

**Documentation of statistics for  
Economy-wide material flow accounts 2020**

## **1 Introduction**

The purpose of the Economy Wide-Material Flow Account (EW-MFA) is to provide a general picture of the type and weight of the materials (natural resources and commodities) that are, on the one hand, recovered from nature or imported and, on the other hand, exported from Denmark. The Economy Wide-Material Flow Account is one of the integrated Environmental-Economic Accounts (Green National Accounts) that is used as a term for separate accounts for environmentally related matters compiled in close relation with the National Accounts. The same boundaries, definitions and classifications are used in compilation of Green National Accounts as in National Accounts. In that way, it is possible to analyse the relationship between the economy on the one hand and the environment on the other, in a logical way.

Based on the EW-MFA and a model, developed by Eurostat, the Danish imports and exports are converted into raw material equivalents (RME), which express the amount of raw materials necessary on a global scale to be able to produce a good or a service. RME includes all raw materials extracted from nature, including the raw materials required in the production processes, both with the primary producer and with all subcontractors, domestic and foreign.

## **2 Statistical presentation**

The Material Flow Account contains information on material flows in the form of the weight of Danish resource extraction, import and exports broken down by the type of materials.

### **2.1 Data description**

The Material Flow Accounts describes the type and weight of the commodities and materials that are necessary for maintaining Danish production and consumption and for exports of commodities. The accounts provide a basis for understanding the general relationships between consumption of resources and generation of waste and other undesirable residual products.

The material flows converted into raw material equivalents reflect the global extraction of raw materials that is necessary for the production of the imports, exports and the total Danish resource use.

## 2.2 Classification system

The EW-MFA is published on the basis of a Eurostat's classification system as part of the European environmental accounts. This classification splits the resources into 50 or so groups, which contain biomass, metal ores and products, non-metallic minerals and products, fossil energy carriers and products, and other resources.

The underlying import and export data is classified according to the [Combined Nomenclature \(CN\)](#), which is the merchandise nomenclature applied by the EU when reporting data on EU trade and trade with non-EU countries. In the Danish External Trade in Goods Statistics the most detailed statistics published are classified according to the CN. The CN consists of around 9,300 commodity codes. A detailed description of the CN codes is available in the EU Official Journal dissemination of Combined Nomenclature.

The classification of the material flows converted to raw materials diverges from the EW-MFA classification for some raw materials groups. In addition, the RME account contains more aggregated raw material groups than the EW-MFA account. The groups under the RME are divided into raw materials and exported and imported goods and services. The goods and services expressed in RME follow the [CPA nomenclature](#).

## 2.3 Sector coverage

Not relevant for these statistics.

## 2.4 Statistical concepts and definitions

Material Flow Accounts: Economy-wide material flow accounts (EW-MFA) means consistent compilations of the material inputs into national economies, the changes of material stock within the economy and the material outputs to other economies or to the environment.

## 2.5 Statistical unit

The statistical unit for the EW-MFA is the total economy as described in the National Accounts.

The raw material equivalents can be assessed for an individual product or for top-level categories, such as total imports, exports or consumption.

## 2.6 Statistical population

All units engaged in economic activity on the Danish territory.

## 2.7 Reference area

The EW-MFA: Denmark. The RME: Global resource extraction necessary to satisfy Danish import, export, consumption etc.

## **2.8 Time coverage**

The Material Flow Accounts cover the time period from 1993 and onwards.

The raw material equivalents cover the time period from 2008 and onwards.

## **2.9 Base period**

Not relevant for these statistics.

## **2.10 Unit of measure**

The material flows are measured in tonnes per year.

## **2.11 Reference period**

These statistics covers the calendar year.

## **2.12 Frequency of dissemination**

Yearly.

## **2.13 Legal acts and other agreements**

The legal authority to collect data is provided by the Act on Statistics Denmark, section 8, as subsequently amended (most recently by Act no. 610 of 30th May, 2018).

These statistics are covered by [Regulation no. 691/2011](#) on European environmental economic accounts.

## **2.14 Cost and burden**

There is no direct response burden in relation to the compilation of these statistics, since all information is based on existing statistics.

## **2.15 Comment**

Further information can be found at the subject page on [Material flows and waste](#) or by contacting Statistics Denmark directly.

## **3 Statistical processing**

Material Flow Accounts and the raw material equivalents are compiled on the basis of internal and external sources on resource extraction. The RME account is based on modelling.

### **3.1 Source data**

The Economy-wide Material Flow accounts are based on information concerning weights of materials is obtained from the external trade statistics and the energy accounts as well as statistics on quarrying and agricultural statistics on agriculture. Data regarding weights of fish landings are obtained from the Ministry of Food, Agriculture and Fisheries.

The raw material equivalents are based on information from the EW-MFA, the national accounts, foreign trade statistics, energy account and the Eurostat RME model.

### **3.2 Frequency of data collection**

EW-MFA: Annually. The RME: The frequency of data collection has not been decided yet.

### **3.3 Data collection**

Data is collected from different internal and external sources by extracting information from data bases, excel spreadsheets and printed publications.

### **3.4 Data validation**

First there is a process of data validation of each primary statistics, as described in the respective quality statements of the relevant statistics. It is followed by an initial validation of input data in connection to compilation of the Material Flow Accounts.

### **3.5 Data compilation**

First there is a process of data validation of each primary statistics, as described in the respective quality statements of the relevant statistics. It is followed by an initial validation of input data in connection to compilation of the Material Flow Accounts.

### **3.6 Adjustment**

Not relevant for these statistics.

## **4 Relevance**

Environmental Accounts are relevant for those interested in the correlation between the economy on the one side and natural resources on the other side. The results are relevant for conducting analyses of the circular economy. Ministries and consultant firms are among the main users of environmental accounts. Accounts are included in the overall European environmental accounts, collected and compiled by Eurostat.

### **4.1 User Needs**

External users of the material flow accounts are ministries, business and trade organizations, research institutes and engineering consultancy firms who want a general view of the interactions between the economy and the environment.

## **4.2 User Satisfaction**

The EW-MFA is discussed with expert users in the user committee for economic-environmental statistics and accounts.

## **4.3 Data completeness rate**

Import and export data, along with the derived indicators in the EW-MFA can be considered complete. In order to fulfil the Eurostat's requirements for completeness within the EW-MFA, some additional flows of residuals (emissions to air, among others), as well as material accumulation in the economy, have to be accounted for as well.

## **5 Accuracy and reliability**

Information concerning the material flows in the form of the weights of some different material types areas based on conversion factors from other units to kilogram's. For these types of materials some extra uncertainty is introduced by the conversion. Therefore, the information on the weights of materials is considered to be less accurate.

The raw material equivalents are based on a relatively new calculation method involving model calculations and a vast number of assumptions and estimates. Accordingly, the figures are subject to a substantial degree of uncertainty and first and foremost reflect orders of magnitude.

### **5.1 Overall accuracy**

Information concerning the material flows in the form of the weights of some different material types areas based on conversion factors from other units to kilogram's. For these types of materials some extra uncertainty is introduced by the conversion. Therefore, the information on the weights of materials is considered to be less accurate.

The raw material equivalents are based on a relatively new calculation method involving model calculations and a vast number of assumptions and estimates. Accordingly, the figures are subject to a substantial degree of uncertainty and first and foremost reflect orders of magnitude.

### **5.2 Sampling error**

Not relevant for these statistics.

### **5.3 Non-sampling error**

There have not been undertaken any measurements of other uncertainties for this statistics.

### **5.4 Quality management**

Statistics Denmark follows the recommendations on organisation and management of quality given in the Code of Practice for European Statistics (CoP) and the implementation guidelines given in the Quality Assurance Framework of the European Statistical System (QAF). A Working Group on Quality and a central quality assurance function have been established to continuously carry through control of products and processes.

## **5.5 Quality assurance**

Statistics Denmark follows the principles in the Code of Practice for European Statistics (CoP) and uses the Quality Assurance Framework of the European Statistical System (QAF) for the implementation of the principles. This involves continuous decentralized and central control of products and processes based on documentation following international standards. The central quality assurance function reports to the Working Group on Quality. Reports include suggestions for improvement that are assessed, decided and subsequently implemented.

## **5.6 Quality assessment**

No measurements of quality has been done, however the quality of the statistics is seen as best possible, given the resources available for the compilation of accounts. The Material Flow Accounts have the scope and the degree of detail that is on the same level as other countries, such as Netherlands, Sweden and Norway. Accounts are compiled in accordance with recommendations and quality standards provided by UN and Eurostat.

## **5.7 Data revision - policy**

Statistics Denmark revises published figures in accordance with the [Revision Policy for Statistics Denmark](#). The common procedures and principles of the Revision Policy are for some statistics supplemented by a specific revision practice.

## **5.8 Data revision practice**

Preliminary figures are compiled and published in December. The final figures are published in December 3 years after the reference year.

The publication of the Material Flow Accounts in December 2020 includes a revision of the previously published time series with domestic extraction of the material type 1.3.1. Timber (industrial wood, incl. firewood) for the period 1993 – 2018. The revision incorporates an error correction of the classification of Danish firewood, which must be part of the material type 1.3.1.

The revision includes the domestic extraction of the material types 1.3.1. Timber (industrial wood, incl. firewood), 1.3 Wood and products thereof and 1 Biomass.

## **6 Timeliness and punctuality**

Data is normally published without delays.

### **6.1 Timeliness and time lag - final results**

Preliminary figures are compiled and published in December. The final figures are published in December 3 years after the reference year.

### **6.2 Punctuality**

The environmental accounts are normally published without delay in relation to the scheduled publication.

## **7 Comparability**

The Material Flow Accounts are compiled in the form of time series and is available for each year from 1993 until the last year that is published (from 2008 for the RME). The Material Flow Accounts are consistent and fully comparable within these years. Furthermore, the Material Flow accounts are comparable with the Material Flow Accounts of other EU countries compiled according to the Regulation no. 691/2011 on European environmental economic accounts.

### **7.1 Comparability - geographical**

Internationally there is a high degree of comparability with other countries, as the Danish Environmental accounts follow the same principles and methods as described in SEEA- framework.

### **7.2 Comparability over time**

The Material Flow Accounts are available for each year from 1993 until the last year that is published (from 2008 for the RME). The Material Flow Accounts are consistent and fully comparable within these years.

### **7.3 Coherence - cross domain**

The Energy Accounts contains the same information on the fossil energy and products thereof. The unit of the equivalent energy accounts is, however, Giga Joule.

The economy wide material flow accounts serve as the basis for the detailed material flow accounts.

### **7.4 Coherence - internal**

It is ensured that data is internally consistent.

## **8 Accessibility and clarity**

These statistics are in a Danish press release. In the StatBank, these statistics can be found under the subject [Material flows and waste](#). In addition the statistics has a [subject page](#).

### **8.1 Release calendar**

The publication date appears in the release calendar. The date is confirmed in the weeks before.

### **8.2 Release calendar access**

The Release Calendar can be accessed on our English website: [Release Calendar](#).

### **8.3 User access**

Statistics are always published at 8:00 a.m. at the day announced in the release calendar. No one outside of Statistics Denmark can access the statistics before they are published.

#### **8.4 News release**

These statistics are published monthly in a Danish press release.

#### **8.5 Publications**

The EW-MFA is a part of the Denmark in figures yearly book and was part of the Statistical Yearbook up until 2017. The RME was the topic of the DST-analysis [How the Danish consumption affects the world's natural resources](#).

#### **8.6 On-line database**

The statistics are published in the StatBank under the subject Material flows and waste in the following table:

- [MRM2](#): Economy-wide material flow accounts by material type and indicator
- [RME1](#): Material flows converted to raw material equivalents by type of raw material and indicator
- [RME2](#): Import and export in raw material equivalents by goods and services and type of raw material

#### **8.7 Micro-data access**

Accounts are published at the most detailed level.

#### **8.8 Other**

Not relevant for these statistics.

#### **8.9 Confidentiality - policy**

Not relevant for these statistics.

#### **8.10 Confidentiality - data treatment**

Not relevant for these statistics.

#### **8.11 Documentation on methodology**

- Statistics Denmark (2018): [Green National Accounts for Denmark 2015-2016](#).
- European Commission. Eurostat (2018): [Economy Wide Material Flow Accounts Handbook](#)
- Statistics Denmark (2019): How the Danish consumption affects the world's natural resources
- Eurostat (2019): [Documentation of the EU RME model](#)
- Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, World Bank (2012): [System of Environmental-Economic Accounting 2012 - Central Framework](#).

## **8.12 Quality documentation**

Results from the quality evaluation of products and selected processes are available in detail for each statistics and in summary reports for the Working Group on Quality.

## **9 Contact**

The administrative placement of these statistics are in the division of National Accounts. The person responsible is Emil Urhammer, tel. +45 39 17 30 26, e-mail: euh@dst.dk

### **9.1 Contact organisation**

Statistics Denmark

### **9.2 Contact organisation unit**

National Accounts, Economic Statistics

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