

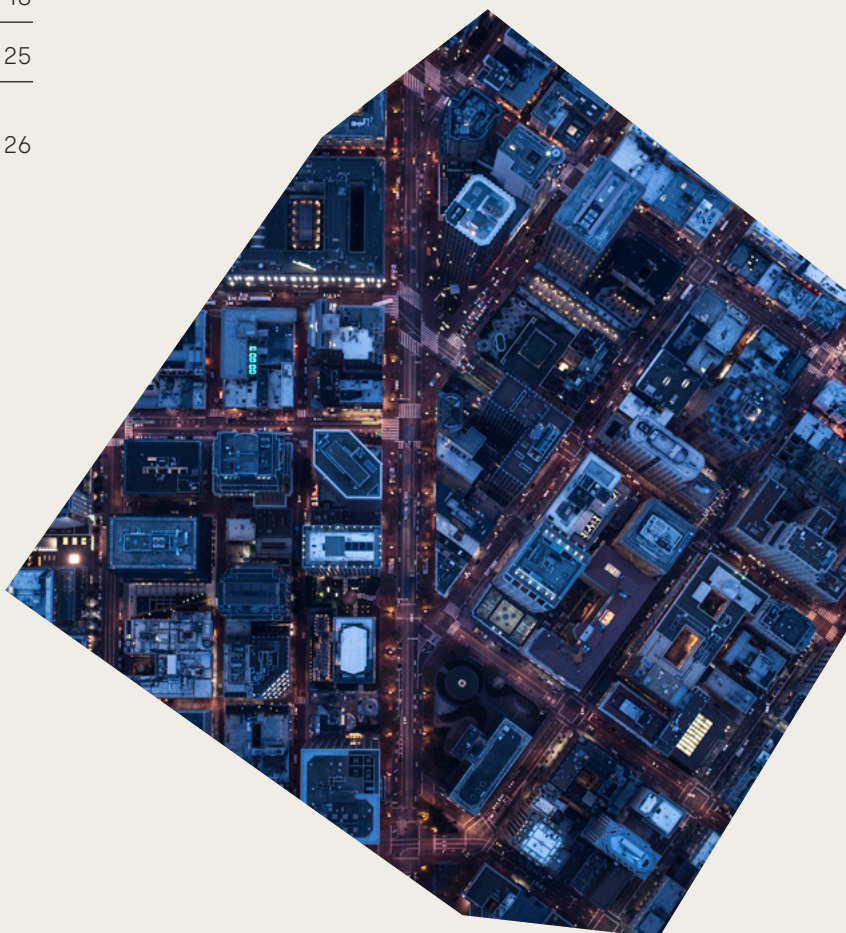
# Circular Transition Indicators (CTI)

→ *Sector Guidance - Buildings*



# Contents

	<i>Foreword</i>	04		
<b>01.</b>	<i>Executive Summary</i>	06	<b>04.</b>	<i>Conclusion</i> 48
<b>02.</b>	<i>Introduction</i>	08		<i>Annex</i> 50
<b>03.</b>	<i>CTI for Buildings: Methodological approach</i>	12		<i>Glossary</i> 52
	Introduction	13		
	Target audience	17		
	CTI for Buildings methodology	18		
	Setting the objectives and scope	25		
	Guidance by stage in the building's life-cycle	26		



In partnership with:



Thank you to the companies and organizations that contributed to this work:



We developed this guide in close consultation with a broad range of stakeholders, find a full list [here](#).

# Foreword



# Foreword

Buildings and infrastructure shape how we live, work and connect with the world around us. The built environment underpins economic development and societal well-being, yet its predominantly linear model – defined by resource extraction, energy-intensive processes and short-term design – is placing unsustainable pressure on our planet and the systems we depend on.

The sector is at a critical inflection point. It is responsible for nearly 40% of global carbon emissions and over a third of global resource consumption. Construction and demolition alone generate an estimated 1.4 billion metric tons of waste annually, much of which companies landfill or downcycle – leading to environmental degradation, lost material value, rising costs and growing systemic risk.

The circular economy offers a powerful response. Circular strategies – such as designing for longevity and adaptability, enabling reuse and refurbishment, and leveraging digital tools like material passports – can significantly reduce embodied carbon while unlocking economic opportunity. Evidence suggests circular construction can cut emissions by up to 38% while reducing dependency on virgin materials and increasing operational efficiency. Importantly, circularity also strengthens business resilience, supports regulatory readiness and creates long-term competitive advantage in an increasingly resource- and carbon-constrained world.

Market dynamics are accelerating this shift. Regulatory frameworks such as the Corporate

Sustainability Reporting Directive (CSRD), extended producer responsibility (EPR) schemes, digital product passports (DPP) and embodied carbon regulations are reshaping expectations. At the same time, innovation in design, materials and digital platforms is making circularity more scalable than ever.

To support this transition, the World Business Council for Sustainable Development (WBCSD), working with its members and partners, has developed the **Circular Transition Indicators (CTI) for Buildings**. Based on [CTI v4.0](#), this guidance offers practical metrics and definitions for assessing and improving circular performance across the building life-cycle – empowering organizations to reduce impact, boost efficiency and future-proof their portfolios.

The Circular Transition Indicators (CTI) provide the methodological foundation for performance measurement and management within the [Global Circularity Protocol](#) for Business led by WBCSD and One Planet Network (hosted by UNEP) – a unified global framework for setting targets, measuring outcomes, and reporting progress on resource efficiency and circularity.

We invite all stakeholders to adopt CTI as the shared language for circular action. Together, we can create a built environment that is not only low-carbon and resource-efficient, but regenerative, inclusive and economically resilient.

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# Executive summary



# 01.

# 01. Executive Summary

The built environment is one of the largest contributors to global environmental challenges. It is responsible for nearly 40% of global CO<sub>2</sub> emissions, with material extraction, production and disposal driving resource depletion at an unsustainable rate. Buildings account for 50% of global material use, yet only 10% of materials re-enter the economy after demolition. The sector follows a linear model, leading to excessive waste and inefficiencies. At the same time, regulatory pressures, investor expectations and market demand for sustainable and circular business models are accelerating. Stricter environmental, social and governance (ESG) regulations and increasing demand for transparent sustainability reporting require companies to demonstrate circularity efforts.

Despite growing awareness, measuring and managing circular performance remains a major challenge. Many organizations lack standardized metrics, struggle with end-of-life material reuse, and face uncertainty in regulatory compliance. This guidance introduces a new building life-cycle-based methodology, the Circular Transition Indicators (CTI) for Buildings which is designed to address these challenges by providing a comprehensive approach to measure and manage circular performance in buildings. Following the CTI core methodology (v4.0), CTI for Buildings helps companies in the built environment sector understand and improve the circular performance of their buildings and projects. It also supports internal decision-making and initiates value chain collaboration and discussions.

The methodology introduces a holistic assessment framework that measures circular performance at five critical stages of a building's life-cycle:

- **Design:** Ensuring buildings are designed for adaptability, disassembly and material recovery.
- **Construction:** Optimizing material use, construction waste and emissions reductions.
- **Operation:** Achieving extended lifespan and energy efficiency.
- **Retrofitting:** Enhancing durability, minimizing environmental impact, preserving the building's value and ensuring compliance with new regulations.
- **Deconstruction:** Enabling closed loops by ensuring efficient material recovery and re-integration and the minimization of waste and greenhouse gas (GHG) emissions.

Adopting a life-cycle-based methodology for measuring and managing circular performance, such as the CTI for Buildings, will help companies set circularity roadmaps and measurable targets, track progress on sustainability goals and enhance regulatory compliance. This will ensure alignment with evolving frameworks such as the Corporate Sustainability Reporting Directive (CSRD), the EU taxonomy, ESG reporting standards, and circular economy policies and regulations. Additionally, the integration of circularity principles into each stage of a building's life-cycle projects can lead to emissions reductions of up to 38% and related cost savings.<sup>1</sup> It can also boost investor confidence and offer a competitive advantage.

We invite all stakeholders in the built environment value chain to adopt CTI as their preferred framework for measuring and managing their circular performance. By speaking a common language and adopting a unified way to measure success, the sector can successfully transition to a more resource-efficient, low-carbon and regenerative built environment – one where materials retain their highest value, there is minimal waste, and every stage of a building's life-cycle embeds sustainability.

# Introduction



## 02.

## 02. Introduction

The built environment encompasses the human-made spaces designed to support activities, ranging from individual buildings and parks to neighborhoods, cities and their associated infrastructure – such as water supply systems and energy and digital networks. It represents a material, spatial and cultural outcome of human effort, combining physical and intangible networks that facilitate living, working and recreation.<sup>2</sup> With the global urban population expected to rise from 55% today to almost 70% by 2050,<sup>3</sup> the demand for urban infrastructure will skyrocket, with projections currently estimating an increase of 241 billion m<sup>2</sup> of new floor area by 2060 compared to 2020 levels.<sup>4</sup> With such a significant influence, building sustainably by applying circular economy principles is essential in driving the systemic and transformative change needed to accelerate decarbonization and sustainable development.

However, the sector faces persistent challenges, including resource depletion, excessive waste generation and high carbon footprints, as buildings represent around 40% of total global carbon emissions, 50% of global material extraction, 33% of global water consumption and 35% of global waste generation.<sup>5</sup> Traditional linear practices – characterized by a “take, make, waste” approach – dominate construction and deconstruction processes, leading to inefficiency and environmental degradation.<sup>6</sup> Additionally, the evolving, highly complex and resource-intensive sustainability regulation requirements, such as the Corporate Sustainability Reporting Directive (CSRD), make it difficult for companies to keep up with compliance, adding to the increasing sustainability-related costs.<sup>7</sup>

A circular economy is an economic model that is regenerative by design, aiming to preserve the value of products, components and materials by fostering innovative business models that promote durability, optimal reuse, refurbishment, remanufacturing and recycling. By adopting circular economy strategies, companies can collaborate to eliminate waste, enhance resource efficiency, remain within planetary boundaries and unlock economic benefits.<sup>8</sup> The adoption of circular economy principles in the built environment can present an innovative and impactful solution to these challenges by focusing on resource efficiency, material recovery, adaptability and longevity from the design phase and across the life-cycle stages of buildings.

By applying circular economy strategies, the built environment sector has the potential to reduce the global carbon emissions from building materials by 38%<sup>9</sup> and, according to a study published by the World Economic Forum and McKinsey, 75% of the sector's embodied carbon emissions by 2050, abating 3.4 to 4 Gt CO<sub>2</sub>.<sup>10</sup> Additionally, the same study mentions that embedding circular economy practices in the built environment sector has the potential to yield an annual profit gain of USD \$31-46 billion by 2030 and USD \$234-360 billion by 2050. More specifically, projections show the estimated annual net value impact of recirculating materials and minerals will reach USD \$31-48 billion by 2030 and USD \$184-310 billion by 2050. Meanwhile, the net impact of reuse and remanufacturing will range between USD \$6-13 billion in 2030 and USD \$45-96 billion by 2050.<sup>11</sup>

As the link between circular economy strategies and decarbonization efforts becomes increasingly tangible, the financial sector has turned its focus to embedding circularity efforts in their climate transition plans.<sup>12</sup> As banks move from setting greenhouse gas (GHG) emissions reduction targets to implementing them, the need to assess their portfolios against circularity criteria and the respective climate impact becomes crucial to financial decision-making. By investing in circular solutions and projects while reducing financing for high-GHG-emitting activities, financial institutions can lower their financed emissions and support emissions reductions through transition finance. This approach also helps them progress toward their own climate change mitigation targets.<sup>13</sup> Hence, businesses from the built environment sector that adopt circular practices and communicate their circular performance could benefit from this transition by leveraging sustainability-linked financing, preferential loan terms that stem from circularity actions and the attraction of impact-oriented investments.

A clear method for assessing the implementation of circular principles in buildings is key to evaluating circular resource use and performance evaluation. Establishing a consistent measurement framework and adopting a standardized approach can enable stakeholders to evaluate the circularity of their buildings and identify steps to enhance their performance, ultimately driving the transition to a more sustainable built environment.<sup>14</sup> To address this gap, we propose the WBCSD Circular Transition Indicators (CTI) framework.

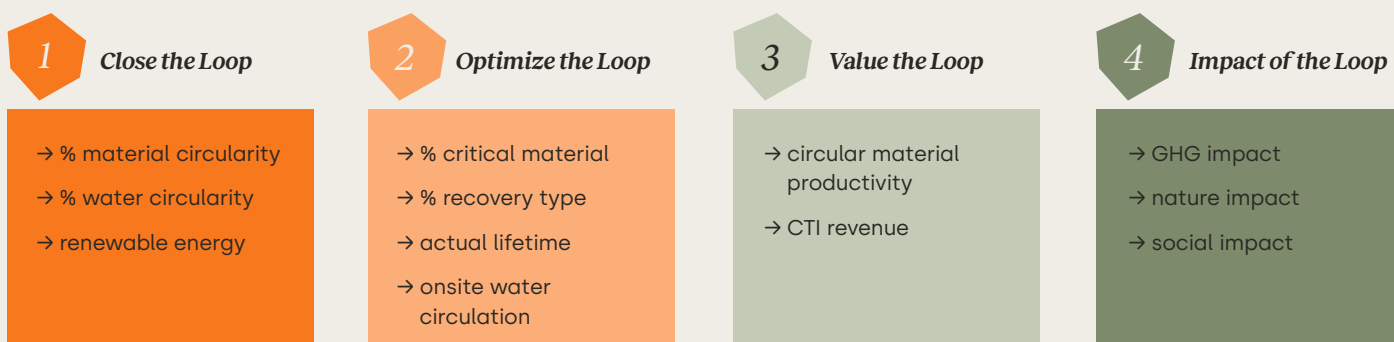
## The Circular Transition Indicators

As the circular economy gains traction, preparing for the transition towards a more circular business model and associated risks and opportunities is essential for companies. To enable this transition, WBCSD, along with 50+ member companies, has developed the Circular Transition Indicators (CTI), a quantitative and objective framework that guides companies in measuring the circular performance of products or business processes. It helps companies identify the solutions that will have the greatest impact on their business,

evaluate and understand those risks and comprehend the impact of their circularity strategies and actions.<sup>15</sup>

CTI has proven applicable across industries and value chains. It offers a simple methodology that is scalable and flexible in scope. It helps companies assess their circular performance at different business levels, such as the product level, the business unit level or the full company. The design of the methodology is sector-, geography- and material-agnostic. It provides four indicator modules (Figure 1).<sup>16</sup>

Figure 1: The four indicator modules of the CTI methodology<sup>17</sup>



The CTI methodology includes a 7-step process cycle (Figure 2) that aims to guide companies through their circularity performance assessment journey and provide them with the necessary information to improve it and support further decision-making and emerging reporting requirements.<sup>18</sup>

The process starts with the identification of the objectives and the scope of the assessment in terms of the business level, the period and which material flows the company will include in the assessment.

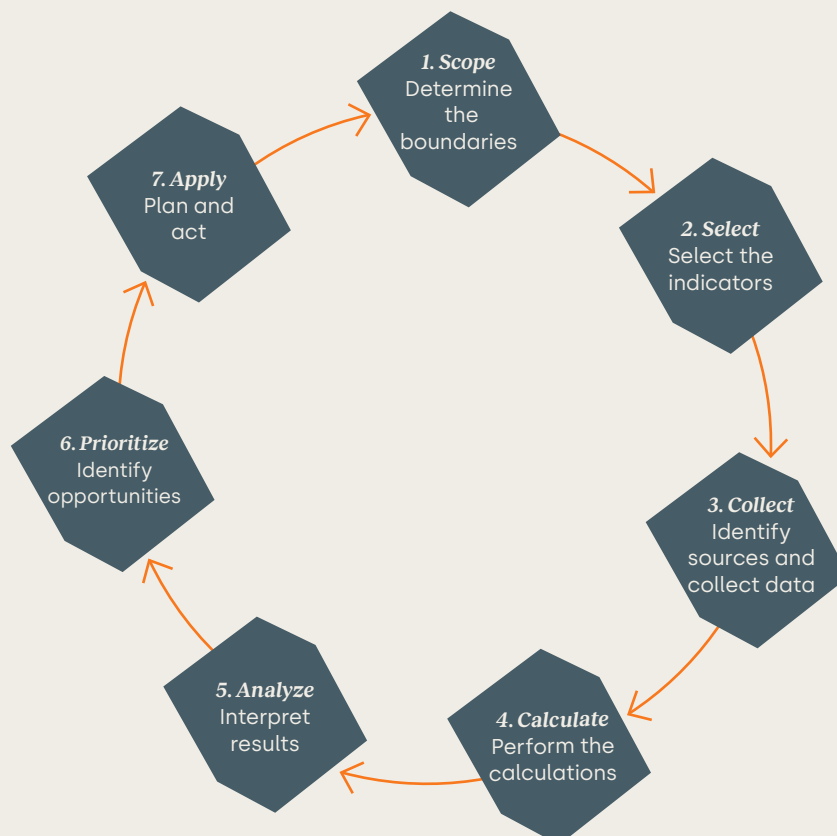
Afterwards, the company determines the set of indicators that are in scope for the assessment. It should choose the indicators based on the scope of the assessment and the additional insights the company wants to gain from the assessment.

The next steps are to collect the necessary data and perform the calculations. Based on an analysis of the results, the company drafts an action roadmap to advance circularity and prioritize key actions. The prioritization can be performed by identifying risks and opportunities that arise from adopting circular practices, through a scenario analysis exercise. The 7th step is to develop an action plan, including SMART (Specific, Measurable, Achievable, Relevant and Time-Bound) targets and initiatives, that will focus on the prioritized roadmaps.<sup>19</sup>

A collaborative effort between WBCSD, partners and member organizations was behind the development of the built environment sectoral guidance. The CTI for Buildings methodology provides a standardized framework to measure circularity in buildings and steer the industry towards a shared vision of a sustainable and low-carbon built environment. Additionally, the methodology supports companies with data-driven decision-making for a more circular business model and compliance with emerging reporting requirements by facilitating transparent communication, comparability and regulatory risk mitigation. It encourages the transition towards a low-carbon construction sector by:

- Promoting low-carbon, recycled or renewable materials that require less energy for extraction and processing;
- Supporting circular design and construction methods that reduce material waste;
- Ensuring the easy upgrading, deconstruction and repurposing of building components, minimizing deconstruction activities that produce waste and GHG emissions;
- Encouraging retrofitting instead of demolition;
- Promoting closed material loops that reduce the need for new material extraction;
- Encouraging on-site reuse of materials.

Figure 2: The seven step CTI process<sup>20</sup>



# CTI for Buildings: *Methodological approach*



# 03.