Circular Economy Indicators related to waste (II)

SDG and Environment Statistics Unit, 2025
Early Warning and Assessment Division, UNEP

Indicator 8: Proportion of hazardous waste treated, by type of treatment

Hazardous waste treated

This indicator of circular economy corresponds to the SDG 12.4.2 (b) Proportion of hazardous waste treated.

The methodology for this indicator is based on UNSD's Metadata for 12.4.2, UNEP's step-by-step guide: SDG Indicator 12.42: Hazardous Waste Generation and UNEP's Global Chemicals and Waste Indicator Review Document (2021).

SDG target 12.4 aims to achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil to minimize their adverse impact on human health and the environment.

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Hazardous waste treated

Indicator 12.4.2 (b) **LEVEL II INDICATOR** *Proportion of hazardous waste treated*	Proportion of hazardous waste treated, by type of treatment
	Quantity of hazardous waste treated during reporting year / quantity of hazardous waste generated × 100
LEVEL III INDICATORS *Environmentally sound treatment of own generated hazardous waste*	Related to the country capacity for sound treatment of own hazardous waste within the country and the capacity for treatment of hazardous waste from other countries.

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Hazardous waste treated
Disaggregation

This Indicator can be disaggregated depending on the country's policy information needs:

- Disaggregation at sector level, by ISIC codes.
- Disaggregation by type of landfilling (landfilling in specialized, controlled and uncontrolled landfills).
- Disaggregation by type of treatment per each generating sector.
- Disaggregation by type of recycling operation (R2 to R12 from Basel Convention Annex IV).

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Hazardous waste treated
Interpretation (I)

Chemicals are part of everyday life.

There are over 140,000 different substances used in all economic sectors globally.

The benefits of chemicals are many and so their potential to impact human health and the environment if not properly managed.

There is an increase in the complexity of products and unidentified hazardous components, and/or items which are not hazardous, but present hazardousness in a variety of ways when improperly discarded and end up in air, water or are burned.

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Hazardous waste treated
Interpretation (II)

All countries, especially middle- and low-income countries, are facing the complex challenge of managing hazardous waste.

The situation is complicated by limited human, financial and/or technical resources.

Action is needed to support the sustainable use of chemicals and environmentally sound management of hazardous waste.

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Hazardous waste treated
Data availability (I)

At the global level, UNSD collects data from all countries (except those covered by the OECD/Eurostat Joint Questionnaire on Environment Statistics) through the UNSD/UNEP Questionnaire on Environment Statistics (waste section).

Data collection on hazardous waste management is usually done by the competent authorities designated under the Basel Convention.

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Hazardous waste treated
Data availability (II)

On a national level, data regarding hazardous waste management can be derived from hazardous waste collection operators, as well as treatment facilities and local/regional and national environmental protection agencies. Depending on national obligations for record keeping and reporting, the extent of the data available might vary at country level.

National statistics offices something collect information about hazardous waste management.

Information on exported/imported hazardous waste is generally available through the customs office.

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Hazardous waste treated
Data availability (III)

Hazardous waste management statistics involve many national and sub-national stakeholders which may create discrepancies.

To address these possible discrepancies, inter-institutional stakeholder collaboration is always encouraged.

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Hazardous waste treated
Limitations in the use of the indicator (I)

Data on hazardous waste treatment may be scarce in some countries, due to a series of factors, such as: lack or insufficient policies and regulations, limited human, financial and technical resources within government agencies…)

Data on illegal waste collection, illegal trade, and illegal dumping or deliberate leakage into the environment are difficult to capture.

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Hazardous waste treated
Limitations in the use of the indicator (II)

The informal and semi-formal sectors, including waste picking and recycling by the informal private sector, all of which are especially relevant to the situation in developing countries, are difficult to measure because they are unregulated and operate without oversight. Data collection disaggregated by sex and age for the informal waste sector is particularly difficult.

Limitations in terms of usable data for calculating the indicator may arise due to discrepancies between these definitions and the definitions included in national legislation.

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Hazardous waste treated

Level II – Proportion of hazardous waste treated

$$\text{Proportion of hazardous waste treated (\%)} = \frac{\text{Quantity of hazardous waste treated during the reporting year}}{\text{Total quantity of hazardous waste generated during the reporting year}} \times 100$$

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Hazardous waste treated

Proportion of hazardous waste treated

Proportion of hazardous waste treated (%) = (Quantity of hazardous waste treated during the repo...

Category	Unit	2000	2001	20...
Hazardous waste treated or disposed of during the year	tonnes	-	-	-
Total Hazardous Waste Generated	tonnes	-	-	-
Proportion of hazardous waste treated	%	#DIV/0	#DIV/0!	#DIV/...

For each year, enter the amount of waste treated or disposed.

For each year, enter the amount of waste generated

The proportion of hazardous waste treated will appear here

Note: Proportion of hazardous waste treated can be above 100% in any given year. Hazardous wa...
Part of the hazardous waste may not be treated or disposed of during the year that it is generated.

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Hazardous waste treated

Level III – Environmentally sound treatment of own generated hazardous waste

This indicator shows the country capacity in terms of hazardous waste treatment.

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Hazardous waste treated

This indicator can be further, further detailing country capacity and performance on more specific environmentally sound waste treatment practices.

Country capacity for sound treatment of its own hazardous waste within country.

Country capacity for treatment of hazardous waste from other countries. This sub-indicator only considers imported waste.

Hazardous waste exported in order to be treated in an environmentally sound manner.

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Management of Hazardous Waste (UNSD/UNEP Questionnaire on Environment Statist

• If the value turns red, please check if it is correct.

Category	Unit	2000	2001	2002	2003	2004
Hazardous waste generated during the year	tonnes	-	-	-	-	-
Hazardous waste imported during the year	tonnes					
Hazardous waste exported during the year	tonnes					
Hazardous waste treated or disposed of during the year	tonnes	-	-	-	-	-
Amounts going to: Recycling	tonnes					
Incineration	tonnes					
of which: with energy recovery	tonnes					
Landfilling	tonnes					
Other, please specify in the footnote	tonnes					

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Environmentally sound treatment of own generated hazardous waste

Category	Unit	2000	2001	2002	2003	2004
Capacity to treat own generated waste	tonnes					
Proportion of waste treated in country	%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Proportion of waste exported	%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Capacity to treat imported waste	tonnes	-	-	-	-	-

Footnotes

Code	Footnote text

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Indicator 9: National recycling rate, tons of material recycled

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National recycling rate

This indicator of circular economy corresponds to the SDG 12.5.1 National recycling rate, tons of material recycled.

The methodology for this indicator is based on UNSD Metadata for 12.5.1, UNEP's step-by-step guide: SDG Indicator 12.5.1: National recycling rate, tons of material recycled and UNEP's Global Chemicals and Waste Indicator Review Document (2021).

SDG target 12.5 aims to substantially reduce waste generation through prevention, reduction, recycling and reuse.

Indicator 12.5.1 has four indicators in total.

National recycling rate

LEVEL I INDICATOR *National recycling rate*	(Material recycled + material exported for recycling – material imported for recycling) / total waste generated (with gap filling for regional and global aggregates)
LEVEL II INDICATORS *Total Waste Generated (excluding construction, mining and agriculture) by type, including e-waste*	This is the denominator for recycling and useful for understanding the target 12.5 on waste reduction
National recycling rate by type of waste, including e-waste (other possible disaggregation include, metals and packaging waste)	Based on national data sources, including disaggregation of the recycling rate
Waste intensity	Waste generated divided by domestic material consumption (DMC) (as an indicator of waste reduction)

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National recycling rate
Interpretation of the indicator (I)

Minimizing waste generation and maximizing the recycling of waste is central to the concept of circular economy or sustainable consumption and production.

National recycling rate is part of measuring progress towards circular economy, by better understanding the recycling rate by type of material and equipping policymakers with evidence-based information to develop targeted policies.

Assessing the recycling rate also helps countries identify their dependency on raw material (extraction, import, export) and influence policies on recycling capacity expansion.

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National recycling rate
Interpretation of the indicator (II)

Recycling rate does not capture prevention, reduction, reuse and repair.

This indicator needs to be interpreted against other indicators as the Domestic Material Consumption and material flows, helping to connect this indicator to resource efficiency in consumption and production.

Currently, the total amount of produced materials that are recycled are estimated to be low (based on academic literature).

When countries better understand how waste is generated, collected and recycled, it will enable them and other stakeholders to better determine how to deal with major waste streams, for example e-waste or plastic.

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National recycling rate
Data availability (I)

The data sources for this indicator are national governments, including national statistical offices and ministries/agencies responsible for the environment.

National data is collected through the UNSD/UNEP Questionnaire on Environment Statistics (waste section), and by the Basel Convention for hazardous waste.

Data on amounts of waste generated can be obtained collecting data from waste generators themselves either through regular reporting or special surveys or collecting data from waste management facilities (for example, municipal waste authorities).

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National recycling rate
Data availability (II)

It is interesting to collect data by type of material especially for high value recyclables, such as non-ferrous metals, ferrous metals and packaging wastes.

At a national level quantity of materials recycled and materials exported for recycling is relatively easy to collect from large facilities and customs authorities.

A common way to improve waste data is to carry out surveys or measurements for a sample of waste generators belonging to a specific category.

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National recycling rate
Limitations in the use of the indicator

While prevention, reduction, reuse, repair are important aspects of reducing material consumption and waste, they are difficult to measure.

A challenge in measuring this indicator is identifying the stage in the recovery process when waste stops being waste.

In addition, data on waste are often collected at the municipal level which can lead to a rural data gap.

As well, even though it plays a key role, it is difficult to obtain data on activities of the informal sector.

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National recycling rate. Calculation

National Recycling Rate = $\dfrac{\text{(Material recycled} + \text{Material exported intended for recycling} - \text{Material imported intended for recycling)} \times 100}{\text{Total waste generated}}$

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National recycling rate

Total waste generated = Waste from manufacturing (ISIC 10-33) + Waste from electricity, gas, steam and air conditioning supply (ISIC 35) + Waste from other economic activities (excluding ISIC38) + Municipal waste (excluding construction and demolition)

ISIC 38: waste collection and treatment

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National recycling rate

Waste generation using UNSD/UNEP ISIC categories (excluding construction, mining and agriculture), including e-waste

• If the value turns red, please check if it is correct

Category	Unit	2000	2001	2002	2003	2004	2005	2006	2007
Manufacturing (ISIC 10-33)	tonnes								
Electricity, gas, steam and air conditionning supply (ISIC 35)	tonnes								
Other economic activities (ISIC 38)	tonnes								
Households	tonnes								
e-waste	tonnes								
Total waste generation (excluding construction, mining and agriculture), including e-waste	tonnes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes:
- Please note that the unit in this table is "1,000 tonnes (metric tons)"
- If the requested data are not available, please leave the cell blank. If the requested variable is not applicable (the phenomenon is not relevant) to th
- Please provide in the Footnotes Section below information on the source and data collection methodology for the values provided, such as estimation

Footnotes

Code	Footnotes text

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Hazardous Waste by stream, according to the Basel Convention	Unit	2000	2001	2002	2003	2004	2005
Y1 Clinical wastes from medical care in hospitals, medical centres and clinics	tonnes						
Y2 Wastes from the production and preparation of pharmaceutical products	tonnes						
Y3 Waste pharmaceuticals, drugs and medicines	tonnes						
Y4 Wastes from the production. formulation and use of biocides and phytopharmaceuticals	tonnes						
Y5 Wastes from the manufacture, formulation and use of wood preserving chemicals	tonnes						
Y6 Wastes from the production, formulation and use of organic solvent	tonnes						
Y7 Wastes from heat treatment and tempering operations containing cyanides	tonnes						
Y8 Waste mineral oils unfit for their originally intended use	tonnes						
Y9 Waste oils/water, hydrocarbons/water mixtures, emulsions	tonnes						
Y10 Waste substances containing or contaminated with PCBs, PCTs, and/or PBBs	tonnes						
Y11 Waste tarry residues from refining, distillation and any pyrolytic treatment	tonnes						
Y12 Wastes from production, formulation and use of inks, dyes, pigments, paints, lacquers, varnish	tonnes						
Y13 Wastes from production formulation and use of resins, latex, plasticizers, glues/adhesives	tonnes						
Y14 Waste chemical substances arising from research and development or teaching activities which are not identified and/or are new and whose effects on man and/or the environment are not known	tonnes						
Y15 Wastes of an explosive nature not subject to other legislation	tonnes						
Y16 Wastes from production, formulation and use of photographic chemicals and processing materials	tonnes						
Y17 Wastes resulting from surface treatment of metals and plastics	tonnes						
Y46 Wastes collected from households	tonnes						
NEC Wastes not elsewhere classified	tonnes						
Total hazardous waste generated	tonnes	0	0	0	0	0	0

Hazardous Waste by source by economic activity, according to ISIC 4	Unit	2000	2001	2002	2003	2004	2005
1. Agriculture, forestry and fishing (International Standard Industrial Classi-fication (ISIC) codes 01-03)	tonnes						
2. Mining and quarrying (ISIC 05-09)	tonnes						
3. Manufacturing (ISIC 10-33)	tonnes						
4. Electricity, gas, steam and air conditioning supply (ISIC 35)	tonnes						
5. Construction (ISIC 41-43)	tonnes						
6. Other economic activities excluding ISIC 38, and	tonnes						
7. Households	tonnes						
Total hazardous waste generated	tonnes	0	0	0	0	0	0

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E-Waste Generation and Collection (UNSD/UNEP Questionnaire on Environment Statistics, Waste section, Table R6)

• If the value turns red, please check if it is correct

Line	Category	Unit	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
1	Total E-waste generated	1000 t	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	*Amounts going to:* Large equipment	1000 t										
3	Screens, monitors, and equipment containing screens	1000 t										
4	Temperature exchange equipment (cooling and freezing equipment)	1000 t										
5	Small E-waste	1000 t	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	*of which:* lamps	1000 t										
7	*of which:* small equipment	1000 t										
8	*of which:* small IT and telecommunication equipment	1000 t										
9	Total E-waste collected	1000 t	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	*Amounts going to:* Large equipment	1000 t										
11	Screens, monitors, and equipment containing screens	1000 t										
12	Temperature exchange equipment (cooling and freezing equipment)	1000 t										
13	Small E-waste (=14+15+16)	1000 t	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	*of which:* lamps	1000 t										
15	*of which:* small equipment	1000 t										
16	*of which:* small IT and telecommunication equipment	1000 t										

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Line	Category	Unit	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
9	E-waste recycling rate (% of generation)	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	*Amounts going to:* Large equipment	%										
11	Screens, monitors, and equipment containing screens	%										
12	Temperature exchange equipment (cooling and freezing equipment)	%										
13	Small E-waste (=14+15+16)	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	*of which:* lamps	%										
15	*of which:* small equipment	%										
16	*of which:* small IT and telecommunication equipment	%										
9	Total e-waste recycled	1000 t	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	*Amounts going to:* Large equipment	1000 t	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	Screens, monitors, and equipment containing screens	1000 t	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	Temperature exchange equipment (cooling and freezing equipment)	1000 t	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	Small E-waste (=14+15+16)	1000 t	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	*of which:* lamps	1000 t	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	*of which:* small equipment	1000 t	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	*of which:* small IT and telecommunication equipment	1000 t	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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Recycling of waste by Basel recycling streams

*If the value turns red, please check if it is correct.

	Category	Unit	2000	2001	2002	2003	2004	2005
	Total waste amounts going to recycling	1000 t	0.00	0.00	0.00	0.00	0.00	0.00
Y1	Clinical wastes from medical care in hospitals, medical centres and clinics	1000 t						
Y2	Wastes from the production and preparation of pharmaceutical products	1000 t						
Y3	Waste pharmaceuticals, drugs and medicines	1000 t						
Y46	Wastes collected from households	1000 t						
E-W	E-waste	1000 t						
NEC	Wastes not elsewhere classified	1000 t						
	Total waste imported for recycling during the year	1000 t	0.00	0.00	0.00	0.00	0.00	0.00
Y1	Clinical wastes from medical care in hospitals, medical centres and clinics	1000 t						
Y2	Wastes from the production and preparation of pharmaceutical products	1000 t						
Y3	Waste pharmaceuticals, drugs and medicines	1000 t						
Y46	Wastes collected from households	1000 t						
E-W	E-waste	1000 t						
NEC	Wastes not elsewhere classified	1000 t						
	Total waste exported for recycling during the year	1000 t	0.00	0.00	0.00	0.00	0.00	0.00
Y1	Clinical wastes from medical care in hospitals, medical centres and clinics	1000 t						
Y2	Wastes from the production and preparation of pharmaceutical products	1000 t						
Y3	Waste pharmaceuticals, drugs and medicines	1000 t						
Y46	Wastes collected from households	1000 t						
E-W	E-waste	1000 t						
NEC	Wastes not elsewhere classified	1000 t						
Notes:								

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Management of waste (partial adaptation from UNSD/UNEP Questionnaire on Environment Statistics, waste section)

*If the value turns red, please check if it is correct.

Category	Unit	2000	2001		2002		2003		2004	
Total waste amounts going to recycling	1000 t	0.00	0.00	#	0.00	#	0.00	#	0.00	#
Of which from: Manufacturing (ISIC 10-33)	1000 t									
Of which from: Electricity, gas, steam and air conditionning supply (ISIC 35)	1000 t									
Of which from: Other economic activities (ISIC 38)	1000 t									
Of which from: Households	1000 t									
Of which from: e-waste	1000 t									
Waste imported for recycling during the year	1000 t	0.00	0.00	#	0.00	#	0.00	#	0.00	#
Of which from: Manufacturing (ISIC 10-33)	1000 t									
Of which from: Electricity, gas, steam and air conditionning supply (ISIC 35)	1000 t									
Of which from: Other economic activities (ISIC 38)	1000 t									
Of which from: Households	1000 t									
Of which from: e-waste	1000 t									
Waste exported for recycling during the year	1000 t	0.00	0.00	#	0.00	#	0.00	#	0.00	#
Of which from: Manufacturing (ISIC 10-33)	1000 t									
Of which from: Electricity, gas, steam and air conditionning supply (ISIC 35)	1000 t									
Of which from: Other economic activities (ISIC 38)	1000 t									
Of which from: Households	1000 t									
Of which from: e-waste	1000 t									

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Recycling of waste by Basel recycling streams

	Category	Unit	2000	2001	2002	2003	2004	2005
			• If the value turns red, please check if it is correct.					
	Total waste amounts going to recycling	1000 t	0.00	0.00	0.00	0.00	0.00	0.00
Y1	Clinical wastes from medical care in hospitals, medical centres and clinics	1000 t						
Y2	Wastes from the production and preparation of pharmaceutical products	1000 t						
Y3	Waste pharmaceuticals, drugs and medicines	1000 t						
Y46	Wastes collected from households	1000 t						
E-W	E-waste	1000 t						
NEC	Wastes not elsewhere classified	1000 t						
	Total waste imported for recycling during the year	1000 t	0.00	0.00	0.00	0.00	0.00	0.00
Y1	Clinical wastes from medical care in hospitals, medical centres and clinics	1000 t						
Y2	Wastes from the production and preparation of pharmaceutical products	1000 t						
Y3	Waste pharmaceuticals, drugs and medicines	1000 t						
Y46	Wastes collected from households	1000 t						
E-W	E-waste	1000 t						
NEC	Wastes not elsewhere classified	1000 t						
	Total waste exported for recycling during the year	1000 t	0.00	0.00	0.00	0.00	0.00	0.00
Y1	Clinical wastes from medical care in hospitals, medical centres and clinics	1000 t						
Y2	Wastes from the production and preparation of pharmaceutical products	1000 t						
Y3	Waste pharmaceuticals, drugs and medicines	1000 t						
Y46	Wastes collected from households	1000 t						
E-W	E-waste	1000 t						
NEC	Wastes not elsewhere classified	1000 t						

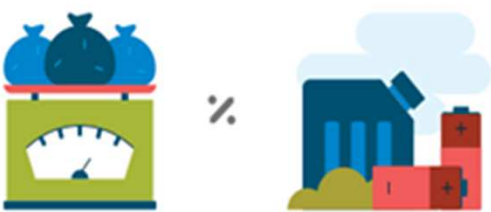*With financial support from the Programme Cooperation Agreement between the European Commission and UNEP*

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National recycling rate

National recycling rate (Basel waste streams)

Category	Unit	2000	2001	2002	2003	2004	2005
Total waste amounts going to recycling	1000 t	-	-	-	-	-	-
Waste imported for recycling during the year	1000 t	-	-	-	-	-	-
Waste exported for recycling during the year	1000 t						
National recycling rate	%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

National recycling rate (UNSD/UNEP waste categories)

Category	Unit	2000	2001	2002	2003	2004	2005
Total waste amounts going to recycling	1000 t	-	-	-	-	-	-
Waste imported for recycling during the year	1000 t	-	-	-	-	-	-
Waste exported for recycling during the year	1000 t						
National recycling rate	%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

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Waste intensity of production

$$\text{Waste intensity of production} = \frac{\text{Total waste generated}}{\text{DMC}}$$

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National recycling rate

National recycling rate (UN SD/UNEP waste categories)						
Category	Unit	2000	2001	2002	2003	2004
Total waste amounts going to recycling	1000 t	-	-	-	-	-
Waste imported for recycling during the year	1000 t	-	-	-	-	-
Waste exported for recycling during the year	1000 t					
National recycling rate	%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Waste intensity (UN SD/UNEP waste categories)						
Category	Unit	2000	2001	2002	2003	2004
Total waste generated	1000 t	-	-	-	-	-
Domestic Material Consumption (DMC)	1000 t	-	-	-	-	-
Waste intensity (total waste generated / DMC)		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

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National recycling rate

National recycling rate (Basel waste streams)						
Category	Unit	2000	2001	2002	2003	2004
Total waste amounts going to recycling	1000 t	-	-	-	-	-
Waste imported for recycling during the year	1000 t	-	-	-	-	-
Waste exported for recycling during the year	1000 t					
National recycling rate	%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Waste intensity (Basel waste streams)						
Category	Unit	2000	2001	2002	2003	2004
Total waste generated	1000 t	-	-	-	-	-
Domestic Material Consumption (DMC)	1000 t	-	-	-	-	-
Waste intensity (Total waste generated / DMC)		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

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Indicator 3: Circular material use rate

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Circular material use rate

The Circular Material Use (CMU) rate is an indicator of circular economy.

It has been developed by Eurostat as the indicator for the EU monitoring framework for the circular economy.

This indicator, also called "Circularity rate", measures the contribution of recycled materials towards the overall use of materials.

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Circular material use rate
Disaggregation

It is possible to consider a breakdown of CMU rate by material categories:

- Biomass
- Metals minerals
- Non-metallic minerals
- Fossil energy materials.

An analysis by material category will allow illustrating their specific potential for reuse, recovery or recycling.

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Circular material use rate
Interpretation

Alone the amount of material re-fed into the economy measured in absolute terms does not necessarily represent the circularity of an economy.

Example: the amount of secondary material re-fed might increase at the same pace as the overall amount of materials - the circularity of the economy does not increase.

A higher CMU rate value means that more secondary materials substitute for primary raw materials thus reducing the environmental impacts of extracting primary material.

This indicator measures both the capacity of a country to produce secondary raw materials and its effort to collect waste for recovery.

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Sankey diagram
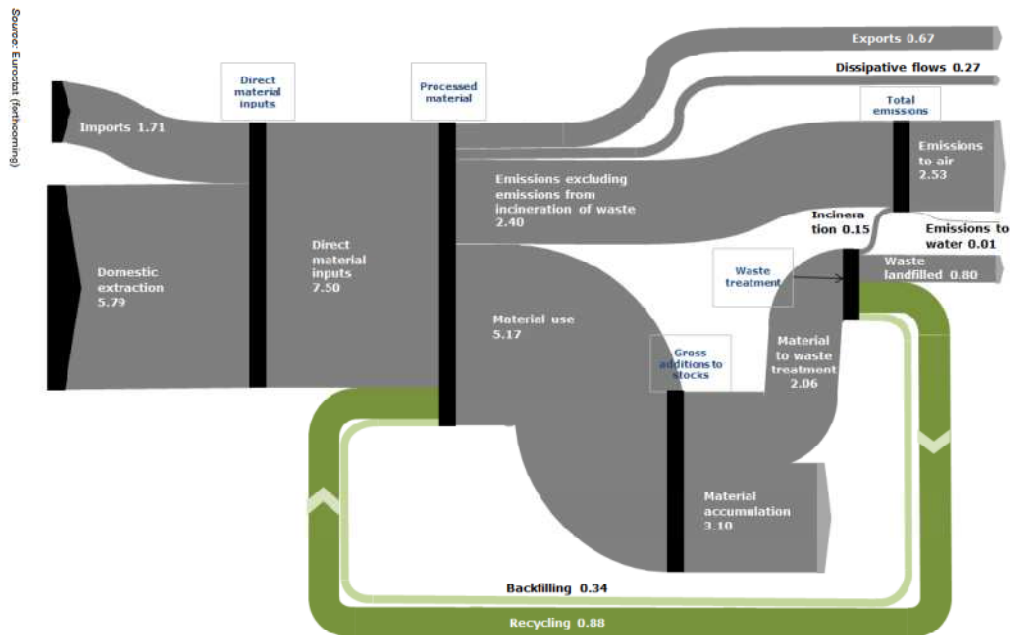

Source: Eurostat (forthcoming)

Figure 1–1: Material flows [Gt] in the EU-28 economy, 2016

Material flows true scale in Gt/year (billion ton/year) in 2016 for EU28

Circular material use rate.
Calculation (I)

The circular material use rate, measured as percentage of total material use, is calculated:

$$CMU = \frac{U}{M} = \frac{(RCV - R - IMP_W + EXP_W)}{DMC + (RCV - R - IMP_W + EXP_W)}$$

CMU: Circular Material Use rate
U: use of materials (recycled)
M: Overall material use
RCV_R: amount of waste recycled in domestic recovery plants
IMPw: amount of imported waste bound for recycling
EXPw: amount of exported waste bound for recycling
DMC: Domestic Material Consumption

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Circular material use rate
Calculation (II)

$$CMU = \frac{U}{M} = \frac{(RCV - R - IMP_W + EXP_W)}{DMC + (RCV - R - IMP_W + EXP_W)}$$
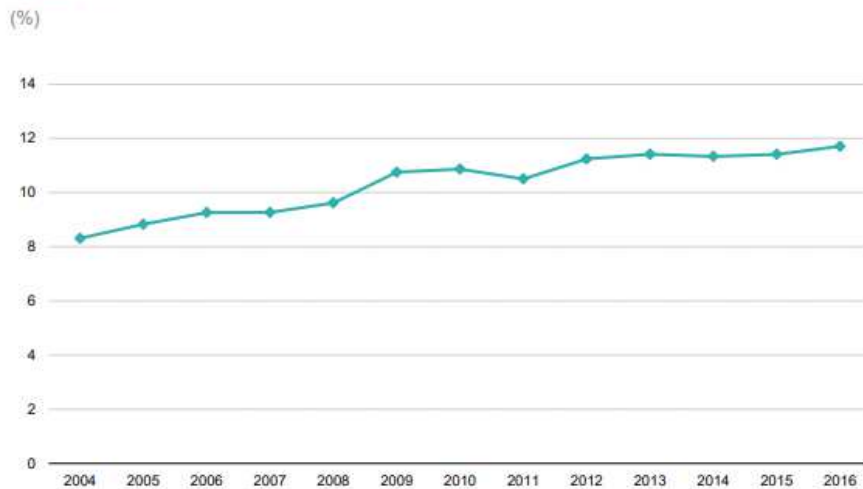
A higher CMU rate value means that more secondary materials substitute for primary raw materials thus reducing the environmental impacts of extracting primary material.

A higher CMU can also be consequence of a lower DMC, with no variation in secondary materials use.

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Figure 3–1: Circular material use rate, in percentage, EU-28

Source: Eurostat (online data code: cei_srm030)

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Figure 3–2: Circular material use rate, domestic material consumption and circular use of materials, EU-28
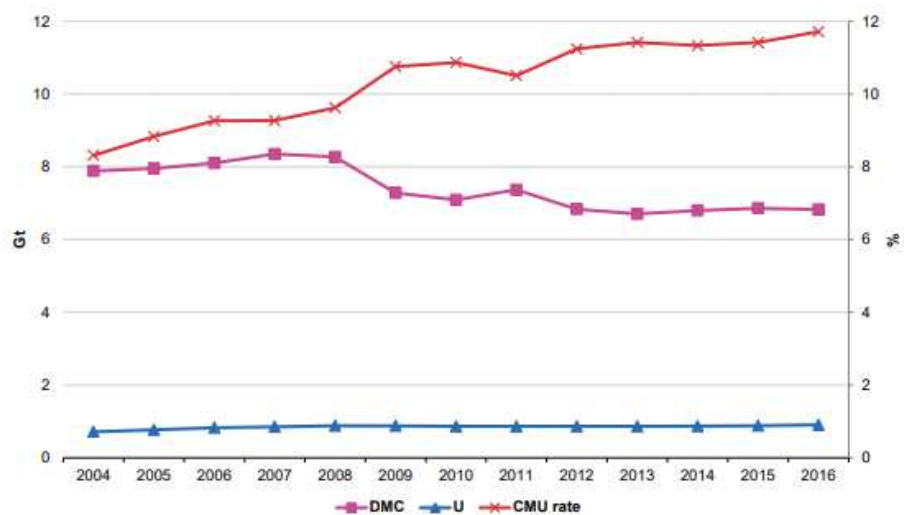
Note: DMC and U: primary axis; Circular material use rate: secondary axis

Source: Eurostat (online data codes: cei_srm030, env_wastrt, env_ac_mfa)

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Figure 3–3: Circular material use rate by material categories, EU-28

MF1: Biomass
MF2: metal ores
MF3: Non-metallic Minerals
MF4: fossil energy Carries/materials
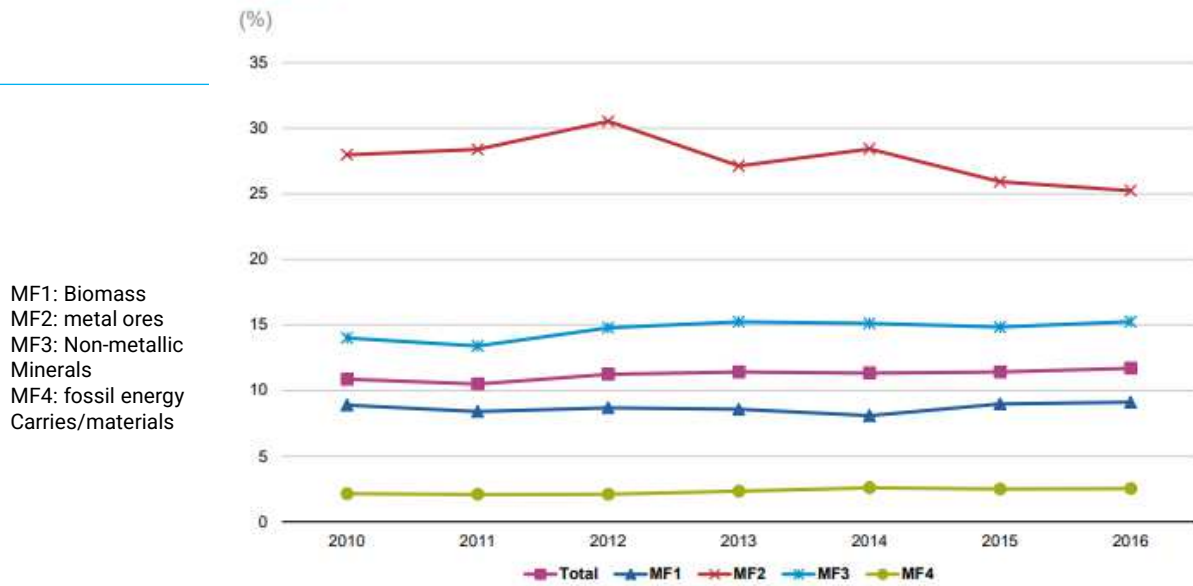
Source: Eurostat (online data code: env_ac_curm)

Circular material use rate
Calculation (III)

As waste data are not usually reported by material flow,.

It is necessary to establish a correspondence between waste categories and the four main material flow categories.

Eurostat has developed the following table.

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Code	EWC-Stat label	MF1 biomass	MF2 Metal ores	MF3 Non-metallic minerals	MF4 Fossil energy carriers
Total	Total Waste	0%	0%	0%	0%
W011	Spent solvents	0%	0%	0%	100%
W012	Acid, alkaline or saline wastes	0%	0%	100%	0%
W013	Used oils	0%	0%	0%	100%
W02A	Chemical wastes (W014+W02+W031)	7%	16%	18%	59%
W032	Industrial effluent sludges	42%	8%	43%	6%
W033	Sludges and liquid wastes from waste treatment	21%	16%	47%	16%
W05	Health care and biological wastes	62%	1%	3%	35%
W061	Metal wastes, ferrous	0%	100%	0%	0%
W062	Metal wastes, non-ferrous	0%	100%	0%	0%
W063	Metal wastes, mixed ferrous and non-ferrous	0%	100%	0%	0%
W071	Glass wastes	0%	0%	100%	0%
W072	Paper and cardboard wastes	100%	0%	0%	0%
W073	Rubber wastes	0%	0%	0%	100%
W074	Plastic wastes	0%	0%	0%	100%
W075	Wood wastes	100%	0%	0%	0%
W076	Textile wastes	30%	0%	0%	70%
W077	Waste containing PCB	0%	0%	100%	0%

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Circular material use rate.   Calculation (IV)

These conversion factors have the following caveats and limitations:

- The water content of the waste was ignored for the conversion. It may result in a bias for waste with high water content (e-g. oil emulsions). The problem does not exist for sludges because they are usually reported in dry weight.

- All material components of a waste category are counted as recovered (the recovery process usually aims only at a part of material components).

- The conversion factors were based on German waste statistics (the types of waste that are recovered vary from country to country).

- The amounts of metal waste refer to the pure metal (in DMC are refer to the metal ore).

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Management of Waste (partial adaptation from UNSD/UNEP Questionnaire on Environment

Category	Unit	2000	2001				
Total waste amounts going to recycling	1000 t	0.00	0.00				
Of which from: Manufacturing (ISIC 10-33)	1000 t						
Of which from: Electricity, gas, steam and air conditioning supply (ISIC 35)	1000 t						
Of which from: Other economic activities excluding ISIC 38	1000 t						
Of which from: Households	1000 t						
Of which from: e-Waste	1000 t	0.00	0.00	0.00	0.00	0.00	
Waste imported for recycling during the year	1000 t	0.00	0.00	0.00	0.00	0.00	
Of which from: Manufacturing (ISIC 10-33)	1000 t						
Of which from: Electricity, gas, steam and air conditioning supply (ISIC 35)	1000 t						
Of which from: Other economic activities excluding ISIC 38	1000 t						
Of which from: Households	1000 t						
Of which from: e-Waste	1000 t						

Enter the amount of waste by category and year

If there is a note, enter the reference to the right of the cell and include the note at the bottom of the table

Gray-shaded fields are calculated fields that provide the total amounts going to recycling, imported, and exported

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Category	Unit					
Waste exported for recycling during the year	1000 t	0.00	0.00	0.00	0.00	0.00
Of which from: Manufacturing (ISIC 10-33)	1000 t					
Of which from: Electricity, gas, steam and air conditioning supply (ISIC 35)	1000 t					
Of which from: Other economic activities excluding ISIC 38	1000 t					
Of which from: Households	1000 t					
Of which from: e-Waste	1000 t					

Notes:

- Please note that the unit in this table is "**tonnes (metric tons)**".
- **If the requested data are not available, please leave the cell blank. If the requested variable is not applicable (the pher**
- Please provide in the Footnotes Section below information on the source and data collection methodology for the values provided, suc

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Recycling of Waste by Basel Recycling Streams

	Category	Unit	2000	2001	2002	2003	2004	2005
	Total waste amounts going to recycling	**1000 t**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Y1	Clinical wastes from medical care in hospitals, medical centres and clinics	1000 t						
Y2	Wastes from the production and preparation of pharmaceutical products	1000 t						
Y3	Waste pharmaceuticals, drugs and medicines	1000 t						
Y4	Wastes from the production...... of biocides and phytopharmaceuticals	1000 t						
Y5	Wastes from the manufacture...... of wood preserving chemicals	1000 t						
Y6	Wastes from the production, formulation and use of organic solvent	1000 t						
Y7	Wastes from heat treatment and tempering operations containing cyanides	1000 t						
Y8	Waste mineral oils unfit for their originally intended use	1000 t						
Y9	Waste oils/water, hydrocarbons/water mixtures, emulsion	1000 t						
Y10	Waste substances ....containing or contaminated with PCBs, PCTs, PBBs	1000 t						

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Circular Material Use (CMU) rate

• If the value turns red, please check if it is correct.

	Category	Unit	2000	2001	2002					
	Total waste recycled in domestic recovery plans (RCV_R)	Tonnes								
	Amount of imported waste bound for recovery (IMPw)	Tonnes								
	Amount of exported waste bound for recovery (EXPw)	Tonnes								
	Domestic Material Consumption (DMC)	Tonnes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Use of materials (U)	**Tonnes**	0.00	0.00	0.00					
	Overall material use (M)	**Tonnes**	0.00	0.00	0.00					
	Circular Material Use rate	**%**	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!					

Enter the total waste recycled in domestic recovery plants and the amount of imported and exported waste bound for recovery for each year

If there is a note, enter the reference to the right of the cell and include the note at the bottom of the table

The use of materials (U), the overall material use (M) and the Circular Material Use (CMU) rate will appear here

Notes:
- Please note that the unit in this table is "**Tonnes**".
- **If the requested data are not available, please leave the cell blank. If the requested**
- Please provide in the Footnotes Section below information on the source and data coll

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Circular Material Use (CMU) rate by material category

• If the value turns red, please check if it is correct.

Category	Unit	2000	2001	2002	2003	2004	2005
Total waste recycled in domestic recovery plans (RCV_R)	Tonnes	0.00	0.00	0.00	0.00	0.00	0.00
Biomass waste recycled in domestic recovery plans	Tonnes						
Metal ores waste recycled in domestic recovery plans	Tonnes						
Non-metallic minerals waste recycled in domestic recovery plans	Tonnes						
Fossil energy carriers waste recycled in domestic recovery plans	Tonnes						
Amount of imported waste bound for recovery (IMPw)	Tonnes	0.00	0.00	0.00	0.00	0.00	0.00
Biomass imported waste bound for recovery	Tonnes						
Metal ores imported waste bound for recovery	Tonnes						
Non-metallic minerals imported waste bound for recovery	Tonnes						
Fossil energy carriers imported waste bound for recovery	Tonnes						
Amount of exported waste bound for recovery (EXPw)	Tonnes	0.00	0.00	0.00	0.00	0.00	0.00
Biomass exported waste bound for recovery	Tonnes						
Metal ores exported waste bound for recovery	Tonnes						
Non-metallic minerals exported waste bound for recovery	Tonnes						
Fossil energy carriers exported waste bound for recovery	Tonnes						

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Thank you

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https://sdgs.unep.org/circular-economy

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