



# **Circular Economy:** from Indicators and Data to Policy-making

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# 03

## Data Availability



### 3.1 Circular Economy Core Indicators

Circular economy is a recent thematic topic, whose boundaries definition is still in progress, and many indicators are not yet well-defined. In general, the information required to populate the circular economy indicators covers different types of fields (economic, environmental and social), and some of the indicators try to measure complex phenomena and require multi-dimensional data.

Some of the indicators are completely new, and a standard, internationally adopted methodology is not yet available, while methodologies for other indicators have only been recently adopted in many countries. These two factors play an important role in terms of their availability rate.

To evaluate the availability of circular economy indicators, it is also relevant to consider that currently data collected for these indicators are scattered due to the lack of homogenized questionnaire that solely focus on circular economy.

As previously mentioned, only the 15 core indicators not classified as placeholders were considered. Table 3 shows the available core indicators highlighted in grey. Out of the initial 15 indicators, data for 12<sup>5</sup> of them are available (80 per cent).

<sup>5</sup> Including proxy indicators due to the unavailability of the initial indicators or to complement them.

**Table 3** Data availability for CE core indicators as of 21/10/2023

Framework	Proposed core indicators
Material life-cycle and value chain	Material consumption and productivity a. Domestic Material Consumption (DMC) b. Raw Material Consumption (RMC) c. Material productivity <sup>6</sup> d. Raw material productivity <sup>7</sup>
	Total waste generation Proxy: Municipal waste generation
	Circular material use rate
	National recycling rate Proxy: Municipal waste recycling rate
	Waste going to final disposal
	Interactions with the environment
Responses and actions	Taxes and government support for circular economy business models
	Investments in waste management, waste collection and sorting
	Tax rate/tonne landfilled or incinerated
	Government and business R&D expenditure on circular economy technologies
Socio-economic opportunities for a just transition	Business investment in circular economy activities
	Gross value added related to circular economy sectors Jobs in circular economy sectors

Source: Author's elaboration

<sup>6</sup> Material intensity data are available. Material productivity can be calculated as its inverse.

<sup>7</sup> Raw material intensity data are available. Raw material productivity can be calculated as its inverse.

The distribution of the available core indicators' data at geographical level is presented in Table 4, Table 5 and Table 6. In Table 4, for example, 17 per cent of the indicators from UNSD have data from more than 180 countries and for 8 per cent of the indicators from the World Bank.

**Table 4** Proportion of available CE core indicators' data at country level and by data source<sup>8</sup>

Number of countries	UNSD	World Bank	OECD	Eurostat	Proportion of CE core indicators available at country level
≥ 180	17%	8%			25%
60 – 179	8%				8%
40 – 59	17%				17%
30 – 39					
20 – 29				50%	50%
0 -19					

Source: Author's calculations

Table 5 and Table 6 present the distribution of the available core indicators' data at regional, sub-regional and global levels, according to the country groupings defined by the United Nations Statistics Division (UNSD 1999). It is important to note that, according to UNEP's World Environment Situation Room aggregation method, regional aggregates are calculated if data is available for more than 55 per cent of countries within the same region. The list of the regions and subregions is available in Annex I.

<sup>8</sup> The percentage of available indicators' data considers proxy indicators as they have better coverage.

**Table 5** Proportion of available CE core indicators' data at regional level and by data source

Number of regions/subregions	UNSD	World Bank	OECD	Eurostat	Proportion of CE core indicators available at regional level
All regions/subregions (37)	8%				8%
20 – 36 regions/subregions	8%	8%			16%
4 – 19 regions/subregions					
1 – 3 regions/subregions				50%	50%
0 regions/subregions	26%				26%

Source: Author's calculations

**Table 6** Proportion of available CE core indicators' data at global level and by data source

UNSD	World Bank	OECD	Eurostat	Proportion of CE core indicators available at global level
17%	8%			25%

Source: Author's calculations

In general, the highest share of data availability at global and regional levels originates from UNSD data, while Eurostat covers 27-28 countries. Eurostat data availability reflects the recent efforts made by the institution to have information about circular economy sectors and activities, using information from different statistical operations.

### 3.2 Circular Economy Variables

To adequately analyze the availability of the data, it is important to mention that only two core indicators are represented by one variable each and have one single unit of measurement each (Table 7).

**Table 7** CE core indicators represented by only one variable.

CE core indicators	Variables
Circular material use rate	Circular material use rate
GHG emissions from production activities	Total GHG emissions

Source: Author's elaboration

In other cases, indicators data are available for different sectors, different intensities representations and/or different measurement units, or additional proxy is available, as shown in Table 8.

**Table 8** CE core indicators represented by several variables with different disaggregation and measurement units

CE core indicators	Variables
Material consumption and productivity a. Domestic Material Consumption (DMC) b. Raw Material Consumption (RMC) c. Material productivity d. Raw material productivity	DMC
	DMC by raw material
	RMC
	RMC by raw material
	DMC/GDP
	DMC by raw material/GDP
	RMC/GDP

CE core indicators	Variables
Total waste generation	Total waste generation
	Total waste generation by sector
	Municipal waste generation (proxy)
National recycling rate <i>Proxy: Municipal waste recycling rate</i>	Recycling rate of all waste excluding major mineral waste
	Municipal waste recycling rate (proxy)
Intensity of use of renewable freshwater resources	Water stress
	Water stress by sector
Business investment in CE activities	Business investment on CE activities as percentage of the GDP
	Business investment on CE activities
Gross value added to CE sectors	Gross value added to CE sectors as percentage of the GDP
	Gross value added to CE sectors
Jobs in CE sectors	Jobs in CE sectors
	Proportion of jobs in CE sectors in total employment

Source: Author's elaboration

Two other indicators require calculations using several variables, as shown in Table 9. For example, investment in waste management is calculated by adding the amount of investments made by governments and by corporations.

**Table 9** CE core indicators to be calculated from several variables

Core indicators	Variables
Waste going to final disposal = Waste going to landfill final disposal + Waste going to incineration without energy recovery	Waste (excluding major mineral waste) going to landfill final disposal
	Waste (excluding major mineral waste) going to incineration without energy recovery
Investment in waste management = Investment in waste management by governments + investment in waste management by corporations	Investment in waste management by governments
	Investment in waste management by corporations

Source: Author's elaboration

One additional indicator is represented by 14 variables to provide a better understanding of the initial indicator, as shown in Table 10.

**Table 10** Variables identified to represent one core indicator

Core indicators	Variables
Pollutant discharges to water bodies and share of safely treated <i>Proxy: proportion of discharges safely treated</i>	Industrial discharges to water bodies
	Agricultural discharges to water bodies
	Industrial BOD discharged
	Industrial COD discharged
	Industrial N discharged
	Industrial P discharged
	Industrial SS discharged
	Agricultural BOD discharged
	Agricultural COD discharged
	Agricultural N discharged
	Agricultural P discharged
	Agricultural SS discharged
	Proportion of total discharges to water bodies safely treated ( <i>proxy</i> )
	Proportion of industrial discharges to water bodies safely treated ( <i>proxy</i> )

Source: Author's elaboration

Considering what has been presented above, 39 variables were selected for the 12 circular economy core indicators. Annex II shows the list of CE core indicators considered (excluding placeholder indicators) by theme, available variables for each indicator, sources selected, available time series and units of measurement.

The distribution of the available variables at geographical level is presented in Table 11, Table 12 and Table 13, as well as the data sources for the different groups of variables.

**Table 11** Proportion of available variables at country level and by data source

Number of countries	UNSD	World Bank	OECD	Eurostat	Availability at country level
≥ 180	16%	3%			19%
60 – 179	5%				5%
40 – 59	8%				8%
30 - 39					
20 - 29			3%	31%	34%
0 -19	5%		29%		34%

Source: Author's calculations

Table 12 and Table 13 present the distribution of the available variables at regional, sub-regional and global levels, according to the country groupings defined by the United Nations Statistics Division (UNSD 1999). The list of the regions and subregions is available in Annex I.

**Table 12** Proportion of available variables at regional level and by data source

Number of regions	UNSD	World Bank	OECD	Eurostat	Availability at regional level
All regions/ subregions (37)	10%				10%
20 – 36 regions/ subregions	5%	3%			8%
4 – 19 regions/ subregions					
1 – 3 regions/ subregions			3%	31%	34%
0 regions/ subregions	20%		28%		48%

Source: Author's calculations

**Table 13** Proportion of available variables at global level and by data source

UNSD	World Bank	OECD	Eurostat	Availability at global level
20%	3%			23%

Source: Author's calculations

### 3.3 Circular Economy Core Indicators with Low Availability

Table 14 represents a special group of core indicators for which data availability could be improved. Such indicators could be considered as having (a) very complex methodology, so estimated data is only available at global level, (b) indicators whose data are currently only reported by countries to Eurostat, although methodology is globally available, and (c) indicators with no international methodology available due to a missing definition of circular economy boundaries.

In the first two instances, additional capacity building efforts to increase national capacities is needed to improve data availability at national level, focusing on methodology, including definitions, concepts, calculations and collection methods. The adoption of a standardized methodology through increased collaboration between international organizations, in line with the one already started and that has produced the guidelines on which this report is based, is needed for indicators with no international methodology available.

**Table 14** Circular economy core indicators with low availability

Indicators with weak availability	Reason
Material consumption and productivity b. Raw material consumption (RMC) d. Raw material productivity	Complex methodology
Pollutant discharges from material extraction and processing to water bodies and share safely treated	Complex methodology and/or no formal obligation to supply data to any international institution
Circular material use rate	Data reported by countries to Eurostat and no formal obligation to supply data to any other international institution
National recycling rate	Data reported by countries to Eurostat and no formal obligation to supply data to any other international institution
Waste going to final disposal	Data reported by countries to Eurostat and no formal obligation to supply data to any other international institution
Investments in waste management, waste collection and sorting	Data reported by countries to Eurostat and no formal obligation to supply data to any other international institution
Business investment on CE activities	No international harmonised methodology is available and no formal obligation to supply data to any international institution
Gross value added related to CE sectors	No international harmonised methodology is available and no formal obligation to supply data to any international institution
Jobs in CE sectors	No international harmonised methodology is available and no formal obligation to supply data to any international institution

Source: Author's elaboration