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# **Validation rules for economy-wide material flow accounts (EW-MFA) 2024 data collection Technical Note**

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eurostat 

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## 1. Introduction

Economy-wide material flow accounts (EW-MFA) provide an aggregate overview, in thousand tonnes per year, of the material flows into and out of an economy.

**This document presents the EW-MFA validation rules for data collection 2024 (deadline: 30 April 2024). Please note that there are no changes compared to last year.**

The EW-MFA validation rules 2024 are based on a proposal discussed and approved by the working group environmental accounts in May 2019. In this document the validation rules are expressed in general terms and are based on the experiences gained in past data collections employing Excel questionnaires. The rules are expressed in 'human language' close to the terms of the Excel questionnaire (terms such as e.g. questionnaire cells, symbols, footnotes, etc.). This is the terminology familiar to most of the EW-MFA compilers and working group members.

## 2. Types of validation results

A validation rule is a logical statement applied to data. Whenever a validation rule is applied on a dataset it issues a validation result, which may refer to an individual data point, combination of data points or calculations based on reported data points. The SDMX validation tools distinguish four types of validation results:

- OK** This means that the transmitted data passed the validation rule and no specific follow up is required. At this stage of validation, no further explanations are expected to be provided. However, it might be possible that questions will be asked during a later stage of the validation process. In general, validation rules that have 'OK-result' are not listed in the validation report.
- ERROR** This means that a serious issue related to format, completeness, coherence, consistency and/or plausibility was detected in the transmitted data. In a fully automatized SDMX data transmission process an 'ERROR-result' implies the refusal of the data transmission and consequently the need of a new transmission by the data provider. In other words, the data are automatically sent back to the sender, without Eurostat having looked at them.
- WARNING** This means that some reported element is 'suspicious'. It highlights an issue of attention and for which a valid explanation might exist. It does not mean that the data is not coherent or that a new data transmission is required. It merely indicates an element of special attention. A 'WARNING-result' will usually trigger questions to the sender seeking for

an explanation and clarification of the reported values. Data provider can accelerate the validation procedures by providing footnotes explaining these warnings.

INFO This means that some reported element is simply an issue of attention to be highlighted. A further clarification or explanation is not required.

This document only addresses rules which may result in ERROR and WARNING.

The following chapters present 17 validation rules, grouped into 9 categories. For each validation rule, the type of validation result (see previous section) is indicated in rectangular brackets [ERROR, WARNING].

### 3. Validation rules for EW-MFA

This chapter presents a list of validation rules for EW-MFA. The list is based on the experiences gained in past EW-MFA data collections.

The validation rules are presented by categories. For each validation rule the type of validation result is indicated in rectangular brackets [ERROR, WARNING]. Checks of the ERROR type should be performed a-priori by the reporting national statistical institute before transmitting data to Eurostat – i.e. ensuring error-free data sets.

This document expresses the rules in a language close to the terms of the Excel questionnaire (such as questionnaire cells, symbols, footnotes, etc.). This is the terminology familiar to most of the EW-MFA compilers and working group members.

#### 3.1 Completeness

This check gives an overview of completeness of the dataset<sup>1</sup> received.

**Rule 1.** The dataset must include valid symbols (see below rules 2 and 3) for the five mandatory reference years (see [Regulation \(EU\) 691/2011](#), Annex III, section 4) and the mandatory characteristics (see [Regulation \(EU\) 691/2011](#), Annex III, sections 3 and 5). The five mandatory years are T-2y, T-3y, T-4y, T-5y, and T-6y (with T = year of the data collection). Mandatory characteristics are the three EW-MFA indicators ‘domestic extraction’, ‘physical imports’, and ‘physical exports’ in a breakdown by type of material.

- 'Missing' value (e.g. empty cell in Excel questionnaire or missing record in .csv flat file) for the mandatory years and characteristics trigger an [ERROR] result.

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<sup>1</sup> A data set is a multi-dimensional cube of data points

Annex 1 to this document provides a good overview on mandatory characteristics versus non-mandatory characteristics.

## 3.2 Symbols

Symbols are the value of a data point. This check identifies invalid symbols for the data points that have passed the completeness check (i.e. data points for mandatory characteristics and reference years excluding exceptional cases listed under **Rule 1**).

**Rule 2.** Mandatory data points<sup>2</sup> must have certain valid symbols (types of values)

Non-valid symbols for mandatory data points will trigger an [ERROR]. Valid symbols for mandatory data points are:

- Positive numeric values or zero numeric value;
- 'Not available' value is exceptionally allowed for data points with the following combinations of characteristics:
  - Table A – Domestic extraction for the following two material classes:
    - 'Straw' (MF.1.2.1.1),
    - 'Other crop residues' (MF.1.2.1.2);
  - Tables B (Imports – Total trade) and D (Exports – Total trade):
    - 'Straw' (MF.1.2.1.1)
    - adjustment items for residence principle (MF.4.2.3, MF.4.2.3.1, MF.4.2.3.2 and MF.4.2.3.3).

**Rule 3.** Valid symbols (types of values) for all non-mandatory data points beyond those that have passed the completeness check are:

- positive numeric values or zero numeric value,
- 'not available' value and 'missing' value;
- Negative numerical values are accepted only for the following combinations of characteristics:
  - Table A item MF.1.3 - MEMO 'Net increment of timber stock';
  - Table H for item H.6 'Physical trade balance';
  - Table H for item H.8 'Net additions to stock';
  - Table I for item RMC (total and sub-items).

Invalid symbols trigger an [ERROR] result.

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<sup>2</sup> all mandatory data points that have passed the completeness

### 3.3 Internal consistency

The internal consistency requires that the sum of components equals the corresponding total or subtotal. Notably, the current reporting/transmission via the Excel questionnaire widely requires reporting of totals and sub-totals.

**Rule 4.** For each of the equations presented in the following tables, the total/sub-total (left-hand side of equation) must equal the sum of its components (terms at the right-hand side of equation).

For all reference years reported, the non-compliance of the following equations create [ERROR] results in the case of mandatory characteristics, and [WARNING] results in the case of non-mandatory characteristics. Non-mandatory cases are highlighted in *italics and red font* in the following tables.

The precision of the consistency checks is set to 0.00001

**IMPORTANT: The consistency checking of the following equations is only performed in cases when all terms on the right-hand side of the equation have numeric values (exceptions are marked with \*\* and \*).**

#### Rule 4.1. Table A 'Domestic extraction'

4.1.1	${}_A\text{TOTAL} = {}_A\text{MF.1} + {}_A\text{MF.2} + {}_A\text{MF.3} + {}_A\text{MF.4}$
4.1.2	${}_A\text{MF.1} = {}_A\text{MF.1.1} + {}_A\text{MF.1.2} + {}_A\text{MF.1.3} + {}_A\text{MF.1.4}$
4.1.3	${}_A\text{MF.1.1} = {}_A\text{MF.1.1.1} + {}_A\text{MF.1.1.2} + {}_A\text{MF.1.1.3} + {}_A\text{MF.1.1.4} + {}_A\text{MF.1.1.5} + {}_A\text{MF.1.1.6} + {}_A\text{MF.1.1.7} + {}_A\text{MF.1.1.8} + {}_A\text{MF.1.1.9} + {}_A\text{MF.1.1.A}$
4.1.4	${}_A\text{MF.1.2} = {}_A\text{MF.1.2.1} + {}_A\text{MF.1.2.2}$
4.1.5	${}_A\text{MF.1.2.1} = {}_A\text{MF.1.2.1.1} + {}_A\text{MF.1.2.1.2}$
4.1.6	${}_A\text{MF.1.2.2} = {}_A\text{MF.1.2.2.1} + {}_A\text{MF.1.2.2.2}$
4.1.7	${}_A\text{MF.1.3} = {}_A\text{MF.1.3.1} + {}_A\text{MF.1.3.2}$
4.1.8	${}_A\text{MF.1.4} = {}_A\text{MF.1.4.1} + {}_A\text{MF.1.4.2} + {}_A\text{MF.1.4.3}$
4.1.9	${}_A\text{MF.2} = {}_A\text{MF.2.1} + {}_A\text{MF.2.2}$
4.1.10	${}_A\text{MF.2.2} = {}_A\text{MF.2.2.1} + {}_A\text{MF.2.2.2} + {}_A\text{MF.2.2.3} + {}_A\text{MF.2.2.4} + {}_A\text{MF.2.2.5} + {}_A\text{MF.2.2.6} + {}_A\text{MF.2.2.7} + {}_A\text{MF.2.2.8} + {}_A\text{MF.2.2.9}$
4.1.11	${}_A\text{MF.3} = {}_A\text{MF.3.1} + {}_A\text{MF.3.2} + {}_A\text{MF.3.3} + {}_A\text{MF.3.4} + {}_A\text{MF.3.5} + {}_A\text{MF.3.6} + {}_A\text{MF.3.7} + {}_A\text{MF.3.8} + {}_A\text{MF.3.9}$
4.1.12	${}_A\text{MF.4} = {}_A\text{MF.4.1} + {}_A\text{MF.4.2}$

4.1.13	${}_A MF.4.1 = {}_A MF.4.1.1 + {}_A MF.4.1.2 + {}_A MF.4.1.3 + {}_A MF.4.1.4$
4.1.14	${}_A MF.4.2 = {}_A MF.4.2.1 + {}_A MF.4.2.2$
4.1.15	${}_A MF.2.2.1 \geq {}_A MF.2.2.1 \text{ MEMO}$
4.1.16	${}_A MF.2.2.2 \geq {}_A MF.2.2.2 \text{ MEMO}$
4.1.17	${}_A MF.2.2.3 \geq {}_A MF.2.2.3 \text{ MEMO}$
4.1.18	${}_A MF.2.2.4 \geq {}_A MF.2.2.4 \text{ MEMO}$
4.1.19	${}_A MF.2.2.5 \geq {}_A MF.2.2.5 \text{ MEMO}$

#### Rule 4.2. Table B 'Physical imports'

4.2.1	${}_B \text{TOTAL} = {}_B MF.1 + {}_B MF.2 + {}_B MF.3 + {}_B MF.4 + {}_B MF.5 + {}_B MF.6$
4.2.2	${}_B MF.1 = {}_B MF.1.1 + {}_B MF.1.2 + {}_B MF.1.3 + {}_B MF.1.4 + {}_B MF.1.5 + {}_B MF.1.6$
4.2.3	${}_B MF.1.1 = {}_B MF.1.1.1 + {}_B MF.1.1.2 + {}_B MF.1.1.3 + {}_B MF.1.1.4 + {}_B MF.1.1.5 + {}_B MF.1.1.6 + {}_B MF.1.1.7 + {}_B MF.1.1.8 + {}_B MF.1.1.9 + {}_B MF.1.1.A$
4.2.4	${}_B MF.1.2 = {}_B MF.1.2.1 + {}_B MF.1.2.2$
4.2.5	${}_B MF.1.2.1 = {}_B MF.1.2.1.1$
4.2.6	${}_B MF.1.2.2 = {}_B MF.1.2.2.1$
4.2.7	${}_B MF.1.3 = {}_B MF.1.3.1 + {}_B MF.1.3.2$
4.2.8	${}_B MF.1.4 = {}_B MF.1.4.1 + {}_B MF.1.4.2$
4.2.9	${}_B MF.1.5 = {}_B MF.1.5.1 + {}_B MF.1.5.2 + {}_B MF.1.5.3 + {}_B MF.1.5.4$
4.2.10	${}_B MF.2 = {}_B MF.2.1 + {}_B MF.2.2 + {}_B MF.2.3$
4.2.11	${}_B MF.2.2 = {}_B MF.2.2.1 + {}_B MF.2.2.2 + {}_B MF.2.2.3 + {}_B MF.2.2.4 + {}_B MF.2.2.5 + {}_B MF.2.2.6 + {}_B MF.2.2.7 + {}_B MF.2.2.8 + {}_B MF.2.2.9$
4.2.12	${}_B MF.3 = {}_B MF.3.1 + {}_B MF.3.2 + {}_B MF.3.3 + {}_B MF.3.4 + {}_B MF.3.5 + {}_B MF.3.6 + {}_B MF.3.7 + {}_B MF.3.8 + {}_B MF.3.9 + {}_B MF.3.B$
4.2.13	${}_B MF.4 = {}_B MF.4.1 + {}_B MF.4.2 + {}_B MF.4.3$
4.2.14	${}_B MF.4.1 = {}_B MF.4.1.1 + {}_B MF.4.1.2 + {}_B MF.4.1.3 + {}_B MF.4.1.4$
4.2.15	${}_B MF.4.2^{**} = {}_B MF.4.2.1 + {}_B MF.4.2.2 + {}_B MF.4.2.3^*$
4.2.16	${}_B MF.4.2.3^{**} = {}_B MF.4.2.3.1^* + {}_B MF.4.2.3.2^* + {}_B MF.4.2.3.3^*$
4.2.17	${}_B \text{Total} = {}_B \text{Raw products} + {}_B \text{Semi-manufactured products} + {}_B \text{Finished products}$

\*\* This equation is checked even if one or more of the right-hand terms marked with \* have no numerical value

#### Rule 4.3. Table D 'Physical exports'

4.3.1	$\text{D}^{\text{TOTAL}} = \text{D}^{\text{MF.1}} + \text{D}^{\text{MF.2}} + \text{D}^{\text{MF.3}} + \text{D}^{\text{MF.4}} + \text{D}^{\text{MF.5}} + \text{D}^{\text{MF.6}}$
4.3.2	$\text{D}^{\text{MF.1}} = \text{D}^{\text{MF.1.1}} + \text{D}^{\text{MF.1.2}} + \text{D}^{\text{MF.1.3}} + \text{D}^{\text{MF.1.4}} + \text{D}^{\text{MF.1.5}} + \text{D}^{\text{MF.1.6}}$
4.3.3	$\text{D}^{\text{MF.1.1}} = \text{D}^{\text{MF.1.1.1}} + \text{D}^{\text{MF.1.1.2}} + \text{D}^{\text{MF.1.1.3}} + \text{D}^{\text{MF.1.1.4}} + \text{D}^{\text{MF.1.1.5}} + \text{D}^{\text{MF.1.1.6}} + \text{D}^{\text{MF.1.1.7}} + \text{D}^{\text{MF.1.1.8}} + \text{D}^{\text{MF.1.1.9}} + \text{D}^{\text{MF.1.1.A}}$
4.3.4	$\text{D}^{\text{MF.1.2}} = \text{D}^{\text{MF.1.2.1}} + \text{D}^{\text{MF.1.2.2}}$
4.3.5	$\text{D}^{\text{MF.1.2.1}} = \text{D}^{\text{MF.1.2.1.1}}$
4.3.6	$\text{D}^{\text{MF.1.2.2}} = \text{D}^{\text{MF.1.2.2.1}}$
4.3.7	$\text{D}^{\text{MF.1.3}} = \text{D}^{\text{MF.1.3.1}} + \text{D}^{\text{MF.1.3.2}}$
4.3.8	$\text{D}^{\text{MF.1.4}} = \text{D}^{\text{MF.1.4.1}} + \text{D}^{\text{MF.1.4.2}}$
4.3.9	$\text{D}^{\text{MF.1.5}} = \text{D}^{\text{MF.1.5.1}} + \text{D}^{\text{MF.1.5.2}} + \text{D}^{\text{MF.1.5.3}} + \text{D}^{\text{MF.1.5.4}}$
4.3.10	$\text{D}^{\text{MF.2}} = \text{D}^{\text{MF.2.1}} + \text{D}^{\text{MF.2.2}} + \text{D}^{\text{MF.2.3}}$
4.3.11	$\text{D}^{\text{MF.2.2}} = \text{D}^{\text{MF.2.2.1}} + \text{D}^{\text{MF.2.2.2}} + \text{D}^{\text{MF.2.2.3}} + \text{D}^{\text{MF.2.2.4}} + \text{D}^{\text{MF.2.2.5}} + \text{D}^{\text{MF.2.2.6}} + \text{D}^{\text{MF.2.2.7}} + \text{D}^{\text{MF.2.2.8}} + \text{D}^{\text{MF.2.2.9}}$
4.3.12	$\text{D}^{\text{MF.3}} = \text{D}^{\text{MF.3.1}} + \text{D}^{\text{MF.3.2}} + \text{D}^{\text{MF.3.3}} + \text{D}^{\text{MF.3.4}} + \text{D}^{\text{MF.3.5}} + \text{D}^{\text{MF.3.6}} + \text{D}^{\text{MF.3.7}} + \text{D}^{\text{MF.3.8}} + \text{D}^{\text{MF.3.9}} + \text{D}^{\text{MF.3.B}}$
4.3.13	$\text{D}^{\text{MF.4}} = \text{D}^{\text{MF.4.1}} + \text{D}^{\text{MF.4.2}} + \text{D}^{\text{MF.4.3}}$
4.3.14	$\text{D}^{\text{MF.4.1}} = \text{D}^{\text{MF.4.1.1}} + \text{D}^{\text{MF.4.1.2}} + \text{D}^{\text{MF.4.1.3}} + \text{D}^{\text{MF.4.1.4}}$
4.3.15	$\text{D}^{\text{MF.4.2}}^{**} = \text{D}^{\text{MF.4.2.1}} + \text{D}^{\text{MF.4.2.2}} + \text{D}^{\text{MF.4.2.3}}^{*}$
4.3.16	$\text{D}^{\text{MF.4.2.3}}^{**} = \text{D}^{\text{MF.4.2.3.1}}^{*} + \text{D}^{\text{MF.4.2.3.2}}^{*} + \text{D}^{\text{MF.4.2.3.3}}^{*}$
4.3.17	$\text{D}^{\text{Total}} = \text{D}^{\text{Raw products}} + \text{D}^{\text{Semi-manufactured products}} + \text{D}^{\text{Finished products}}$

\*\* This equation is checked even if one or more of the right-hand terms marked with \* have no numerical value



Rule 4.4. Table F 'Domestic processed output'

4.4.1	$fTOTAL = fMF.7.1 + fMF.7.2 + fMF.7.3 + fMF.7.4 + fMF.7.5$
4.4.2	$fMF.7.1^{**} = fMF.7.1.1 + fMF.7.1.2 + fMF.7.1.3 + fMF.7.1.4 + fMF.7.1.5^{*} + fMF.7.1.6^{*} + fMF.7.1.7^{*} + fMF.7.1.8 + fMF.7.1.9 + fMF.7.1.A + fMF.7.1.B + fMF.7.1.C + fMF.7.1.D + fMF.7.1.E + fMF.7.1.F^{*}$
4.4.3	$fMF.7.1.1 = fMF.7.1.1.1^{*} + fMF.7.1.1.2^{*}$
4.4.4	$fMF.7.3 = fMF.7.3.1 + fMF.7.3.2 + fMF.7.3.3 + fMF.7.3.4 + fMF.7.3.5$
4.4.5	$fMF.7.4 = fMF.7.4.1 + fMF.7.4.2 + fMF.7.4.3 + fMF.7.4.4 + fMF.7.4.5 + fMF.7.4.6 + fMF.7.4.7 + fMF.7.4.8$

\*\* This equation is checked even if one or more of the right-hand terms marked with \* have no numerical value

Rule 4.5. Table G 'Balancing items'

4.5.1	$gTOTAL = gMF.8.1 - gMF.8.2$
4.5.2	$gMF.8.1 = gMF.8.1.1 + gMF.8.1.2 + gMF.8.1.3 + gMF.8.1.4$
4.5.3	$gMF.8.2 = gMF.8.2.1 + gMF.8.2.2 + gMF.8.2.3$
4.5.4	$gMF.8.2.1 = gMF.8.2.1.1 + gMF.8.2.1.2$
4.5.5	$gMF.8.2.2 = gMF.8.2.2.1 + gMF.8.2.2.2$

Rule 4.6. Table H 'Indicators'

4.6.1	H.1 Domestic extraction (DE) = Table A Total Domestic extraction
4.6.2	H.2 Imports = Table B Total Physical Imports
4.6.3	H.3 Exports = Table D Total Physical Exports
4.6.4	H.4 Direct material input (DMI) = H.1 Domestic extraction (DE) + H.2 Imports
4.6.5	H.5 Domestic material consumption (DMC) = H.4 Direct material input (DMI) - H.3 Exports
4.6.6	H.6 Physical trade balance (PTB) = H.2 Imports - H.3 Exports
4.6.7	<i>H.7 Domestic processed output (DPO) = Table F Total Domestic processed output (DPO)</i>
4.6.8	<i>H.8 Net additions to stock (NAS) = H.5 Domestic material consumption (DMC) - H.7 Domestic processed output (DPO) + Table G Balancing items: input side (MF. 8.1) -</i>

	<i>Table G Balancing items: output side (MF. 8.2)</i>
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#### Rule 4.7. Table I 'Material flow accounts in raw material equivalents'

4.7.1	<i>I.1 Total Domestic extraction (DE) = <math>\Sigma</math> Table A (MF.1 + MF.2 + MF. 3 + MF. 4)</i>
4.7.2	<i>I.1.1 (DE) MF.1 = <math>_A</math>MF.1</i>
4.7.3	<i>I.1.2 (DE) MF.2 = <math>_A</math>MF.2</i>
4.7.4	<i>I.1.3 (DE) MF.3 = <math>_A</math>MF.3</i>
4.7.5	<i>I.1.4 (DE )MF.4 = <math>_A</math>MF.4</i>
4.7.6	<i>I.2 Total Imports in RME (IMP_RME) = I.2.1 MF.1 + I.2.2 MF.2 + I.2.3 MF.3 + I.2.4 MF.4</i>
4.7.7	<i>I.3 Total Raw material input (RMI) = Total I.1 Domestic extraction (DE) + Total I.2 Imports in RME (IMP_RME)</i>
4.7.8	<i>I.3.1 (RMI) MF.1 = I.1.1 (DE) MF.1 + I.2.1 (IMP_RME) MF.1</i>
4.7.9	<i>I.3.2 (RMI) MF.2 = I.1.2 (DE) MF.2 + I.2.2 (IMP_RME) MF.2</i>
4.7.10	<i>I.3.3 (RMI) MF.3 = I.1.3 (DE) MF.3 + I.2.3 (IMP_RME) MF.3</i>
4.7.11	<i>I.3.4 (RMI) MF.4 = I.1.4 (DE) MF.4 + I.2.4 (IMP_RME) MF.4</i>
4.7.12	<i>I.4 Total Exports in RME (EXP_RME) = I.4.1 MF.1 + I.4.2 MF.2 + I.4.3 MF.3 + I.4.4 MF.4</i>
4.7.13	<i>I.5 Total Raw material consumption (RMC) = I.3 Raw material input (RMI) - I.4 Exports in RME (EXP_RME)</i>
4.7.14	<i>I.5.1 (RMC) MF.1 = I.3.1 (RMI) MF.1 - I.4.1 (EXP_RME) MF.1</i>
4.7.15	<i>I.5.2 (RMC) MF.2 = I.3.2 (RMI) MF.2 - I.4.2 (EXP_RME) MF.2</i>
4.7.16	<i>I.5.3 (RMC) MF.3 = I.3.3 (RMI) MF.3 - I.4.3 (EXP_RME) MF.3</i>
4.7.17	<i>I.5.4 (RMC) MF.4 = I.3.4 (RMI) MF.4 - I.4.4 (EXP_RME) MF.4</i>

### 3.4 Removing values previously transmitted

This check identifies the deletion of previously reported or estimated data outside the mandatory 5-year band specified in Regulation (EU) 691/2011. Deletion means

replacing previously transmitted or estimated numeric values<sup>3</sup> by a colon (i.e. ‘not available’) or an empty cell (‘missing value’) in the current transmission.

**Rule 5.** Removing numeric values previously transmitted (i.e. overwriting with ‘not available’ or ‘missing value’) for data points that are or have been mandatorily requested generates an [ERROR].

This concerns the period between reference year 2008 (=first mandatory year) and T-2y; i.e. all years that – at a certain stage in time – have been fallen into the mandatory 5-year band established in Regulation (EU) 691/2011.

**Rule 6.** Removing numeric values previously transmitted (i.e. overwriting with ‘not available’ or ‘missing value’) for data points that have never been mandatory according to Regulation (EU) 691/2011 generates a [WARNING] result.

This concern all previously reported data for reference years before 2008.

### 3.5 Footnotes

The Excel questionnaire<sup>4</sup> knows two types of footnote symbols: symbols for pre-defined footnotes (letters) and symbols for free-text footnotes (numbers). The following rules check the correctness of symbols used for pre-defined footnotes.

**Rule 7.** Valid symbols for the five pre-defined footnotes are the following:

Footnote symbol in Excel questionnaire	Label of pre-defined footnote	Explanation/Meaning
b)	Break in series	Break occurring when there is a change in the standards for defining and observing a variable over time. The flag 'b' is to be attached to the first time period after the break. Where possible, further details should be provided in the national quality report via ESS-MH, under the sub-concept 15.2.1.1. 'Comparability - over time detailed'.
c)	Confidential	Confidential data are data which are subject to confidentiality

<sup>3</sup> A numeric value may be a positive value, a zero value, and a negative value

<sup>4</sup> Please note the new footnote syntax established with the 2020 data collection cycle.

		<p>clauses.</p> <p>Where possible, further details should be provided in the national quality report via ESS-MH, under the concept 7. 'Confidentiality'.</p>
d)	Secondary confidentiality	<p>Secondary confidential data are data made confidential in order to prevent third parties to indirectly calculate the data points genuinely flagged as confidential.</p> <p>Please note that this footnote converts into confidential (c) when published in Eurostat's online database.</p>
e)	Estimated data	<p>The 'e' (estimate) flag shall be used only if one or several data points have been calculated using a significantly different methodology and/or sources than the rest of the data points in the questionnaire. Small methodological deviations shall be explained in the national quality report via ESS-MH, under the sub-concept 18.5.2.</p> <p>'Estimation approaches for specific items' (provided in Annex 2 of the national quality report) shall not be flagged as estimate.</p>
p)	Provisional	<p>The 'p' (provisional) flag shall be used when a data point value is expected to be revised and submitted to Eurostat before the next data collection. In the case of early estimates, the flag 'e' is deemed sufficient and the 'p' flag can be omitted. Notice all 'p' (provisional) flags sent during a given data collection will be systematically removed during the subsequent data collection, unless the 'p' flags are again resubmitted.</p>

The use of non-valid footnote symbols triggers an [ERROR] result.

**Rule 8.** A free-text footnote symbol (numbers) with no text specified for and associated with in the footnote list of the Excel questionnaire triggers an [ERROR] result.

**Rule 9.** The following combinations of cell content (value of data point) and pre-defined footnote symbol are not possible: a cell containing a colon (:) meaning 'not available' must not appear together with the pre-defined footnotes p) or e). Such a combination leads to an [ERROR] result.

See also **Rule 12** about confidentiality.

**Rule 10.** Only the following combinations of pre-defined footnotes are possible and allowed. Combinations beyond those trigger an [ERROR] result.

Combinations of pre-defined footnote symbols in Excel questionnaire	Combinations of pre-defined footnotes
)b)e)	Break in time series whilst estimated data
)b)p)	Break in time series whilst provisional
)b)e)p)	Break in time series whilst estimated data whilst provisional
)c)b)	Confidential whilst break in time series
)d)b)	Secondary confidentiality whilst break in time series
)e)p)	Estimated data whilst provisional

### 3.6 Confidentiality

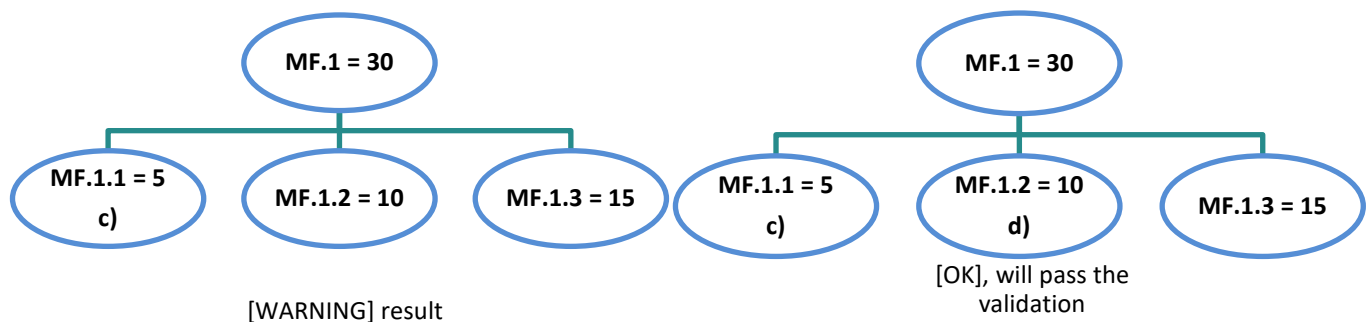
This check verifies certain rules related to confidentiality.

**Rule 11.** Confidentiality at the 1-digit MF level of material category (e.g. MF.1) is not allowed. This is an [ERROR] rule.

**Rule 12.** Cells with a colon (:) meaning 'not available' must not be confidential. This is an [ERROR] rule.

**Rule 13.** In case a data point flagged as confidential can be derived through calculation creates a [WARNING] result.

Two example cases are given below. The first example case (left) creates a [WARNING] result while the second case (right) will pass this validation rule with [OK].



### 3.7 Plausibility of reported time series (annual change rates)

This check detects for a wide range of characteristics reported via the Excel questionnaire any implausible changes between consecutive years in time series. Implausible annual change rates are defined in form of thresholds, i.e. a maximum annual change rate that is still considered plausible.

**Rule 14.** An implausible annual change rate triggers a [WARNING] result. 'Implausible annual change rates' are defined below for the Tables A, B, D, F, G, H, and I of the EW-MFA questionnaire.

**Rule 15.** Implausible annual change rates must be explained with a free-text footnote; or flagged with the pre-defined footnote symbol b), meaning 'break in time series'. Implausible annual change rates without a footnote triggers an [ERROR] result.

Implausible annual change rates between consecutive years are specified for each characteristic and presented in the following.

#### Rule 15.1. Table A 'Domestic extraction'

15.1.1	Total domestic extractions (aggregated over all material categories) which vary more than 30% between consecutive years.
15.1.2	Material categories (1-digit MF level) which vary more than 30% between consecutive years if they are bigger than 20% of total 'Domestic extraction'.
15.1.3	Material classes (2-digit MF level) which vary more than 30% between consecutive years if they are bigger than 20% of their superior material category (1-digit MF-level).
15.1.4	Material group (3-digit MF level) which vary more than 30% between consecutive years if they are bigger than 20% of their superior material classes (2-digit MF-level).
15.1.5	Material sub-group (4-digit MF level) which vary more than 30% between consecutive years if they are bigger than 20% of their superior material group (3-digit MF-level).
MEMO items: no check	

Rule 15.2. Table B 'Physical imports'

15.2.1	Total physical imports (aggregated over all material categories) which vary more than 50% between consecutive years.
15.2.2	Material categories (1-digit MF level) which vary more than 50% between consecutive years if they are bigger than 20% of total 'Physical imports'.
15.2.3	Material classes (2-digit MF level) which vary more than 50% between consecutive years if they are bigger than 20% of their superior material category (1-digit MF-level).
15.2.4	Material group (3-digit MF level) which vary more than 50% between consecutive years if they are bigger than 20% of their superior material classes (2-digit MF-level).
15.2.5	Material sub-group (4-digit MF level) which vary more than 50% between consecutive years if they are bigger than 20% of their superior material group (3-digit MF-level).
15.2.6	Physical imports by stage of manufacturing (raw products, semi-finished products and finished products) which vary more than 50% between consecutive years.

Rule 15.3. Table D 'Physical exports'

15.3.1	Total physical exports (aggregated over all material categories) which vary more than 50% between consecutive years.
15.3.2	Material categories (1-digit MF level) which vary more than 50% between consecutive years if they are bigger than 20% of total 'Physical exports'.
15.3.3	Material classes (2-digit MF level) which vary more than 50% between consecutive years if they are bigger than 20% of their superior material category (1-digit MF-level).
15.3.4	Material group (3-digit MF level) which vary more than 50% between consecutive years if they are bigger than 20% of their superior material classes (2-digit MF-level).
15.3.5	Material sub-group (4-digit MF level) which vary more than 50% between consecutive years if they are bigger than 20% of their superior material group (3-digit MF-level).
15.3.6	Physical exports check by stage of manufacturing (raw products, semi-finished products and finished products) which vary more than 50% between consecutive years.

Rule 15.4. Table F 'Domestic processed output'

15.4.1	MF.7 Total domestic processed output (aggregated over all material categories) which vary more than 30% between consecutive years.
15.4.2	MF.7.1 Emissions to air – Total which vary more than 30% between consecutive years.

15.4.3	MF.7.1.1 Emissions to air – carbon dioxide and its breakdown by material sub-group (4-digit MF levels) which vary more than 30% between consecutive years if they are bigger than 50% of their superior material group.
15.4.4	MF.7.1.2 – MF.7.1.F Emissions to air – material groups other than carbon dioxide which vary more than 50% between consecutive years.
15.4.5	MF.7.2 to MF.7.5 domestic processed output – material classes other than emissions to air which vary more than 50% between consecutive years.

Rule 15.5. Table G 'Balancing items'

15.5.1	MF.8 Total balancing items (= MF.8.1 minus MF 8.2) which vary more than 30% between consecutive years.
15.5.2	MF.8.1 Balancing item: input side which vary more than 30% between consecutive years.
15.5.3	MF.8.1.1 Balancing item: input side – Oxygen for combustion processes which vary more than 30% between consecutive years.
15.5.4	MF.8.1.2 to MF.8.1.4 Balancing items: input side – breakdown by material groups (3-digit MF-level) which vary more than 50%.
15.5.5	MF.8.2 Balancing item: output side and its breakdown by material group and sub-groups (3-digit and 4-digit MF-levels) which vary more than 30% between consecutive years.

Rule 15.6. Table H 'Indicators'

15.6.1	(H.1) Domestic extraction (DE) which vary more than 30% between consecutive years.
15.6.2	(H.2) Imports which vary more than 50% between consecutive years.
15.6.3	(H.3) Exports which vary more than 50% between consecutive years.
15.6.4	(H.4) Direct material input (DMI) which vary more than 50% between consecutive years.
15.6.5	(H.5) Domestic material consumption (DMC) which vary more than 50% between consecutive years.
15.6.6	(H.6) Physical trade balance (PTB) which vary more than 50% between consecutive years.
15.6.7	(H.7) Domestic processed output (DPO) which vary more than 30% between consecutive years.
15.6.8	(H.8) Net additions to stock (NAS) which vary more than 50% between consecutive years.

Rule 15.7. Table I 'Material flow accounts in raw material equivalents'



15.7.1	(I.1) Domestic extraction (DE) – Total which vary more than 30% between consecutive years.
15.7.2	(I.1) Domestic extraction (DE) – broken down by material categories (1-digit MF level) which vary more than 30% between consecutive years if they are bigger than 20% of total 'Domestic extraction'.
15.7.3	(I.2) Imports in RME – Total which vary more than 50% between consecutive years.
15.7.4	(I.2) Imports in RME broken down by material categories (1-digit MF level) which vary more than 50% between consecutive years if they are bigger than 20% of total 'Imports in RME'.
15.7.5	(I.3) Raw material input (RMI) – Total which vary more than 50% between consecutive years.
15.7.6	(I.3) Raw material input (RMI) broken down by material categories (1-digit MF level) which vary more than 50% between consecutive years if they are bigger than 20% of total 'Raw material input'.
15.7.7	(I.4) Exports in RME – Total which vary more than 50% between consecutive years.
15.7.8	(I.4) Exports in RME broken down by material categories (1-digit MF level) which vary more than 50% between consecutive years if they are bigger than 20% of total 'Exports in RME'.
15.7.9	(I.5) Raw material consumption (RMC) – Total which vary more than 50% between consecutive years.
15.7.10	(I.5) Raw material consumption (RMC) broken down by material categories (1-digit MF level) which vary more than 50% between consecutive years if they are bigger than 20% of total 'Raw material consumption (RMC)'.
15.7.11	(I.2) Imports in RME – Total and breakdown by material category (1-digit MF level) for which the annual change rate (%) for two subsequent years differs more than 20 percentage points from the corresponding annual change rate (%) of physical imports (Table B of EW-MFA questionnaire).
15.7.12	(I.3) Raw material input (RMI) – Total for which the annual change rate (%) for two subsequent years differs more than 20 percentage points from the corresponding annual change rate (%) of Direct material input (DMI) (Table H, item H.4 of EW-MFA questionnaire).
15.7.13	(I.4) Exports in RME – Total and breakdown by material category (1-digit MF level) for which the annual change rate (%) for two subsequent years differs more than 20 percentage points from the corresponding annual change rate (%) of physical exports (Table D of EW-MFA questionnaire).
15.7.14	(I.5) Raw material consumption (RMC) – Total for which the annual change rate (%) for two subsequent years differs more than 20 percentage points from the corresponding annual change rate (%) of Domestic material consumption (DMC) (Table H, item H.5 of EW-MFA questionnaire).

### 3.8 Plausibility of revisions

This check detects implausible revisions between the current and previous year's questionnaire. Implausible revisions are defined in form of thresholds, i.e. a maximum change rate that is still considered plausible.

**Rule 16.** Implausible revisions trigger a [WARNING] result. Change rates for 'implausible revisions' are defined below for the Tables A, B, D, F, G, H, and I of the EW-MFA questionnaire.

Implausible revisions (change rates) between the current and previous year's questionnaire are specified for each characteristic and presented in the following:

#### Rule 16.1. Table A 'Domestic extraction'

16.1.1	Table A - Total which varies more than 30%.
16.1.2	Material categories (1-digit MF level) which vary more than 30% if they are bigger than 20% of total 'Domestic extraction'.
16.1.3	Material classes (2-digit MF level) which vary more than 30% if they are bigger than 20% of their superior material category (1-digit MF-level).
16.1.4	Material group (3-digit MF level) which vary more than 30% if they are bigger than 20% of their superior material classes (2-digit MF-level).
16.1.5	Material sub-group (4-digit MF level) which vary more than 30% if they are bigger than 20% of their superior material group (3-digit MF-level).
MEMO items: no check	

#### Rule 16.2. Table B 'Physical imports'

16.2.1	Table B - Total which vary more than 50%.
16.2.2	Material categories (1-digit MF level) which vary more than 50% if they are bigger than 20% of total 'Physical imports'.
16.2.3	Material classes (2-digit MF level) which vary more than 50% if they are bigger than 20% of their superior material category (1-digit MF-level).
16.2.4	Material group (3-digit MF level) which vary more than 50% if they are bigger than 20% of their superior material classes (2-digit MF-level).
16.2.5	Material sub-group (4-digit MF level) which vary more than 50% if they are bigger than 20% of their superior material group (3-digit MF-level).
16.2.6	Physical imports by stage of manufacturing (raw products, semi-finished products and finished products) which vary more than 50%.

#### Rule 16.3. Table D 'Physical exports'

16.3.1	Table D - Total which vary more than 50%.
16.3.2	Material categories (1-digit MF level) which vary more than 50% if they are bigger than 20% of total 'Physical exports'.
16.3.3	Material classes (2-digit MF level) which vary more than 50% if they are bigger than 20% of their superior material category (1-digit MF-level).
16.3.4	Material group (3-digit MF level) which vary more than 50% if they are bigger than 20% of their superior material classes (2-digit MF-level).
16.3.5	Material sub-group (4-digit MF level) which vary more than 50% if they are bigger than 20% of their superior material group (3-digit MF-level).
16.3.6	Physical exports check by stage of manufacturing (raw products, semi-finished products and finished products) which vary more than 50%.

#### Rule 16.4. Table F 'Domestic processed output'

16.4.1	MF.7 Domestic processed output – Total which vary more than 30%.
16.4.2	MF.7.1 Emissions to air – Total which vary more than 30%.
16.4.3	MF.7.2 to MF.7.5 domestic processed output – material classes other than emissions to air which vary more than 50%.

#### Rule 16.5. Table G 'Balancing items'

16.5.1	MF.8 Balancing item – Total (= MF.8.1 minus MF 8.2) which vary more than 30%.
16.5.2	MF.8.1 Balancing item: input side which vary more than 30%.
16.5.3	MF.8.2 Balancing item: output side which vary more than 30%.

#### Rule 16.6. Table H 'Indicators'

16.6.1	H.1 Domestic extraction (DE) which vary more than 30%.
16.6.2	H.2 Imports which vary more than 50%.
16.6.3	H.3 Exports which vary more than 50%.
16.6.4	H.4 Direct material input (DMI) which vary more than 50%.
16.6.5	H.5 Domestic material consumption (DMC) which vary more than 15%.
16.6.6	H.6 Physical trade balance (PTB) which vary more than 50%.
16.6.7	H.7 Domestic processed output (DPO) which vary more than 30%.
16.6.8	H.8 Net additions to stock (NAS) which vary more than 50%.

Rule 16.7. Table I 'Material flow accounts in raw material equivalents'

16.7.1	(I.1) Domestic extraction (DE) – Total which vary more than 30%.
16.7.2	(I.2) Imports in RME – Total which vary more than 50%.
16.7.3	(I.3) Raw material input (RMI) – Total which vary more than 50%.
16.7.4	(I.4) Exports in RME – Total which vary more than 50%.
16.7.5	(I.5) Raw material consumption (RMC) – Total which vary more than 50%.

**3.9 External consistency (cross-domain plausibility)**

This check compares EW-MFA data with data from other statistical domains.

**Rule 17.** Implausible differences between EW-MFA data and data from other statistical domains trigger a [WARNING] result.

Implausible differences are specified in the following structured by EW-MFA characteristics and other statistical domains.

Rule17.1. EW-MFA Handbook – Plausibility of metal content

The percentage (%) of pure metal content in gross ore for copper, nickel, lead, zinc and tin that varies  $\pm 30\%$  of the ore grades provided in the EW-MFA Handbook Table 11.

Rule 17.2. Agriculture statistics domain

Biomass elements of domestic extraction [[env\\_ac\\_mfa](#)] are compared with **crop statistics** (Crop production in [EU standard humidity](#) [[apro\\_cpsh1](#)]). Implausible differences are:

17.2.1	MF.1.1.1 that varies $\pm 10\%$ from crop code C0000
17.2.2	MF.1.1.2 that varies $\pm 10\%$ from crop code R1000
17.2.3	MF.1.1.3 that varies $\pm 10\%$ from crop code R2000
17.2.4	MF.1.1.4 that varies $\pm 10\%$ from crop code P0000
17.2.5	MF.1.1.5 that varies $\pm 10\%$ from crop code F4000
17.2.6	MF.1.1.6 that varies $\pm 10\%$ from sum of crop codes I1100+O1000
17.2.7	MF.1.1.7 that varies $\pm 10\%$ from sum of crop codes V1000 + V2000 + V3100 + V3200

	+ V3300 + V3410 + V3420 + V3430 + V3600 + V3900 + V4000 + V5000 + V9000 + U1000
17.2.8	MF.1.1.8 that varies $\pm 10\%$ from sum of crop codes V3510 + V3520 + F1100 + F1200 + F2000 + S0000 + F3000 + T0000 + W1000
17.2.9	MF.1.1.9 that varies $\pm 10\%$ from crop code I2000
17.2.10	MF.1.1.A that varies $\pm 10\%$ from sum of crop codes I3000 + I4000 + I5000 + I6000 + I9000
17.2.11	MF.1.2.2.1 that varies $\pm 30\%$ from sum of crop codes R9000 + G0000 (the amounts should be reported in European standard humidity of 15%M (1000t))
17.2.12	MF.1.2.2 that varies $\pm 30\%$ from the roughage requirement calculated by multiplying the livestock values that come from European agricultural statistics with annual feed intake coefficients provided in the EW-MFA Handbook Table 8.

### Rule 17.3. Forest accounts domain

Biomass elements of domestic extraction [env\_ac\_mfa] are compared with **forestry statistics**. Implausible differences are:

17.3.1	MF.1.3.1 that varies $\pm 20\%$ from [for_remov] wood products = Industrial roundwood (code RW_IN) after conversion into mass [t at 15 % moisture content] by using the factors provided in Annex 2.
17.3.2	MF.1.3.2 that varies $\pm 20\%$ from [for_remov] wood products = Fuelwood, including wood for charcoal (code RW_FW) after conversion into mass [t at 15 % moisture content] by using the factors provided in Annex 2.
17.3.3	MF.1.3. MEMO that varies $\pm 20\%$ from [for_vol_efa] stock or flow = Net annual increment (code NAI); forestry indicator = forest available for wood supply (code FAWS) after conversion into mass [t at 15 % moisture content] by using the factors provided in Annex 2.

### Rule 17.4. Fishery statistics domain

Biomass elements of domestic extraction [env\_ac\_mfa] are compared with **fishery statistics**. Implausible differences are:

MF.1.4. that varies $\pm 20\%$ sum of from fisheries species codes F10 + F20 + F30 + F40 + F50 + F60 + F70 + F80 + F90 (excl. Aqua-culture) [fish_ca_main]
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### Rule 17.5. Energy statistics domain

Fossils elements of domestic extraction [[env\\_ac\\_mfa](#)] are compared with **energy statistics**. Implausible differences are:

17.5.1	MF.4.1.1 that varies $\pm 10\%$ from sum of energy codes C0210 + C0220 [ <a href="#">nrg_cb_sff</a> ]
17.5.2	MF.4.1.2 that varies $\pm 10\%$ from sum of energy codes C0110 + C0121 + C0129 [ <a href="#">nrg_cb_sff</a> ]
17.5.3	MF.4.1.3 that varies $\pm 10\%$ from energy code S2000 [ <a href="#">nrg_cb_sff</a> ]
17.5.4	MF.4.1.4 that varies $\pm 10\%$ from energy code P1100 [ <a href="#">nrg_cb_sff</a> ]
17.5.5	MF.4.2.1 that varies $\pm 10\%$ from sum of energy codes O4100_TOT + O4200 [ <a href="#">nrg_cb_oil</a> ]
17.5.6	MF.4.2.2 that varies $\pm 10\%$ from energy code G3000 [ <a href="#">nrg_cb_gas</a> ]

#### Rule 17.6. COMEXT (international trade in goods statistics) domain

17.6.1	Table B Imports: compare with ‘artificial questionnaires’ <sup>5</sup>
17.6.2	Table D Exports: compare with ‘artificial questionnaires’ <sup>5</sup>

#### Rule 17.7. Air emissions accounts domain

Elements of domestic processed output – F.1 emissions to air [[env\\_ac\\_mfadpo](#)] are compared with **air emissions accounts** [[env\\_ac\\_ainah\\_r2](#)]. Implausible differences are:

17.7.1	MF.7.1.1 that varies $\pm 10\%$ from air pollutant CO2
17.7.2	MF.7.1.2 that varies $\pm 10\%$ from air pollutant CH4
17.7.3	MF.7.1.3 that varies $\pm 10\%$ from air pollutant N2O
17.7.4	MF.7.1.4 that varies $\pm 10\%$ from air pollutant NOX
17.7.5	MF.7.1.8 that varies $\pm 10\%$ from air pollutant CO
17.7.6	MF.7.1.9 that varies $\pm 10\%$ from air pollutant NMVOC
17.7.7	MF.7.1.A that varies $\pm 10\%$ from air pollutant SOX_SO2E
17.7.8	MF.7.1.B that varies $\pm 10\%$ from air pollutant NH3
17.7.9	MF.7.1.E that varies $\pm 10\%$ from air pollutant PM10

<sup>5</sup> For each country, Eurostat produces an ‘artificial questionnaire’ for the purpose of plausibility checking and gap-filling. It is an EW-MFA questionnaire including estimates for Tables B and D based on already existing European statistics, namely international trade in goods statistics (COMEXT database).

Rule 17.8. Cross-checking for Table I with EW-MFA data

## Rule 17.8.1. Table I 'Imports in RME' and Table B 'Physical imports'

17.8.1.1	I.2.1 (IMP_RME) MF.1 should have a value between 100 - 800 % of <sub>B</sub> MF.1
17.8.1.2	I.2.2 (IMP_RME) MF.2 should have a value between 100 - 800 % of <sub>B</sub> MF.2
17.8.1.3	I.2.3 (IMP_RME) MF.3 should have a value between 100 - 800 % of <sub>B</sub> MF.3
17.8.1.4	I.2.4 (IMP_RME) MF.4 should have a value between 100 - 800 % of <sub>B</sub> MF.4

## Rule 17.8.2. Table I 'Exports in RME' and Table D 'Physical exports'

17.8.2.1	I.4.1 (EXP_RME) MF.1 should have a value between 100 - 800 % of <sub>D</sub> MF.1
17.8.2.2	I.4.2 (EXP_RME) MF.2 should have a value between 100 - 800 % of <sub>D</sub> MF.2
17.8.2.3	I.4.3 (EXP_RME) MF.3 should have a value between 100 - 800 % of <sub>D</sub> MF.3
17.8.2.4	I.4.4 (EXP_RME) MF.4 should have a value between 100 - 800 % of <sub>D</sub> MF.4

## Rule 17.8.3. Table I 'RMC' with 'DMC' indicator

17.8.3.1	$\frac{I.5.1 (RMC) MF.1}{1.5 RMC Total} = \pm 20 \% \text{ of } ({}_A MF.1 + {}_B MF.1 - {}_D MF.1) / H.5 DMC Total$
17.8.3.2	$\frac{I.5.2 (RMC) MF.2}{1.5 RMC Total} = \pm 20 \% \text{ of } ({}_A MF.2 + {}_B MF.2 - {}_D MF.2) / H.5 DMC Total$
17.8.3.3	$\frac{I.5.3 (RMC) MF.3}{1.5 RMC Total} = \pm 20 \% \text{ of } ({}_A MF.3 + {}_B MF.3 - {}_D MF.3) / H.5 DMC Total$
17.8.3.4	$\frac{I.5.4 (RMC) MF.4}{1.5 RMC Total} = \pm 20 \% \text{ of } ({}_A MF.4 + {}_B MF.4 - {}_D MF.4) / H.5 DMC Total$

Rule 17.9. Cross-checking for Table I with EU data [[env ac rme](#)]

17.9.1	Comparison of the development over time: Does the percentage change between two subsequent years for total exports and imports in RME differ less than 25 percentage points from the percentage change for EU imports and exports in tonnes RME?
17.9.2	Comparison of the shares for each material category: Do the shares for each material category differ less than 30 percentage points from the shares for the EU?
17.9.3	Comparison of tonnes RME per capita: Do the values for tonnes RME per capita for imports and exports deviate less than 80 % from the values for the EU?
17.9.4	Comparison of the relationship between values in tonnes RME and values in tonnes: Does the ratio between total imports in tonnes RME to total imports in tonnes

	deviate less than 50 % from the corresponding ratio for the EU? Does the ratio between total exports in tonnes RME to total exports in tonnes deviate less than 50 % from the corresponding ratio for the EU?
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## Annex 1: Overview of mandatory characteristics versus non-mandatory characteristics

MATERIAL code	MATERIAL label	Characteristic (indicator):				
		domestic extraction	physical imports	physical exports	domestic processes output	balancing items
		m = mandatory; o = non-mandatory; (m) = removed from questionnaire; empty = not applicable *: 'not available' is allowed to report in questionnaire †: to report only if applicable #: In order to fulfil completeness (see rule 1), Eurostat replaces 'not available' with zero + footnote s) and a free-text footnote: "This value is not available but assumingly so small and neglectable that it can be treated as a real zero', except, the cell is indeed not available (e.g. GHG inventory has no figures for F-gases).				
MF.1	Biomass	m	m	m		
MF.1.1	Crops (excluding fodder crops)	m	m	m		
MF.1.1.1	Cereals	m	m	m		
MF.1.1.2	Roots, tubers	m	m	m		
MF.1.1.3	Sugar crops	m	m	m		
MF.1.1.4	Pulses	m	m	m		
MF.1.1.5	Nuts	m	m	m		
MF.1.1.6	Oil-bearing crops	m	m	m		
MF.1.1.7	Vegetables	m	m	m		
MF.1.1.8	Fruits	m	m	m		
MF.1.1.9	Fibres	m	m	m		
MF.1.1.A	Other crops (excluding fodder crops) n.e.c.	m	m	m		
MF.1.2	Crop residues (used), fodder crops and grazed biomass	m	m	m		
MF.1.2.1	Crop residues (used)	m	m	m		
MF.1.2.1.1	Straw	m*	m*	m*		
MF.1.2.1.2	Other crop residues (sugar and fodder beet leaves, etc.)	m*	(m)	(m)		
MF.1.2.2	Fodder crops and grazed biomass	m	m	m		
MF.1.2.2.1	Fodder crops (including biomass	m	m	m		

MATERIAL code	MATERIAL label	Characteristic (indicator):				
		domestic extraction	physical imports	physical exports	domestic processes output	balancing items
	harvest from grassland)					
MF.1.2.2.2	Grazed biomass	m				
MF.1.3	Wood	m	m	m		
MF.1.3.1	Timber (industrial roundwood)	m	m	m		
MF.1.3.2	Wood fuel and other extraction	m	m	m		
MF.1.3 MEMO	Net increment of timber stock (memo item)	o				
MF.1.4	Wild fish catch, aquatic plants and animals, hunting and gathering	m	m	m		
MF.1.4.1	Wild fish catch	m	m	m		
MF.1.4.2	All other aquatic animals and plants	m	m	m		
MF.1.4.3	Hunting and gathering	m				
MF.1.5	Live animals and animal products (excluding wild fish, aquatic plants and animals, hunted and gathered animals)		m	m		
MF.1.5.1	Live animals (excluding wild fish, aquatic plants and animals, hunted and gathered animals)		m	m		
MF.1.5.2	Meat and meat preparations		m	m		
MF.1.5.3	Dairy products, birds, eggs and honey		m	m		
MF.1.5.4	Other products from animals (animal fibres, skins, furs, leather, etc.)		m	m		
MF.1.6	Products mainly from biomass		m	m		
MF.2	Metal ores (gross ores)	m	m	m		
MF.2.1	Iron	m	m	m		
MF.2.2	Non-ferrous metal	m	m	m		

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MF.2.2.1	Copper	m	m	m		
<i>MF.2.2.1</i>	<i>Copper - metal content</i>	o				
<i>MEMO</i>						
MF.2.2.2	Nickel	m	m	m		
<i>MF.2.2.2</i>	<i>Nickel - metal content</i>	o				
<i>MEMO</i>						
MF.2.2.3	Lead	m	m	m		
<i>MF.2.2.3</i>	<i>Lead - metal content</i>	o				
<i>MEMO</i>						
MF.2.2.4	Zinc	m	m	m		
<i>MF.2.2.4</i>	<i>Zinc - metal content</i>	o				
<i>MEMO</i>						
MF.2.2.5	Tin	m	m	m		
<i>MF.2.2.5</i>	<i>Tin - metal content</i>	o				
<i>MEMO</i>						
MF.2.2.6	Gold, silver, platinum and other precious metals	m	m	m		
MF.2.2.7	Bauxite and other aluminium	m	m	m		
MF.2.2.8	Uranium and thorium	m	m	m		
MF.2.2.9	Other non-ferrous metals	m	m	m		
MF.2.3	Products mainly from metals		m	m		
MF.3	Non-metallic minerals	m	m	m		
MF.3.1	Marble, granite, sandstone, porphyry, basalt, other ornamental or building stone (excluding slate)	m	m	m		

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MF.3.2	Chalk and dolomite	m	m	m		
MF.3.3	Slate	m	m	m		
MF.3.4	Chemical and fertiliser minerals	m	m	m		
MF.3.5	Salt	m	m	m		
MF.3.6	Limestone and gypsum	m	m	m		
MF.3.7	Clays and kaolin	m	m	m		
MF.3.8	Sand and gravel	m	m	m		
MF.3.9	Other non-metallic minerals n.e.c.	m	m	m		
MF.3.A	<i>Excavated earthen materials (including soil), only if used (optional reporting)</i>	o				
MF.3.B	Products mainly from non-metallic minerals		m	m		
MF.4	Fossil energy materials/carriers	m	m	m		
MF.4.1	Coal and other solid energy materials/carriers	m	m	m		
MF.4.1.1	Lignite (brown coal)	m	m	m		
MF.4.1.2	Hard coal	m	m	m		
MF.4.1.3	Oil shale and tar sands	m	m	m		
MF.4.1.4	Peat	m	m	m		
MF.4.2	Liquid and gaseous energy materials/carriers	m	m	m		
MF.4.2.1	Crude oil, condensate and natural gas liquids (NGL)	m	m	m		

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MF.4.2.2	Natural gas	m	m	m		
MF.4.2.3	Fuels bunkered (Imports: by resident units abroad; Exports: by non-resident units domestically)		m**	m**		
MF.4.2.3.1	Fuel for land transport		m**	m**		
MF.4.2.3.2	Fuel for water transport		m**	m**		
MF.4.2.3.3	Fuel for air transport		m**	m**		
MF.4.3	Products mainly from fossil energy products		m	m		
MF.5	Other products		m	m		
MF.6	Waste for final treatment and disposal		m	m		
SM_FIN	Stage of Manufacturing - finished products		o	o		
SM_SFIN	Stage of Manufacturing - semi-finished products		o	o		
SM_RAW	Stage of Manufacturing - raw products		o	o		
MF.7	Domestic processed output				o	
MF.7.1	Emissions to air				o	
MF.7.1.1	Carbon dioxide (CO <sub>2</sub> )				o	
MF.7.1.1.1	Carbon dioxide (CO <sub>2</sub> ) from biomass combustion				o*	
MF.7.1.1.2	Carbon dioxide (CO <sub>2</sub> ) excluding biomass combustion				o*	

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MF.7.1.2	Methane (CH <sub>4</sub> )				o	
MF.7.1.3	Dinitrogen oxide (N <sub>2</sub> O)				o	
MF.7.1.4	Nitrous oxides (NO <sub>x</sub> )				o	
MF.7.1.5	Hydroflourcarbons (HFCs)				o* #	
MF.7.1.6	Perflourocarbons (PFCs)				o* #	
MF.7.1.7	Sulfur hexaflouride				o* #	
MF.7.1.8	Carbon monoxide (CO)				o	
MF.7.1.9	Non-methane volatile organic compounds (NMVOC)				o	
MF.7.1.A	Sulfur dioxide (SO <sub>2</sub> )				o	
MF.7.1.B	Ammonia (NH <sub>3</sub> )				o	
MF.7.1.C	Heavy metals				o	
MF.7.1.D	Persistent organic pollutants (POPs)				o	
MF.7.1.E	Particles (e.g. PM <sub>10</sub> , Dust)				o	
MF.7.1.F	Other emissions to air				o* #	
MF.7.2	Waste disposal to the environment				o	
MF.7.2MEMO	Waste disposal to controlled landfills (memo item)				o	
MF.7.3	Emissions to water				o	
MF.7.3.1	Nitrogen (N)				o*	
MF.7.3.2	Phosphorus (P)				o*	
MF.7.3.3	Heavy metals				o*	
MF.7.3.4	Other substances and (organic)				o*	

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		domestic extraction	physical imports	physical exports	domestic processes output	balancing items
	materials					
MF.7.3.5	Dumping of materials at sea				o*	
MF.7.4	Dissipative use of products				o	
MF.7.4.1	Organic fertiliser (manure)				o*	
MF.7.4.2	Mineral fertiliser				o*	
MF.7.4.3	Sewage sludge				o*	
MF.7.4.4	Compost				o*	
MF.7.4.5	Pesticides				o*	
MF.7.4.6	Seeds				o*	
MF.7.4.7	Salt and other thawing materials spread on roads (including grit)				o*	
MF.7.4.8	Solvents, laughing gas and other				o*	
MF.7.5	Dissipative losses				o	
MF.8	Balancing items: net output (= Balancing item: output side - Balancing item: input side)					o
MF.8.1	Balancing items: input side					o
MF.8.1.1	Oxygen for combustion processes					o
MF.8.1.2	Oxygen for respiration of humans and livestock; bacterial respiration from solid waste and wastewater					o
MF.8.1.3	Nitrogen for Haber-Bosch process					o
MF.8.1.4	Water requirements for the domestic production of exported					o

MATERIAL code	MATERIAL label	Characteristic (indicator):				
		domestic extraction	physical imports	physical exports	domestic processes output	balancing items
	beverages					
MF.8.2	Balancing items: output side					o
MF.8.2.1	Water vapour from combustion					o
MF.8.2.1.1	Water vapour from moisture content of fuels					o
MF.8.2.1.2	Water vapour from the oxidised hydrogen components of fuels					o
MF.8.2.2	Gases from respiration of humans and livestock (CO <sub>2</sub> and H <sub>2</sub> O), and from bacterial respiration from solid waste and wastewater (H <sub>2</sub> O)					o
MF.8.2.2.1	Carbon dioxide (CO <sub>2</sub> )					o
MF.8.2.2.2	Water vapour (H <sub>2</sub> O)					o
MF.8.2.3	Excorporated water from biomass products					o