

Systems approaches to make cities resource efficient

Local governments are tasked with maintaining and improving overall quality of life for their cities of which economic development, environment, and health are critical aspects. Long seen as a dichotomy, we now have proven and cost efficient solutions that allow us to combine both economic development and health of places and people. A resource efficient approach generates innovation and combines greater productivity with lower operating costs and reduced environmental impacts, while opening up consumer choices for sustainable lifestyles. **Resource efficiency reduces overall city consumption while improving quality of life.**

It is however, difficult to achieve resource efficiency if city management is compartmentalized. How many cities are there where the water providers do not talk to energy providers? Urban metabolism is one systems approach to city planning, which makes integrated, inter-sectoral, planning possible. Defined as a way of looking at cities and all the resources that flow within their complex networks (“material flows”) of interlocked social and physical infrastructure, urban metabolism conceptualizes the city as a living super-organism in which there are continuous flows of inputs and outputs helps in the study of the patterns of movements of matter and energy. It encourages city planners to consider how cities source, process, and use resources in their spatial and socio-economic planning. Through resource flow analysis cities can:

- Develop policies based on quantitative and qualitative knowledge of the flow of key resources (water, waste, energy, materials) taking into consideration its potential impact on food systems and land
- Consider city resource vulnerabilities beyond city boundaries and over time, making a city more resilient
- Use an integrated analysis to identify sectors where costs/waste can be cut down and ‘close the loop’ towards circular economy.
- Ensure equitable sourcing and distribution of, and access to resources using a resource map layered with socio-economic data

Cities occupy **3%** of land surface

Cities produce **50%** of global waste

Cities account for **60- 80%** of global GHG emissions

Cities consume **75%** of natural resources

Cities produce **80%** of global GDP



High potential for savings through Resource Efficiency

30%

Water savings globally through minor investment and behavioral change

30% to 50%

Energy savings potential in existing buildings through behavioral change and application of readily available and low-cost technologies.

USD 41 TRILLIONS IN SAVINGS

Investment required for urban infrastructure in the next 20 years: Greater resource efficiency - in water, waste, transport and energy- could generate significant savings by reducing infrastructure needs and operating costs.



What is the Global Initiative for Resource Efficient Cities?

The Global Initiative for Resource Efficient Cities (GI-REC) is a cooperation platform offered by UN Environment to connect many different institutions that are using systems approaches (specifically urban metabolism and morphology approaches) towards building low-carbon, resilient, and resource efficient cities. Using UN Environment’s convening ability, the Initiative distinguishes itself from other city sustainability activities by (a) building on existing city networks, and (b) having a sustainable consumption and production entry point to assist cities with realizing the economic, social and environmental benefits of resource efficiency.

PARTNERS



Tools and Support Mechanisms

Creating Knowledge

(developing tools and research products)
In various fields related to resource efficiency and SCP as well as to increase access, processing and use of resources through supply chain and life cycle management, to facilitate decision-making in creating solutions to improve efficiency of processes and use of resources within and across value chains, taking a Life-Cycle approach.

Piloting

To help cities apply the Urban Metabolism approach:

- Access to methodology and technical expertise.
- Intra-city decision-making processes based on science, translating theory into practice.

Network Platform

It provides a mechanism for decision makers to exchange experiences, share best practices, and establish a peer-review process across cities for further improving access to resources and their efficient use.