



Indicator 8.4.2/12.2.2

SDG and Environment Statistics
Unit - UNEP

TARGET

8·4



**IMPROVE RESOURCE
EFFICIENCY IN
CONSUMPTION AND
PRODUCTION**

TARGET

12·2



**SUSTAINABLE
MANAGEMENT AND
USE OF NATURAL
RESOURCES**

SDG Target 8.4 and Indicator 8.4.2

Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Target 8.4:

“Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-Year Framework of Programmes on Sustainable Consumption and Production, with developed countries taking the lead”

Indicator 8.4.2:

“Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP”

UNEP is the custodian agency for this indicator

SDG Target 12.2 and Indicator 12.2.2

Goal 12: Ensure sustainable consumption and production patterns.

Target 12.2:

“By 2030, achieve the sustainable management and efficient use of natural resources”

Indicator 12.2.2:

“Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP”

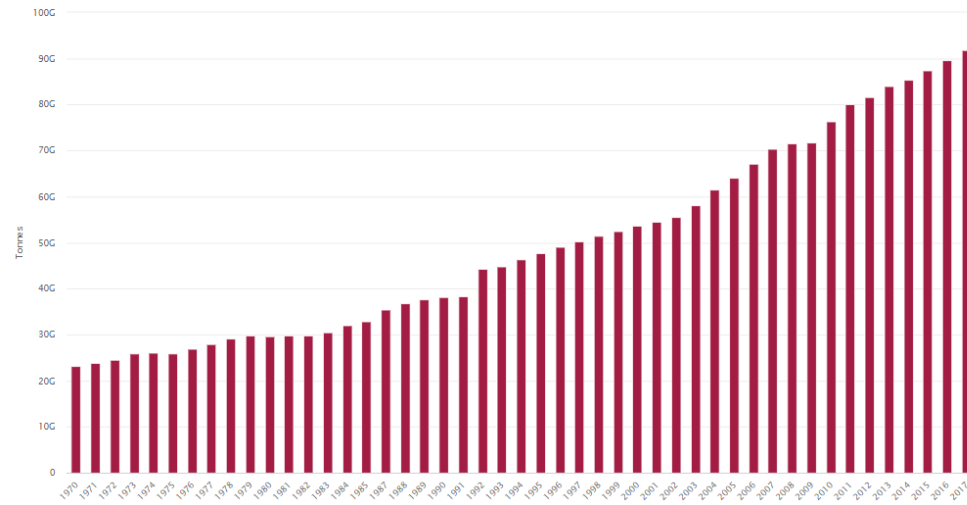
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Introduction

- Every day we consume products or services that are based on natural resources being extracted around the globe. In order to meet this consumption level, the worldwide extraction of biotic and abiotic natural resources increased by 65 billion tonnes since 1970 reaching a raw material extraction of more than 92 billion tonnes by 2017.
- Extracted natural resources, either processed or unprocessed, as well as (intermediate) goods are intensively traded around the globe.
- To account a nation's consumption, two different indicators can be used:
 1. **Domestic Material Consumption (DMC)** is currently the most widely used and accepted consumption indicator.
 2. **Raw Material Consumption (RMC)**, or "Material Footprint", accounts for the physical quantity of materials required along the supply chains of all goods and services finally consumed in a country – the so-called "raw material equivalents" (RME).

Introduction

- Material resources, are materials originating from natural resources that form the material basis of the economy: metals (ferrous, non-ferrous) non-metallic minerals (construction minerals, industrial minerals), biomass (wood, food) and fossil energy carriers.
- The indicator is defined as the total amount of material directly used in an economy and equals direct material input (DMI) minus exports. DMI measures the direct input of materials for the use in the economy.
- DMI equals domestic extraction (DE) plus imports. For the 'per capita' calculation of the indicator the average population is used (the arithmetic mean of the population on 1st January of two consecutive years).



Introduction

Consumption (DMC) is based on the Economy-wide Material Flow Accounts (EW-MFA). The theory of Economy-wide material flow accounts includes compilations of the overall material inputs into national economy, the changes of material stock within the economy and the material outputs to other economies or to the environment.

- EW-MFA covers all solid, gaseous, and liquid materials, except water and air. Water included in products is included.
- Material Flows Accounting is a well-established methodology with a strong conceptual basis in Physical accounting and economics.

Introduction

- Material productivity is the ratio between GDP and DMC and corresponds to the wealth created per unit of natural resources consumed. It is used to assess the decoupling between the use of natural resources and the growth of the economy).
- DMC reports the amount of materials that are used in a national economy. DMC is a territorial (production side) indicator.
- DMC also presents the amount of material that needs to be handled within an economy, which is either added to material stocks of buildings and transport infrastructure or used to fuel the economy as material throughput.
- DMC describes the physical dimension of economic processes and interactions. It can also be interpreted as long-term waste equivalent. Per-capita DMC describes the average level of material use in an economy – an environmental pressure indicator – and is also referred to as **metabolic profile**.

Why is this SDG Important?

- Reports on the apparent consumption of materials in a national economy.

Definition

- **Domestic material consumption (DMC)** - refers to the amount of materials (in terms of weight) used in an economy, i.e. materials extracted or harvested in the country, plus materials and products imported, minus material and products exported. The data refer to metals, non-metallic minerals (construction minerals, industrial minerals), biomass (wood, food) and fossil energy carriers.
- **Total Material Consumption (TMC)** - measures the total material use associated with domestic production and consumption activities, including indirect import flows, less export and associated indirect export flows.

Limitations

- It does not include unused domestic extraction and indirect flows of imports and exports, thus it is only a proxy for the actual total material consumption.

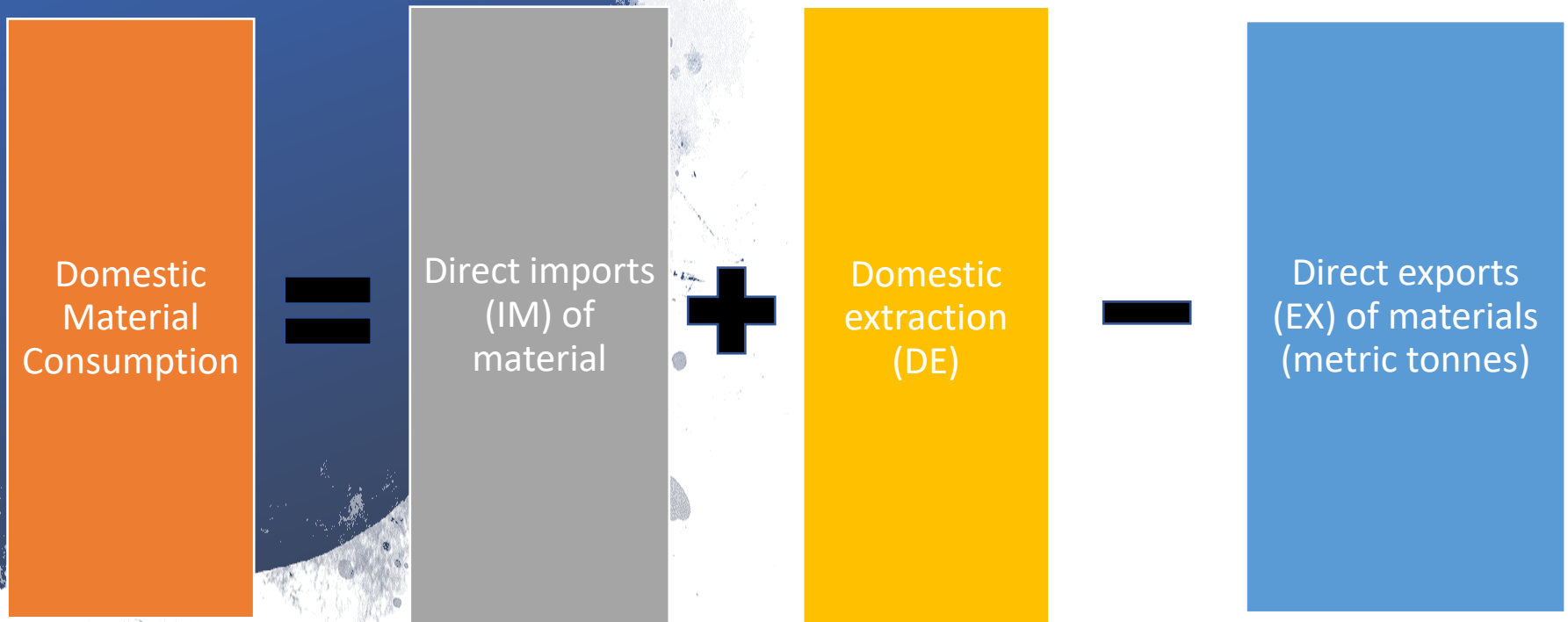
Methodology – Approach

UN Environment Programme proposed a two-pronged approach to capacity building, which is:

- enhancing the accounting capabilities for Domestic material consumption (DMC) and Material footprint (MF) within countries,
- At the same time supporting the UN Environment Programme International resource panel (IRP), in continuing to update the global database and encouraging countries to verify and adopt the dataset made available by UN Environment Programme to fill the gap until capacity is available in all regions and countries.

Methodology – Computation method

Domestic material consumption

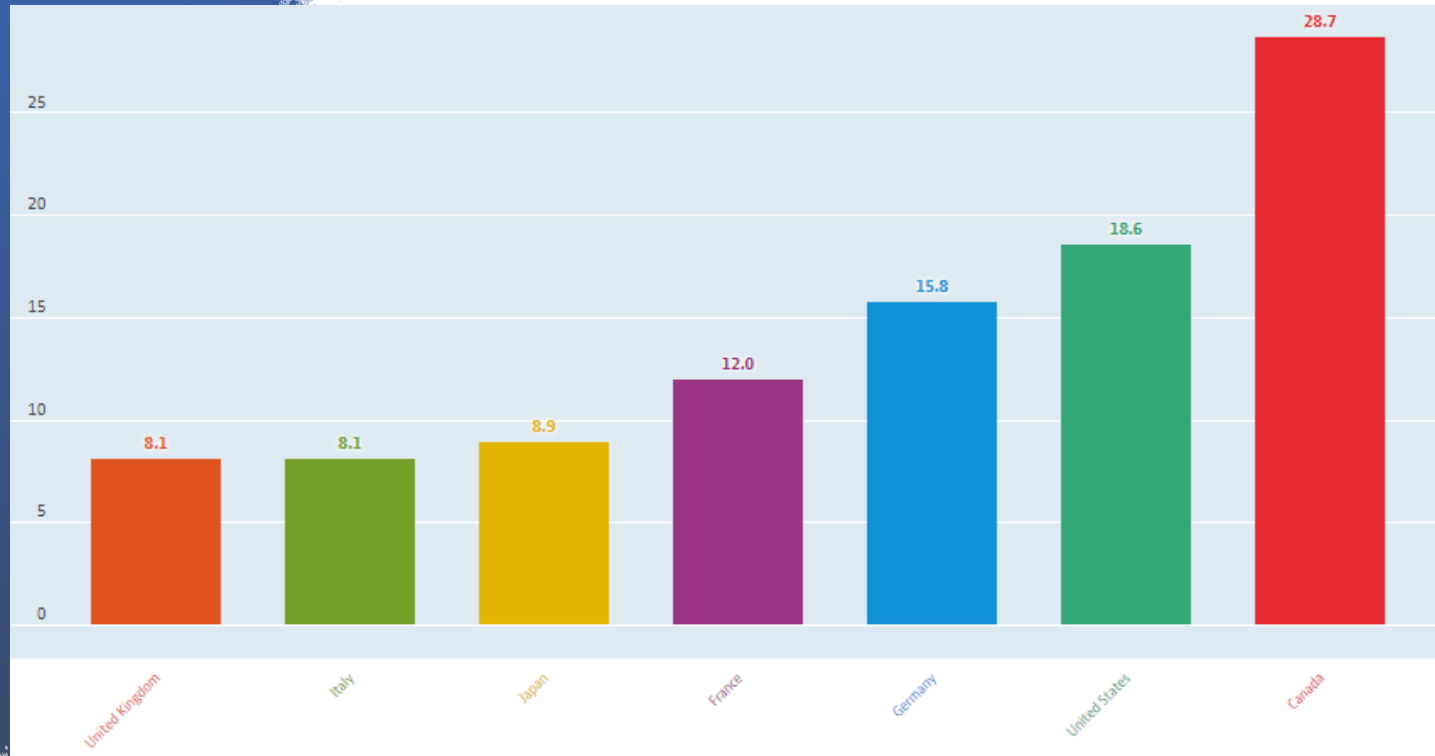


Data

- Data sources – IEA, USGS, FAO and COMTRADE databases.
- Data will be made available for more than 170 countries and covers each nation over a time period of 47 years (1970 – 2017)
- Process of data collection is still under discussion.
- Data compilers – UNEP, OECD and EUROSTAT



Material consumption Total, Tonnes/capita, 2018



Example

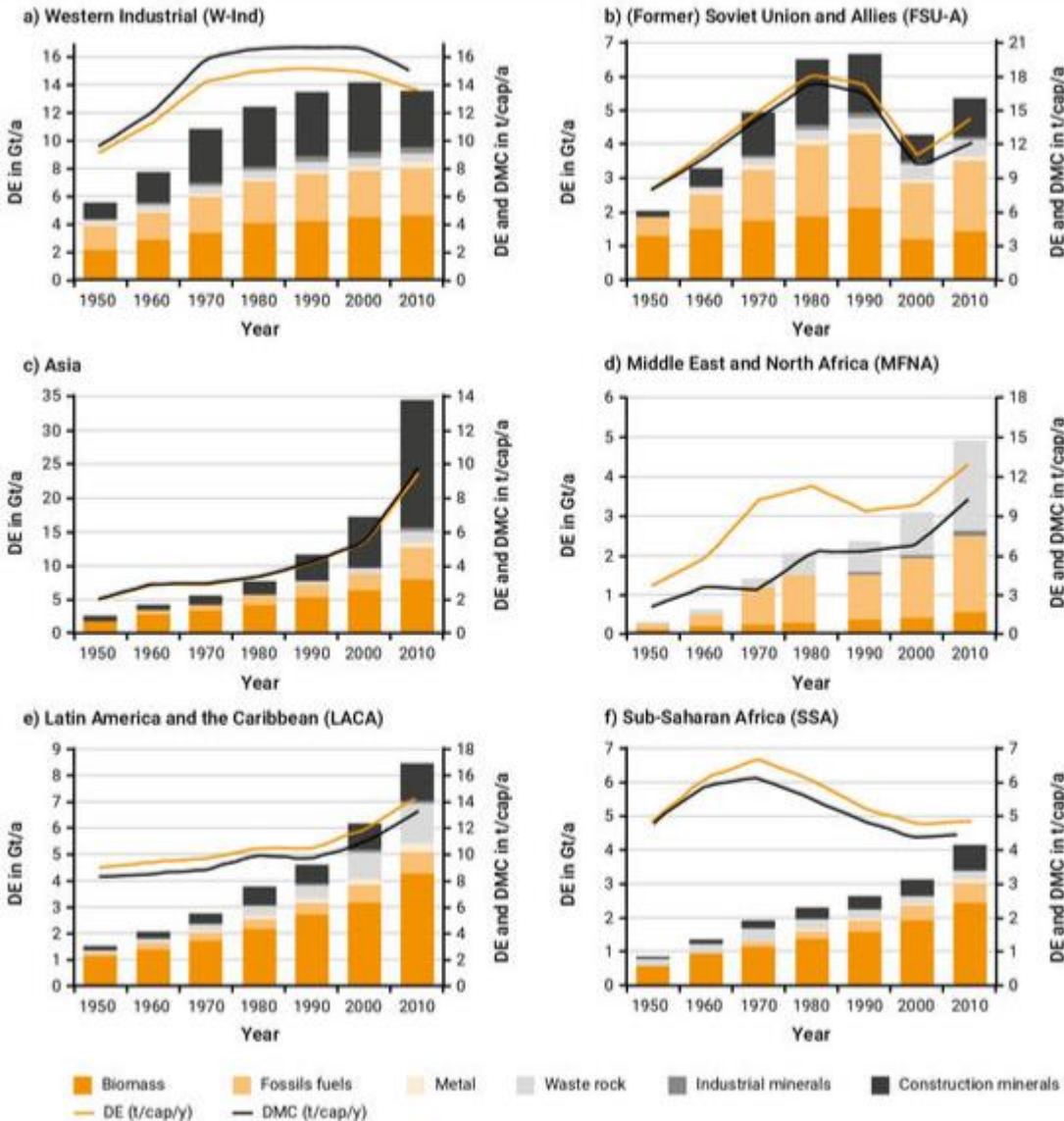
Example



Domestic extraction and Domestic material consumption

The figure shows data on extraction, trade, and apparent consumption of materials for six regions in Gigatonnes/year (Gt/a) and in per capita values/year (t/cap/a)

Source: Schaffartzik et al. (2014)



Example – Case study (Portugal)



Autonomous Regions of the Azores and Madeira

Objectives and targets

- Achieve less resource-intensive economic growth;
- Ensure that resource consumption does not exceed the environment's regeneration capacity;
- Improve resource efficiency and promote the design of economically and environmentally sustainable production and consumption policies, especially in the context of a transition to a circular economy.

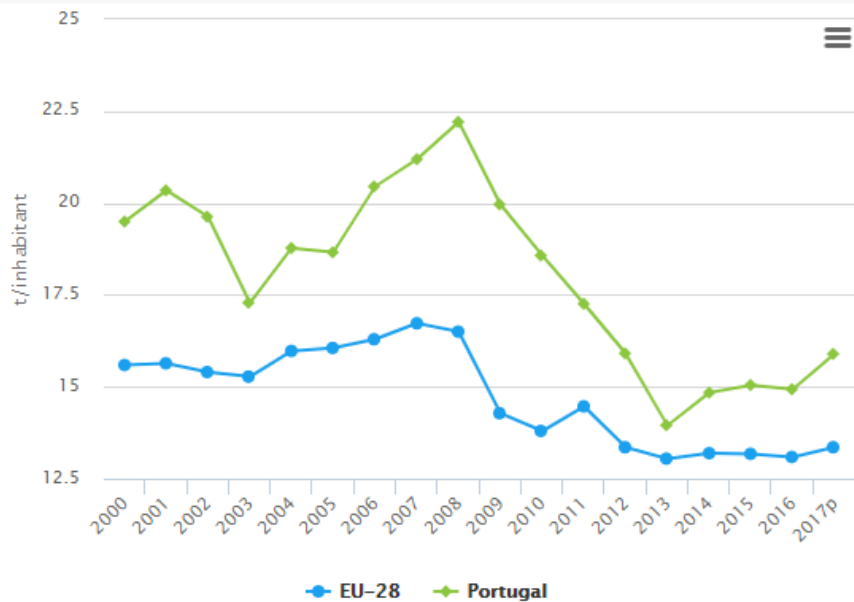


Example – Case study (Portugal)

Progress analysis

In Portugal, the progress of the DMC is strongly influenced by the progress of the activity in the construction sector, as the materials that contribute the most to the total of this indicator are the non-metallic minerals, intensively used in this sector. In 2017, these materials represented about 59.6% of the DMC.

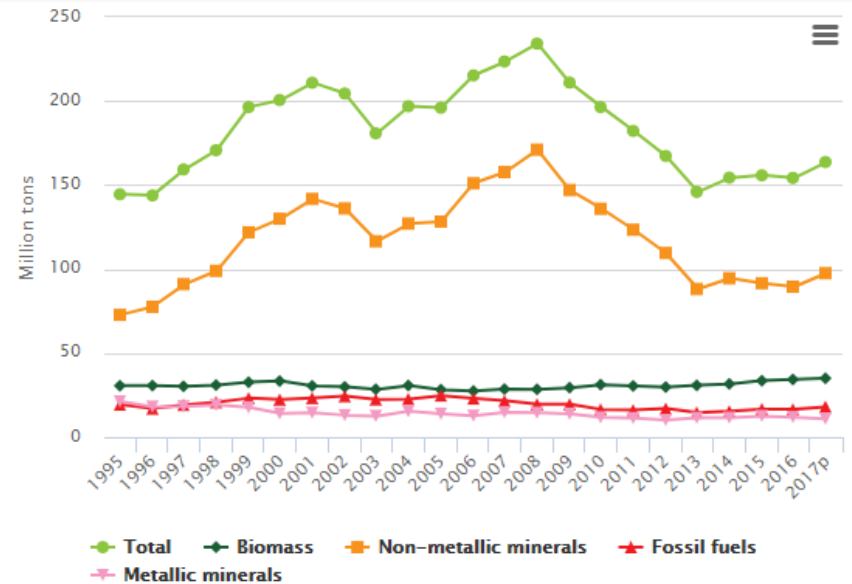
Domestic Material Consumption per capita, in Portugal and EU-28



Source: Eurostat, 2019

INTERACTIVE CHART

Domestic Material Consumption - total and major components



Notas: p - Provisional data

Source: INE, 2018

INTERACTIVE CHART

Example – Case study (Portugal)



- In the last decade, the DMC reached a peak in 2008, showing a downward trend since then, until 2014, when that trend reversed with an increase of 5.8% over the previous year. However, in contrast to previous years, the progress observed in 2014 was not primarily due to the consumption of non-metallic minerals but to the combined increase in consumption of non-metallic materials and fossil fuels. This followed two years with small annual variations (+0.9% in 2015 and -1.1% in 2016).
- In 2017, the DMC increased by 6.2%, mainly due to the increase in fossil fuels (+ 9.7%) and non-metallic minerals (+ 9.0%), reaching a total value of 163.7 million tons.

Summary

- The global material flows database is based on country material flow accounts from the European Union and Japan and estimated data for the rest of the world.
- Estimated data is produced on the bases of data available from different national or international datasets in the domain of agriculture, forestry, fisheries, mining and energy statistics.



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