

# **Exploring assessment frameworks and interlinkages analysis for implementing circular economy strategies in European urban contexts.**

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## **Abstract**

In a growing world, cities have an increasing role in facing contemporary challenges. On one hand, they can be considered the main responsible for the consumption of energy and resources; simultaneously, they are key actors in facilitating and experimenting with transformation toward more sustainable development. In September 2015 the UN adopted the 2030 Agenda for Sustainable Development which is articulated in 17 goals and 169 targets. Among the SDGs (sustainable development goals), which represent a new integrated vision for the global future, SDG 11 is completely dedicated to cities with the aim of making them more inclusive, safe, resilient, and sustainable. On the other hand, circular economy (SDG12) is increasingly adopted in urban governance to implement a socially inclusive and environmentally desirable urban transition. Different interconnections exist between goals related to the circular economy and urban sustainable development both in terms of co-benefits and trade-offs. In this context, the role of cities in the sustainable transition is of long-standing interest. Moreover, little attention has been paid to how a circular economy is implemented in an urban context and which positive and negative impacts and feedback are generated.

The research tried to fill this gap by developing a new assessment framework for the evaluation of environmental impacts of consumption patterns integrated with a local analysis of circular economy implementation in European urban contexts, in the framework of the 2030 Agenda and its 17 SDGs. Starting from a detailed literature review about the role of cities in sustainable development transitions, circular economy implementation at the local level, and evaluation frameworks, the thesis will then implement quantitative and qualitative methodologies. The evaluation of environmental impacts of consumption patterns implemented a life-cycle perspective through the adaptation of the Consumption footprint indicator at the local scale. The indicator enabled the measurement of impacts created along with the entire life cycle of consumed products and services on natural ecosystems, human health, climate change, and depletion of resources. Then, the implementation of circular economy in local contexts is evaluated through the involvement of stakeholders and the development

of a local qualitative analysis. Finally, in order to investigate possible synergies and trade-offs of circular economy implementation on other dimensions of the 2030 Agenda, a preliminary interlinkages analysis is developed. The entire evaluation framework is tested on the exploratory case study of the city of Torino, with the intent of facilitating decision-making and policy development in the field of sustainable transition of cities and territories.