**Data descriptions**

Economy-wide material flow account (EW-MFA) provides an aggregate overview, in thousand tons per year, of the material flows into and out of economy. EW-MFA covers solid, gaseous, and liquid materials, except for bulk flows of water and air. Like the system of national accounts, EW-MFA constitute a multi-purpose information system. The detailed material flows provide a rich empirical database for numerous analytical purposes. Further, EW-MFA are used to derive various material flow indicators.

Following metadata refers to the [five datasets](https://ec.europa.eu/eurostat/data/database) \* based on the EW-MFA data collection (see also the EW-MFA data structure in Annexes):

1. **Material flow accounts (env\_ac\_mfa):** this dataset provides detailed material input flows, in thousand tons per year, into (domestic extraction and physical imports) and out (physical exports) of an economy according to[**Regulation (EU) 691/2011**](http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1416221752426&uri=CELEX:02011R0691-20140616)**.**
2. **Material flow accounts - domestic processed output (env\_ac\_mfadpo):** this dataset provides detailed material flows, termed 'domestic processed output', from an economy to the environment in thousand tonnes per year.
3. **Material flow accounts - balancing items (env\_ac\_mfabi):** this dataset provides balancing items which are required to articulate a consistent material input-output balance of a national economy (in thousand tonnes per year).
4. **Material flow accounts - main indicators (env\_ac\_mfain):** this dataset provides highly aggregated EW-MFA and derived indicators:
   * DOMESTIC EXTRACTION (DE): DE indicates the total amount of material extracted by resident units from the natural environment for further processing in the economy;
   * IMPORTS (IMP): imports of products in their simple mass weight;
   * EXPORTS (EXP): exports of products in their simple mass weight;
   * physical trade balance (PTB): physical imports minus physical exports;
   * direct material input (DMI): DMI indicates the direct input of material into the economy. DMI includes all materials which are of economic value and which are available for use in production and consumption activities and it is calculated as the sum of domestic extraction plus physical imports: *DMI = DE + IMP*;
   * domestic material consumption (DMC): DMC indicates the total amount of material actually consumed domestically by resident units. DMC of a given country's national economy can be calculated as direct material input minus physical exports: *DMC = DMI – EXP.* In general, DMC is additive across countries. However, this feature does not apply to Eurostat's EW-MFA dataset due to the methodology for calculating physical trade for the aggregated EU economy (see point 18.5 of metadata);
   * domestic processed output (DPO): DPO indicates the amounts of solid, liquid and gaseous materials (excluding water and respiratory carbon dioxide) supplied by the national economy and taken up by the natural environment, particularly by the atmosphere;
   * balancing items (BI): balancing items enable the balancing of material input and output related to a national economy. Two groupings of balancing items are distinguishable: BI to be added to material input, such as oxygen for combustion processes and respiration, and nitrogen; BI to be added to material output, such as water vapour from combustion and gases from respiration. 'Total BI' designates the difference between 'BI: input side' and 'BI: output side', i.e. 'BI (input -output)';
   * net additions to stock (NAS): NAS is a measure for the ‘physical growth of the economy’. Materials in form of buildings, infrastructures, durable goods such as e.g. cars, industry machinery, or household appliances are added to the economy’s material stock each year (gross additions), and old materials are removed from stock as buildings are demolished, and durable goods disposed of (removals). NAS is approximated using the following equation: *NAS = DMC - DPO + BI (input-output)*.
5. **Resource productivity (env\_ac\_rp):** this dataset provides ratios of gross domestic product (GDP) over domestic material consumption (DMC) in various unit of measure (see also item 4 of metadata). The term 'resource productivity' designates an indicator that reflects the GDP generated per unit of resources used by the economy. This is typically a macro-economic concept that can be presented alongside labour or capital productivity.

**Same metadata are valid for the MS EXCEL file MFA\_data.xls.**

**DEFINITIONS**

**Area intensity** – the material flow indicator which reflects the pressure of the physical economy on its natural environment. Area intensity is expressed as ratio of domestic extraction and total land area.

**Biomass** – biomass from agriculture, forestry, fishing, hunting and other activity (apiculture and gathering of forest berries and chanterelles) has been taken into account.

**Biomass from agriculture** – biomass from agriculture harvest, biomass from agriculture by-products of harvest used as forage, fodder crops and biomass from grazing of agricultural animals.

**Direct material input** – the material flow indicator which represents quantity of materials really used in domestic economy. In addition to used domestic extraction the imported materials were included in direct material input.

**Direct material productivity** – indicator expressing the productivity of all used materials (extracted from domestic environment and as well as imports). Direct material productivity is calculated as ratio of GDP and direct material input. GDP in chain-linked volume, reference year 2010 is used.

**Dissipative losses of products** – estimations of air emissions of particles due to abrasion of tyres and breaks and erosion of roads as well as leakages during transport and storage of fuels have been taken into account.

**Dissipative use of products** – materials dispersed into the environment as a result of product use.

**Dissipative use on agricultural land** – quantity of mineral fertilizers, farmyard manure, sewage sludge, compost, pesticides expressed as total quantity of used formulations and seeds used by agricultural holdings.

**Dissipative use on roads** – estimated quantities of used de-icing substances sand and granite grave are included in this indicator.

**Domestic material consumption** – material flow indicator which measures the total amount of material directly used in domestic economy (except excavated earthen materials (including soil)). Exported materials were not included. Domestic material consumption reflects the potential quantity of emissions and wastes which might be released into domestic environment.

**Domestic material productivity** – indicator expressing the productivity of materials extracted from domestic environment. Domestic material productivity is calculated as ratio of GDP and used domestic extraction. GDP in chain-linked volume, reference year 2010 is used.

**Emissions and wastes** – quantity of emitted air pollutants, quantity of pollutants in waste water discharged into natural water bodies and quantity of land filled wastes are included in this indicator.

**Emissions into the air** – air emissions of the following air pollutants have been listed: carbon dioxide (CO2), methane (CH4), dinitrogen oxide (N2O), nitrous oxides (NOX), hydroflourcarbons (HFCs), perflourocarbons (PFCs), sulfur hexaflouride (SF6), carbon monoxide (CO), non-methane volatile organic compounds (NMVOC), sulfur dioxide (SO2), ammonia (NH3), heavy metals, persistent organic pollutants (POPs) and particles.

**Emissions into the water** – total quantity of pollutants released into natural water bodies with waste water.

**Fossil fuels** – oil shale and peat. Quantities of oil shale for industrial use and peat for agricultural and industrial use are included.

**Material flow accounts (MFA)** – consistent compilations of the overall material inputs into national economies, the changes of material stock within the economic system and the material outputs into economies of other countries or into the environment, in physical units.

**Material flow indicators** – indicators derived from material flow balance sheets, contain substantial information about special characteristic of domestic material use, its intensity and productivity and environmental risks connected with the use of natural resources. Material flow indicators are usually classified as material input, consumption, resource productivity and intensity, material output and balance indicators.

**Material input** – all materials used in domestic economy (extracted from domestic economy and also imported). Materials are classified according to the basic material categories into biomass, mineral resources and fossil fuels.

**Material output** – all emissions, land filled wastes and also exported materials expressed as basic natural resources indicating their processing level.

**Memorandum items for balancing** – materials which are excluded from MFA (bulk water and air flows), but are essential for the mass balance. Balancing items are added to the input and output side of material balance sheet as well.

**Memorandum items for balancing input** – quantity of oxygen used for combustion of fuels and respiration of humans and livestock have been taken into account.

**Memorandum items for balancing output** – water vapour from combustion (due to water contents and from hydrogen contents of fuels) and also carbon dioxide (CO2) and water vapour from respiration of humans and livestock have been taken into account.

**Minerals** – cement and ceramic clay, technological limestone and limestone for cement, lake lime, land for technology and ceramics, sapropel, constructional gravel, constructional sand, construction limestone and dolomite, used waste of excavation of mineral recourses and used waste of stones and soil.

**Physical exports** – all exported materials are recalculated for their basic natural resources indicating their processing level: raw material, semi-manufactured products and finished products. For example a refrigerator made mostly of metals is accounted as a finished product of mineral resources, as metallic minerals were extracted for its production.

**Physical imports** – all imported materials are recalculated for their basic natural resources indicating their processing level: raw material, semi-manufactured products and finished products. For example a refrigerator made mostly of metals is accounted as a finished product of mineral resources, as metallic minerals were extracted for its production.

**Physical trade balance** – measures surplus or deficit of the physical trade of country’s economy. Physical trade balance equals imports minus exports.

**Total domestic output** – material flow indicator representing the total quantity of material outputs into the environment. In addition to domestic processed output the unused domestic extraction is included in total domestic output.

**Unused biomass from harvest** – estimations of wood harvesting losses and discarded by-catch in fishery are included in this indicator.

**Unused domestic extraction** – materials which are moved or extracted from the environment during economic activity, but which were not used in production or consumption process (for example mining overburden, soil and rock excavated during construction and not used elsewhere and harvest residues).

**Unused extraction from mining and quarrying** – quantity of land filled waste from excavation of mineral recourses and quantity of land filled stones and soil.

**Used domestic extraction** – all solid, liquid and gaseous materials which are of economic value and are used in production and consumption activities.

\*-<https://ec.europa.eu/eurostat/data/database>