

# The Future of Circular Economy Monitoring: Conceptualizing Data, Information and IT Tools for Effective Policymaking

Michiel Pauwels<sup>1,2, \*</sup>, Jolien Ubacht<sup>3</sup>, René Reich<sup>1,4</sup>, Boriana Rukanova<sup>3</sup>, Luc Alaerts<sup>1,4</sup>

<sup>1</sup> KU Leuven, Leuven, Belgium

<sup>2</sup> VITO, Mol, Belgium

<sup>3</sup> Delft University of Technology, Delft, the Netherlands

<sup>4</sup> Flanders Make Vzw, VCCM Corelab, Leuven, Belgium

## Abstract

As interest in circular economy governance grows, effective policymaking requires the creation and continuous monitoring of circular policies. In response, governments worldwide are seeking data and developing indicators to monitor and report progress within their jurisdictions. In recent years, this has led to a proliferation of monitoring frameworks at national, regional, and city levels. Nevertheless, existing research has yet to sufficiently address what types of information are essential for effective CE policymaking, how policymakers and enforcement agencies can access relevant data sources, and how information systems can support policymaking processes. This participatory workshop presents ongoing research on a conceptual framework that identifies key data attributes, information types, and digital infrastructures needed for CE policymaking. It aims to bring together researchers and policymakers working in open data, sustainability, smart cities, and evidence-based governance to discuss challenges, share best practices and build capacity through dialogue with fellow researchers and policymakers.

## Keywords

Circular Economy, Monitoring, Evidence-based policymaking, Data sources

## 1. Introduction

In response to the urgent global need to manage natural resources more efficiently and transition toward climate-neutral societies, many governments have set ambitious goals to implement a circular economy (CE). The EU, in particular, has prioritized CE on its policy agenda since the launch of the Circular Economy Action Plan in 2015 [1]. Despite this momentum, significant challenges remain in developing and implementing effective policies and regulatory instruments that can drive material resource efficiency across different levels of government. Evidence-based policymaking and continuous monitoring are essential for effective government interventions. However, a key obstacle is the lack of actionable data and adequate digital infrastructure to support public authorities in these efforts. Both researchers and policymakers must better understand what kinds of data are required, how they can be accessed and processed, and how to translate insights into impactful interventions. These interventions are critical for promoting circular practices across various value chains and among diverse stakeholders. In this context, our ongoing research investigates the types of data and information that governments need to effectively monitor, report on, and guide the CE transition. We also examine the role of digital tools and infrastructures in supporting this work. Drawing on insights from three research projects [2–4], we propose a conceptual framework that organizes relevant data sources, information types, and digital tools necessary for CE monitoring and reporting in the public sector.

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Proceedings EGOV-CeDEM-ePart conference, August 31-September 4, 2025, University for Continuing Education, Krems, Austria. \* Corresponding author. EMAIL: michiel.pauwels@kuleuven.be (A.1); j.ubacht@tudelft.nl (A.2); rene.reich@kuleuven.be (A.3); b.d.rukanova@tudelft.nl (A.4); luc.alaerts@kuleuven.be (A.5)  
ORCID: 0009-0009-5605-6226 (A.1); 0000-0002-1269-7189 (A.2); 0000-0002-9670-3434 (A.3); 0000-0003-0254-5787 (A.4); 0000-0002-6640-6287 (A.5)

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## 2. Scope and objectives of the workshop

Our research highlights that the CE is an emerging policy domain that requires integrated, multi-level data sources to support monitoring and reporting efforts across different governmental contexts. Based on the policy cycle, we identify four primary use cases in which CE-related data is critical for public sector policymaking: (1) Sensemaking: Understanding the CE landscape to inform agenda-setting; (2) Operationalizing: Designing policies, setting targets, and conducting ex-ante assessments; (3) Control and Enforcement: Monitoring compliance with regulations; (4) Outcome Assessment: Evaluating policy impact to support adaptive governance. This workshop seeks to bring together researchers, policymakers, and practitioners working at the intersection of open data analytics, smart city research, sustainability, and evidence-based policymaking. The key objectives are to:

- Gather input on what kinds of data are most valuable for government actors at different stages of the policy cycle;
- Present and critically evaluate a conceptual framework that outlines relevant data attributes and information types to support effective CE policy processes;
- Co-develop future research directions by exploring knowledge gaps, identifying emerging needs, and discussing opportunities for cross-disciplinary collaboration.

## 3. Workshop outline

The workshop will begin with a brief welcome and introduction, followed by a presentation of the conceptual framework for CE monitoring and an overview of current practices in data-driven CE policymaking. Participants will then join facilitated breakout groups to explore how various data sources and data analytics can support different stages of the policymaking process. Discussions will focus on challenges, and opportunities for integrating CE data into governmental processes. Afterward, all participants will reconvene in a plenary session to share group findings. The workshop will conclude with a summary of key takeaways and suggestions for future research.

## Declaration on Generative AI

The author(s) have not employed any Generative AI tools.

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