Many studies on energy saving in construction have demonstrated the restriction on achievable gains that results from working on single buildings and the necessity of a ‘change of scale’, moving from a single residential unit to the whole urban system. In a time when the world’s energy situation demands transition towards new alternative sources, research has already confirmed the deep relationship between energy consumption and urban morphology through the study of macro-classes of ‘physical’ parameters such as urban density, aspect ratio (H/W), and settlement shape. Re-reading the City’s history from an energy point of view reveals the mutual relationship that exists between spatial configurations, determined by urban design, and the corresponding energy balance. In the course of time, designers’ scant attention to local weather and environmental conditions has been counterbalanced by the use of technologies, with serious consequences for global energy consumption. Our rude awakening from the false belief in the limitless availability of hydrocarbons forces us to rethink urban design in terms of the ‘physical’ and environmental parameters which affect a city’s energy behaviour. The urban energy balance is also deeply affected by spatial configurations resulting from typo-morphological choices. Thus, correct urban design can have a great influence on subsequent energy behaviour if spatial solutions are delineated during projects’ early stages, reintroducing weather and environmental issues among the basic information used by designers in their works.

In the first part, the thesis focus on the main ‘physical’ factors that affected urban energy balance through a deep analysis of contemporary scientific literature. In the second part, it applies this theoretical concepts to a practical case-study of urban design in China. The environmental behaviour of the typo-morphological choices of initial masterplan have been analysed through Envimet® and Heliodon™ softwares and, subsequently, modified to suit the local weather and environmental conditions, registering an overall improvement in its performance.