Validation rules for physical energy flow accounts (PEFA)
Technical Note

Version: 04 April 2024

2024 data collection

eurostat

Contents

1.   Introduction

Physical energy flow accounts (PEFA) record the flows of energy (in terajoules) from the environment to the economy (natural inputs), within the economy (products), and from the economy back to the environment (residuals).

PEFA present data on the physical flows of energy expressed in terajoules in a way that is fully compatible with the European system of accounts (ESA)[1]. Physical energy flow accounts record energy data in relation to the economic activities of resident units of national economies in a breakdown by economic activity. They present the supply and use of natural energy inputs, energy products and energy residuals. Economic activities comprise production, consumption, and accumulation.

National statistical institutes transmit PEFA data to Eurostat under Regulation 691/2011. Eurostat validates PEFA data transmitted by national statistical institutes.

This document presents validation rules for physical energy flow accounts (PEFA). Validation is important. Overall objective is to ensure high data quality of European statistics. It is primarily Eurostat, who undertakes validation of European statistics. There are some validation rules, which can only be performed ex-post by Eurostat, e.g. cross-domain checks.

Many validation rules can and shall be checked a-priori by the reporting national statistical institute before transmitting data – in particular, those checks resulting in ERROR (see next chapter). The ultimate objective is that national statistical institutes transmit error-free data sets to Eurostat, which shortens the validation ping-pong, saving time and resources on both sides.

The Annex to this document presents the different codes used in the PEFA questionnaire and their corresponding Eurobase[2] codes.

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. The SDMX validation tools allow for 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

---

[1] https://ec.europa.eu/eurostat/web/esa-2010

[2] Eurobase is Eurostat's main reference database available online via Eurostat's website: https://ec.europa.eu/eurostat/web/main/data/database

explanations are expected. 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[3] data transmission process an 'ERROR-result' would imply the refusal of the data transmission and consequently the need of a new transmission. In other words, the data would be automatically sent back to the sender, without Eurostat having looked at them.

WARNING This means that some reported element is 'suspicious'. It might refer to an individual data point, combination of data points or calculations based on reported data points. 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' may trigger questions to the sender seeking for an explanation and clarification the reported values. It is up to the validator, i.e. Eurostat, to decide whether a clarification is needed or not. Reporters 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.

The application of validation rules to a dataset generates a validation report, which is usually a list of observations (records) presenting validation results.

This technical note addresses ERROR and WARNING rules. ERROR rules should be checked a-priori by the reporting national statistical institute before transmitting the data to Eurostat.

3. Validation rules for PEFA

This chapter presents a list of validation rules for PEFA. The list is based on the experiences gained in past PEFA 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.

---

[3] Statistical Data and Metadata eXchange: international standard for data and metadata exchange (more information: https://ec.europa.eu/eurostat/web/sdmx-infospace)

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 PEFA compilers and working group members.

The Annex presents the different codes used in the PEFA questionnaire and their corresponding Eurobase codes.

In Eurobase the PEFA data are published in three different data sets employing dimensions as explained in the following:

Energy supply and use by NACE Rev. 2 activity [env_ac_pefasu]

- *Supply and use tables (STK_FLOW):* the elements of this dimension are the five tables detailing energy supply (questionnaire table A) and use; the total energy use (table B) is the sum of transformation use (table B1) and end use (table B2), and a certain part of it is emission relevant (table C).

- *Energy flow (PROD_NRG):* The flows of energy recorded in PEFA are broadly grouped into natural energy inputs (flows from environment to economy), energy products (flows within economy), and energy residuals (flows from economy to environment mainly). Each of these generic groups is further broken down. In total this dimension distinguishes 31 items which are regulated in Commission Delegated Regulation (EU) 2016/172.

- *Classification of economic activities - NACE Rev.2 (NACE_R2):* The supply and use of energy flows is broken down by NACE classification of economic activities. The aggregation level used is A*64 (i.e. 64 branches), fully compatible with ESA supply and use tables. Furthermore, this dimension includes private households, accumulation (e.g. product inventories), the rest of the world economy for imports and exports, and the environment.

- *Geopolitical entity (GEO):* EU Member States, EFTA countries, candidate countries, and potential candidates.

- *Period of time (TIME):* Energy flow data are annual.

- *Unit (UNIT):* Energy flows are reported in Terajoules.

Key indicators of physical energy flow accounts by NACE Rev. 2 activity [env_ac_pefa04]

- *Energy indicator (INDIC_PEFA):* Various key indicators that can be derived from the physical supply and use tables.

- *Classification of economic activities - NACE Rev.2 (NACE_R2)*

- *Geopolitical entity (GEO)*

- *Period of time (TIME)*

- *Unit (UNIT)*

Physical energy flow accounts totals bridging to energy balances totals [env_ac_pefa05]

- *Environment indicator (INDIC_PEFA):* So-called 'bridging-items', which present the various elements explaining the differences between the national totals as reported by PEFA vis-a-vis the national totals as reported by Eurostat's energy balances.

- *Geopolitical entity (GEO)*

- *Period of time (TIME)*

- *Unit (UNIT)*

3.1   Completeness

The validation rules presented in this section check the completeness of the dataset.

Rule 1.   The dataset must include all mandatory characteristics, for the three mandatory reference years (3 reference years mentioned in Regulation (EU) 691/2011[4], Annex VI, section 4, paragraph 6). Missing data for supply[5], use[6] and emission-relevant use[7] of energy flows as well as for bridging items[8] trigger an [ERROR] result.

Rule 2.   Missing data for transformation use[9] and end-use of energy flows[10] for the three mandatory reporting years trigger a [WARNING] result.

3.2   Symbols

Symbols are the alphanumeric characters of a reported value for a data point (cell). This check identifies invalid symbols for both, (a) data points that have passed the

---

[4]   https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1416221752426&uri=CELEX:02011R0691-20140616

[5] PEFA questionnaire table A (legally mandatory)

[6] PEFA questionnaire table B (legally mandatory)

[7] PEFA questionnaire table C (legally mandatory)

[8] PEFA questionnaire table E (legally mandatory)

[9] PEFA questionnaire table B.1 (voluntary)

[10] PEFA questionnaire table and B.2 (voluntary)

completeness check, i.e. data points for mandatory characteristics and reference years, as well as for (b) voluntary data points. .

Rule 3. All mandatory and voluntary data points must have a valid symbol.

Non-valid symbols for mandatory data points will trigger an [ERROR] while non-valid symbols for voluntary data points will trigger a [WARNING].Valid symbols are:

- Positive value and zero value;

- Negative value, for the following characteristics:

  o supply, use and emission-relevant use of energy flows

  by

  o 'changes in inventories and produced assets', 'statistical differences', and 'manufacture of coke and refined petroleum products' (except for Total Use)

  as well as

  o for the bridging item 'other adjustments and statistical discrepancy';

- 'Not available' and 'missing' value for voluntary data points.

3.3 Footnotes

The Excel questionnaire[11] knows two types of footnote symbols: symbols for pre-defined footnotes (letters) and symbols for free-text footnotes (numbers).

Rule 4. This rule checks the correctness of symbols of pre-defined footnotes. The valid 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.
c)	Confidential	Confidential data are data which are subject to confidentiality clauses. Where possible, further details

---

[11] Please note the new footnote syntax established with the 2020 data collection cycle.

		should be provided in the national quality report via ESS-MH, under the concept 7. 'Confidentiality'.
d)	Secondary confidentiality	Secondary confidential data are data made confidential in order to prevent third parties to indirectly calculate the data points genuinely flagged as confidential.
e)	Estimated data	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.
p)	Provisional	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.

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

Rule 5.   A free text footnote symbol with no text defined for it in the footnote area of the questionnaire triggers an [ERROR] result.

Rule 6.   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 9 about confidentiality.

Rule 7.   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

3.4 Confidentiality

The following rules are related to confidentiality.

Rule 8. Confidentiality at the first hierarchical level of the two dimensions NACE_R2 and NRG_PROD is not allowed. For NACE_R2 this is e.g. 1 digit NACE level. For the dimensions NRG_PROD this is the level of the three generic types of energy flows (i.e. natural energy inputs N00, energy products P00, and energy residuals R00). This is an [ERROR] rule.

Rule 9. Cells with a colon (:) meaning 'not available' must not be confidential. This is an [ERROR] rule.

Rule 10. In case a data point flagged as confidential can be derived through calculation creates a [WARNING] result.

3.5 Internal consistency of hierarchically classified dimensions/characteristics

This set of rules relates to the hierarchically classified characteristics (dimensions), namely economic activities (NACE_R2), energy flows, i.e. natural energy inputs, energy products, and energy residuals (PROD_NRG), type of supply/use table (STK_FLOW), PEFA indicators (INDIC_PEFA), and bridging items (INDIC_PEFA). The internal consistency requires that – for each dimension – the sum of components (addends) equals the respective superior aggregate. Notably, the current reporting/transmission via the Excel questionnaire widely requires reporting of aggregates.

Rule 11. For the dimension economic activities (NACE_R2), each of the equations presented in the following table must hold when all addends are available.

This check refers to Tables A, B, B.1, B.2, C and D in which dimension NACE_R2 is employed.

11.a	A_U 01-99 = A + B + C + D + E + F + G + H + I + J + K + L + M + N + O +P +Q +R + S + T + U
11.b	A = A01 + A02 + A03
11.c	C = C10_C12 + C13_C15 + C16 + C17 + C18 + C19 + C20 + C21 + C22 + C23 + C24 + C25 +

	C26 + C27 + C28 + C29 + C30 + C31_32 + C33
11.d	E = E36 + E37-E39
11.e	G = G45 + G46 + G47
11.f	H = H49 + H50 + H51 + H52 + H53
11.g	J = J58 + J59_J60 + J61 + J62_J63
11.h	K = K64 + K65 + K66
11.i	L68A < L
11.j	M = M69_M70 + M71 + M72 + M73 + M74_M75
11.k	N = N77 + N78 + N79 + N80_N82
11.l	Q = Q86 + Q87_Q88
11.m	R = R90_R92 + R93
11.n	S = S94 + S95 + S96
11.o	TOTAL_HH = TOTAL + HH
11.p	HH = HH_TRA + HH_HEAT + HH_OTH
11.q	TSUE = TOTAL + HH + CH_INV_PA + SD_SU + ROW_ACT + ENV

This is an [ERROR] rule. Differences smaller than 0.00001 are accepted, i.e. they do not trigger an error.

> **Rule 12.** For the dimension energy flow (PROD_NRG) each of the equations presented in the following table must hold when all addends are available.
>
> This check refers to Tables A, B, B.1, B.2, and C, in which dimension PROD_NRG is employed.

12.a	N00 = N01 + N02 + N03 + N04 + N05 + N06 + N07
12.b	P00 = P08 + P09 + P10 + P11 + P12 + P13 + P14 + P15 + P16 + P17 + P18 + P19 + P20 + P21 + P22 + P23 + P24 + P25 + P26 + P27
12.c	R00 = R28 + R29 + R30 + R31
12.d	NPR = N00 + P00 + R00 + STADIF
12.e	P00w < NPR

This is an [ERROR] rule. Differences smaller than 0.00001 are accepted, i.e. they do not trigger an error.

> **Rule 13.** For the dimension PEFA indicator (INDIC_PEFA) each of the equations presented in the following table must hold when all addends are available.

These checks refer to Table D.

13.a	PEFA_IND06 = PEFA_IND06a + PEFA_IND06b
13.b	PEFA_IND14 = PEFA_IND14a + PEFA_IND14b
13.c	PEFA_IND17 = PEFA_IND17b - PEFA_IND17a

This is an [ERROR] rule. Differences smaller than 0.00001 are accepted, i.e. they do not trigger an error.

Rule 14. For the dimension bridging item (INDIC_PEFA) each of the equations presented in the following table must hold when all addends are available.

These checks refer to Table E.

14.a	EUSE_TER = EUSE_RES - EUSE_RES_ABR + EUSE_TER_NRES + ADJ_SD
	(Gross inland consumption (territory principle) = Energy use by resident units - Energy use by resident units, fuel purchased abroad - total + Energy use by non-resident units (only if included in gross inland energy consumption), fuel purchased on the territory - total + Other adjustments and statistical discrepancies)
14.b	EUSE_RES_ABR = EUSE_RES_ABR_FWTR + EUSE_RES_ABR_LTR + EUSE_RES_ABR_WTR + EUSE_RES_ABR_ATR
	(Energy use by resident units, fuel purchased abroad - total = Energy use by resident units, fuel purchased abroad - fishing vessels + Energy use by resident units, fuel purchased abroad - land transport + Energy use by resident units, fuel purchased abroad - water transport + Energy use by resident units, fuel purchased abroad - air transport)
14.c	EUSE_TER_NRES = EUSE_TER_NRES_LTR + EUSE_TER_NRES_WTR + EUSE_TER_NRES_ATR
	Energy use by non-resident units (only if included in gross inland energy consumption), fuel purchased on the territory - total = Energy use by non-resident units (only if included in gross inland energy consumption), fuel purchased on the territory - land transport + Energy use by non-resident units (only if included in gross inland energy consumption), fuel purchased on the territory - water transport + Energy use by non-resident units (only if included in gross inland energy consumption), fuel purchased on the territory - air transport)

This is an [ERROR] rule. Differences smaller than 0.00001 are accepted, i.e. they do not trigger an error.

Rule 15. For the dimension type of supply/use table (STK_FLOW), all equations presented in the following table must hold when all addends are available.

This check concerns Table B (USE) and its sub-layers Table B.1 (USE_TRS), Table B.2 (USE_END) and Table C (ER_USE).

The sub-layer Tables B.1 and B.2 should add up to Table B. The sub-layer Table C is an 'of which' and hence should have values equal or smaller than the superior Table B.

no.		
15.a	For all data points: USE = USE_TRS + USE_END	The sub-layer Tables B.1 and B.2 should add up to Table B
15.b	For all data points (excluding rows 'STADIF', 'NPR', and excluding columns 'CHINV_PA', 'STADIF', 'ROW_ACT', 'ENV', 'TSUE'): USE >= ER_USE	The sub-layer Table C should be equal to or smaller than Table C
15.3	only for data point row 'P12' : column 'C19': USE > ER_USE	For use of energy product P12 (Crude oil, NGL, and other hydrocarbons (excl. bio)) by production activity C19 (Manufacture of coke and refined petroleum products): Table B should be greater than Table C _new_

This is an [ERROR] rule. Differences smaller than 0.00001 are accepted, i.e. they do not trigger an error.

3.6 Internal consistency between tables (identities)

This set of rules relates to identities involving data points in Table A and B, as well as Table D and E.

Rule 16. The rule on the identity of supply and use of energy flows checks that total supply (row totals of Table A) equals to total use (row totals of Table B) for each natural energy input, energy product, energy residual, statistical differences, and their sum.

TSUE (Table A) = TSUE (Table B)

This is an [ERROR] rule. Differences smaller than 0.00001 are accepted, i.e. they do not trigger an error.

Rule 17. The rule on the identity of inputs and outputs of economic activities checks that total supply (column totals in Table A) is equal to total use (column totals in Table B) for each production activity and household activity.

NPR (Table A) = NPR (Table B)

This is an [ERROR] rule. Differences smaller than 0.00001 are accepted, i.e. they do not trigger an error.

Rule 18. The rules on key indicators check that the different vectors of key indicators (Table D) are equal to the sum of respective supplies (Table A) and uses (Table B) of energy flows.

18.a	PEFA_IND01 = N00 (Table B) ; for NACE_R2 = 'A' to 'U' and 'A_U 01-99' Extraction of natural energy inputs by production activities = Use of natural energy inputs by production activities from Table B
18.b	PEFA_IND02 = P00 (Table A) ; for NACE_R2 = 'A' to 'U' and 'A_U 01-99' Domestic production of energy products = Supply of energy products by production activities from Table A
18.c	PEFA_IND03 = P00 (Table B) ; for NACE_R2 = 'A' to 'U' and 'A_U 01-99' Intermediate consumption of energy products = Use of energy products by production activities from Table B
18.d	PEFA_IND04 = P00 (Table B) ; for NACE_R2= 'HH', 'HH_HEAT', 'HH_TRA', 'HH_OTH' Household consumption of energy products = Use of energy products by households from Table B
18.e	PEFA_IND05 = R28 (Table B) + R29 (Table B) ; for 'A' to 'U' and 'A_U 01-99' and 'HH', 'HH_HEAT', 'HH_TRA', 'HH_OTH' Use of waste for energetic purposes = Use of renewable waste + Use of non-renewable waste by production and household activities from Table B
18.f	PEFA_IND06 = R30 (Table A*) + R31 (Table A) ; for 'A' to 'U' and 'A_U 01-99' and 'HH', 'HH_HEAT', 'HH_TRA', 'HH_OTH' and STADIF* Net domestic energy use = Supply of energy losses all kinds of + Supply of energy incorporated in products for non-energy use, by production and household activities and statistical differences*
18.g	PEFA_IND06a = R30 (Table A*) ; for 'A' to 'U' and 'A_U 01-99' and 'HH', 'HH_HEAT', 'HH_TRA', 'HH_OTH' and STADIF* Net domestic energy use for energy purposes = Supply of energy losses all kinds of, by production and household activities and statistical difference *
18.h	PEFA_IND06b = R31 (Table A*) ; for 'A' to 'U' and 'A_U 01-99' and 'HH', 'HH_HEAT', 'HH_TRA', 'HH_OTH' and STADIF* Net domestic energy use for non-energy purposes = Supply of energy incorporated in products for non-energy use, by production and household activities and statistical difference *

13

18.i	PEFA_IND07 = NPR [N00_P00_R00] (Table A) ; for 'A' to 'U' and 'A_U 01-99' and 'HH', 'HH_HEAT', 'HH_TRA', 'HH_OTH', CHINV_PA
	Total energy input/output = Total supply of energy by production and household activities, and accumulation from Table A which is identical with Total use of energy by production and household activities, and accumulation from Table B
18.j	PEFA_IND08 = NPR (Table C) ; for 'A' to 'U' and 'A_U 01-99' and 'HH', 'HH_HEAT', 'HH_TRA', 'HH_OTH' and STADIF
	Emission-relevant use of energy = Total emission-relevant use by production and household activities, and statistical differences from Table C
18.k	PEFA_IND09 = P00:TSUE [P00:NRG_FLOW] (Table B) + NPR:ROW_ACT [N00_P00_R00:ROW_ACT] (Table A)
	Direct energy input (DEI) = Total use of energy products from Table B + Total supply of energy by the rest of the world, i.e. imports from Table A
18.l	PEFA_IND10 = NPR:ENV (Table B) + NPR:ROW_ACT (Table B)
	Direct energy outputs = Total use of energy by the environment + Total use of energy by the rest of the world, i.e. exports from Table B
18.m	PEFA_IND12 = NPR:CHINV_PA (Table B) – NPR:CHINV_PA (Table A) + NPR:STADIF (Table B)
	Net additions to stock (reported) = Use of energy by accumulation (additions to stock) and statistical differences from Table B minus Supply of energy by accumulation (withdrawal from stock from Table A
18.n	PEFA_IND13 = PEFA_IND09 – NPR:ROW_ACT (Table B)
	Domestic energy consumption = Direct energy input (DEI) - Total use of energy by the rest of the world, i.e. exports from Table B
18.o	PEFA_IND14 = NPR:ROW_ACT (Table A)
	Imports of energy products and energy residuals (waste for energetic use) = Total supply of energy by the rest of the world, i.e. imports from Table A
18.p	PEFA_IND14a = P00:ROW_ACT (Table A)
	Imports of energy products = Total supply of energy products from the rest of the world, i.e. imports from Table A
18.q	PEFA_IND14b = R00:ROW_ACT (Table A)
	Imports of energy residuals (waste for energetic use) = Total supply of energy residuals by the rest of the world, i.e. imports from Table A
18.r	PEFA_IND15 = NPR:ENV (Table B)
	Domestic processed output = Total use of energy by the environment from Table B
18.s	PEFA_IND16 = NPR:ROW_ACT (Table B)
	Exports of energy products and residuals = Total use of energy products and residuals by the rest of the world, i.e. exports from Table B

18.t	PEFA_IND17a = NPR:CHINV_PA (Table A)
	Supply of energy residuals from stock = Supply of energy residuals by accumulation (withdrawal from stock) from Table A
18.u	PEFA_IND17b = NPR:CHINV_PA (Table B)
	Additions (use) of energy products and residuals to stocks = Use of energy products and residuals by accumulation (additions to stocks) from Table B
18.y	PEFA_IND18 = NPR:STADIF (Table B)
	Statistical discrepancy between supply and use of energy products and residuals = Total use of energy by statistical discrepancy from Table B

* Note: statistical differences (STADIF) – by convention – are recorded net in the use table B with reversed sign; implying that a supply or surplus of energy is recorded with negative sign in the use table B ('quasi negative use').

This is an [ERROR] rule. Differences smaller than 0.00001 are accepted, i.e. they do not trigger an error.

> **Rule 19.** This rule checks that the total energy use by resident units (Table E) is equal to the row sum of net domestic energy use (Table D).

| EUSE_RES (Table E) = row sum of PEFA_IND06 |
| Energy use by resident units (Table E) = Net domestic energy use (Table D) |

This is an [ERROR] rule. Differences smaller than 0.00001 are accepted, i.e. they do not trigger an error.

3.7 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.

This check refers to Tables A, B, B.1, B.2, C and D.

> **Rule 20.** 'Implausible revisions' are those bigger than 40% if the cell contributes at least 10 % to the respective column total or at least 10% to the respective row total.

Implausible revisions trigger a [WARNING].

3.8 Internal plausibility

These checks verify the internal plausibility of the reported data, which is the plausibility within a reported data set.

> **Rule 21.** Plausibility of the production activity extracting, i.e. using, natural energy inputs: the following table specifies for each natural energy input the most plausible production activities typically extracting the respective natural input.

Natural energy input	Plausible production activities
N01: Fossil non-renewable natural energy inputs	NACE B
N02: Nuclear non-renewable natural energy inputs	NACE B
N03: Hydro based renewable natural energy inputs	NACE D
N04: Wind based renewable natural energy inputs	NACE D
N05: Solar based renewable natural energy inputs	NACE D
N06: Biomass based renewable natural energy inputs	NACE A01, A02, B, D, C20

This is a [WARNING] rule and concerns Tables B and B.1.

> **Rule 22.** Plausibility of the supply and use of nuclear fuel (P22): specifies those economic activities for which supply and use of nuclear fuel is considered plausible.

Subject	Plausible economic activities
Supply of nuclear fuel (P22)	NACE B, Changes in inventories, Imports
Use of nuclear fuel (P22)	NACE D, Changes in inventories, Exports

This is an [WARNING] rule and concerns Tables A, B, B.1, B.2 and C.

> **Rule 23.** The rule on NACE L68A (Imputed rents of owner-occupied dwellings) checks that the supply and use of energy flows reported by NACE L68A should be 0.

L68A = 0

This is an [WARNING] rule. Differences smaller than 0.00001 are accepted, i.e. they do not trigger an error. It concerns Tables A, B, B.1, B.2, and C.

Rule 24.   Plausibility of the statistical differences reported for a certain energy flow (i.e. natural energy inputs, energy products, and energy residuals): For each energy flow, the statistical differences should be below 5% of the total use of the respective energy flow.

STADIF (Tables B, B.2, C) <= 5% of TSUE (Tables B, B.2, C) ;

for N00, N01-N07, P00, P08-P27, R00, R28-R31

This is a [WARNING] rule and concerns Tables B, B.2, and C.

Rule 25.   Plausibility of the statistical differences reported for a certain production and household activity: For each economic activity, the statistical difference should be below 5% of total use energy flow (i.e. natural inputs, products, residuals)[12] of the given economic activity.

STADIF (Tables B, B.2) <= 5% of NPR (Tables B, B.2) ;

for 'A' to 'U' and 'A_U   01-99' and 'HH', 'HH_HEAT', 'HH_TRA', 'HH_OTH'

This is a [WARNING] rule and concerns Tables B and B.2.

Rule 26.   Plausibility of 'total energy use by resident units (domestic energy use) – residence principle': It is implausible that the 'Energy use by resident units' equals the 'Gross inland energy consumption (territory principle)'.

EUSE_TER (Table E) ≠ EUSE_RES (Table E)

This is an [ERROR] rule. Differences smaller than 0.00001 are accepted, i.e. they do not trigger an error. It concerns Table E.

Rule 27.   Plausibility of bridging item 2.3 (Table E): Use of energy products by water transport (NACE H50) reported in Table B must be bigger than or equal to bridging item 2.3 'Energy use by resident units, fuel purchased abroad - water transport'.

P00:H50 (Table B) ≥ EUSE_RES_ABR_WTR (Table E)

This is an [ERROR] rule and concerns Tables B and E.

Rule 28.   Plausibility of bridging item 2.4 (Table E): Use of energy products [P00] by air transport (NACE H51) reported in Table B must be bigger than or equal to

---

[12] which equals to the energy 'turnover' or 'throughput' of the respective economic activity

bridging item 2.4 'Energy use by resident units, fuel purchased abroad - air transport'.

P00:H51 (Table B) ≥ EUSE_RES_ABR_ATR (Table E)

This is an [ERROR] rule and concerns Tables B and E.

Rule 29. Plausibility of net domestic energy use: For each production and household activity (except for NACE C17 Manufacture of paper and paper products and NACE D Electricity, gas, steam and air conditioning supply), the net domestic energy use (Table D) should be higher than or equal to the sum of use of electrical energy (P26) and heat (P27).

PEFA_IND06 (Table D) ≥ P26 (Table B) + P27 (Table B);

for 'A' to 'U' and 'A_U   01-99'except NACE D, and 'HH', 'HH_HEAT', 'HH_TRA', 'HH_OTH'

This is a [WARNING] rule.

Rule 30. Plausibility of transformation losses: The economy-wide transformation losses recorded in Table B.1, data point R30:ENV, should be bigger than 0.

R30:ENV (Table B.1) > 0

This is a [WARNING] rule.

3.9 Plausibility of reported time series (year-on-year changes)

This section presents rules for checking implausible changes between consecutive years in time series for a wide range of characteristics.

Implausible annual change rates are defined in form of thresholds, i.e. maximum annual change rates that are still considered plausible.

Rule 31. An implausible annual change rate triggers a [WARNING] result. 'Implausible annual change rates' are defined below for Tables A, B, B.1, B.2, C, D, and E of the PEFA questionnaire.
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.

Table A: Supply of energy

Energy flow	Economic activity	Threshold, i.e. implausible annual change rate
N00	ENV, TSUE	±30%
P00	A_U 01-99	±30%
P00	C	±30%
P00	D	±30%
P00	ROW_ACT	±30%
R30	A_U 01-99	±30%
R30	TSUE	±30%

Table B: Use of energy

Energy flow	Economic activity	Threshold, i.e. implausible annual change rate
N00	A_U 01-99	±30%
N00	D	±30%
P00	TSUE	±30%
P12	A_U 01-99	±30%
P12	C	±30%
P12	TSUE	±30%
P13	TSUE	±30%
P00	ROW_ACT	±30%
R30	ENV	±30%
R30	TSUE	±30%
NPR	C	±30%
NPR	D	±30%
NPR	ROW_ACT	±30%
N00	TSUE	±30%
P00	TSUE	±30%
R00	TSUE	±30%

Table B.2: End use of energy

Energy flow	Economic activity	Threshold, i.e. implausible annual change rate
P14	H51	±30%
P15	H51	±30%
P17	H50	±30%
P18	H50	±30%
P19	H50	±30%
P14	H49	±30%
P17	H49	±30%
P14	HH_TRA	±30%
P14	HH_TRA	±30%

Table E: bridging items

Bridging item	Threshold, i.e. implausible annual change rate
EUSE_RES_ABR_ATR	±30%
EUSE_TER_NRES_ATR	±30%
EUSE_RES_ABR_FWTR	±30%
EUSE_RES_ABR_WTR	±30%
EUSE_TER_NRES_WTR	±30%
EUSE_RES_ABR_LTR	±30%
EUSE_TER_NRES_LTR	±30%

3.10 External consistency (cross-domain plausibility)

This section is about the consistency of PEFA data vis-a-vis data from other statistical domains.

PEFA vs. Air Emission Accounts (AEA)

Rule 32. Implausible differences between PEFA data and data from Air Emission Accounts (AEA) trigger a [WARNING] result

In order to be able to check coherence between AEA and PEFA, one needs to relate tonnages of emissions to energy flows expressed in terajoules. For the resulting

emission factors – i.e. tonnes of emissions per terajoule of energy use – one may define plausible ranges around IPCC standard emission factors.

PEFA vs. Air Emission Accounts (AEA)	
32.a	If CO_2 (AEA) > 0 then P00 (PEFA Table C) > 0 If CO_2 (AEA) = 0 then P00 (PEFA Table C) = 0 for 'A' to 'U', 'HH', 'HH_HEAT', 'HH_TRA', 'HH_OTH'
32.b	CO_2:H51 (AEA) / P15:H51 (PEFA Table C) = 72 tCO2/TJ +/-40%
32.c	CO_2:H50 (AEA) / (P17:H50 + P18:H50 + P19:H50) (PEFA Table C) = 75 tCO2/TJ +/-40%
32.d	CO_2 + CO2_BIO (AEA) / P00 (PEFA Table C) = annual change rate not beyond +/- 30% ; for 'A' to 'U', 'HH', 'HH_HEAT', 'HH_TRA', 'HH_OTH' This rule is only applied for PEFA data points (combinations of country, year, economic activity) where – for a given year – the emission-relevant use of all energy products (P00) is above a certain threshold – currently this threshold is defined as 5% of the PEFA maximum value for the respective country and year.

PEFA vs. OECD's air transport CO2-emissions

Rule 33. Implausible differences between PEFA data and OECD's air transport CO2-emissions trigger a [WARNING] result

In order to be able to check coherence between data on CO2-emissions of air transport available from OECD[13] and PEFA, one needs to relate tonnages of emissions to energy flows expressed in terajoules. For the resulting emission factors – i.e. tonnes of emissions per terajoule of energy use – one may define plausible ranges around IPCC standard emission factors.

PEFA vs. OECD's air transport	
33.a	CO_2: ((A)+(B)+(D)+(E)+(F)) (OECD) / P15:H51 (Table C) = 72 tCO2/TJ +/-40%
33.b	CO_2: ((B)+(E)+(F)) (OECD) / EUSE_RES_ABR_ATR (Table E) = 72 tCO2/TJ +/-40%
33.c	CO_2: ((C)+(G)) (OECD) / EUSE_TER_NRES_ATR (Table E) = 72 tCO2/TJ +/-40%

---

[13] https://stats.oecd.org/Index.aspx?DataSetCode=AIRTRANS_CO2

PEFA vs. Energy statistics

Rule 34. Implausible differences between PEFA data and Energy statistics trigger a [WARNING] result

The following table describes PEFA data points that are compared to corresponding data points in energy statistics; and specifies for each data point pair plausible ranges for differences.

PEFA vs. Energy statistics	
34.a	N00:A_U (Table B) + R28:TSUE (Table A) + R29:TSUE (Table A) + P22:ROW_ACT (Table A) + P22: CHINV_PA (Table B) = +/-20% PPRD :TOTAL (nrg_bal_c)	The sum of the use of all natural energy inputs by economic activities, the supply of waste, the imports of nuclear fuel and the nuclear fuel obtained from stocks should be close (+/- 20%) to the 'Primary production' as reported by energy statistics (Eurobase table nrg_bal_c).
34.b	P26:A_U (Table A) = +/-20% GEP:TOTAL (nrg_bal_c)	The supply of Electrical energy (P26) by economic activities should be close (+/- 20%) to the 'Gross electricity production' as reported by energy statistics (Eurobase table nrg_bal_c).
34.c	R31:CHINV_PA (Table B) = +/-20% FC_NE :TOTAL (nrg_bal_c)	The changes in stocks (use) of Energy incorporated in products for non-energy use (R31) should be close (+/- 20%) to the 'Final consumption - non-energy use' as reported by energy statistics (Eurobase table nrg_bal_c).
34.d	P00:ROW_ACT (Table A) = +/-20% IMP :TOTAL (nrg_bal_c)	The total imports of energy products should be close (+/- 20%) to the 'Imports' as reported by energy statistics (Eurobase table nrg_bal_c).
34.e	P00:ROW_ACT (Table B) = +/-20% EXP :TOTAL (nrg_bal_c)	The total exports of energy products should be close (+/- 20%) to the 'Exports' as reported by energy statistics (Eurobase table nrg_bal_c).
34.f	EUSE_TER (Table E) = GIC :TOTAL (nrg_bal_c)	The Gross inland consumption (territory principle)should be equal to the 'Gross inland consumption' as reported by energy statistics (Eurobase table nrg_bal_c).

34.g	P00:HH_HEAT (Table C) = +/-40% SFF_P1000_S2000:FC_OTH_HH_E_SH + G3000:FC_OTH_HH_E_SH + O4000:FC_OTH_HH_E_SH + R5110-5150_W6000RI:FC_OTH_HH_E_SH + SFF_P1000_S2000:FC_OTH_HH_E_SC + G3000:FC_OTH_HH_E_SC + O4000:FC_OTH_HH_E_SC + R5110-5150_W6000RI: FC_OTH_HH_E_SC + SFF_P1000_S2000:FC_OTH_HH_E_WH + G3000:FC_OTH_HH_E_WH + O4000:FC_OTH_HH_E_WH + R5110-5150_W6000RI : FC_OTH_HH_E_WH + SFF_P1000_S2000:FC_OTH_HH_E_CK + G3000:FC_OTH_HH_E_CK + O4000:FC_OTH_HH_E_CK + R5110-5150_W6000RI: FC_OTH_HH_E_CK (nrg_d_hhq)	The emission-relevant use of energy products, total (P00) by Heating/cooling activities by households (HH_HEAT) should be close (+/- 40%) to the final energy consumption of households of solid fuels + natural gas + oil and petroleum products + primary solid biofuels for space heating + space cooling + water heating + cooking as reported by the detailed energy statistics on the final energy consumption of households (Eurobase table nrg_d_hhq).
34.h	P00:HH_OTH (Table C) = +/-40% * SFF_P1000_S2000:FC_OTH_HH_E_LE + G3000:FC_OTH_HH_E_LE + O4000:FC_OTH_HH_E_LE + SFF_P1000_S2000:FC_OTH_HH_E_OE + G3000:FC_OTH_HH_E_OE + O4000:FC_OTH_HH_E_OE (nrg_d_hhq)	The emission-relevant use of energy products, total (P00) by Other activities by households (HH_OTH) should be close (+/- 40%) to the final energy consumption of households of solid fuels + natural gas + oil and petroleum products + primary solid biofuels for lighting and electrical appliances + other end use as reported by the detailed energy statistics on the final energy consumption of households (Eurobase table nrg_d_hhq).
34.i	P00:HH_HEAT (Table B) = +/-40% TOTAL:FC_OTH_HH_E_SH + TOTAL:FC_OTH_HH_E_SC + TOTAL:FC_OTH_HH_E_WH + + TOTAL:FC_OTH_HH_E_CK (nrg_d_hhq)	The use of energy products, total (P00) by Heating/cooling activities by households (HH_HEAT) should be close (+/- 40%) to the final energy consumption of households of all products for space heating + space cooling + water heating + cooking as reported by the detailed energy statistics on the final energy consumption of households (Eurobase table nrg_d_hhq).
34.j	P00:HH_OTH (Table B) = +/-40% TOTAL:	The use of energy products, total

	FC_OTH_HH_E_LE + TOTAL: FC_OTH_HH_E_OE (nrg_d_hhq)	(P00) by Other activities by households (HH_OTH) should be close (+/- 40%) to the final energy consumption of households of all products for lighting and electrical appliances + other end use as reported by the detailed energy statistics on the final energy consumption of households (Eurobase table nrg_d_hhq).
34.k	TER_NRES_WTR (Table E) > 0 if FC_TRA_DNAVI_E (nrg_bal_c) > 0	PEFA bridging item 3.2 (Energy use by non-resident units, fuel purchased on the territory – water transport) should be greater than zero for countries[14] where domestic navigation exists, i.e. energy statistics (Eurobase table nrg_bal_c) report *Final consumption - transport sector - domestic navigation - energy use* (code: FC_TRA_DNAVI_E) greater than zero.
34.l	TER_NRES_WTR (Table E) ≤ FC_TRA_DNAVI_E (nrg_bal_c)	PEFA bridging item 3.2 (Energy use by non-resident units, fuel purchased on the territory – water transport) should be smaller than or equal to energy statistics' (Eurobase table nrg_bal_c) *Final consumption - transport sector - domestic navigation - energy use* (code: FC_TRA_DNAVI_E).

* The rule is applied only in case the share of P00:HH_OTH is higher than 1% in total use.

PEFA vs. Economy-wide Material Flow Accounts (EW-MFA)

Rule 35. Implausible differences between PEFA data and Economy-wide Material Flow Accounts (EW-MFA) trigger a [WARNING] result

---

[14] Energy statistics of following countries do not report any final consumption for domestic navigation: Slovakia, Slovenia, Bosnia and Herzegovina, Montenegro, North Macedonia, and Kosovo.

The following table describes PEFA data points that are compared to corresponding data points in economy-wide material flow accounts (EW-MFA); and specifies for each data point pair plausible ranges for differences.

PEFA vs. Economy-wide Material Flow Accounts (EW-MFA)	
N01:A_U (Table B.1) = +/-20% MF411:DE + MF412:DE + MF413:DE + MF414:DE + MF421:DE + MF422:DE	the transformation use of fossil non-renewable natural energy inputs should be close (+/- 20%) to the domestic extraction of Lignite + Hard coal + Oil shale and tar sands + Peat* + Crude oil, condensate and NGL + Natural gas as reported by the Economy-wide Material Flow Accounts (Eurobase table env_ac_mfa).

* Note: Peat for non-energy purposes is included in EW-MFA while excluded in PEFA. Hence, this cross-domain plausibility check does not work in countries with significant peat extractions used for non-energy purposes.

PEFA vs. ESA supply table

Rule 36. Implausible differences between PEFA data and ESA supply table trigger a [WARNING] result

The following table describes PEFA data points that are compared to corresponding data points in ESA supply tables[15]; and specifies for each data point pair plausible ranges for differences. The volatility of energy prices may significantly limit the comparison of physical and monetary data. Hence, the following cross-domain plausibility checks need to be carefully tested and reviewed.

PEFA VS. MONETARY SUPPLY TABLE		
36.a	If CPA_D (naio_10_cp15) > 0 then P26 (Table A) > 0 for 'A' to 'U', 'HH', 'HH_HEAT', 'HH_TRA', 'HH_OTH' If CPA_D (naio_10_cp15) = 0 or not available then P26 (Table A) = 0 for 'A' to 'U', 'HH', 'HH_HEAT', 'HH_TRA', 'HH_OTH'	data on supply of 'Electrical energy' (P26) by a certain economic/household activity can be higher than 0 only in case when the data reported on the supply of product group 'Electricity, gas, steam and air conditioning' by the same economic/household activity are higher than 0 as reported in the monetary supply dataset (Eurobase table naio_10_cp15).
36.b	If TOTAL (naio_10_cp15) > 0 then P00 (Table A) > 0	data on total supply by a certain economic/household activity can be higher

	for A' to 'U', 'HH', 'HH_HEAT', 'HH_TRA', 'HH_OTH' If TOTAL (naio_10_cp15) = 0 or not available then P00 (Table A) = 0 for 'A' to 'U', 'HH', 'HH_HEAT', 'HH_TRA', 'HH_OTH'	than 0 only in case when the data reported on the supply of all products, total by the same economic/household activity are higher than 0 as reported in the monetary supply dataset (Eurobase table naio_10_cp15).
36.c	P00 (Table A) / CPA_B+CPA_C19+CPA_C20+CPA_D (naio_10_cp15) = +/- 30% between each consecutive year for 'B', 'C19', 'C20', 'C21', 'D' *	The ratio calculated by relating the supply of energy products, total (P00) by Mining and quarrying (B), Manufacture of coke and refined petroleum products (C19), Manufacture of chemicals and chemical products (C20) and Electricity, gas, steam and air conditioning supply (D) to the monetary supply of the sum of product groups Mining and quarrying (CPA_B), Coke and refined petroleum products (CPA_C19), Chemicals and chemical products (CPA_C20) and Electricity, gas, steam and air conditioning (CPA_D) by the respective NACE sector should vary not more than 30% between consecutive years.
36.d	P00 (Table B) / TOTAL (naio_10_cp15) = +/- 30% between each consecutive year for 'A' to 'U', 'HH', 'HH_HEAT', 'HH_TRA', 'HH_OTH' *	The ratio calculated by relating the use of energy products (P00) by each economic and household activity to the monetary supply of product groups, total by the respective NACE sector should vary not more than 30% between consecutive years.
36.e	P00 (Table B) / CPA_B+CPA_C19+CPA_C20+CPA_D (naio_10_cp16) = +/- 30% between each consecutive year for 'A' to 'U', 'HH', 'HH_HEAT', 'HH_TRA', 'HH_OTH' *	The ratio calculated by relating the use of energy products (P00) by each economic and household activity to the monetary supply of the sum of product groups Mining and quarrying (CPA_B), Coke and refined petroleum products (CPA_C19), Chemicals and chemical products (CPA_C20) and Electricity, gas, steam and air conditioning (CPA_D) by the respective NACE sector should vary not more than 30% between consecutive years.

* This rule is only applied for PEFA data points (combinations of country, year, economic activity) where – for a given year – the supply of all energy products (P00) is above a certain threshold – currently this threshold is defined as 5% of the maximum value for the respective country and year, which is most often the value reported for NACE D35

26

PEFA vs. transport statistics

new

Rule 37. Implausible differences between PEFA data and transport statistics trigger a [WARNING] result

The following table describes PEFA data points that are compared to corresponding data points in transport statistics (Eurobase data set **iww_go_anave**).

PEFA VS. TRANSPORT STATISTICS	
37.a	PEFA bridging item 2.3 'Energy use by resident units, fuel purchased abroad - water transport' should be greater than zero if transport statistics [iww_go_anave] indicate respective transport activity by resident vessels abroad.
37.b	PEFA bridging item 3.2 'Energy use by non-resident units (only if included in gross inland energy consumption), fuel purchased on the territory - water transport' should be greater than zero if transport statistics [iww_go_anave] indicate inland waterway transport activity by non-resident vessels in the reporting country.

ANNEXES – code lists employed by PEFA

NACE_R2: economic activities

This code list is employed for the classification of columns in PEFA questionnaire tables A, B, B.1, B.2, C, and D.

PEFA questionnaire	Eurobase	
code	code	label
A_U 01-99	A_U	Total NACE industries
A	A	Agriculture, forestry and fishing
A01	A01	Crop and animal production, hunting and related service activities
A02	A02	Forestry and logging
A03	A03	Fishing and aquaculture
B	B	Mining and quarrying
C	C	Manufacturing
C10-C12	C10-C12	Manufacture of food products, beverages and tobacco products
C13-C15	C13-C15	Manufacture of textiles, wearing apparel and leather products
C16	C16	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
C17	C17	Manufacture of paper and paper products
C18	C18	Printing and reproduction of recorded media
C19	C19	Manufacture of coke and refined petroleum products
C20	C20	Manufacture of chemicals and chemical products
C21	C21	Manufacture of basic pharmaceutical products and pharmaceutical preparations
C22	C22	Manufacture of rubber and plastic products
C23	C23	Manufacture of other non-metallic mineral products
C24	C24	Manufacture of basic metals
C25	C25	Manufacture of fabricated metal products, except machinery and equipment
C26	C26	Manufacture of computer, electronic and optical products
C27	C27	Manufacture of electrical equipment
C28	C28	Manufacture of machinery and equipment n.e.c.
C29	C29	Manufacture of motor vehicles, trailers and semi-trailers
C30	C30	Manufacture of other transport equipment
C31_C32	C31_C32	Manufacture of furniture; other manufacturing
C33	C33	Repair and installation of machinery and equipment

PEFA questionnaire	Eurobase	
code	code	label
D	D	Electricity, gas, steam and air conditioning supply
E	E	Water supply; sewerage, waste management and remediation activities
E36	E36	Water collection, treatment and supply
E37-E39	E37-E39	Sewerage, waste management, remediation activities
F	F	Construction
G	G	Wholesale and retail trade; repair of motor vehicles and motorcycles
G45	G45	Wholesale and retail trade and repair of motor vehicles and motorcycles
G46	G46	Wholesale trade, except of motor vehicles and motorcycles
G47	G47	Retail trade, except of motor vehicles and motorcycles
H	H	Transportation and storage
H49	H49	Land transport and transport via pipelines
H50	H50	Water transport
H51	H51	Air transport
H52	H52	Warehousing and support activities for transportation
H53	H53	Postal and courier activities
I	I	Accommodation and food service activities
J	J	Information and communication
J58	J58	Publishing activities
J59_J60	J59_J60	Motion picture, video, television programme production; programming and broadcasting activities
J61	J61	Telecommunications
J62_J63	J62_J63	Computer programming, consultancy, and information service activities
K	K	Financial and insurance activities
K64	K64	Financial service activities, except insurance and pension funding
K65	K65	Insurance, reinsurance and pension funding, except compulsory social security
K66	K66	Activities auxiliary to financial services and insurance activities
L	L	Real estate activities
L68A	L68A	Of which: Imputed rents of owner-occupied dwellings
M	M	Professional, scientific and technical activities
M69_M70	M69_M70	Legal and accounting activities; activities of head offices; management consultancy activities
M71	M71	Architectural and engineering activities; technical testing and analysis
M72	M72	Scientific research and development

PEFA questionnaire	Eurobase	
code	code	label
M73	M73	Advertising and market research
M74_M75	M74_M75	Other professional, scientific and technical activities; veterinary activities
N	N	Administrative and support service activities
N77	N77	Rental and leasing activities
N78	N78	Employment activities
N79	N79	Travel agency, tour operator reservation service and related activities
N80-N82	N80-N82	Security and investigation, service and landscape, office administrative and support activities
O	O	Public administration and defence; compulsory social security
P	P	Education
Q	Q	Human health and social work activities
Q86	Q86	Human health activities
Q87_Q88	Q87_Q88	Residential care activities and social work activities without accommodation
R	R	Arts, entertainment and recreation
R90-R92	R90-R92	Creative, arts and entertainment activities; libraries, archives, museums and other cultural activities; gambling and betting activities
R93	R93	Sports activities and amusement and recreation activities
S	S	Other service activities
S94	S94	Activities of membership organisations
S95	S95	Repair of computers and personal and household goods
S96	S96	Other personal service activities
T	T	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use
U	U	Activities of extraterritorial organisations and bodies
HH	HH	Total activities by households
HH_HEAT	HH_HEAT	Heating/cooling activities by households
HH_TRA	HH_TRA	Transport activities by households
HH_OTH	HH_OTH	Other activities by households
CHINV_PA	CH_INV_PA	Changes in inventories and produced assets
STADIF	SD_SU	Statistical discrepancy between supply and use of energy for total activities
ROW_ACT	ROW_ACT	Economic activities of the rest of the world
ENV	ENV	Environment
TSUE	NRG_FLOW	Energy flows over all activities

PROD_NRG: energy flows (natural energy inputs, energy products, energy residuals)

This code list is employed for the classification of rows in PEFA questionnaire tables A, B, B.1, B.2, and C.

PEFA questionnaire	Eurobase	
code	code	label
N00	N00	Natural energy inputs
N01	N01	Fossil non-renewable natural energy inputs
N02	N02	Nuclear non-renewable natural energy inputs
N03	N03	Hydro based renewable natural energy inputs
N04	N04	Wind based renewable natural energy inputs
N05	N05	Solar based renewable natural energy inputs
N06	N06	Biomass based renewable natural energy inputs
N07	N07	Other renewable natural energy inputs
P00	P00	Energy products
P08	P08	Hard coal
P09	P09	Brown coal and peat
P10	P10	Derived gases (= manufactured gases excl. biogas)
P11	P11	Secondary coal products (coke, coal tar, patent fuel, BKB and peat products)
P12	P12	Crude oil, NGL, and other hydrocarbons (excl. bio)
P13	P13	Natural gas (without bio)
P14	P14	Motor spirit (without bio)
P15	P15	Kerosenes and jet fuels (without bio)
P16	P16	Naphtha
P17	P17	Transport diesel (without bio)
P18	P18	Heating and other gasoil (without bio)
P19	P19	Residual fuel oil
P20	P20	Refinery gas, ethane and LPG
P21	P21	Other petroleum products incl. additives/oxygenates and refinery feedstocks
P22	P22	Nuclear fuel
P23	P23	Wood, wood waste and other solid biomass, charcoal
P24	P24	Liquid biofuels

PEFA questionnaire	Eurobase	
code	code	label
P25	P25	Biogas
P26	P26	Electrical energy
P27	P27	Heat
R00	R00	Energy residuals
R28	R28	Renewable waste
R29	R29	Non-renewable waste
R30	R30	Energy losses all kinds of (during extraction, distribution, storage and transformation, and dissipative heat from end use)
R31	R31	Energy incorporated in products for non-energy use
STADIF	SD_IO	Statistical discrepancy between input and output of all energy flows
NPR	N00_P00_R00	Natural energy inputs, energy products and energy residuals
P00w	EPRD_OUSE	Energy products for own use

INDIC_PEFA: key indicators

This code list is employed for the classification of rows in PEFA questionnaire table D.

PEFA questionnaire		Eurobase	
code	label	code	label
PEFA_IND01	Extraction of natural energy inputs by economic activities	NEI_EXT	Extraction of natural energy inputs
PEFA_IND02	Domestic production of energy products	EPRD_DOM	Domestic production of energy products
PEFA_IND03	Intermediate consumption of energy products	EPRD_ICNS	Intermediate consumption of energy products
PEFA_IND04	Household consumption of energy products	EPRD_HHCNS	Household consumption of energy products
PEFA_IND05	Use of waste for energetic purposes	WST_USE	Use of waste for energetic purposes
PEFA_IND06	Net domestic energy use	NETDOM_EUSE	Net domestic energy use
PEFA_IND06a	Net domestic energy use for energy purposes	NETDOM_EUSE_EP	Net domestic energy use for energy purposes
PEFA_IND06b	Net domestic energy use for non-energy purposes	NETDOM_EUSE_NEP	Net domestic energy use for non-energy purposes
PEFA_IND07	Total energy input/output	NRG_INP_OUT	Energy input and output

PEFA questionnaire		Eurobase	
code	label	code	label
PEFA_IND08	Emission-relevant use of energy		
PEFA_IND09	Direct energy input (DEI)		
PEFA_IND10	Direct energy outputs		
PEFA_IND11	Net additions to stock (calculated)		
PEFA_IND12	Net additions to stock (reported)		
PEFA_IND13	Domestic energy consumption		
PEFA_IND14	Imports of energy products and energy residuals (waste for energetic use)		
PEFA_IND14a	Imports of energy products		
PEFA_IND14b	Imports of energy residuals (waste for energetic use)		
PEFA_IND15	Domestic processed output		
PEFA_IND16	Exports of energy products and residuals		
PEFA_IND17	Net changes (use minus supply) of energy products and residuals in inventories and produced assets		
PEFA_IND17a	Supply of energy residuals from stock		
PEFA_IND17b	Additions (use) of energy products and residuals to stocks		
PEFA_IND18	Statistical discrepancy between supply and use of energy products and residuals		

INDIC_PEFA: bridging items

This code list is employed for the classification of rows in PEFA questionnaire E.

PEFA questionnaire		Eurobase	
code	label	code	label
DEU_RES	Total energy use by resident units (domestic energy use) - residence principle	EUSE_RES	Energy use by resident units
TOT_NRA	Energy use by resident units abroad	EUSE_RES_ABR	Energy use by resident units, fuel purchased abroad - total
NRA_FISH	National fishing vessels operating abroad	EUSE_RES_ABR_FWTR	Energy use by resident units, fuel purchased abroad - fishing vessels

PEFA questionnaire		Eurobase	
code	label	code	label
NRA_LAND	Land transport operated by resident units abroad	EUSE_RES_ABR_LTR	Energy use by resident units, fuel purchased abroad - land transport
NRA_WATER	International water transport undertaken by resident units	EUSE_RES_ABR_WTR	Energy use by resident units, fuel purchased abroad - water transport
NRA_AIR	International air transport operated by resident units	EUSE_RES_ABR_ATR	Energy use by resident units, fuel purchased abroad - air transport
TOT_NRES	Energy use by non-residents on the territory	EUSE_TER_NRES	Energy use by non-resident units (only if included in gross inland energy consumption), fuel purchased on the territory - total
NRES_LAND	Land transport operated by non-residents on the territory	EUSE_TER_NRES_LTR	Energy use by non-resident units (only if included in gross inland energy consumption), fuel purchased on the territory - land transport
NRES_WATER	Water transport operated by non-residents on the territory	EUSE_TER_NRES_WTR	Energy use by non-resident units (only if included in gross inland energy consumption), fuel purchased on the territory - water transport
NRES_AIR	Air transport operated by non-residents on the territory	EUSE_TER_NRES_ATR	Energy use by non-resident units (only if included in gross inland energy consumption), fuel purchased on the territory - air transport
ADJ_OTH	Other adjustments and statistical discrepancies	ADJ_SD	Other adjustments and statistical differences
ADJ_DSP_DNRGXINRG	Energy flows not reported in energy statistics but included in PEFA (bridging item 1)	ADJ_SD_DUXGIC	Other adjustments and statistical differences - energy flows included in energy use by resident units (net domestic energy use) while excluded in gross inland energy consumption
GIEC_TER	Gross inland consumption - territory principle	EUSE_TER	Gross inland energy consumption (territory principle)