



"Urban metabolism narratives in the digital turn: becoming real-world and real-time."

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ABSTRACT

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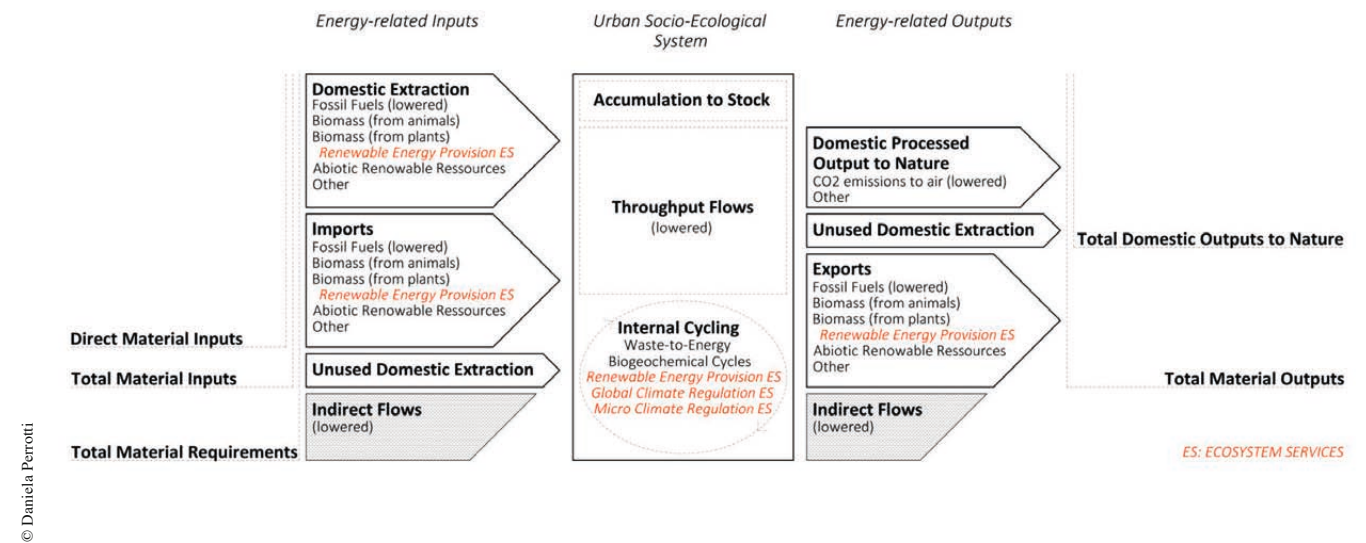


»Urban metabolism narratives in the digital turn: becoming real-world and real-time«

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Ich möchte den Begriff der »urbanen Ressourcen« so definieren, dass er sowohl die Materialflüsse (fossile Brennstoffe, Mineralien, Metalle, Biomasse usw.) als auch die biophysikalischen Kreisläufe (Inhalts- und Nährstoffe) umfasst. Wie können wir verschiedene Arten von Ressourcenflüssen und -kreisläufen in den urbanen Stoffkreislauf integrieren, um die Stadtplanung zu optimieren? In den letzten Jahren wurden erhebliche Anstrengungen unternommen, um integrierte Methoden zur Bewertung der urbanen Stoffkreisläufe in der Stadt- und Industrieökologie zu entwickeln, die transversal über Stoffströme und biogeochemische Kreisläufe hinweg arbeiten. Ein Beispiel für ein integriertes Modell, das helfen kann, die Lücke zwischen »grüner« und »grauer« Infrastruktur zu überbrücken, ist die erweiterte Stoffstromanalyse, die wir in meinem Team entwickelt haben (siehe Bild). Können wir Stoffkreislaufdaten nutzen, um neue urbane Narrative zu erzeugen? Ich bin mir sicher, der Digital Turn kann helfen, neue, gestalterisch motivierte Narrative ganz unterschiedlicher Art zu generieren.

As a starting point of my talk, I would like to propose a definition of »urban resources« that encompasses both material flows (e.g. fossil fuels, minerals, metals, biomass) and biogeochemical cycles (substances and nutrients) (Perrotti 2015). Their multiple entanglements are at the core of the research initiative »Urban Metabolism and Nature-based Solutions« that I lead at the University of Louvain as part of my professorship. Since its outset in the 1960s, the Urban Metabolism field provides tools and methods to quantify resource inputs and outputs at the city's scale. Cross-disciplinary aspirations and analytical efforts to work transversally across material flows and biogeochemical cycles are essential for breaking silos in science. They can ultimately lead to more comprehensive urban policy and practice. How can we integrate different kinds of resource flows and cycles in urban metabolism frameworks for the purpose of advancing urban planning and design? Recent years have seen the development of integrated assessment methods across urban and industrial ecology. The ecosystem-service extended Material Flow Analysis we developed with my team is an example (see image, Perrotti and Stremke 2018). Once a framework has been established, the added value of the digital turn can be explored by address-ing (at least) two questions. To what extent can the digital turn facilitate the work of urban metabolism analysts and urban planners? And how can we make the most of digitalization to generate new urban narratives? Digitalization can increase effectiveness and agility in data management, as seen for the City of Heidelberg's »agile task force« that drives the Patrick-Henry-Village planning process.



Centralized, GIS-based data portals on biophysical flows and ecosystem services managed by local authorities are essential to facilitate urban metabolism know-ledge sharing. They can help process data of different kinds, resolutions, and scales, which can increase research uptake in policy. Additionally, the development of open access urban metabolism plat-forms using data sourced by independent entities and individuals is growing. In European research projects, citizens are increasingly engaged in data collection and data sharing operations; often, they are also asked to decide what data are needed to achieve a specific goal. Which role can these new layers of data play in the digitalization of resource management and the »designing with flows«? How to harmonize data sourcing and standardization across public and private-driven initiatives to facilitate their use in policy and practice? Can we use metabolic data to produce new urban narratives? The digital turn can help generate new, design-driven narratives of very different kinds. The design of adaptative parks around the world based on longitudinal collection of climatic data provides an example (Perrotti 2014). We are familiar with the idea that buildings are adaptative, but parks can be adaptative too. Here designing with flows consists of inviting people to engage individually or collectively in a series of activities outdoors, depending on the season and micro-climatic conditions; this represents mainly a »top-down« approach, a strategy led by the designer (Perrotti 2012). Complementarily, digitalization can offer the opportunity to design urban narratives »bottom-up«. It is not a question of scale, but rather one of context and inclusivity. For example, in Medellín, Colombia publicly managed drinking-water tanks that were originally fenced for security reasons were redesigned following a consultation process and used to generate new and more

inclusive urban public spaces (Unidades de Vida Articulada). The production of public space offers an unparalleled opportunity to experiment with ecologically and economically optimized cities. These new narratives need to be embodied into physical interactions if we want to use them as opportunities to raise awareness of the importance of managing natural cycles and socio-economic flows in an integrated way.

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