

## CLIMATE, ENERGY AND URBAN FORM

Maider Llaguno Munitxa

It has become now apparent that the global trend towards urbanization conflicts with the limitation of natural resources. The modification of the urban climate due to the heat island effect, global warming and its impact on energy use of buildings are now the focus of contemporary urban technologies and politics. And those are crucially determined by climate and urban form.

The research will address the massive increase of urban population that is currently taking place primarily in meridional latitudes. Shenzhen/Hong-Kong, Shanghai, Chongqing, Mumbai, Delhi, Cairo, Caracas, Mexico, Sao Paulo and the American Sunbelt are the regions where contemporary urban growth is primarily located. While the contemporary city models of technological development remain inspired by the modernist city, the current technologies and standards are very different in purpose and nature than those that inspired the modernist examples. The technical infrastructure of the city has become a crucial object of contemporary urban politics.

This research will consider warm-climate, “southern” cities as the object of study, to develop tools for analysis and design of urban forms capable to optimize the environmental performance of urban fabrics.

While the modernist city had an interest in orientation and ventilation as mechanisms to improve the urban milieu, the environmental and ecological concerns are increasingly important, and the form and materiality of cities is becoming one of the most important vehicles to a decreased demand for cooling energy, removal of pollutant dispersion and improvement in the overall outdoor quality.

In order to further explore the urban culture, politics and architectural sensibility that might emerge out of these performative urban morphological and material logics, this research proposes to explore analytically the performance of a number of urban morphologies. This will enable us to understand their effect on the reduction of urban heat island, the improvement of microclimatic conditions at the neighborhood scale and reduction of CO<sub>2</sub> emissions, study that will be particularly relevant for warm-climate cities. The potential benefits include, in addition to a decreased demand for cooling energy, removal of pollutant dispersion and an improvement in the overall quality of the outdoor areas.

The research will aim to provide empirical evidence, from a number of case study urban morphologies (Sao Paulo, Shanghai, Mumbai, Singapore...) seeking to understand the relationship between urban form and heat island effect. This evidence will be followed by a parametric study of the described urban morphologies to analyze their performance and synthesize alternative paradigms.