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Physical Energy Flow Accounts

Belgian methodology

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Methodological notes

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Abstract - This paper presents the sources used and methodologies proposed to create the Physical Energy Flow Accounts for Belgium, which cover the years 2008-2017 and are due 30 September 2019. This reporting is done to comply with Regulation No. 538/2014 of the European Commission.

Jel Classification - C80, Q40, Q56
Keywords – Environmental economic accounts, Physical Energy Flow Accounts

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1. Introduction

Physical energy flow accounts (PEFA) display energy flows in physical terms from the environment into the economy (extraction of natural inputs), within the economy (manufacture and use of energy products) and from the economy to the environment (discharge of energy residuals)[1]. Since the PEFA are fully compatible with the System of National Accounts (SNA), residential energy flows can be broken down by economic activity. What is more, the PEFA show how these economic activities are related to the environment, on the one hand as provider of resources contributing to the economy, and on the other hand as recipient of residuals.

Regulation (EU) No. 691/2011 of the European Parliament and of the Council of 6 July 2011 on European environmental economic accounts, amended by Regulation (EU) No. 538/2014 of the European Parliament and of the Council of 16 April 2014[2], requires all EU Member States to yearly report the PEFA as of 2017. The accounts complement energy statistics with data respecting the residence principle. PEFA are designed in relation to the System of Environmental Economic Accounting (SEEA) and provide coherent and extensive information to support EU policy priorities on green growth and resource efficiency.

This report explains the data sources and methodology used to construct the PEFA for Belgium. The methodology is in line with the Eurostat PEFA Manual.

Three generic types of physical flows must be reported: natural inputs (from the environment into the economy), energy products (within the economy) and energy residuals (from the economy to the environment). A distinction between inputs, products and residuals can be made based on the SNA framework. The PEFA further indicate the origin and destination of each energy flow. The origin or destination of an energy flow is either production, consumption, accumulation, the rest of the world or the environment.

PEFA comprise a set of five obligatory tables. The core of the PEFA consists of physical supply and use tables (PSUT) to record physical energy flows, within the economy and between the economy and the environment. The PSUT respect the most important characteristic of monetary supply and use tables (SUT), which is the supply-use identity. This means that for each flow type, the total supply equals the total use[3]. All the energy flows are measured in physical units. Table 1 gives an overview of the five tables required by Eurostat.

Table A: Physical supply table for energy flows

Table A describes the origin of all energy flows. It shows five source categories: the environment, industries, households, the rest of the world and accumulation. The energy flows are delivered by the environment as natural inputs, or by the residents (industries, households, accumulation) and the rest of the world to other economic agents as energy products, or sent back to the environment as residuals.

1 As defined by Regulation (EU) No. 538/2014 of the European Parliament and of the Council of 16 April 2014.
2 http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0538&from=EN
3 PEFA Manual

Table 1 The PEFA tables

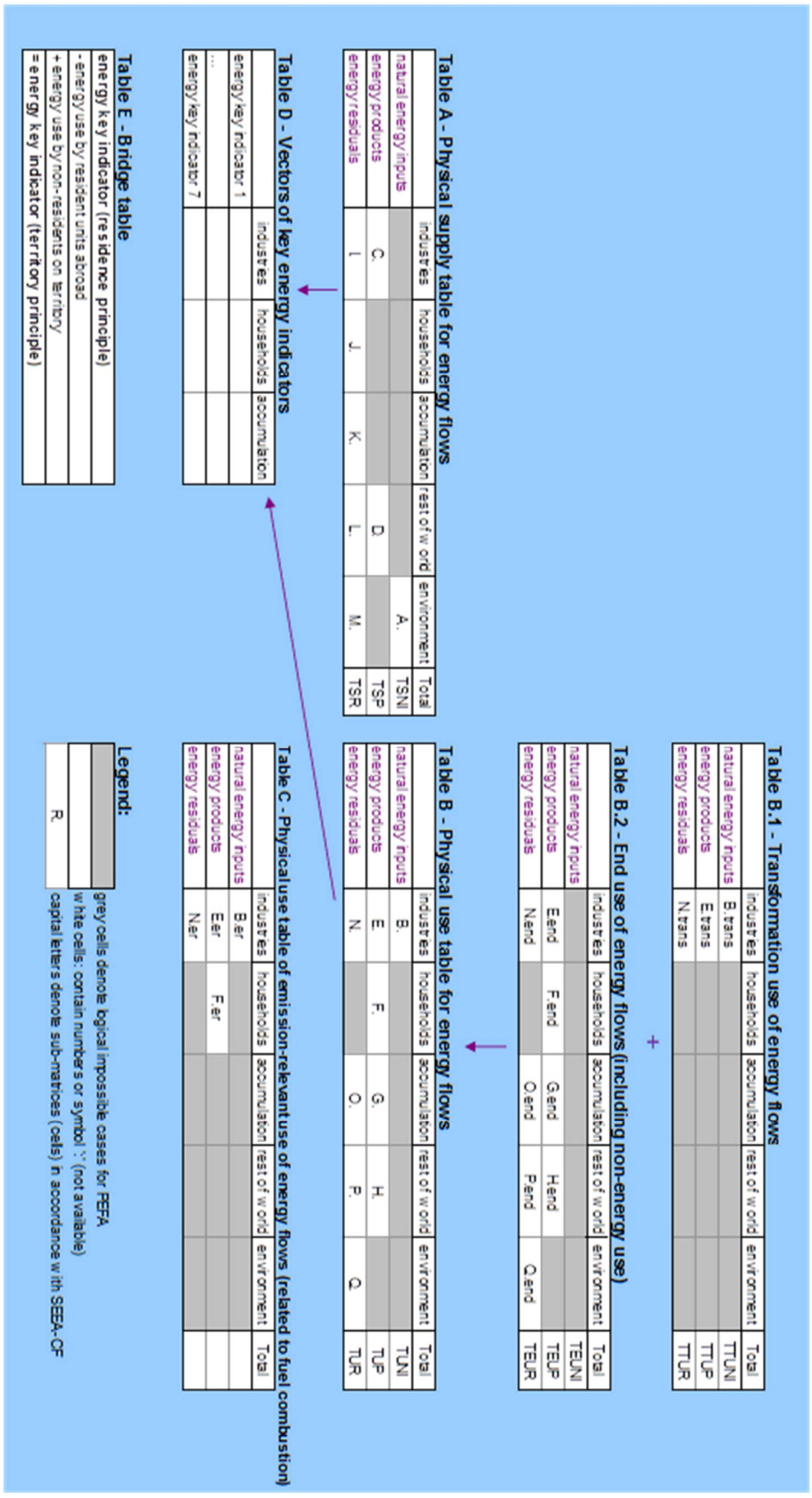

Table B: Physical use table for energy flows

The physical use table for energy flows shows the destinations of the different flows. The destinations consist of five user categories[4]. It shows the users or receivers of all energy flows.

Hence, each flow is reported twice: first at its origin, secondly at its destination.

Table C: Physical use table of emission-relevant use of energy flows

This table shows which energy flows recorded in the use table generate emissions. Table C is a sub-layer of table B.

Table D: Vectors of key energy indicators

Table D calculates seven key indicators derived from the tables A and B. It gives specific information on – among others – the totals of certain economic activities for specific types of energy flows. The purpose of this table is to give a quick overview of the main PEFA characteristics of each country.

Table E: Bridge table

One of the main issues in creating the PEFA is to overcome the difference in scope between the energy statistics, which are territory based, and the national accounts following the residence principle. The regional energy balances, which are the basic data source for the Belgian PEFA, include all energy uses on the regional territories, regardless of whether the process is related to the Belgian economy or not. According to the residence principle, the defining factor is not the territory but the residence of the economic activity, which in this case is the economic activity that uses the energy flow. That is why – to correspond to the NA – data from the energy statistics have to be adjusted to this residence principle.

Table E reconciles the residence principle with the territory principle. It depicts the main adjustments done to the key indicator of the residence principle to obtain the key indicator of the territory principle. It starts from the domestic energy use by resident units, deducting all energy uses related to activities carried out by national residents abroad and adding those by non-residents on the territory. By subsequently correcting (adding or deducting) the other adjustments or statistical discrepancies, the gross inland energy consumption can be calculated.

[4] These user categories are the same as the source categories in the supply table.

2. Sources

The PEFA are built on three data sets. The first concerns energy data, the second economic data, and the third transport data. Each data set is described in the following subsections.

2.1. Energy data

The main sources for the Belgian PEFA are the regional energy balances provided by the three regions and the annual energy questionnaires reported to Eurostat and the International Energy Agency.

2.1.1. Regional energy balances

The PEFA tables are largely based on the regional energy balances. Since the regionalisation of energy and environment competences, the regions have built their own energy balance. The energy balances are published by the Vlaams Energieagentschap for Flanders[5], by the Service Public de Wallonie (SPW) for the Walloon Region[6] and by Leefmilieu Brussel / Bruxelles Environnement (LB/BE) for the Brussels-Capital Region[7]. The energy balances display energy flows within a certain territory and energy consumption by processes rather than by economic activity.

2.1.2. Annual energy questionnaires

Regulation (EC) No 1099/2008 on energy statistics[8] requires all Members States to report five annual questionnaires (AQ). The "Energy Observatory" of the FPS Economy reports those five AQ for Belgium to Eurostat, the International Energy Agency and the United Nations Economic Commission for Europe. They display data about the supply, generation, transformation and consumption of all major energy sources: oil, natural gas, electricity and heat, solid fuels and renewables.

2.1.3. Choice of principal energy sources

We choose to rely on the regional energy balances as the major source of data to compile the PEFA while Eurostat suggests a methodology based on the five AQ. Normally both sources should be identical, but due to different approaches, this is not always the case.

There are three reasons why we choose the regional energy balances. First of all, the regional energy balances give more details on the activity processes[9] compared to the AQ. Secondly, the regional balances are closely related to the regional air emissions inventories, which are used to construct the Air

5 https://emis.vito.be/nl/rapporten-energiebalans-vlaanderen

6 https://energie.wallonie.be/fr/bilans-energetiques-wallons.html?IDC=6288

7 https://leefmilieu.brussels/synthese-2015-2016/energie

8 Annex B of Regulation (EC) No 1099/2008 of 22 October 2008 on energy statistics

9 The activity process refers to the different phases in which energy products are used. In the regional energy balances, the energy flows evolve stepwise from production and imports, into transformation, to consumption and losses. These steps correspond to the notion of process we use in this report.

Emissions Accounts. In order to maintain the consistency in our environmental accounts we thus use these balances. Finally, we opt for these balances because regional data allow us to report regional PEFA.

2.2. Economic data

In this subsection, the economic data sources used for the creation of the PEFA are listed.

2.2.1. National accounts

a. Supply and use tables

Every five years (2010, 2015,…) a complete set of SUT is constructed by the National Bank of Belgium (NBB) and the Federal Planning Bureau (FPB). For the intermittent years the NBB calculates SUT on the basis of industry and product totals and the product by industry framework of the most recently available complete set of SUT. The use of some energy products in transport activities are taken from the intermediate use sub-matrix[10] in basis prices. The latter implies that the use of goods and services is expressed in prices without taxes and subsidies on products and without trade and transport margins.

b. Excise duties on fuels

Data on excise duties on diesel and gasoline (including biodiesel and biogasoline) are taken from the use table of excise duties built by the FPB. It shows the level of excises paid on petroleum products used for road transport per economic activity. It offers a distribution key to allocate diesel and gasoline consumption for road transport to the responsible industry.

c. Household Budget Survey

Fuel expenditures on diesel and gasoline by households are taken from the household budget survey (HBS). It offers a distribution key to allocate diesel and gasoline consumption for road transport between industries and households for two of the three vehicle categories.

2.2.2. Regional accounts

a. Value added

Gross value added data (B1.g) in basic current prices for each economic activity are published for the three regions in the Regional Accounts.

b. Employment

The Regional Accounts also provide total employment figures (employers and self-employed) per economic activity for the regions.

[10] Products by industry.

c. Disposable income

Regional disposable income (B6.n) is used when national aggregates on households need to be regionalised.

2.3. Transport data

2.3.1. Road transport

Four specific data sources for road transport are identified. Moreover, excise duties derived from the SUT and the household budget survey play a leading role in the allocation of road transport to different NACEs and households.

a. Road transport model COPERT

The specific road transport model named COPERT 5[11] calculates the fuel used on the territory of the three regions, without distinguishing between transport conducted by industries or households. The COPERT output used for the PEFA is the fuel consumption in Terajoules of six different fuel types by four types of vehicles. Data on the mopeds and motorcycles are added to data on passenger cars and are treated together in the calculations because motorcycles are not isolated in the vehicle kilometre balances.

b. Vehicle kilometre balance

Each year, the Ministry of Mobility calculates a vehicle kilometre balance. Based on this balance, two adjustment ratios can be calculated with respect to the total kilometres driven on the Belgian territory. The first ratio is the percentage of the total kilometres driven by foreign vehicles on the Belgian territory, the second the percentage of the total kilometres driven by the Belgian residential vehicles on foreign territory.

c. Vehicle ownership register

The vehicle ownership register provided by the vehicle registry office contains all vehicles registered in Belgium by type of vehicle and by owner. The owner of a vehicle is either a registered enterprise, for which the economic classification by NACE is given, or an individual owner.

d. Total fuel consumption

The total fuel consumption in litres for diesel and gasoline given by FEBIAC based on data from the SPF Economy.

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[11] The COPERT 5 methodology is part of the EMEP/EEA air pollutant emission inventory guidebook for the calculation of air pollutant emissions and is consistent with the 2006 IPCC Guidelines for the calculation of greenhouse gas emissions. The development of COPERT is coordinated by the European Environment Agency (EEA), in the framework of the activities of the European Topic Centre for Air Pollution and Climate Change Mitigation. The European Commission's Joint Research Centre manages the scientific development of the model.

2.3.2. Air transport

The data for air transport from the energy balances correspond to the fuel sold on regional territories. Alternative sources are selected to estimate residential air transport energy use of gasoline and kerosene. For the military use of aviation gasoline and kerosene (NACE 84), we receive data from the Ministry of Defence. For civil aviation, we developed a new method in 2019 based on data from the intermediate use table for the Belgian air transport companies (the use of product 19A04 by NACE 51) and data on the share of fuel consumption in total intermediate use of Air France for the period 2003-2018. The table of annual kerosene prices on the European market edited by Thomson Reuters is used to transform the monetary data into physical data.

2.3.3. Water transport

a. Inland waterways transport

The database "Transport by nationality of vessel", published by Eurostat, measures the inland waterways transport of goods in tonne-kilometres. It allows to filter out the tonne-kilometres performed by Belgian and foreign ships on the Belgian territory and by Belgian ships abroad. Based on these data, we calculate the ratios needed to adjust energy consumption for inland waterways transport to the residence principle.

b. Sea transport

Monetary use of all oil products (SUT product code 19A) for the maritime industry is used. We no longer use the consumption data that are available on the 6-digit CPA level for heavy fuel oil (19A05) and diesel (19A06). The Belgian oil balance submitted to the International Energy Agency is used to distinguish between these two oil products. In order to transform the monetary data into physical data a table on yearly average fuel prices is used. The table of average prices of these fuels for maritime transport is made by the FPS Economy.

3. Methodology

The methodology to build the PEFA is separated into two major steps. First, we build the PEFA for each region. Second, we compile the national Belgian PEFA on the basis of these three regional PEFA.

The starting point to build regional PEFA are the energy balances built by each region. These balances contain data that are linked to the supply and use sides of the PEFA. Some adaptations allow us to allocate all energy uses and processes to NACE industries and households. The transport data are treated separately in order to adapt the regional data based on the territory principle to the residence principle. These steps generate the three regional PEFA and are further explained in subsection 3.1.

The second part consists of integrating the regional PEFA into the national PEFA which is described in subsection 3.2. To obtain the Belgian domestic tables A and B, the regional PEFA are added up. The three other tables are calculated using tables A and B and allow us to create a time series of PEFA questionnaires.

3.1. Regional PEFA

In this part, we describe the methodological process of how the regional energy balances are turned into the three regional PEFA (only tables A and B). Due to differing regional characteristics, the reporting of the energy products and processes differs from region to region. This also influences the methodology used by each region to record their energy balance. Therefore, the compilation rules vary slightly per region. In what follows, we present the common compilation rules without going into the specifics for each region.

First, the regional tables A and B are compiled.

3.1.1. Table A: supply side

As mentioned before, table A describes the origin of all energy flows[12]. In the regional energy balances, we first record all flows of renewable natural energy inputs coming from the environment as energy inputs. Secondly, energy products are either provided by some particular industries or imported from the rest of the world. We identify several processes that are linked to the supply side. Primary production is allocated to the extracting or producing industries (solid biomass to NACE 01, wood to NACE 02, coal to NACE 05_09, black liquor to NACE 17, naphtha and liquid biofuels to NACE 20). Recuperation of certain energy products is allocated to the industry related to the product (wood to NACE 17, coke oven products to NACE 19 and electricity and heat to NACE 35). Transformation outputs are allocated to the major transformative industries NACE 19, 24, 35, 37_39 but also a variety of NACE industries in which autoproducers are active. Finally, the energy residuals return from the economy to the environment as waste or losses of all kinds.

[12] Table 1 on page 2 provides a good overview of the origins of the three generic energy flows.

3.1.2. Table B: use side

The use side table records the energy flows by destination. Two sub-layers were added to Table B (B.1 and B.2) in the 2016-version of the PEFA Questionnaire, one showing the transformation use of energy flows, and one showing the end use. To construct these tables, it is necessary to identify which processes refer to which industries in the regional energy balances, which also include this distinction between transformation use and end use of energy flows. Hereafter, we go through the principal categories of processes and give some explanation on how we allocate the amounts to economic activities and households.

a. Table B.1 : Transformation use of energy flows

Transformation use denotes the input into those transformation processes where part or all of the energy content of the entering natural input/product/residual is moved to at least one energy product leaving the process. The transformation use by the main activity producers is mainly linked to a few NACE industries. The high level of detail in the energy balances allows us to directly relate this kind of use to NACE 19, NACE 24, NACE 35 and NACE 37_39. A smaller part of transformation use is processed by autoproducers which are associated to a variety of economic activities. To fulfil the International Recommendations for Energy Statistics, a large work of structuration on regional data of those autoproducers was necessary. We needed to achieve the distinction between two major flows. On the one hand, input flows used for the generation of electricity for own use or for sale and the generation of heat for sale are considered as transformation inputs, part of the energy production. On the other hand, input flows transformed into heat for own use are considered as final consumption of the inputs, and thus have to be reported in table B.2.

b. Table B.2 : End use of energy flows

'End use' is the complementary type of use to 'transformation use'. 'End use' denotes the input (use) of energy flows into those transformation processes where all of the energy content of the entering natural input/product/residual is moved solely to residuals leaving the process.

Own use

This refers to the consumption of energy flows for the direct support of the production processes of the so-called energy sector or energy industry (NACE 19, NACE 24, NACE 35 and NACE 37_39)

Agriculture, forestry and fishing

Flanders provides sufficient information to allocate energy use by agriculture, forestry and fishing directly to NACE industries by A*64. For Wallonia, we used a key based on gross value added to distribute the end use by agriculture, forestry and fishing activities between NACE 01, 02 and 03.

Manufacturing and service industries

For the industries NACE 10_12, 13_15, 24, 55_56 and 85, there is a one-to-one relation with a process from the regional energy balances. The energy use of those processes is assigned to the industry in question.

For some regions, and for the majority of the other industries, processes from the energy balances represent several A*64 industries. To ensure a good matching between processes and economic activities, we first identify to which NACE each process refers. This information can often be found in the detailed regional reports. If this is not the case, the regions have to be contacted. Secondly, we calculate specific keys to distribute energy used in the processes between those NACEs. We use gross value added in order to break down industrial processes into NACE industries. Tertiary activities are distributed between NACE industries based on the level of employment.

Households

The energy use by households must be reported for heating, road transport and other uses separately. The energy balances and regional reports give some details to associate the fuel uses to the different purposes. The Flemish energy balance unfortunately does not provide enough details. We therefore had to make the assumption that the distribution keys based on the data for Wallonia also hold for Flanders.

Transport

Four means of transport are distinguished in the source data of the PEFA. This subsection explains how energy use from transport activities are allocated to the responsible economic entity and adapted to the residence principle. Since data from the energy balance follow a territorial principle, we convert energy use for transport to the residence principle. First road transport is treated, then transport by rail, air transport and finally water transport.

Road transport

As mentioned before, the transport model COPERT shows the fuel used on the Belgian and regional territories. First, adjustment ratios estimated by the vehicle kilometre balance are applied to the territorial fuel uses obtained from COPERT to get total residential fuel use. For each type of vehicle (cars, light duty vehicles and heavy duty vehicles), the part of fuel use for the foreigners driving on Belgian soil is subtracted and the part for the Belgians driving abroad is added.

Next, the corrected regional fuel used by residents needs to be attributed to the industries and the households responsible for the road transport. According to the NA, fuel used by a truck operated by a food enterprise (NACE 10), should be attributed to the food sector, while the fuel used by a truck operated by e.g. a transport company in commission of that same food enterprise, should be put into the transport industry (NACE 49). For petroleum products, we use a combination of data sources to split fuel consumption between industries and households. Two methods are used in function of the vehicle categories. For heavy duty vehicles, we assume households are not responsible for fuel consumption. Therefore for this vehicle category, regionalised Belgian excise duties are used to break down the national

residential fuel use into the regional economic activities. For cars and light duties vehicles, we first calculated fuel use by the households on the basis of the household budget survey and the average price of different fuels. Then we calculated ratios for each fuel, showing the share of the households in the total use of these fuel types (after deducting the use by heavy duty vehicles). These ratios were then applied to the total use of the different fuel types by passenger cars on the one hand and light duty vehicles on the other hand to divide fuel use by these vehicle types between the industries and the households. Then regionalised Belgian excise duties are used to break down the part of the industries among the different regional industries. Regional disposable income is used to break down the fuel consumption of households among regions.

The distribution of the use of LPG and CNG for road transport according to the economic activity is based on the number of LPG-driven vehicles owned by economic agents. The owner is either a registered enterprise classified by industry according to the A*64 level of the NACE Rev.2.2 classification, or an individual owner. All individual owners are considered as households[13]. Based on the ownership, an allocation key is calculated for LPG and CNG using the assumption that each vehicle uses the same amount of fuel.

Railroad transport

Energy use of activities concerning railroads are directly derived from the energy balances and allocated to the corresponding industry for railway transportation, which is the same as for road transport, namely NACE 49. According to the PEFA Manual, it is unlikely that a residence principle adjustment is necessary.

Air transport

Air France data allow us to calculate ratios between fuel consumption and total purchases for this airline company for the period 2003-2017. By applying these annual ratios to the total intermediate consumption of the Belgian aviation industry, found in the SUT, it is possible to estimate the kerosene consumption of the residential airlines, assuming the share of fuel in their total purchases to be identical to Air France.

A comparison between the values for fuel consumption thus obtained and the values in the SUT for the years for which the SUT are created on the most detailed level (2005, 2010 ,2015), showed these values to be relatively similar. The difference is less than 1% in 2015, between 8% and 9% in 2010 and around3% in 2005. The 'Air France' method estimates the fuel consumption for the key years of the SUT (2005, 2010, 2015) in a satisfactory way, and was therefore applied to the entire 2003-2018 time series. The advantage of this method is that the Air France data are available for this entire time series. As a consequence, they allow us to obtain a time series showing a less erratic pattern than the time series calculated on the basis of the intermediate SUT.

[13] Among the individual owners, there are self-employed persons using the vehicles for their professional activity, but it is impossible to separate them from the household owners. Therefore, the number of vehicles attributed to household owners is overestimated.

The time series of kerosene prices used to convert fuel consumption from monetary units to physical units was also adjusted. We constructed a price series which takes into account the hedging policy pursued by the airlines to protect themselves against rising fuel prices. On the basis of the annual reports of Air France and Lufthansa (parent company of Brussels Airlines), it was decided to use an average hedging percentage of 30% for the Belgian airlines. This means that 30% of the fuel consumption of year t is considered as to have been bought in year t-1, the year preceding the actual fuel consumption. As a result of this policy, airlines are smoothing out market prices and reducing their exposure to large price fluctuations. We further assumed that the companies pursue a hedging policy for the dollar/euro exchange rate, which is the same as for fuel prices. The time series of physical kerosene consumption after these two adjustments is better in line with known circumstances in the past. The consumption peak of 2008 and the trough of the crisis in 2009 are visible, while the previous method based on the SUT alone showed an increase in kerosene consumption in 2009.

We have not yet developed an approach to estimate the energy use of national planes abroad, nor of foreign companies in Belgium. This is only necessary to fill the bridge table, since the use table provides the data on the fuel used by resident air companies.

Next to kerosene, air transport companies also use gasoline. For aviation gasoline, the AQ delivers data on domestic consumption. These data are considered to represent the Belgian residential use of gasoline.

Water transport

The energy use of water transport consists of inland water and sea transport activities.

Inland waterways

For inland waters, we use the ratios calculated on the basis of the Eurobase dataset on transport by nationality of vessel, as presented in Section 2. These ratios are applied to the energy use derived from the energy balances. Consequently, we get the energy consumption of national vessels abroad and of foreign vessels on the Belgian territory.

Sea transport

The total amount of all oil products (SUT product 19A) is available on a yearly basis for the entire time series and is divided across the two products used by the residential shipping companies (heavy fuel oil and diesel) based on the data of the Belgian oil balance. This balance reports the energy consumption of the 'international marine bunkers' sector. This value corresponds to the total amount of fuel (heavy fuel oil and diesel separately) that is purchased by the international maritime sector in the Belgian ports. We start from the hypothesis that all Belgian shipping companies have an identical profile in terms of the relative consumption of these two fuels as the entire spectrum of shipping companies on the Belgian territory. The two quantities are converted into monetary units on the basis of the average yearly market prices of those fuels provided by the FPS Economy. These monetary data provide us with an allocation key to divide the total monetary consumption of product 19A of the Belgian shipping companies between heavy fuel oil and diesel. Applying the average prices of the two fuels to these monetary values,

we then obtain the physical consumption of heavy fuel oil and diesel by the Belgian shipping companies.

Non-energy use

The non-energy use related to the chemical industry is allocated to NACE 20. For other industries, it depends on the region. For example, Wallonia gives more information about which industry uses products for non-energy use, while Flanders gives an aggregate figure which is allocated to all industries based on the use of the product 19A08 in the Use Table.

Calculations

Finally, a program is run which puts the methodological decisions described in subsection 3.1 into practice. The inputs needed to run the program are all the data sources presented in Section 2. The program is executed for each region and produces three regional PEFA (tables A and B).

3.2. Belgian PEFA

As mentioned above, we opt for the regional energy balances rather than the national energy statistics, used for the AQ. Some differences exist between these sources, which leads to statistical discrepancies. These appear in the bridging table.

3.2.1. PEFA builder

The PEFA builder is a tool developed by Eurostat to help countries in compiling their PEFA on the basis of the AQ. It proposes successive validations, conversions and calculations through eight major steps to complete the five tables of the PEFA questionnaire. We use this tool to obtain data about imports and exports. Indeed, the AQ of Belgium report the trade of energy products with EU countries and the rest of the world, while the energy balances do not.

We go through the entire process proposed by the PEFA builder. For every step, corrections are performed as indicated by this tool. An important step is the integration of transport data to make the residence principle adjustments and incorporate road transport data generated by COPERT. We extract imports and exports data at the end. We also derive a conversion factors table from the tool that we will apply to calculate Table C.

3.2.2. PEFA questionnaire

The PEFA questionnaire is the official layout required by Eurostat to answer the European obligation. It is composed of the five tables that we described in Section 1.

Table A and table B

The three regional supply and use tables and the data on exports and imports are gathered into the Belgian PEFA. A program is executed in which the three regional PEFA are aggregated with the file of exports and imports. This leads to the Belgian supply and use tables. Subsequently, we populate the official tables A and B of the PEFA.

Table C

The PEFA builder uses conversion factors which are applied on the energy flows of the use table to calculate Table C. We deduct those shares and apply them to the Belgian use table. They allow us to isolate the energy flows that produce emissions. The purpose is to identify the energy inputs, energy products or residuals that generate emissions in the energy consumption.

Table D

The seven indicators from table D are automatically derived from tables A and B.

Table E

Table E makes the bridge between the domestic energy use by resident units calculated from tables A and B of the PEFA and the gross inland energy consumption derived from the AQ. Energy uses from transport activities are the major activities which explain this difference. Therefore, we integrate the energy use related to the residents abroad and the non-residents on the territory for the means of transport for which this type of data is available. For sea transport and air transport, we have no information to estimate those residence principle adjustments. For road transport, we dispose of such adjustment ratios. Nevertheless, the approach with the transport model COPERT implies using data on fuel used and not fuel sold, which is reported in the AQ. As a result, an extra 'bridging item' is needed when bridging to the Eurostat gross domestic energy use total. That bridging item will consist of the difference between the fuel used for road transport calculated by the regional transport models and the fuel sold as presented in the five AQ. As a result of the lack of residence principle adjustments for air and sea transport and the difference in the data sources, an important statistical discrepancy arises in Table E that we cannot attribute to a specific aspect. In the near future, we will investigate new methods to fill that gap. The balance of payment statistics may be a potential source to make adjustments for air and sea transport to the residence principle.

Abbreviations

- AEA Air Emissions Accounts
- AQ Annual Questionnaires
- BE – LB Bruxelles Environnement – Leefmilieu Brussel
- EEA European Environnement Agency
- EMEP European Monitoring and Evaluation Programme
- ESA95 European System of Accounts, version 1995
- ICN – INR Institut des Comptes Nationaux – Instituut voor de nationale rekeningen
- IPCC Intergovernmental Panel on Climate Change
- IEA International Energy Agency
- NA National Accounts
- NACE Statistical classification of economic activities in the European Community
- NBB National Bank of Belgium
- PEFA Physical Energy Flow Accounts
- PSUT Physical Supply and Use Tables
- SEEA System of Environmental Economic Accounting
- SNA System of National Accounts
- SUT Supply and Use tables
- SPW Service Public de Wallonie
- VITO Vlaamse instelling voor technologisch onderzoek

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