



Eurostat's approach to get material footprint data for EU Member States

Arturo de la Fuente

Eurostat, unit E.2 'environmental statistics and accounts, sustainable development'

Overview

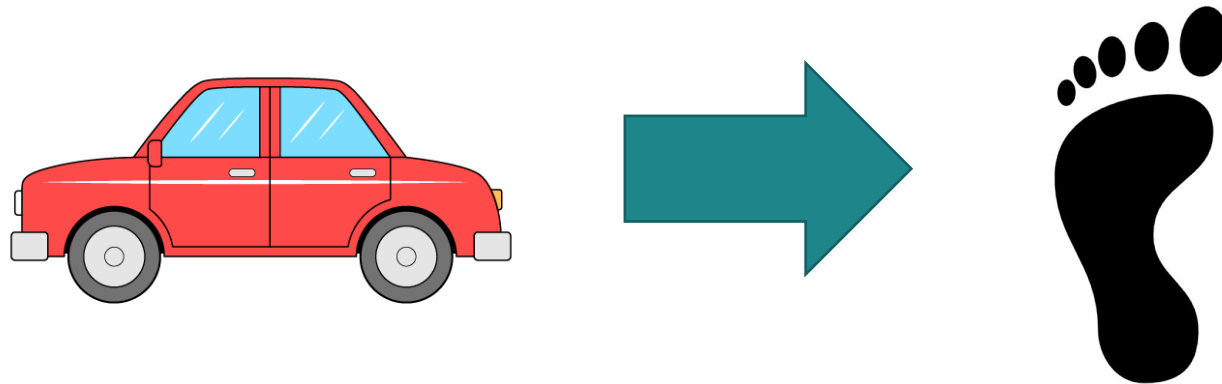
1. What is a material footprint
2. Eurostat material footprint estimates for the whole European Union
3. Material footprint estimates for EU Member States

1 What is a material footprint?

Extractions of natural resources are linked to economic production

Production is actually triggered by demand

Footprints attribute the consequences to the final demand



Footprints are very relevant for Circular Economy policies but they are hard to estimate

The European Union has agreed that there will be political targets to reduce material footprints

Methods to calculate material footprints

Input-output modelling (IO)

- Analyses macroeconomic production structures
- IO tables combined with environmental accounts
- Produces top-down estimates
- Suitable for official statistics
- Producer in the EU: Eurostat

Life Cycle Analysis (LCA)

- Analyses individual products through their life cycle ('representative products')
- Produces bottom-up estimates
- Suitable for research studies
- Producer in the EU: Joint Research Centre

Eurostat calculates and publishes material footprint for the EU as a whole

Data available for years 2000-2019

2

Eurostat MF: calculation method Raw material equivalents (1/2)

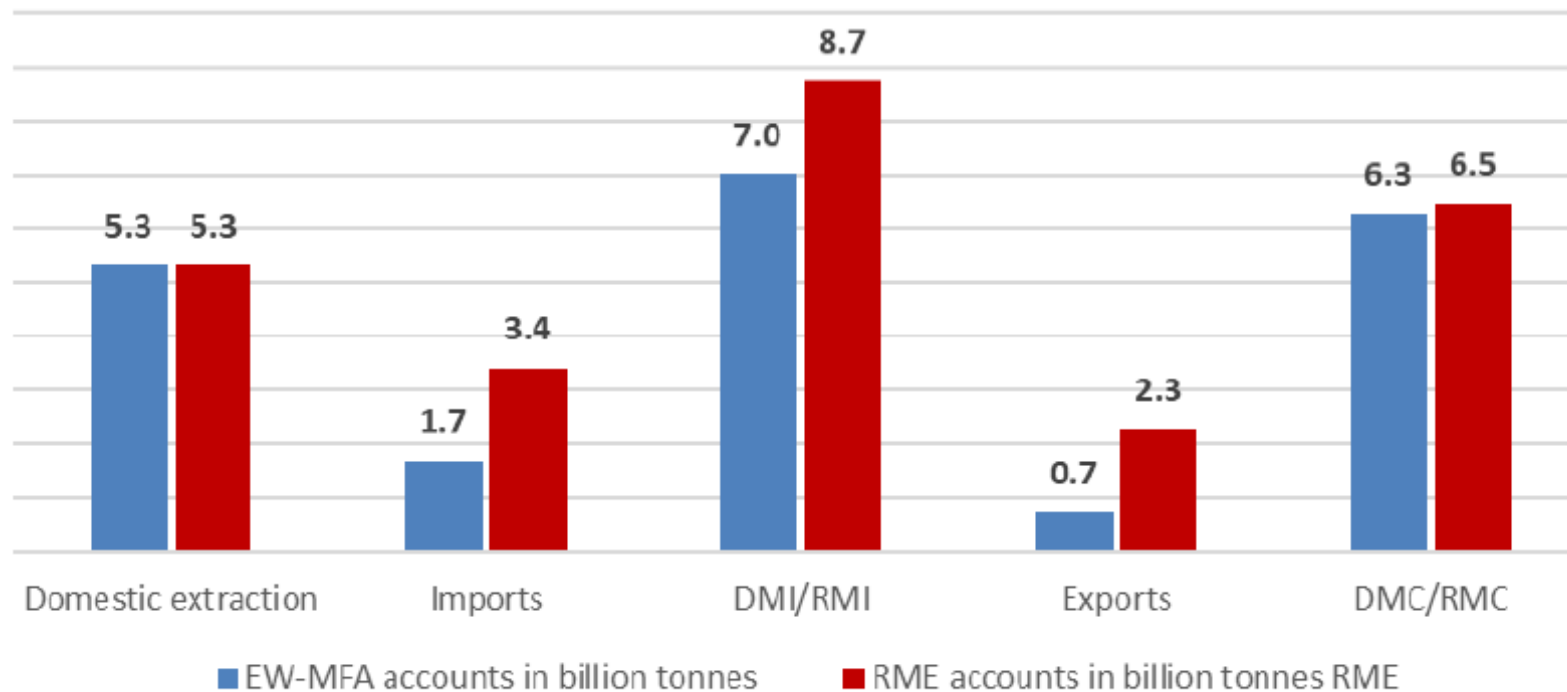
- IO modelling combined with Material Flow Accounts (MFA)
- Because Eurostat's MFA do not have industry breakdowns, we need a special solution
- We focus on the imports and exports
 - We transform imports and exports into 'raw material equivalents'
 - Domestic extractions are already in 'raw material equivalents', by construction

Eurostat MF: calculation method

Raw material consumption (RMC)

Material footprint = RMC = Domestic extractions + imports_{RME} – exports_{RME}

Figure 1: Comparison of EW-MFA and MFA-RME 2019



Eurostat MF: calculation method

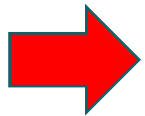
Raw material equivalents (2/2)

- Eurostat does IO modelling for the aggregated EU. Not country-by-country
- Eurostat environmentally-extended input-output model for RME:
 - high-resolution IOT with 182x182 product groups
 - 51 raw material categories (without aggregates)
 - Categories of final uses and imports

3

EU Member States MF: data available

- 3 categories of EU Member States:
 1. Countries who produce Raw Material Consumption (RMC) estimates using their own methods, and they submit their estimates to Eurostat
 2. Countries who produce RMC estimates with tools that Eurostat makes available, and they submit their estimates to Eurostat
 3. Countries who do not produce any RMC estimate
- Only 12 +1 countries produce MF estimates (categories 1&2 above)



Incomplete coverage of the 27 EU Member States

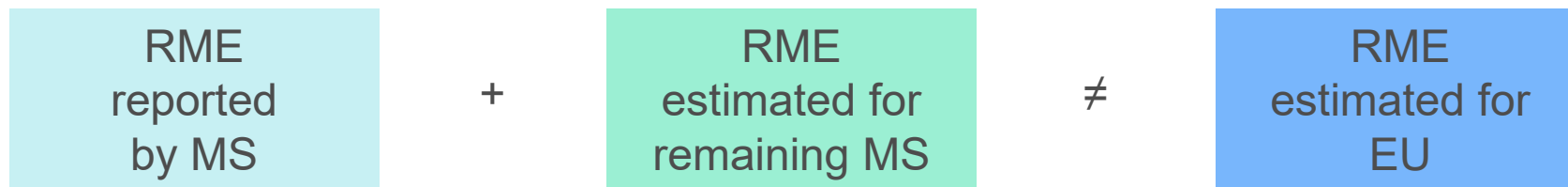
- This is a problem for monitoring policymaking

Eurostat solution for complete dataset of EU Member States: What?

- Eurostat now preparing estimates for the missing EU Member States, as to complete the country database
- New Eurostat country estimates to be published in January 2022
 - Data years: 2008 to 2019
 - Categories: biomass, metal ores, non-metallic minerals, and fossil energy materials/carriers
- Material footprints will be used for SDGs and circular economy monitoring in the European Union

Eurostat solution for complete dataset of EU Member States: How?

- Eurostat ‘adjusted coefficient approach’ model for country RME:
 - Country-level monetary imports and export from IOT as starting point (64 product groups)
 - Hybridization (mixed monetary and physical units) of trade vectors (182 product groups)
 - Country-level trade vectors x EU RME coefficients = country-level RME of imports and exports (51 raw material categories)
 - Adjustment for country-specific production technologies
- Estimation model closely linked to the EU RME model (data and methodology), but:

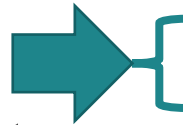


Conclusions

- Material footprints indicators becoming very important for policymaking in the European Union
 - Policy targets
- Material footprints data exist for EU-wide and 13 European countries
- Eurostat preparing estimates for missing 15 countries
- Those estimates will be used immediately in EU policy dashboards
- European countries can report their own estimates to Eurostat in the MFA questionnaire

Where to learn more?

- [Eurostat online database](#) (datasets env_ac_rme and env_ac_rmefd)
- [Environmental accounts methodology page](#), section input-output modelling (country RME tool and documentation)
- [Statistics explained article on material footprints](#)



ACCESS TO MORE DETAILED DATA (DATABASE)

Material flows and resource productivity (env_mrp)

- Material flow accounts (env_ac_mfa) M i
- Material flow accounts - domestic processed output (env_ac_mfadpo) M i
- Material flow accounts - balancing items (env_ac_mfabi) M i
- Material flow accounts - main indicators (env_ac_mfain) M i
- Material flow accounts in raw material equivalents - modelling estimates (env_ac_rme) M i
- Material flow accounts in raw material equivalents by final uses of products - modelling estimates (env_ac_rmefd) M i
- Resource productivity (env_ac_rp) M i
- Material import dependency (env_ac_mid) M i
- Circular material use rate (env_ac_cur) M i Updated
- Circular material use rate by material type (env_ac_curm) M i Updated
- Material flows for circular economy - Sankey diagram data (env_ac_sd) M i Updated

Thank you

arturo.de-la-fuente@ec.europa.eu



© European Union 2021

