Material flow accounts in Raw Material Equivalents (MFA-RME)

Eurostat – Unit E2

Working Group Environmental Accounts

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1. Introduction

Material flow accounts in raw material equivalents (MFA-RME) include imports in RME, exports in RME, raw material input (RMI) and raw material consumption (RMC). These RME indicators measure material flows of traded products converted into the amount of material extraction needed to produce them.

Instead, EW-MFA measure traded products using the actual weight of the product when it crosses the border, irrespective of their stage of production. By quantifying the material flows in RME, the flows are represented consistently, because RME include all direct and indirect material extraction needed to produce the traded product. This puts all traded products on an equal footing and allows countries to be meaningfully compared in terms of resource use.

The Commission DG Environment (DG ENV) has expressed interest in country estimates of RME indicators. So far, Eurostat has been producing and publishing RME estimates for the EU, but not country estimates. Even though countries also seem to have policy demand for RME indicators, only very few NSIs compile and publish them, and so far it has been on an ad hoc basis only.

Eurostat would like to better understand why more widespread and regular compilation of MFA-RME is not materialising in the countries. Eurostat welcomes any input on how it can support the development of regular production in the countries.

This document presents an overview of Eurostat's RME-related activities in 2015, the planned work for 2016 and an outlook on future developments.

Questions to the Working Group:

- Are RME indicators, for example RMC, requested by your national policy makers?
- Do you plan to produce RME indicators? If so, will you publish them on a regular basis? Do you plan to use Eurostat's country RME tool? Which additional support would you need from Eurostat? If not, what is deterring your institute from producing RME indicators?

2. Brief overview of RME activities in 2015

Eurostat published RME indicators for 2000-2013 at the end of October 2015, for the EU27 and by NACE Rev. 1.1. A significantly revised Statistics Explained online article was published in December.

In June 2015, Eurostat had released the first version of the country RME tool, which allows the country compiler to produce country-level estimates of flows in raw material equivalents (RME). The tool, implemented in an Excel workbook, is accompanied by a handbook and a set of five data files. The user only has to introduce data from trade statistics and, if available, an input-output table. In October, an updated version was published following the update of
the EU RME model. This updated version includes the updated EU RME coefficients and also extends other input data time series to 2013.

3. Activities in 2016 related to Eurostat's EU RME model
The Eurostat RME model is currently updated to NACE Rev. 2 and EU28. Updated estimates for 2008-2014 are scheduled to be published in August/September 2016. In addition, a few other improvements are being implemented, including a cif-fob price correction and introducing information related to main EU trading partners regarding metal recycling and the energy mix used to generate electricity.

Currently there is no guidance on how to treat secondary materials incorporated in traded products in MFA-RME. Eurostat developed a discussion paper that analyses the various conceptual approaches possible when dealing with secondary materials in traded products in terms of RME. The aim is to discuss which approach fits best with the concept of expressing products in RME, which will consecutively be recommended as approach for expressing secondary materials in RME. The discussion paper will be shared with the Task Force on material flows for written consultation before the April Working Group (WG) meeting. The comments and view from the Task Force will be briefly presented in the WG meeting, and the WG members will have the possibility to send written comments in the weeks after the meeting.

The development of various databases on material flows within research projects provides the opportunity to compare those results with the data from the Eurostat EU RME model. This would also allow for some additional basic quality assurance. The EEA will perform the comparison in 2016 to support the development of their "The European environment—state and outlook" report (SOER) to be published in 2020. Eurostat will cooperate and take note of the outcomes to identify areas that need further work.

4. Activities in 2016 related to the country RME tool and promoting country estimates
The country RME tool will be updated to NACE Rev.2 after the update of the EU RME model. The updated country RME tool is scheduled to be released in fall 2016 after the release of the EU RME estimates.

Several countries have already used Eurostat's country RME tool. In a pilot study in spring 2015, Switzerland has used the model to calculate and publish country estimates for import and export flows in RME, RMC and resource productivity based on RMC.(1) The UK has released an article and related dataset on RME-related indicators at the end of February, based on estimates obtained with the tool.(2) The Netherlands is updating the country estimates published in 2012, using the country RME tool for the new estimates. They will present their approach and experience with the country RME tool in the WG meeting (agenda point 3.4).

1 http://www.bfs.admin.ch/bfs/portal/en/index/themen/02/22/publ.html?publicationID=6736
2 http://www.ons.gov.uk/releases/ukenvironmentalaccountshowmuchmaterialistheukconsuming
In the upcoming months, Eurostat will set-up a members-only expert group on the CROS portal where countries can share and discuss their experience with the tool and their estimates. It will also contain a reporting template for country RME estimates, which countries can use to send their estimates to Eurostat. In case a sufficient number of countries report country RME estimates on a regular basis and agree with publication, the estimates can be published via Eurostat's online database Eurobase. An invitation to request access will be send to the WG and Task Force on material flows once the discussion platform is ready.

5. Institutionalising multi-country modelling of raw material equivalents

5.1. Eurostat's contribution

Eurostat has taken up the challenge to develop an EU multi-country supply-use and input-output table (EU-MC-SUIOTs) that will be recognised as official statistics by international organisations such as the OECD, UN and WTO. This EU-MC-SUIOT will allow integrated input-output modelling at the EU level, while representing countries individually. The project is called FIGARO (Full International and Global Accounts for Research in input-Output). The WG was briefed about this project in the 2015 meeting (Doc 'Input-output modelling with environmental accounts – infrastructure and tools').

The EU-MC-SUIOT will represent all domestic and international flows among EU countries at the NACE Rev. 2 (64*64 industry/product) detail. The aim is to have an experimental EU-MC-SUIOT using ESA 2010 methodology. It will be available by summer 2017 for the reference year 2010. Based on that experience, a work plan will be developed to produce annual EU-MC-SUIOT and time series of EU-MC-SUIOT from 2010 to 2015 (IOTs 2010-2015, SUTs 2010 and 2015). At this moment, the work focuses on reviewing methods used for comparable databases and the treatment of asymmetries in trade statistics. A longer description of the project can be found in last year's WG document (Section 5 of the document linked to above).

5.2. Specific challenges remain for global material flow accounting

The EU-MC-SUIOT will allow estimating country-level footprint-type indicators, while including all indirect effects that occur in the EU throughout the production chain. It will represent production technologies and material input coefficients for each Member State separately, instead of using a weighted EU average representation of the EU technology as done in the EU RME model.

In the current EU RME model, import RME coefficients have been corrected for the products for which it is unacceptable to assume that it is produced with a technology like the one used in the EU. Given that the EU-MC-SUIOT will not contain information on non-EU production techniques either, it would be necessary to perform the same corrections as for the EU RME model, but now at individual country level. This will take more time and resources than for the EU RME model.
An alternative to making corrections is to directly include information on non-EU production techniques in the model. Given that OECD will insert the EU-MC-SUIOT in its own database, which also includes non-EU countries, this more complete database could be used for modelling the worldwide economic linkages. There are tentative plans for creating an institutionalised global EW-MFA database, which combined with the OECD database, would give the necessary inputs for a global model.

Irrespective of whether the EU RME estimates would be based on an EU model or a global model, the EU-MC-SUIOT and the currently foreseen global OECD database do not have sufficient industry/product detail for acceptably accurate material flow accounting. The EU-MC-SUIOT will have an A*64 breakdown and the OECD database will most likely have an even less detailed breakdown. This is not sufficiently detailed for material flow accounting: the NACE Rev. 2 A*64 classification only includes one industry 'Mining and quarrying', without distinguishing between different materials. For material flow accounting, this industry should be split into at least three different ones, and the related basic products industries should also have a reasonable level of detail. Hence, to use the EU-MC-SUIOT for material flow accounting, transparent disaggregation methods would have to be developed, relying on information already available at Eurostat.

6. Conclusions
EU RME estimates have been published for several years now and Eurostat will continue publishing these estimates. In the next few years, the options for using a model that is based on a multi-country database with linked individual countries (EU-MC-SUIOT) will be further explored together with colleagues from national accounting and from the OECD.

The country RME tool allows individual countries to estimate RME-related indicators using a relatively straightforward method. Some countries have started working with the tool, and the first results are promising, but Eurostat would like to see more countries using the tool. Once a substantial set of countries produces RME results on a regular basis, publication by Eurostat would be appropriate.