adaptation strategies are more effective and having a bigger impact on residents. Future enhancement to the SCHEEME could also incorporate outdoor thermal comfort index in addition to vulnerability index.

As a designer in building engineering and having major involvement of sustainable infrastructure on some large developments, AECOM welcomes an opportunity to work with the research team to further evaluate the applicability of existing SCORCHIO output to user requirements and establish the feasibility of employing the tool in real-world situations across a range of the spatial scales that it can represent, including massing, urban form, green infrastructure, built environment, vulnerability and social impact of design, etc.

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