Chapter 43
Evaluating the Smart and Sustainable Built Environment in Urban Planning

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ABSTRACT

The measurement of urban performance is one of the important ways in which one can assess the complexity of urban change, and judge which projects and solutions are more appropriate in the context of smart and sustainable urban development. This chapter introduces a new system for measuring urban performances. This is the result of two years of joint cooperation between the authors and the Italian iiSBE members group. It is based on previous research findings in the field of evaluation systems for the sustainable built environment. This new approach is useful for evaluating smart and sustainable urban redevelopment planning solutions, as it is based on benchmarking approaches and multi-scalar quantitative performance indicators (KPIs), from individual building level to city level. A number of important implications of the main findings of this study are set out in the concluding section, together with suggestions for future research.

INTRODUCTION

Policy-makers are specifically challenged by the need to achieve sustainable development in cities, promoting a transition that radically decarbonises energy sources without undermining wellbeing and patterns of consumption. This scenario is known as Energy Transition towards a Post-Carbon Society. However, if not properly designed, policies aimed at reducing greenhouse gas emissions may affect the resilience of our energy system and its ability to tolerate disturbance and deliver stable and affordable energy services to consumers (ftp://ftp.cordis.europa.eu/pub/fp7/ssh/docs/towards_post_carbon_society_en.pdf).

Moreover, European urban areas have to respond properly and urgently in order to preserve their attraction for creative talents and firms, and to avoid any reduction in their level of 'liveability'. This leads to a new *'urban imperative'* and raises the whole question of long-term strategies for sustainable development (JPI, 2010).

Cities are dynamic living organisms that are constantly evolving. Rees (1997) describes cities as the engines of economic growth, the centres of social discourse and the living repositories of human cultural achievement, but also as nodes of pure consumption and the entropic black holes of industrial society. When addressing the complex problems of city management and planning, it is not sufficient to be concerned simply with the physical structure of the city; the interplay of intangible economic, social and environmental factors needs to be considered in a holistic way as well. This represents a substantial challenge for those political and technical actors (planners, designers and urban authorities) trying to devise smarter strategies and policies, urban plans and projects that can guide cities along a more sustainable development path.

City planning and urban re/development decision-making is recognized as being an extremely complex process involving a wide range of stakeholders, and requiring an integrated and holistic system approach (Veirier, 2008; Brandon & Lombardi, 2011). Key requirements are robust real-time information and analysis systems which depend on integrated dimensional databases of city indicators. These include both a detailed profiling of societal and user needs, as well as the development of an advanced integrated information technology system in local government.

Because of the complexity of the urban planning problem, development control is often characterised by adversarial decision-making processes that can provide a significant disincentive to inward investment, undermining business confidence and competitiveness. In particular, new processes are needed that can re-engineer urban re/development planning so as to streamline policy implementation and decision-making, which in turn can support more sustainable urban regeneration and the improved growth and competitiveness of cities and their constituent business components.

According to Roberts and Hughes (2006), "Urban regeneration is a widely experienced but little understood phenomenon … [and] there is no single prescribed form of urban regeneration practice … One of the major difficulties [is] … the absence of quality literature that encompasses the whole of the organisation and functioning of the urban regeneration process."

Recent research findings highlight the fact that decisions on city design and planning can only be based on the preferences of citizens. Otherwise they will fail. Therefore, mechanisms need to be found to ensure that citizens understand the issues and options, and can express their preferences; a great deal of social science research is still needed to understand the interaction between city design, social preferences, human behaviour, economic issues and policy incentives.

The Operational Implementation Plan recently developed by the European Innovation Partnership on Smart Cities and Communities (http://ec.europa.eu/eip/smartcities/files/operational-implementation-plan-oip-v2_en.pdf) highlights the need for the joint-creation of platforms and decision tools (simulation, visualization/virtualization, open data/information platforms) in order to increase levels of awareness, increase inhabitants' involvement in the planning and implementation processes, establish social communities, increase energy production within the district (by "prosumers"), and increase the provision of information-intensive energy services.

There are more than 150 city indicator systems in place, covering a series of different criteria including geographical and thematic issues. In addition, a remarkable number of methods have been developed aimed at evaluating sustainability in the built environment (Brandon & Lombardi, 2011). Current methods

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