

microclimate  
 urban consumption  
 Construction law  
 Aix-Marseille  
 socioeconomics  
 Urban Climate Maps  
 urban planning  
 LCZ  
 Toulouse  
 urban morphology  
 50 cities  
 socioeconomics  
 urban database  
 energy consumption  
 Urban Climate Maps  
 La Rochelle  
 urban morpholo  
 human behavior  
 Aix-Marseille  
 microclimate  
 TEB mode  
 Construction law  
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 50 cities  
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 Urban Climate Maps

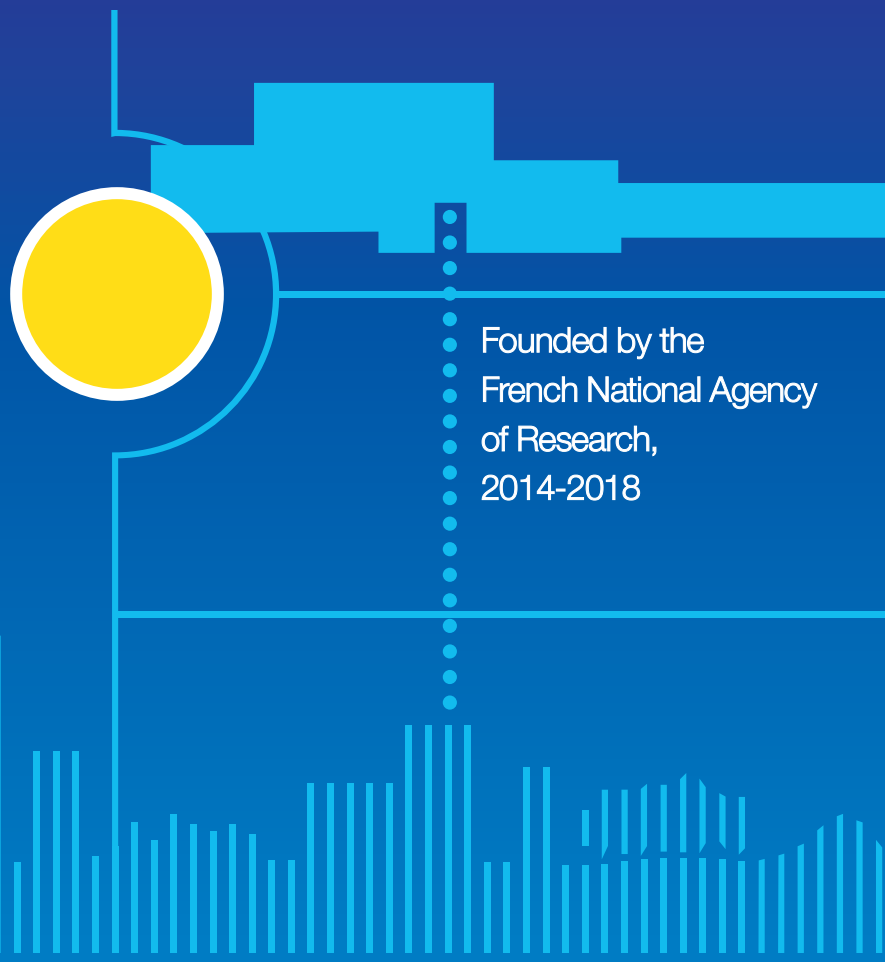
# MAPUCE

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## Applied Modeling and Urban Planning: Urban climate and Energy



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Conception graphique : Benoît Colas, UT2J / CPRS - DAR

## The main research question

How can we improve local government policies in order to reduce energy consumption and to optimise the urban climate?

## The general context

After recent evolutions in the environmental French legal framework following European directives and International treaties, urban planning constitutes a pertinent frame of reference to take into account environmental issues within the local public policies. However, there is still a lack of knowledge that difficult local authorities action. For example from 2012, every French city over 50 000 inhabitants should implement a Territorial Climate and Energy Plan addressing mitigation and adaptation actions. But, at the urban scale, urban micro-climate and energy household consumption are poor known.

## The main objectives

The main objective of the MAPUCE project is to integrate quantitative data of urban climate and energy consumption into urban planning and legal documents. The methodology should be applicable to the whole of France.

## The methodology

Based on data available at the national level, we will develop an automatic method to calculate indicators that characterise the urban morphology and socioeconomics. The main focus being done on indicators which are relevant to the numerical simulation of energy consumption at the scale of an urban quarter.

Human behaviour strongly impacts the energy consumption of buildings. Therefore, the urban climate model TEB, which includes a building energy model will be used. The model will then be modified to take into account aspects of the residents' behavior related to energy consumption. The urban climate simulations will be made for a variety of French cities. A first panel of 50 cities have been selected. Diagnostics of both energy consumption and urban climate will be calculated for both historical and future climate.

We will analyse the French Urban Planning legislation and the Construction law in order to determine whether they include (or not) issues related to energy consumption and urban climate, to determine potential opportunities of progress.

Based on exemplary cases analysis in France and abroad and the requirements expressed by urban planning agencies we will try to improve transfer knowledge of local climate and energy household consumption. For example the creation of Urban Environmental Climate Maps, guides and training sessions for territorial authorities. Three experimental cities, Toulouse, Aix en Provence-Marseille and La Rochelle, are involved to the project to test the results, methodologies and developed tools.

