SUME – Sustainable Urban Metabolism For Europe

EU-funding: Seventh Research Framework Programme – CP FP7

Collaborative Research Project, Area 6.2.1.5 Urban development

ENV.2007.2.1.5.1 Urban metabolism and resource optimization in the urban fabric

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Consortium:	9 partners from 8 countries and 2 continents (Europe and Asia)
Project Coordinator:	ÖIR – Austrian Institute for Regional Studies and Spatial Planning (Vienna, Austria)
Key Words:	urban planning, metabolism, built environment, energy consumption, material consumption

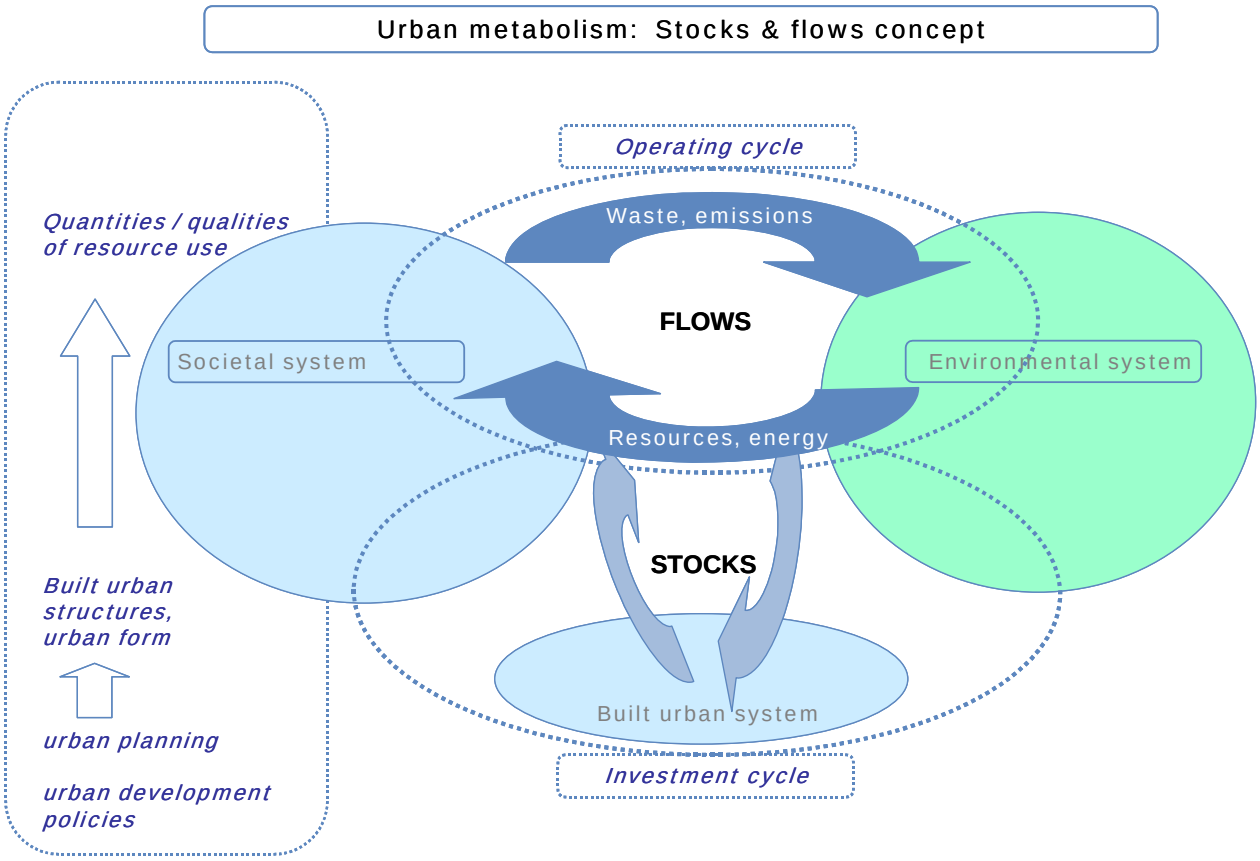
1. Consortium

Partner No.	Institution	Country
01	Austrian Institute for Regional Studies and Spatial Planning (OIR) – coordinator	AT
02	University of Porto, Faculty of Engineering (FEUP)	PT
03	Nordregio – Nordic Centre for Spatial Development (Nordregio)	SE
04	Foundation for research and technology – Hellas (FORTH)	GR
05	University of Newcastle upon Tyne (UNEW)	UK
06	Delft University of Technology (TU Delft)	NL
07	Klagenfurt University, Faculty for Interdisciplinary Studies (UNI-KLU)	AT
08	Chinese Academy of Sciences (CASIA)	CN
09	Warsaw School of Economics (SGH)	PL

2. SUME approach

Urban development is running environmental risks, consuming huge amounts of resources and putting strains on the environmental system. The European-funded SUME project (Sustainable Urban Metabolism for Europe), is focusing on the way how future urban systems can be designed which is consistently less damaging to the environment than the present.

The concept of urban metabolism helps to understand and analyze the way how societies – in large parts located in urban areas – use resources, energy and land, all elements of the environmental system, for maintaining and reproducing themselves. The way in which cities and urban areas are being built – the urban form in spatial terms, but also in technological terms – is greatly influencing the quantities and qualities of resources being used in maintaining urban life. The extraction of specific energy and material resources as well as the return of waste and exhaust to the environmental system is increasingly damaging and needs to be addressed.



3. The Project Objectives

The driving forces behind the dynamic processes of urban development are demographic change, the individual performance of urban areas in (global) economic competition, the speed and direction of applying technological innovations under various societal/political conditions. While the dynamics of urban development in these components have been studied and debated for a long time, the interrelation between urban development and urban metabolism in the sense of physical interaction with the environment is far less understood. More specifically, the main challenge of this project is to find a link between the urban metabolism approach to urban spatial development concepts in a way helpful to foster a more sustainable development path of urban areas in the future.

4. Methodology

Based on the urban metabolism approach, the flows of resources, energy and waste are being used to maintain the urban system. The built environment – in a systems logic the stocks of the urban system – is using a substantial portion of flows to be built. The way cities are being built has a great impact on the quantities and the qualities of flows needed to maintain the urban system over time. The SUME approach will analyse the technological and spatial qualities of built urban systems (the stocks), and analyse the impacts of these “urban forms” on the qualities and quantities of resources needed and maintain them subsequently. This analysis of urban forms in a stocks & flows-model will show what kind of urban forms and which built structures can be used in order to reduce resource and energy consumption in urban systems.

5. Expected Results

Urban development includes processes of growth in new areas, decay and abandonment and also restructuring and rehabilitation in parallel. The weight and speed of these alternate components of urban development is varying strongly between different cities and countries, leading to different patterns of land use, resource and energy consumption.

The SUME project will analyse the potential to transform existing urban built environments (buildings and spatial structures) in order to significantly reduce resource/energy consumption, taking these differences into account. From a strategic point of view, it will be necessary to know whether existing rates of transforming urban structures should be increased in order to improve urban form and to reduce resource use.

The results will provide essential inputs for environmental and spatial policy making, for urban development policies and for transportation policies at both, national and local levels. It will be useful for scientific and practical application.