

Project: Estimates for Raw Material Consumption (RMC) and Raw Material Equivalents (RME) conversion factors

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Eurostat developed a model for the aggregated EU-28 to estimate indicators going beyond the EW-MFA data and indicators currently collected from national statistical institutes. The following **indicators** have been estimated for the EU-28 (time period 2008-2014):

- Imports in Raw Material Equivalents (IMP_RME)
- Raw Material Input (RMI)
- Exports in Raw Material Equivalents (EXP_RME)
- Raw Material Consumption (RMC)

For the time period 2000-2007, the results for these indicators have been chain-linked back based on the results for 2008 and the change rate derived from the results of last year's modelling. These results have only been published for the main material categories.

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[\(XLSX\)](#) [Summary RME data - main aggregates](#) (published December 2016)

A file with detailed results by product groups is also made available. Each single year sheet contains several 51x182 matrices (51 material categories by 182 product groups) providing RME numbers. Such 51x182 matrices are given for the following items:

- Domestic extraction (DE) *identical with original EW-MFA data*
- RME of imports (IMP)
- RME of total final uses; *further detailed into:*
 - RME of total final domestic uses
 - RME of exports (EXP)

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[\(XLSX\)](#) [Detailed RME data by product groups and material categories](#)
(published December 2016)

For compiling RME-related estimates at the country level, Eurostat has published the '[Country RME tool](#)', accompanied by the '[Handbook country RME tool](#)' and a [data input file](#). These files can also be found on the [methodology page](#) of the dedicated section on Environment on the Eurostat website under the heading 'Country raw material equivalents (RME) tool'. Eurostat may collect and publish these indicators on country level on a voluntary basis in the future.

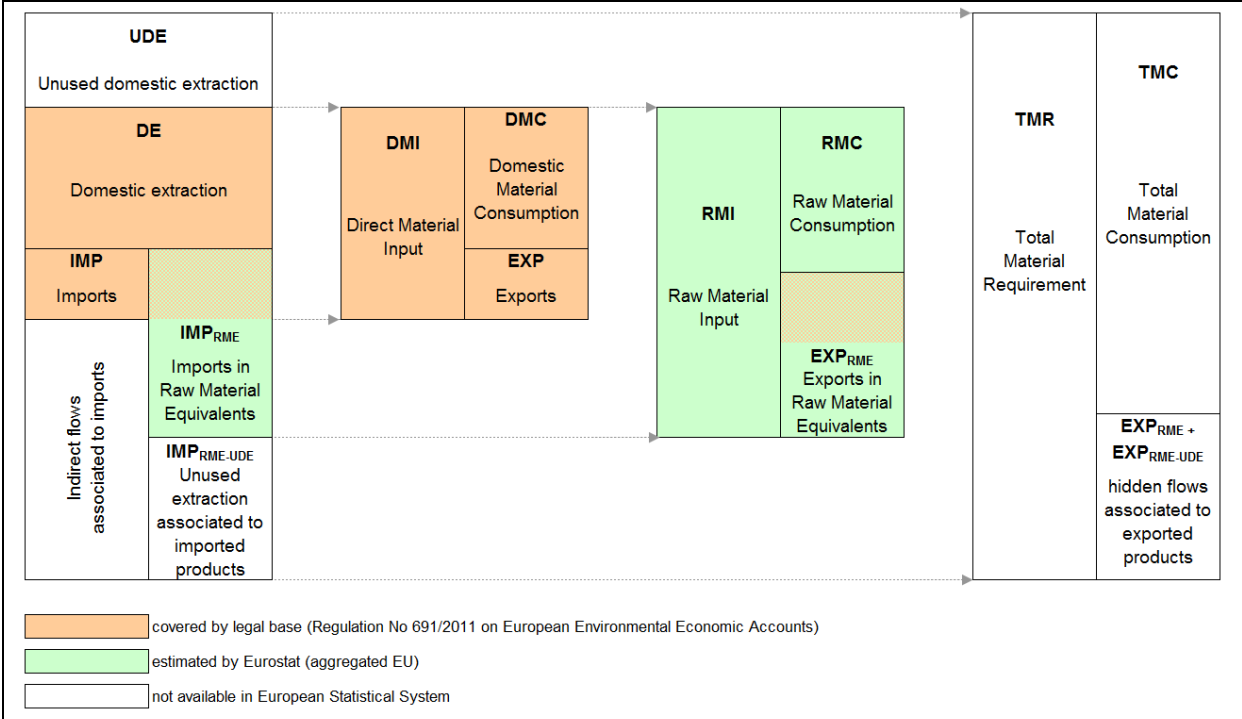
Brief description of the project and estimation model

Various indicators can be derived from EW-MFA. So far, the *domestic material consumption (DMC)* is the most prominent indicator which is provided through the European Statistical System (see Figure 1). One drawback of the DMC indicator is its 'asymmetry': it measures the domestic extraction of material resources in tonnes of gross ore (or gross harvest); whereas

the imports are measured in weight of goods crossing the border independent of how far the imported products have been processed.

Another EW-MFA based indicator has been developed to remedy this asymmetry: *raw material consumption (RMC)*. Next to the domestic extraction, the RMC indicator comprises imports expressed or converted into their raw material equivalents (RME), i.e. into equivalents of domestic extractions that have been induced in the rest of the world to produce the respective product.

Figure 1: Scheme for EW-MFA and derived indicators



In January 2009 Eurostat started a project to develop a methodology to estimate RMI and RMC for the aggregated EU economy. The consortium developed a comprehensive modelling framework which at its core has an expanded hybrid input-output model. The model has been updated in 2016 to the ESA 2010 framework and the NACE Rev. 2 classification.

This input-output model is based on a time series of the 64x64 input-output tables for the aggregated EU-28 economy as provided by Eurostat ⁽¹⁾. In a first step the monetary IOT is expanded to 182x182 industries. The disaggregation especially refers to branches of extraction of raw materials, like agriculture, and mining and quarrying, to branches of primary processing of raw materials, like food industry, basic metal production, production of secondary energy carriers and some manufacturing branches, like metal industries and chemical industries. The expansion is based on the structural information of an expanded monetary IOT for Germany which could be estimated by utilising detailed internal supply and use tables with a breakdown by about 3000 product groups. In addition to the initial EU IOT, the COMEXT trade database, structural business statistics (SBS), and agriculture statistics are used to adjust structures to the aggregated EU-28 economy.

¹ <http://ec.europa.eu/eurostat/web/esa-supply-use-input-tables/overview>

In a second step monetary use structures are replaced by physical use structures for selected product groups (hybrid IOT). Those physical use structures are predominantly based on information in physical terms from the energy balance, COMEXT, EW-MFA and some physical information on metal flows.

The raw material equivalents (RME) of imports, exports, and final domestic use of products are estimated by a specific Leontief type approach which is based on the expanded hybrid input-output table and on physical matrices for domestic extraction and imports of so called "LCA products" by 182 homogeneous branches and 51 raw material categories. The usual assumption of the single region Leontief approach is that the imported products are produced under the same production technology as the corresponding domestic products. Those products which are considered not to be represented well by EU production technologies (e.g. because they are not produced in the EU) are treated as "LCA products" in our approach. The raw material equivalents (RME) of imported "LCA products" are estimated by an external approach which is based on LCA inventories and other information (e.g. mine reports).

More information on the methodology used can be found in the [documentation of the EU RME model](#) ⁽²⁾.

Brief description of the RME-coefficients data set

As a by-product Eurostat was able to derive RME-coefficients for imports and exports. These might be used to approximate indicators on the national level by multiplying them with national trade vectors.

The RME-coefficients data set is one Excel workbook. The workbook contains 14 sheets organised by imports/exports and years:

imports2008, ..., imports 2014, exports2008, ..., exports2014.

Please note that the unit of the RME-coefficients varies depending on the product group. Different units are employed:

- t RME / t traded weight (agriculture and non-metallic minerals)
- t RME / 1000 EUR (most product groups)
- t RME / TOE (fossil fuels and energy products)
- t RME / t RME (uranium and thorium ores)

Download:

(XLSX) [RME-coefficients by product groups and material categories](#)
(published December 2016)

² The documentation of the EU-27 model using the NACE Rev 1.1 classification: *Conversion of European product flows into raw material equivalents, ifeu, Heidelberg, May 2012* is still available [here](#).