

Goal 12: Ensure sustainable consumption and production patterns

Target 12.4: By 2020, 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 in order to minimize their adverse impacts on human health and the environment

[12.4.2 Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment](#)

## Institutional information

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**Organization(s):**

United Nations Environment Programme (UNEP) and United Nations Statistics Division (UNSD)

## Concepts and definitions

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**Definition:**

The indicator includes hazardous generated, hazardous waste generated by type (including e-waste as a sub-indicator) and the proportion of hazardous waste treated. For the e-waste sub-category, United Nations University is a co-custodian.

**Hazardous waste generated (in tonnes, per km sq of land area and per capita):** Hazardous waste collected + Hazardous waste given by generator to treatment or disposal facilities + Estimation of Unaccounted for hazardous waste

**Hazardous waste generated by type, including e-waste:** A breakdown of hazardous waste generated by key type of waste, including e-waste

**Proportion of hazardous waste treated:** Quantity of hazardous waste treated during reporting year/quantity of hazardous waste generated x 100

A full methodology for this indicator is available in the document entitled, "Measuring Waste in the Context of the SDGs (UNEP, forthcoming)".

**Rationale:**

Chemicals are part of everyday life. There are over 140,000 different substances used in all economic sectors globally. Their benefits are many and so too are their potential to adversely impact human health and the environment if not properly managed. All countries, but especially developing countries and economies in transition, are facing the complex challenge of managing hazardous waste according to international standards of good practice. The situation is complicated by limited human, financial and/or technical resources. As such, action is needed to support the sustainable use of chemicals and environmentally sound management of hazardous waste. There is also a rapid increase in the generation of hazardous waste. Where most of the conventional hazardous wastes are produced in industrial and manufacturing operations, significant amounts are generated in non-industrial sectors, including sludge

from the healthcare sector; waste-water treatment plants, waste oils, and waste batteries. There is also an increase in the complexity of products and unidentified hazardous components like coatings, and/or items which are not hazardous (laminates and multi-layer packaging), but present hazardousness in a variety of ways when improperly discarded and end up in air, water or are burned.

**Concepts:**

*Hazardous waste* is waste with properties that make it hazardous or capable of having a harmful effect on human health or the environment. Hazardous waste is generated from many sources, ranging from industrial manufacturing process waste to domestic items such as batteries and may come in many forms, including liquids, solids, gases and sludge. They can be discarded as commercial products, like cleaning fluids or pesticides or the by-products of manufacturing processes, from Basel Convention (Article 1, paragraph 1(a)). Waste listed in Annex VIII of the Basel Convention is presumed to be hazardous, while waste listed in Annex IX is presumed not to be hazardous. For the purpose of this indicator, due to comparability reasons, additional waste considered hazardous as per national definitions, as provided by the Basel Convention under Article 1, paragraph 1 (b), are excluded.

*Hazardous waste generated* refers to the quantity of hazardous waste (as per the definition above) that is generated within the country during the reported year, prior to any activity such as collection, preparation for reuse, treatment, recovery, including recycling, or export, no matter the destination of this waste. In case waste that are not covered under the above definition, but are defined as, or are considered to be hazardous waste by national definitions are included in the “hazardous waste generated” amount, a specific note should be added specifying the additional types/streams of hazardous waste included as well as their quantities.

The hazardous waste generated should be reported as a total amount generated during the year, as well as by its distribution among wide categories of economic activities and by households. The economic included in the scope of hazardous waste:

- Agriculture, forestry and fishing (ISIC 01-03)
- Mining and quarrying (ISIC 05-09)
- Manufacturing (ISIC 10-33)
- Electricity, gas, steam and air conditioning supply (ISIC 35)
- Construction (ISIC 41-43)
- Other economic activities excluding ISIC 38

As not all hazardous waste generated is immediately treated or disposed of, the stock of hazardous waste should also be reported, as per the categories and indications in Table R2 of the UNSD/UNEP Questionnaire (waste section).

Related questionnaire statistics

- R2.2 Hazardous waste generated
- R2.5 Hazardous waste treated or disposed of during the year (R2.2 + Imports – Exports)
- R2.6-10 Amounts going to the different types of treatment:
  - Recycling
  - Incineration
    - Incineration with energy recovery
  - Landfilling
  - Other

**Comments and limitations:**

Data on hazardous waste generation and treatment may be scarce in some countries, due to a series of factors, such as lack of, or insufficient, policies and regulations on management and/or reporting; limited human, financial and technical resources within government agencies, lack of clear disclosure and reporting rules and requirements, and unwillingness of generators and public officials in certain countries to disclose the quantities of hazardous waste generated. Some countries may have the data and monitoring systems needed to report, while for others there is a need for training and capacity development to enhance data collection, validation and reporting capacity.

Limitations in terms of usable data for calculating the indicator(s) may arise due to differences in the way of understanding the terminology used in the indicator or differences between these definitions and the definitions included in national legislation. This can lead to differences in reported values and difficulties in cross-checking of reported data. For example, by national legislation, countries may define additional types of waste to be considered as hazardous beyond the waste streams defined in the Basel Convention.

## Methodology

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**Computation Method**

A full methodology for this indicator is available in the document entitled, “Measuring Waste in the Context of the SDGs” (UNEP forthcoming).

For the purpose of this indicator,

Hazardous waste generated should include collected hazardous waste (either by specialized companies or by municipal services), hazardous waste which is given by the generator directly to the treatment or disposal facility, as well as an estimation of the hazardous waste which is unaccounted for. Generated hazardous waste includes exported hazardous waste and excludes imports of hazardous waste.

*Hazardous waste generated =  
hazardous waste collected through municipal services or private companies +  
hazardous waste given by generator to treatment or disposal facilities +  
estimation of hazardous waste unaccounted for*

The estimation of hazardous waste unaccounted for is the most difficult aspect of this methodology as it requires local-level knowledge and estimation. This aspect of the indicator is particularly important as hazardous waste that is unaccounted for is typically also untreated and has a high potential to impact the environment.

The proportion of hazardous waste treated is presented below. Note that the total quantity of hazardous waste treated during the reported year in the reporting country is calculated by adding quantities of hazardous waste treated, per each type of treatment (recycling, incineration with/without energy recovery, landfilling or other), including exports and excluding imports. This matches with the definition of recycling in 12.5.1.

### Proportion of hazardous waste treated (%)

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

\* Hazardous waste treated in the country plus materials exported for treatment minus the materials imported for treatment.

#### Disaggregation:

- Disaggregation by ISIC codes. Information on the generation and treatment of hazardous waste could be collected from industry or municipal level and treatment/disposal facilities.
- Disaggregation by type of landfilling. As there is a significant difference between landfilling in controlled and uncontrolled landfills, further disaggregation on this type of treatment could be analysed.
- Disaggregation by type of treatment per each generating sector;
- Disaggregation by type of recycling operation (R2 to R12 from Basel convention Annex IV).
- Disaggregation by territorial division. Information on the hazardous waste generated can significantly vary throughout the territory of a country as there might be hotspots of hazardous waste generation, concentrated around industry intensive areas.

#### Treatment of missing values:

UNSD, who conducts the data collection, validation and dissemination process via the UNSD/UNEP Questionnaire on Environment Statistics, does not make any estimation or imputation for missing values so the number of data points provided are actual country data.

However, UNEP is considering the possibility of global modelling.

#### Regional aggregates:

The data will be aggregated at the sub-regional, regional and global levels. For the aggregation methods, please see: [http://uneplive.unep.org/media/docs/graphs/aggregation\\_methods.pdf](http://uneplive.unep.org/media/docs/graphs/aggregation_methods.pdf).

#### Sources of discrepancies:

As mentioned, waste statistics involve a large number of national and sub-national stakeholders which may create discrepancies. To address these possible discrepancies, inter-institutional stakeholder collaboration is always encouraged.

## Data Sources

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#### Description:

1. Data provided by national governments, including NSOs and Ministries of Environment

#### Collection process:

The custodian agencies collect national data through the UNSD/UNEP Questionnaire on Environment Statistics (waste section). UNSD carries out extensive data validation procedures that include built-in automated procedures, manual checks and cross-references to national sources of data. Communication is carried out with countries for clarification and validation of data. Only data that are considered accurate or

those confirmed by countries during the validation process are included in UNSD's environment statistics database and disseminated on UNSD's website.

Additionally, data from the Basel Convention reporting may also be sent to countries for their consideration for SDG reporting.

Data for OECD and European Union countries are collected through the biennial OECD/Eurostat Joint Questionnaire on the State of the Environment that is consistent with the UNSD/UNEP Questionnaire, so data are comparable.

## Data Availability

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### Description:

All countries that reply to the questionnaire.

### Time series:

The UNSD/UNEP Questionnaire on Environment Statistics is sent every 2 years requesting annual data and the time series will be maintained.

## Calendar

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### Data collection:

1. The UNSD/UNEP Questionnaire on Environment Statistics is sent every 2 years.

### Data release:

1. First SDG reporting cycle: 2020

## Data providers

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National Statistical Systems

## Data compilers

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1. UNSD and UNEP (and UNU for e-waste)

## References

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### References:

Measuring Waste in the Context of the SDGs (UNEP, forthcoming)

United Nations Statistics Division (UNSD) and United Nations Environment Programme Questionnaire on Environment Statistics (waste section). Available at:

<https://unstats.un.org/unsd/envstats/questionnaire>

## Related indicators

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11.6.1, 12.5.1