Circular Economy Indicator related to air emissions

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

Indicator 12: Total GHG emissions

Total GHG emissions

The circular economy indicator *GHG emissions from production activities* is considered difficult to calculate due to data unavailability.

For this reason, a proxy indicator is proposed: *Total GHG emissions*, that corresponds to SDG 13.2.2.

The methodology for this indicator is based on UNSD's Metadata for 13.2.2.

SDG target 13.2 aims to integrate climate change measures into national policies, strategies and planning.

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Total GHG emissions
Indicator interpretation (I)

Climate change has already caused widespread impacts and related losses and damages on human systems and altered terrestrial, freshwater and ocean ecosystems worldwide.

Observed impacts are connected to physical climate changes, including many that have been attributed to human influence.

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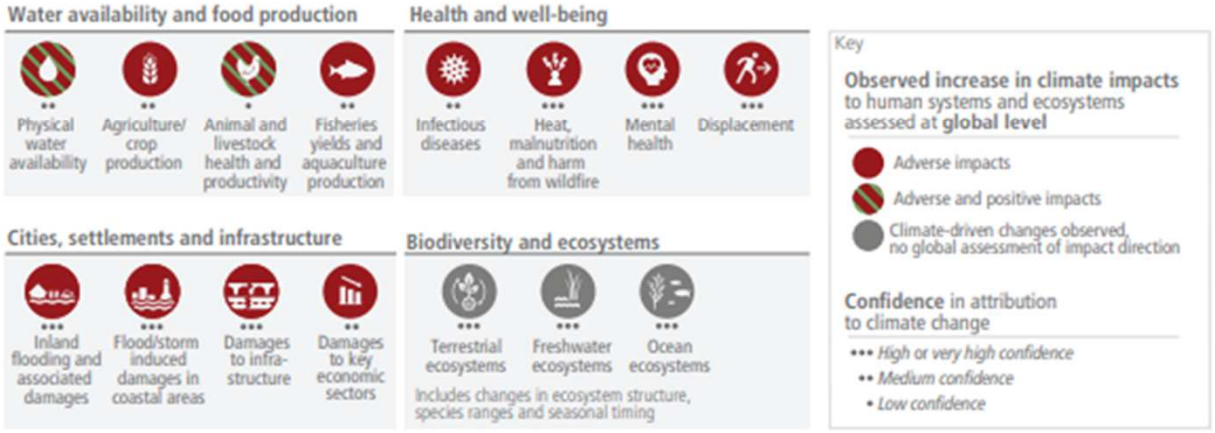
Adverse impacts from human-caused climate change will continue to intensify

a) Observed widespread and substantial impacts and related losses and damages attributed to climate change



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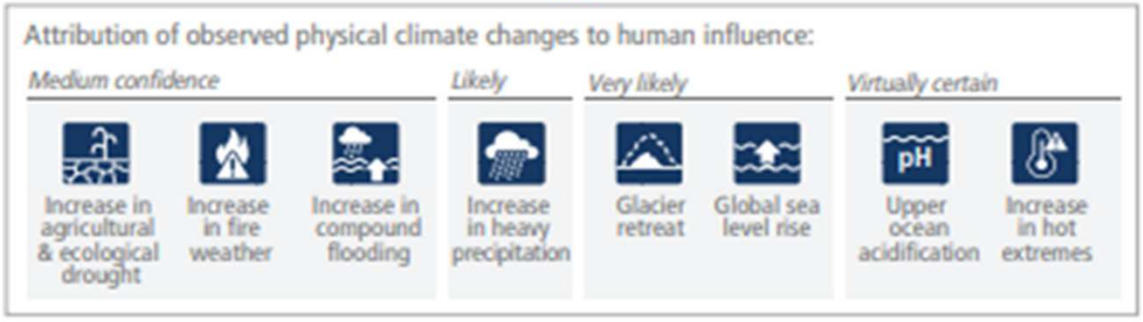
Total GHG emissions

b) Impacts are driven by changes in multiple physical climate conditions, which are increasingly attributed to human influence



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Total GHG emissions
Indicator interpretation (II)

The ultimate objective of the Climate Change Convention (UNFCCC) is to achieve the stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.

Estimating the levels of greenhouse gas (GHG) emissions and removals is an important element of the efforts to achieve this objective.

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Total GHG emissions
Data availability

The Paris Agreement adopted in 2015 marks the beginning of a global strategy. The Paris Agreement strengthens and unifies reporting under the Enhanced Transparency Framework (ETF), making reporting mandatory for all countries with common but flexible requirements.

Starting in 2024, the Biennial Transparency Reports (BTRs) will replace older reporting formats.

Available data are commonly link to the national reports.

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Total GHG emissions
Limitations in the use of the indicator

One of the main limitations in the use of this indicator is related to data availability.

Secondly, total GHG emissions encompass the entire economy and do not provide information about emissions from specific production activities.

The unit of measure of this indicator is the CO2-equivalent emission (it is the amount of carbon dioxide emissions that would have an equivalent effect), but the different gases have a different effect on climate change.

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Total GHG emissions
Calculation (I)

Total GHG emissions are calculated as the sum of emissions of direct GHGs:

- Carbon dioxide (CO_2)
- Methane (CH_4)
- Nitrous oxide (N_2O)
- Perfluorocarbons (PFCs)
- Hydrofluorocarbons (HFCs)
- Sulphur hexafluoride (SF_6) and
- Nitrogen trifluoride (NF_3)

As with the 1996 Guidelines and IPCC Good Practice Guidance, emissions are calculated combining information about a human activities (AD) and the emission factors (EF).

$$\text{Emissions} = AD \times EF$$

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Total GHG emissions Calculation (II)

Example:

In the energy sector fuel consumption would constitute activity data, and mass of carbon dioxide emitted per unit of fuel consumed would be an emission factor.

Fuel consumption * emission factor = emissions.

The emissions factor database is available at https://www.ipcc-nggip.iges.or.jp/EFDB/main.php.

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Total Greenhouse Gas emissions per year

	Category	Unit	2000	2001	2002	2003	2004	2005	2006
	Total GHG emissions per year	**tonnes CO2-equivalent**	**0.00**	**0.00**	**0.00**				
	Carbon dioxide (CO_2)	tonnes CO2-equivalent							
	Methane (CO4)	tonnes CO2-equivalent							
	Nitrous oxide (N2O)	tonnes CO2-equivalent							
	Perfluorocarbons (PFCs)	tonnes CO2-equivalent							
	Hydrofluorocarbons (HFCs)	tonnes CO2-equivalent							
	Sulphur hexafluoride (SF_6)	tonnes CO2-equivalent							
	Nitrogen trifluoride (NF_3)	tonnes CO2-equivalent							

Notes:

- Please note that the unit in this table is "**tonnes CO_2-equivalent**"
- **If the requested data are not available, please leave the cell blank. If the requested variable is not applicable (the phenomenon is not relevant)**
- Please provide in the Footnotes Section below information on the source and data collection methodology for the values provided, such as estima

Footnotes

Code	Footnote text

For each year, enter the emissions of each gas in CO_2-equivalent

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

Total GHG emissions will appear here

Enter any note here

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Thank you

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

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