



## The Metabolism of Cities Story

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Due to pressing and evident environmental challenges in cities, there is a need to characterize, forecast and transform the current linear paradigm of urban economies turning natural resources to waste. In fact, due to high levels of urban resource consumption, cities are vulnerable due to their dependency on a global hinterland for natural resources and pollution assimilation. The evaluation of the metabolic balance of cities is an important aspect to identify the nexus between environmental degradation on the one hand, and socio-economic behaviors of citizens and urban form on the other. As cities continue to grow both in territorial and economic aspects, their vulnerabilities also increase while their resilience decreases. The concept of urban metabolism (UM) is the study of flows entering and exiting urban areas. The urban metabolism approach can help to address these major challenges in cities by better understanding these complex interconnections between an urban area, its economy, its resource requirements and pollution impact.

The [Metabolism of Cities](http://www.metabolismofcities.org) (MOC) site is an open source website launched in 2014 and managed by a group of interdisciplinary [volunteers](#) from South Africa, Belgium, Italy, Norway and Switzerland with the aim to group together [environmental assessment tools](#), [data](#), [current research](#), [lectures](#), [blogs](#), [videos](#) and [publications and technical reports](#) related to the metabolism of cities or urban metabolism research, education and awareness. The goal of this open source platform is to generally rethink the contemporary urbanization processes (i.e. material flow analysis, life cycle assessments, environmental footprint analysis, etc...) in cities through the lens of urban metabolism. This can help untangle the transformation of spatial forms and structures and explore the agency of design in confronting these challenges, urban planning and policy making. The MOC team is committed to continually working toward a sustainable society with integrity and in collaboration with communities all around the world. Our work focuses on critical issues at the intersection of environmental policy and open data sourcing while providing an open discussion (see [Stakeholder Initiative](#) platform) to professionals in the field of urban metabolism. As a part of the Stakeholder Initiative MOC has launched the [Global Urban Metabolism Database](#) with urban metabolism data and indicators (energy, water, air pollution, socioeconomic and

demographic urban characteristics) by examining a variety of research studies that have calculated particular values (material extraction, emissions, construction material use, imports, exports, etc.) for an urban/provincial region at different scales (region, city, municipalities, metropolitan, etc.).

The Metabolism of Cities team want to make sustainability of cities a key concern in the field of urban planning and we want to share information and tools around urban metabolism with anyone interested in this field. By indexing and cataloging a large number of publications from many journals, explaining the basics of urban metabolism, and by centralizing figures and research results into one central hub, the MOC platform aim to provide an open, community-led resource that can help save time and encourage interest for stakeholders looking into understanding more about the metabolism of cities.



Figure 1: Metabolism of Cities ([www.metabolismofcities.org](http://www.metabolismofcities.org))

The MOC database platform can be used as a tool to enable stakeholders address the Sustainable Development Goals (SDGs). The website platform can benefit from a broad mix of participants, including a balance of local government officials and planners; NGOs, private sector firms; and academics engaged in advanced urban systems work and urban metabolism studies, both resource-based and information-based. Special effort can be made to engage thinkers and communicators, who are comfortable with bridging theory and practice. The main Sustainable Development Goal (SDG) that MOC addresses most directly is **SDG #11: Sustainable Cities and Communities** - Make cities and human settlements inclusive, safe, resilient and sustainable.

The MOC database also aids stakeholders that work with these other SDGs:

- **SDG#2: Zero Hunger** - End hunger, achieve food security and improve nutrition and promote sustainable agriculture.
- **SDG#6. Clean Water and Sanitation** - Ensure availability and sustainable management of water and sanitation for all.
- **SDG# 7. Affordable and Clean Energy** - Ensure access to affordable, reliable, sustainable and modern energy for all.
- **SDG# 8. Decent Work and Economic Growth** - Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
- **SDG# 9. Industry, Innovation and Infrastructure** - Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.
- **SDG# 12. Responsible Consumption and Production** - Ensure sustainable consumption and production patterns.
- **SDG# 13. Climate Action** - Take urgent action to combat climate change and its impacts by regulating emissions and promoting developments in renewable energy
- **SDG# 15. Life on Land** - Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Furthermore, the Metabolism of Cities team believe that creating awareness and education on the concept of urban metabolism is crucial in achieving SDG11 and necessary to develop key partnerships between different interdisciplinary groups to develop synergies in cities. When considering and reflecting on the current innovative practices of planning and the different ways of generating the desirable cities of the future we believe transparency, education and awareness is key and necessary in the cities of today and tomorrow. Either we continue as we have been with outdated environmental and social economic habits, or we can apply a more appropriate set of values that are relevant to an evolving eco-system by applying more comprehensive and systemic concepts like urban metabolism and sustainability. The responsibility of our future lies in our hands and will depend on the decisions that we make today. At the MOC website our team have created a wealth of knowledge around urban metabolism which is helping people from all over the world from many different disciplines to better understand this field.



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