National reporting on EW-MFA-based indicators

Session 2: Introduction of the Economy-Wide Material Flow Accounts (EW-MFA) to support reporting on the 2030 Agenda for Sustainable Development

National workshop for Namibia on the Economy-Wide Material Flow Accounts (EW-MFA) to inform the 2030 Agenda for Sustainable Development

Patryk Guenther
23-24 July 2025, Windhoek, Namibia

UNEP is the custodian agency for 25 SDG indicators, including:

- **8.4.1/12.2.1 Material footprint**, material footprint per capita, and material footprint per GDP
- **8.4.2/12.2.2 Domestic material consumption**, domestic material consumption per capita, and domestic material consumption per GDP

The EW-MFA Questionnaire for SDGs was developed by UNEP in late 2021 to validate global estimates and collect national data for SDG reporting on 8.4.1/12.2.1 and 8.4.2/12.2.2

Data collection
Background information

First data collection in **2022**

2nd data collection for MFA indicators in 2024

Data collected every **2 years**

Not contacting countries that report to **Eurostat**

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Process

Country	Salutation	First Name	Last name	Title	Organisation	Address/Mailing label	Email 1	Email 2	Phone 1	Phone 2	Fax 1	Fa:

Early Warning and Assessment Division

UN environment programme

Reference: UNEP/EWAD/SDG&ESII/EP/pg 9 August 2024

Dear Sir/Madam,

The United Nations Environment Programme (UNEP) would like to inform you about the upcoming data collection exercise in your country for the following Sustainable Development Goal (SDG) Indicators:

- 8.4.1-12.2.1: Material footprint, material footprint per capita, and material footprint per GDP
- 8.4.2-12.2.2: Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP

The data will primarily be used for:

- Compiling indicators for Goals 8 and 12,
- Reporting data on these indicators to the United Nations Statistics Division (UNSD) and disseminating them in the SDG Global Database,
- Preparing the SDG Report 2025 and other relevant publications at the regional and global level,
- Measuring progress toward the implementation of the environmental dimension of the SDGs and publishing on the UNEP platforms.

If your organisation is not responsible for calculating and validating data for these indicators, please inform the relevant organisations in your country about this upcoming exercise for them to nominate a focal point per indicator. We will then provide online credentials to the selected focal point who will be responsible for the coordination, collection and reporting of data. The focal point will be able to obtain a pre-filled questionnaire on Economy-Wide Material Flow Accounts for the SDG indicators 8.4.1/12.2.1 and 8.4.2/12.2.2 with estimated data produced by UNEP for validation or replacement with National Data if your country produces data for these indicators, using IRIS for SDGs by 31 October 2024.

We look forward to receiving the nominated focal point's name and full detailed contacts as per the template (attached) by **6 September 2024**. In case of any question or query, please contact Patryk Guenther (patryk.guenther@un.org) with a copy to unep-ewad-sdgs@un.org and Ekaterina Poleshchuk ekaterina.poleshchuk@un.org.

Thank you in advance for your assistance and cooperation.

Yours sincerely,

Jian Liu
Director, Early Warning and Assessment Division
United Nations Environment Programme

To: Designated SDG focal points in UN Member States and territories

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Tel: +254 207623231 | unep-ewad-director@un.org
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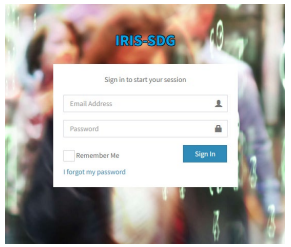

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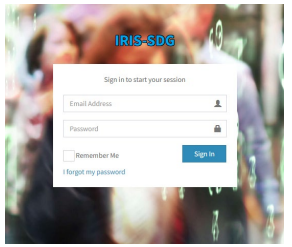
Table A - Domestic extraction
(tonnes)

Material category	Description	2000	2001	2002	2003	2004	2005	2006	2007
A.1	**Biomass**								
A.1.1	Crops								
A.1.2	Crop residues (used), fodder crops, grazed biomass								
A.1.2.1-A.1.2.2	Straw; Other crop residues (sugar and fodder beet leaves, other)	14,981	16,216	19,043	14,993	17,358	16,164	18,742	16,739
A.1.2.3-A.1.2.4	Fodder crops (including biomass harvest from grassland); Grazed biomass								
A.1.3	Wood								
A.1.4	Wild harvest n.e.c.								
A.2	**Metal ores**								
A.2.1	Iron ores								
A.2.2-A.2.3	Aluminium ores; Other metal ores								
A.3	**Non-metallic minerals**								
A.3.1	Ornamental or building stone	31,648	24,060	27,936	31,979	33,848	26,492	26,100	40,928
A.3.2	Carbonate minerals important in cement	526,599	611,321	518,830	505,140	482,021	721,226	854,706	1,008,769
A.3.4	Chemical and fertilizer minerals	66,129	81,245	81,084	79,281	104,785	114,886	132,249	118,766
A.3.5	Salt	523,059	576,091	622,000	683,526	802,374	759,726	664,045	760,809
A.3.6	Gypsum	21,645	24,331	21,333	20,137	18,441	29,080	34,568	40,363
A.3.7	Clays	132,000	148,000	130,000	122,000	112,000	177,000	210,000	245,000
A.3.8	Sand and gravel	2,344,495	2,666,860	2,284,112	2,105,931	1,931,621	3,010,543	3,715,157	4,177,655
A.3.9	Other non-metallic minerals n.e.c.								



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EW-MFA Questionnaire for SDGs

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QUESTIONNAIRE ON ECONOMY-WIDE MATERIAL FLOW ACCOUNTS for the SDG indicators 8.4.1/12.2.1 and 8.4.2/12.2.2
(EW-MFA Questionnaire for SDGs)

Country:

Deadline for returning the EW-MFA Questionnaire for SDGs:

If you have any questions, please contact us at the following email address: unep-ewad-sdgs@un.org

TABLE OF CONTENTS

Sheet	Title	Status
Intro & Contents	Introduction and table of contents	*for information*
Methodology & Guidance	Methodological sources and guidance for working with this Questionn	*for information*
Description & Definitions	Description of tables and definitions	*for information*
Table A	**Domestic extraction**	***to review / re-fill in***
Table B	**Imports of materials**	***to review / re-fill in***
Table C	**Exports of materials**	***to review / re-fill in***
Table D	Headline indicators	*filled automatically*
Table E	**Material flow accounts in raw material equivalents**	***to review / re-fill in***
Table F	**Supplementary information from the country**	***to fill in***

Last update: June 1, 2024

Table A - Domestic extraction
(tonnes)

Material category	Description	2000	...	2021	2022	2023
A.1	**Biomass**					
A.1.1	Crops					
A.1.2	Crop residues (used), fodder crops, grazed biomass					
A.1.2.1-A.1.2.2	Straw; Other crop residues (sugar and fodder beet leaves, other)					
A.1.2.3-A.1.2.4	Fodder crops (including biomass harvest from grassland); Grazed biomass					
A.1.3	Wood					
A.1.4	Wild harvest n.e.c.					
A.2	**Metal ores**					
A.2.1	Iron ores					
A.2.2-A.2.3	Aluminium ores; Other metal ores					
A.3	**Non-metallic minerals**					
A.3.1	Ornamental or building stone					
A.3.2	Carbonate minerals important in cement					
A.3.4	Chemical and fertilizer minerals					
A.3.5	Salt					
A.3.6	Gypsum					
A.3.7	Clays					
A.3.8	Sand and gravel					
A.3.9	Other non-metallic minerals n.e.c.					
A.4	**Fossil fuels**					
A.4.1	Coal and peat					
A.4.2	Crude oil, natural gas and natural gas liquids					
A.4.2.1	Crude oil					
A.4.2.2	Natural gas					
A.4.2.3	Natural gas liquids					
A.4.3	Oil shale and tar sands					
	TOTAL DOMESTIC EXTRACTION	-	-	-	-	-

Table F - Supplementary information from the country

Contact information

Country:	
Organization:	
Contact person:	
Email address:	

Does your organization have any objections to having the data from this questionnaire published in the Global SDG Database (please put an X in the required cells below)?

	No objections	There are objections	Please provide your comments if there are any objections
EW-MFA Questionnaire for SDGs			

Please indicate if you replaced the data with national data and for which years

Table A	
Table B	
Table C	
Table E	

Please indicate if you have a national methodology for EW-MFA (please provide a link)

Please provide additional comments if you have any

Methodology

Indicators 8.4.1/12.2.1 Material footprint, material footprint per capita, and material footprint per GDP **and 8.4.2/12.2.2** Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP, as they are under UNEP custodianship.
Material flow accounts belong to environmental-economic accounts and apply the accounting concepts, structures, rules and principles of the System of Environmental-Economic Accounting 2012 - Central Framework (SEEA CF). The questionnaire should be used in conjunction with reading the global manual on EW-MFA ***"UNEP (2023). The use of natural resources in the economy: A Global Manual on Economy-Wide Material Flow Accounting"*** which is available in Arabic, English, French and Russian:
https://wedocs.unep.org/handle/20.500.11822/38253

In addition to the Global Manual on EW-MFA, the ***EW-MFA Compiler*** was created to support countries to build Economy-Wide Material Flow Accounts. As well as providing the basic structure required for these accounts, a number of simple tools are also included for the calculation of some categories of materials, where those categories are not the result of simple summation. The EW-MFA Compiler also includes annexes with the Correspondence Table HS 2017 Codes to EW-MFA Codes and the Correspondence Table SITC Rev. 4 Codes to EW-MFA Codes. The EW-MFA Compiler is available in Arabic, English, French and Russian here:
https://wedocs.unep.org/20.500.11822/41948

A ***Step-by-Step Guide to the Compiler*** is available in Arabic, English, French and Russian here:
https://wedocs.unep.org/handle/20.500.11822/44799/sessionid=62FE8D806CD2CE77EB31DFA0FE60FF9D

E-learning courses on Domestic Extraction and Trade Flows have been developed by UNEP and CSIRO and are available in English on the UNEP e-learning platform:
https://elearning.unep.org/

How to work with this Questionnaire

All blocks in tables A, B, C, D and E are pre-filled. This data has been prepared by the UNEP International Resource Panel (UNEP IRP): https://www.resourcepanel.org/about-us.

Estimated data is produced from data available in various national or international datasets (IEA, USGS, FAO, COMTRADE) in the domains of agriculture, forestry, fisheries, mining, energy and trade statistics.
Please review (with consent for UNEP to report the data to the Global SDG Database) or replace the data in the tables A, B, C and E with national data, if possible. If you replaced the data, please indicate this in table F "Supplementary information from the country".
The data in table D is automatically calculated and is for your information and possible comments.

How UNEP is going to use the data

The data will be used for reporting on SDG indicators 8.4.1/12.2.1 and 8.4.2/12.2.2, as they are under UNEP custodianship. UNEP will check country responses and submit results to the United Nations Statistics Division (UNSD) for publication in the Global SDG Database. The indicators will also be published on the UNEP World Environment Situation Room (WESR).

Description of tables

Table A - Domestic extraction (DE)
Domestic extraction includes four groups of extracted materials: **A.1 Biomass, A.2 Metal ores, A.3 Non-metallic minerals, and A.4 Fossil fuels.**
A.1 Biomass: According to EW-MFA, DE of biomass includes all biomass of vegetable origin extracted by humans and their livestock, capture of wild fish, and the biomass of hunted animals. Biomass of livestock and livestock products (e.g. milk, meat, eggs, hides) is not accounted for as domestic extraction but considered as flows within the economic system.
The most consistent international source of data on biomass extraction is the statistical database provided by the United Nations Food and Agricultural Organization (FAOSTAT). FAOSTAT covers a huge range of data concerning agriculture, forestry, and fishery, and the land use and food system in general at the level of nation states and in time series from 1961 onwards.
A decision tree to help work through alternative data sources preferentially is presented in Figure 2.1 of the Global Manual on EW-MFA (see the link in the Guidance sheet for this questionnaire).
A.2 Metal ores: For EW-MFA purposes, only that portion of the excavated rock which is to be processed in some way, to obtain the desired metals, should be counted. This means that any soil or rock which is simply excavated and moved, to gain access to the metal ore itself, should not be counted as ore.
While the detailed system described in the Global Manual on EW-MFA, using questionnaire-based surveys of a country's major minerals producers, is recommended, its success is contingent upon the cooperation of the mine operators.
A flow chart to aid in deciding which approach is best for the compiler's particular circumstances is set out in Figure 2.3 of the Global Manual on EW-MFA (see the link in the Guidance sheet for this questionnaire).
A.3 Non-metallic minerals: If accounted by mass, the vast majority of the materials of this category are sand, gravel, and clay used for construction, while the remainders are used either as decorative stones or for chemicals and fertilizers. Certain materials can be used for either industrial or construction purposes, since there is no clear and distinct differentiation between the two.
A flow chart for the compilation of non-metallic mineral EW-MFA is set out in Figure 2.4 of the Global Manual on EW-MFA (see the link in the Guidance sheet for this questionnaire).
A.4 Fossil fuels: Fossil fuels are materials formed from biomass in the geological past and comprise solid, liquid and gaseous materials: coal and peat, crude oil and natural gas, oil shale and tar sands.
For the compiler of EW-MFAs on fossil fuels, the most straightforward approach is to start by checking whether the International Energy Agency (IEA) and/or the United Nations Statistics Division (UNSD) provide data for the country under observation. If yes, data are likely already collected by an official body, and thus can be adjusted to fit to the EW-MFA structures. If such data do not exist other sources can be used.
A decision tree for sourcing data for fossil fuel extraction accounts is presented in Figure 2.5 of the Global Manual on EW-MFA (see the link in the Guidance sheet for this questionnaire).

Table B - Imports of materials & Table C - Exports of materials
The categories have been chosen to correspond as closely as possible with the categories used for domestic extraction, but there are a few additional categories. This is to allow the capture of additional goods which have been processed to some degree, and even some manufactured goods where they are dominated by specific material categories. For example, where DE only accounts for wood as it is extracted from the environment, the trade account will seek to include processed wood and wood products.

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Methodological support

Global manual on EW-MFA:

[UNEP (2023). The use of natural resources in the economy: A Global Manual on Economy-Wide Material Flow Accounting]

- First published in 2021
- Revised in 2023

Translated into:

- Arabic, French, Russian and Spanish

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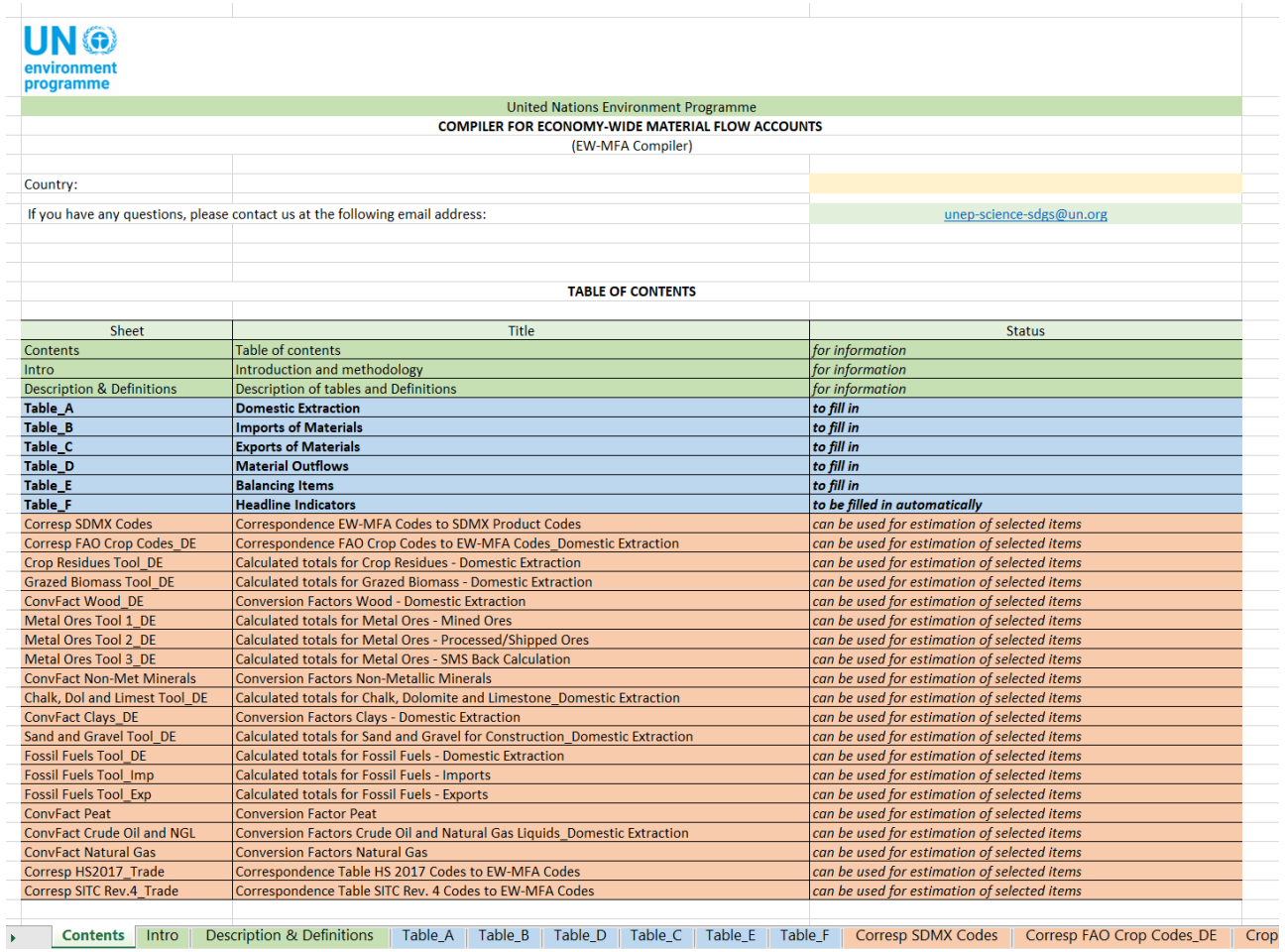
EW-MFA Compiler



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COMPILER FOR ECONOMY-WIDE MATERIAL FLOW ACCOUNTS

(EW-MFA Compiler)

Country:

If you have any questions, please contact us at the following email address: unep-science-sdgs@un.org

TABLE OF CONTENTS

Sheet	Title	Status
Contents	Table of contents	*for information*
Intro	Introduction and methodology	*for information*
Description & Definitions	Description of tables and Definitions	*for information*
Table_A	**Domestic Extraction**	***to fill in***
Table_B	**Imports of Materials**	***to fill in***
Table_C	**Exports of Materials**	***to fill in***
Table_D	**Material Outflows**	***to fill in***
Table_E	**Balancing Items**	***to fill in***
Table_F	**Headline Indicators**	***to be filled in automatically***
Corresp SDMX Codes	Correspondence EW-MFA Codes to SDMX Product Codes	*can be used for estimation of selected items*
Corresp FAO Crop Codes_DE	Correspondence FAO Crop Codes to EW-MFA Codes_Domestic Extraction	*can be used for estimation of selected items*
Crop Residues Tool_DE	Calculated totals for Crop Residues - Domestic Extraction	*can be used for estimation of selected items*
Grazed Biomass Tool_DE	Calculated totals for Grazed Biomass - Domestic Extraction	*can be used for estimation of selected items*
ConvFact Wood_DE	Conversion Factors Wood - Domestic Extraction	*can be used for estimation of selected items*
Metal Ores Tool 1_DE	Calculated totals for Metal Ores - Mined Ores	*can be used for estimation of selected items*
Metal Ores Tool 2_DE	Calculated totals for Metal Ores - Processed/Shipped Ores	*can be used for estimation of selected items*
Metal Ores Tool 3_DE	Calculated totals for Metal Ores - SMS Back Calculation	*can be used for estimation of selected items*
ConvFact Non-Met Minerals	Conversion Factors Non-Metallic Minerals	*can be used for estimation of selected items*
Chalk, Dol and Limest Tool_DE	Calculated totals for Chalk, Dolomite and Limestone_Domestic Extraction	*can be used for estimation of selected items*
ConvFact Clays_DE	Conversion Factors Clays - Domestic Extraction	*can be used for estimation of selected items*
Sand and Gravel Tool_DE	Calculated totals for Sand and Gravel for Construction_Domestic Extraction	*can be used for estimation of selected items*
Fossil Fuels Tool_DE	Calculated totals for Fossil Fuels - Domestic Extraction	*can be used for estimation of selected items*
Fossil Fuels Tool_Imp	Calculated totals for Fossil Fuels - Imports	*can be used for estimation of selected items*
Fossil Fuels Tool_Exp	Calculated totals for Fossil Fuels - Exports	*can be used for estimation of selected items*
ConvFact Peat	Conversion Factor Peat	*can be used for estimation of selected items*
ConvFact Crude Oil and NGL	Conversion Factors Crude Oil and Natural Gas Liquids_Domestic Extraction	*can be used for estimation of selected items*
ConvFact Natural Gas	Conversion Factors Natural Gas	*can be used for estimation of selected items*
Corresp HS2017_Trade	Correspondence Table HS 2017 Codes to EW-MFA Codes	*can be used for estimation of selected items*
Corresp SITC Rev.4_Trade	Correspondence Table SITC Rev. 4 Codes to EW-MFA Codes	*can be used for estimation of selected items*

Contents | Intro | Description & Definitions | Table_A | Table_B | Table_D | Table_C | Table_E | Table_F | Corresp SDMX Codes | Corresp FAO Crop Codes_DE | Crop

Country support tool

- Provides the basic structure required for these accounts, as well as several simple tools for calculating some categories of materials
- Aligned with the EW-MFA global manual
- Published here
- Translated into Arabic, French, Russian, Spanish is coming

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Here

- Coverage: 217 countries/territories
- Period: 1970 – 2024
- Aligned with the SEEA Central Framework
- Provides indicators on extraction and direct trade of raw materials, as well as indirect trade flows (including material footprints)
- Material categories: biomass, fossil fuels, metals, non-metallic minerals (disaggregated into 13 sub-categories)
- Main data sources: FAO, UNSD, UN COMTRADE, IEA, US EIA, World Mining Data, British Geological Survey, US Geological Survey

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Outcome

Once the data is collected, estimated, and validated, it is published on official UN portals, including:

SDG Global Database

https://unstats.un.org/sdgs/dataportal/database

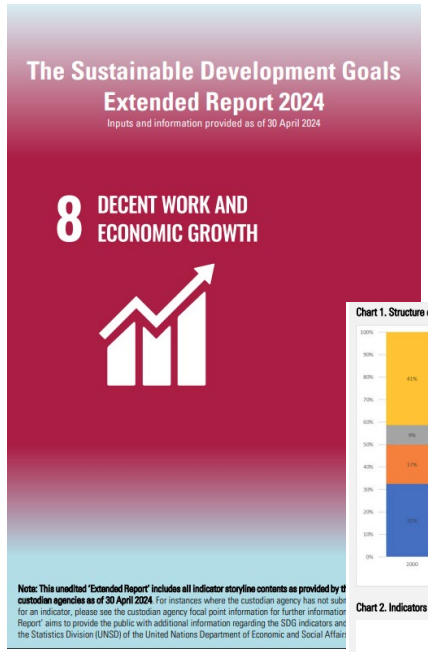
UNEP SDG Data Hub

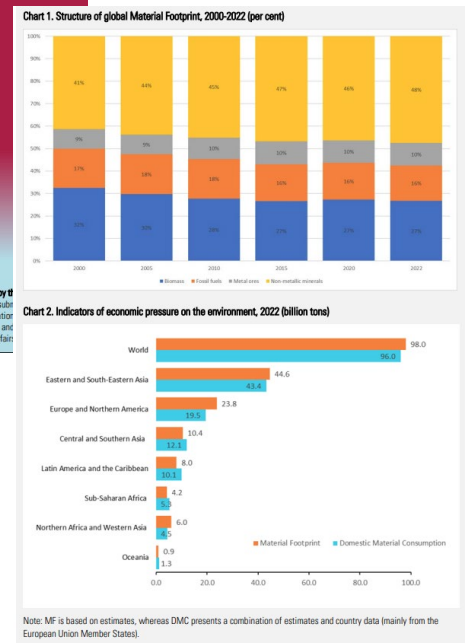
https://sdgs.unep.org/sdg-data/

National Scorecards by UNEP's WESR

https://wesr.unep.org/scorecard/

The data is also used in SDG-related publications, such as *The Sustainable Development Goals Report* presented at High-level Political Forum





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Thank you

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