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A Suggestion for SEEA Standard Tables on Energy

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This paper presents the result of work carried out while the author was working as a Senior Statistician at the United Nations Statistics Division (UNSD) during the first half of 2008. The work has benefited greatly from the discussions with the staff members of the Environmental-Economic Accounts Section. Subsequent work on this paper has been carried out at Statistics Denmark thanks to a co-sponsoring by Eurostat and Statistics Denmark (grant agreement no. 71401.2007.014-2007.489). The views expressed are the views of the author and not necessarily the views of the UNSD, Eurostat or Statistics Denmark.

Content

1 Introduction

Energy accounts have been identified by the UN Committee of Experts on Environmental-Economic Accounting (UNCEEA) as an important domain of environmental-economic accounting. During its first meeting in New York, the UNCEEA agreed that energy accounts should feature prominently in the revised SEEA[1] (Minutes of the First Meeting of the UNCEEA, New York 22-23 June 2006).

At the second UNCEEA meeting in 2007 there was general consensus among the UNCEEA members for the preparation of a publication on energy accounts, *System of Environmental-Economic Accounting for Energy* (SEEA-E), which would present standard concepts, definitions, classifications and tables for energy accounts (Minutes of Second Meeting of the UNCEEA, 5-6 July 2007).

A draft annotated outline of SEEA-E was presented at the third UNCEEA meeting in June 2008, and the UNCEEA agreed with the scope and coverage. The UNCEEEA considered SEEA-E as a very useful input in the SEEA revision process, as standard tables and text could - based on decisions by the London Group - literally be taken from the SEEA-E and used in the SEEA (Draft Minutes of Third Meeting of the UNCEEA 26 - 27 June 2008).

A suggestion for standard tables on energy is presented in this paper. The tables and corresponding descriptions are developed for the purpose of being included in SEEA-E. They are presented to the London Group in order to get comments with respect to how they can be improved and whether the tables are suitable for inclusion in the SEEA-E and/or SEEA.

It should be underlined that the tables and text reflect work in progress. The development of the standard tables for SEEA-E and SEEA must be seen as a process, which has to be carried out in coordination with the on-going work in energy statistics and energy balances carried out by the Oslo Group on Energy Statistics and the InterSecretariat Working Group on Energy Statistics (InterEnerStat).

UNSD in cooperation with the Oslo Group is currently working on the development of IRES, the *International Recommendations on Energy Statistics* (IRES). It is the aim, that IRES and the SEEA-E should be two complementary and fully coordinated documents. While IRES should comply to the extent possible with the SEEA-E conceptual structure and data needs, the SEEA-E's accounting standards should be developed on the basis of IRES, namely using IRES definitions of data items and classifications of energy products and flows[2].

The suggestion for tables presented in this documents has been developed on the basis on existing energy accounting practices in (some) countries, and general methodologies adapted from the national accounts (e.g. boundaries, classification and supply use table formats). While the link to the national accounts and the coherence with other parts of SEEA to some extent impose some restrictions on the format of the tables, other dimensions should be seen as open for discussion, and as something which has to be adjusted as the work in energy statistics and more specifically the drafting of IRES proceeds.

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[1] System of Environmental-Economic Accounting, cf. UN (2003)

[2] Both the SEEA-E and IRES will be complemented by the *Energy Statistics Compilers Manual* (ESCM) which will provide additional guidance to assist countries in the implementation of the international recommendations and compilation of the standard tables

For this reason the discussion of the tables within the London Group is an important input into the further work, while at the same time any conclusions reached at the London Group meeting in Brussels might need to be adjusted as the work on energy statistics and balances progress.

Some of the tables presented in this paper are populated by fictitious numbers. At this stage, these numbers are not necessarily realistic or internally consistent, and more work has to be done on this, once the formats of the tables are decided upon.

2 Overview of the tables

The tables presented here cover both stocks and flows of energy in physical as well as monetary units.

Stocks of energy in physical units:

Table 1: A physical asset account for one type of energy resource
Table 2: A physical asset account for inventories of energy products

Stocks of energy in monetary units:

Table 3: Monetary asset account for energy resources
Table 4: Monetary asset account for inventories of energy products

Flows of energy in physical units:

Table 5: Full physical supply and use table for energy (mass or volume units)
Table 6: Full physical supply and use table for energy (petajoules)
Table 7 I and II: Primary supply of energy (incl. imports) and transformation into end use products
Table 8. End use of energy products
Table 9: Use tables for energy products used for combustion processes (mass or volume units)
Table 10: Use tables for energy products used for combustion processes (petajoules)

Flows of energy in monetary units:

Table 11: Supply table at basic prices with transformation to purchasers' prices
Table 12: Use table at purchasers' prices
Table 13: Taxes, net, on products allocated to use of energy products
Table 14: Trade and transport margins allocated to use of energy products
Table 15: Use table at basic prices
Table 16: Energy products at basic prices used for energy purposes

3 Question to the London Group

What is your view on the tables presented, and which type of tables would you at this point recommend to be included in SEEA and SEEA-E as standard tables, i.e. tables which countries are recommended to implement?

4 Stocks of energy in physical units

Table 1 presents a physical asset account for energy resources. Such an account can be set up for each type of energy resource e.g. natural gas, crude oil, coal etc. An overall classification of the types of energy resources is shown in the heading of Table 3 in this paper, and is further presented in the paper "Suggestion for SEEA classification of energy resources" (Gravgård Pedersen, 2008a), which is also on the agenda of the London Group meeting in Brussels.

The physical energy resource accounts use different units such as tonnes, cubic metres, oil equivalents, petajoule (PJ), etc. depending on what is the most appropriate unit for the resource in focus. By applying conversion factors, it is possible to convert the accounts from one unit to another (e.g. from tonnes to petajoules).

The accounting items in the leading column of Table 1 follow the format of the generic physical asset accounts in SEEA 2003 (cf. Table 7.5 and 7.6 in SEEA 2003). These items are explained in detail in Annex 1.

The suggested categories in the heading show a breakdown by characteristics of the resource, i.e. a classification according to the "accessibility" of the resource according to e.g. economic and geological criteria. The classification is further discussed in the paper "Suggestion for a SEEA classification of natural energy resources" (Gravgård Pedersen, 2008a).

Table 1. A physical asset account for one type of energy ressource

	Total Asset	Of which: Best estimate of reserves	Other reserves	Other resources
	----------Physical unit ----------			
Opening stocks				
Changes due to transactions				
Acquisitions less disposals				
Increases in stocks				
Discoveries				
Reclassification/reappraisals				
Decreases in stocks				
Extractions				
Reclassification/reappraisals				
Other changes in stocks				
Catastrophic losses and uncompensated seizures				
Changes in classifications and structure				
Closing stocks				

Table 2 presents an asset account for inventories of energy products, i.e. physical quantities of energy, which are the result of an extraction or conversion process. The categories in the heading correspond to the overall energy products presented in the tables for physical flows (tables 5-16). However, electricity and heat are excluded in the tables for inventories. It should be considered to which extent the inclusion of waste and renewables are relevant, and if, and how, an accounting for nuclear fuels should be done.

The classification of energy products has to be coordinated with the classification developed in relation to IRES. Further, correspondence tables to e.g. the general product classification systems CPC and HS have to be developed.

The accounting items in the first column correspond to the items used for accounting for inventories in SNA balance sheets and accumulation accounts, cf. Annex 2.

Table 2. A physical asset account for inventories of energy products

	1. Coal, peat and gas work gas, etc.	2. Oil	3. Natural Gas	6. Waste and renewables	7.0 Nuclear fuels
	Physical unit	Physical unit	Physical unit	Physical unit	Physical unit
Opening stocks (LS)					
Changes in inventories (P52)					
Catastrophic losses and uncompensated seizures (K3 and K4)					
Changes in classifications (K6)					
Other changes in inventories n.e.c. (K5)					
Closing stocks (LE)					

Note. Codes in parenthesis refer to the SNA 2008 classification and coding structure

5 Stocks of energy in monetary units

Table 3 presents a monetary asset account for energy resources.

The monetary asset account has the same format as the generic physical account of the SEEA-2003 (cf Table 7.5 and 7.6 of the SEEA 2003), and corresponds closely to the format presented in the SNA balance sheet/accumulation accounts. The items are explained in detail in Annex 3. All entries, besides one, in the monetary asset account for energy resources are the same as those applied for the physical asset accounts. The entry which is particular for the monetary accounts as compared to the physical accounts is the *Revaluation (holding gains and losses)*.

Whether it is possible to implement the table at the level of detail presented is open for discussion.

It should be noted that while the SEEA 2003 presents the generic accounting format also for minerals and energy assets, these accounts are not used in SEEA 2003 when it comes to showing how the accounts can be implemented, and it is not clear from SEEA 2003 how the generic account should be used in practice for energy resources valued by the presnt value method. Instead an adapted form of the generic asset account is used for oil and gas (cf. SEEA 2003, Table 7.12) in order to incorporate the assumptions made with respect to the valuation and interpretation of the effect of the extraction on the stock value (i.e. the definition of depletion).

A final decision on the valuation principles and interpretations of the extraction of natural resources needs to be reached before the final format of the monetary asset account for natural resources and the terminology can be reached. This issue is discussed further in the paper (Gravgård Pedersen, 2008 b) which is also presented at the 13th London Group meeting in Brussels.

The classification of energy resources shown in the heading is presented in the paper " A suggestion for SEEA classifications of energy resources" (Gravgård Pedersen, 2008a).

Table 4 presents a monetary asset accounts for the inventories of energy products. The table corresponds to the physical accounts for inventories of energy products.

The categories in the heading correspond to the energy products presented in the tables for energy flows (tables 11-16). As was the case for the physical account for inventories (table 2), electricity and heat are excluded in the monetary table. Also in this case should it be considered to which extent the inclusion of waste and renewables are relevant, and if and how an accounting for nuclear fuels should be done. The items in the leading column are explained in Annex 4.

Besides having an interest on their own the asset accounts for inventories can be instrumental in relation to the physical flow accounts for energy products since it helps keeping track of whether the recording of the stock changes over time results in unrealistic small or large inventories due to systematic errors in the estimation of the inventory changes.

Table 3 Monetary asset account for energy resources

		EA.111	EA.111.1	EA.111.2	EA.111.3	**EA.112.1**	EA.112.1.1	EA.112.1.2	**EA.113.1**
	Total value of energy resources	**Petroleum**	Natural Gas	Oil	Natural bitumen, extra heavy oil, and others n.e.c.	**Solid energy resources**	Coal	Other solid energy resources (Oil shale, others n.e.c.)	**Uranium Ores**
	Currency unit								
Opening stocks									
Changes due to transactions									
Acquisitions less disposals									
Increases in stocks									
Discoveries									
Reclassifications/reappraisals									
Decreases in stocks									
Extractions									
Reclassifications/reappraisals									
Other changes in stocks									
Catastrophic losses and uncompensated seizures									
Changes in classifications and structure									
Revaluation (holding gains and losses)									
Closing stocks									

Table 4. Monetary asset account for inventories of energy products

	1. Coal, peat and gas work gas, etc.	2. Oil	3. Natural Gas	6. Waste and renewables	7.0 Nuclear fuels
			Currency unit		
Opening stocks (LS)					
Changes in inventories (P52)					
Catastrophic losses and uncompensated seizures (K3 and K4)					
Changes in classifications (K6)					
Other changes in inventories n.e.c. (K5)					
Revaluation (holding gains and losses) (K7)					
Closing stocks (LE)					

Note. Codes in parenthesis refer to the SNA 2008 classification and coding structure

6 Flows of energy in physical units

6.1 Full supply and use tables for energy

Tables 5 and 6 below present standard supply-use tables for energy resource and product use. Table 5 uses mass or volume physical units (tonnes, cubic metres, etc.), while Table 6 use the common unit petajoule for all energy resources and energy products.

The supply table presents for each energy resource and energy product how much is supplied by different units. The table heading of the supply table follows the classification of natural energy resources and energy products. Here it is presented for main groups, but more details can be shown at a second level of the classification. The items in the leading column include implicitly three main categories: supply from the environment, supply from the national economy and supply from the rest of the world. The supply from the environment is only relevant for the natural energy resources. The supply from the domestic economy is divided into industries according to ISIC, and with an emphasis on the industries most relevant for energy production. The supply from the rest of the world includes imports of which energy products purchased by residents abroad are shown explicitly.

The use table presents the destination of the natural energy resources and energy product flows. The table heading of the use table is the same as that of the supply table. Row-wise the use table shows the use by the national economy and by the rest of the world. The use by the national economy includes the use for intermediate consumption by the industries classified in the same way as in the supply table, and the use for final consumption divided by domestic households' private consumption, inventory changes, and exports of which the energy products sold to foreigners on the national territory is shown explicitly.

An additional use item is losses, which records losses in distribution, and which explains the difference between the total energy supplied from the economic units and the total use by these units.

It should be noted, that these supply and use tables records all flows, including flows of the natural energy resources, and the primary as well as the secondary energy products[3]. Coal use, for instance, are recorded both as a natural resource flow from the environment to the mining and quarrying industry and as a flow of coal (as an energy product) from the Mining and quarrying industry to the Electricity, gas, steam and air conditioning supply industry. In addition the electricity and steam generated by using the coal is recorded as a flow from the latter industry to other industries, households and the rest of world.

Table 6 include row totals showing the total supply or use measured by petajoules delivered and received. However, it should be noted that such row sums for physical quantities have primarily interest from a book keeping point of view. No immediate interpretation is applicable for the row sums because of the multiple entries of certain quantities; cf. the recording of coal as both a resource and product flow, and finally as produced electricity.

Under exports the "of which items" shows how much energy, which has been sold to tourists and other non-residents, e.g. for re-fuelling of their cars and lorries and for bunkering of foreign ships and planes.

A distinction is made between use of energy products for energy-purposes and non-energy purposes. The use table include an *of which* item indicating how much is used for non-energy purposes.

Like the monetary supply and use tables of the National Accounts, the total supply and the total use of each energy resource and product are balanced. Thus, the main accounting identity underlying the flow accounts for energy is the following:

$$\textit{Total supply} = \textit{Output} + \textit{Imports}$$
$$=$$
$$\textit{Total use} = \textit{Exports} + \textit{Intermediate use} + \textit{Final use by consumers} + \textit{Inventory changes} + \textit{Losses in distribution}$$

The standard physical supply use tables presented here contains the basic information on the supply and use at a relatively high level of aggregation for energy resources, products as well as for industries. More disaggregated physical supply and use tables can be compiled as a second step.

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[3] Once natural energy resources have been extracted they become energy products which are delivered from the extracting industries to other units of the economy. These energy products are called *primary energy products*. Also bio-fuels and heat and power produced by capturing renewable energy from the environment are termed primary energy products. *Secondary energy products* are produced by transformation of primary or other secondary energy products into other types of energy products, examples are petroleum produced from crude oil, electricity produced from fuel oil and charcoal produced from fuel wood. Although imported products are not necessarily primary energy products according to the above categorization, they are all included as part of the primary supply of energy..

Table 5: Full physical supply and use table for energy (mass or volume units)

Supply

	EA. 111 Petroleum resources	EA 112.1 Solid energy resources	EA113.1 Uranium ores	1. Coal, peat and gas work gas, etc.	2. Oil	3. Natural Gas	4. Electricity	5. Heat	6. Waste and renewables	7. Nuclear fuels
	Toe	Tonnes	Tonnes	Tonnes	Toe	Sm3	GWh	Joules	Tonnes	Tonnes
From the environment										
A - Agriculture, forestry and fishing B – Mining and quarrying C.19 - Manufacture of coke and refined petroleum products C.2011 - Manufacture of basic chemicals D – Electricity, gas steam and air conditioning supply C. Other Manufacturing E - Water supply; etc. F - Construction H - Transportation and storage Other Industries										
Total output										
Imports										
of which purchased by residents abroad										
Total supply										

Use

	EA. 111 Petroleum resources	EA 112.1 Solid energy resources	EA113.1 Uranium ores	1. Coal, peat and gas work gas, etc.	2. Oil	3. Natural Gas	4. Electricity	5. Heat	6. Waste and renewables	7. Nuclear fuels
	Toe	Tonnes	Tonnes	Tonnes	Toe	Sm3	GWh	Joules	Tonnes	Tonnes
A - Agriculture, forestry and fishing B – Mining and quarrying C.19 - Manufacture of coke and refined petroleum products C.2011 - Manufacture of basic chemicals *of which used for non-energy purposes* D – Electricity, gas steam and air conditioning supply C. Other Manufacturing *of which used for non-energy purposes* E - Water supply; etc. F - Construction H - Transportation and storage Other Industries										
Intermediate consumption, total										
Households' private consumption *Inventory changes* *Exports* *of which sold to non-residents on national territory*										
Total final consumption										
Losses in distribution										
Total use *of which for non-energy purposes*										

Table 6: Full physical supply and use table for energy (petajoules)

Supply

	EA. 111 Petroleum resources	EA 112.1 Solid energy resources	EA113.1 Uranium ores	1. Coal, peat and gas work gas, etc.	2. Oil	3. Natural Gas	4. Electricity	5. Heat	6. Waste and renewables	7. Nuclear fuels	**Total supply**
	petajoules										
From the environment	680	270									**950**
A - Agriculture, forestry and fishing										50	**50**
B – Mining and quarrying				270	480	200					**950**
C.19 - Manufacture of coke and refined petroleum products				50	520						**570**
C.2011 - Manufacture of basic chemicals											
D – Electricity, gas steam and air conditioning supply				10			345	315			**670**
C. Other Manufacturing											
E - Water supply; etc.							5	5	20		**30**
F - Construction											
H - Transportation and storage											
Other Industries											
Total output (including output from environment)				330	1 000	200	350	320	70		**3 220**
Imports				20	180	30	30				**260**
of which purchased by residents abroad											
Total supply	**680**	**270**		**350**	**1 180**	**230**	**380**	**320**	**70**		**3 480**

Use

	EA. 111 Petroleum resources	EA 112.1 Solid energy resources	EA113.1 Uranium ores	1. Coal, peat and gas work gas, etc.	2. Oil	3. Natural Gas	4. Electricity	5. Heat	6. Waste and renewables	7. Nuclear fuels	**Total use**
	petajoules										
A - Agriculture, forestry and fishing				10	20		20	10			**60**
B – Mining and quarrying	680	270			10		10	5			**975**
C.19 - Manufacture of coke and refined petroleum products				50	550		10	5			**615**
C.2011 - Manufacture of basic chemicals					100		30	10			**140**
of which used for non-energy purposes					*80*		*10*				*90*
D – Electricity, gas steam and air conditioning supply				270	220	90	40	60	50		**730**
C. Other Manufacturing				60	60	60	70	40			**290**
of which used for non-energy purposes					*10*						*10*
E - Water supply; etc.					20		20	10	10		**60**
F - Construction				10	30		10	10			**60**
H - Transportation and storage					50		20	10			**80**
Other Industries					20		40	50			**110**
Intermediate consumption, total	680	270		400	1 080	150	270	210	60		**3 120**
Households' private consumption					80	50	90	100	10		**330**
Inventory changes				*- 50*	*- 20*						***- 70***
Exports					*30*	*20*	*10*				***60***
of which sold to non-residents on national territory											
Total final consumption				- 50	90	70	100	100	10		320
Losses in distribution					*10*	*10*	*10*	*10*			***40***
Total use	**680**	**270**		**350**	**1 180**	**230**	**380**	**320**	**70**		**3 480**

6.2 Primary energy supply and end use of energy

In order to both highlight and exclude flows of energy products, which are used for transformation into other energy products and used for non-energy purposes, tables 7 and 8 focus on primary energy supply and so-called end use of energy. These tables resemble the energy balances, which are often presented in relation to energy statistics (see, for instance, Energy Statistics Manual, IEA et. al, 2004, chapter 7). These tables separate out the "double counting" of the full physical supply and use tables due to the inclusion of all types of energy products, both primary and secondary at the same time.

Primary energy supply is defined as the sum of primary energy products and the imports of energy. End use of energy is defined as use of energy for other purposes than transformation into other energy products. End use of energy corresponds to what is some times called final use of energy in energy statistics and balances. However, the term *end use* is preferred over final use in SEEA-E in order not to confuse it with the national accounts´ concept of final use, which has a different meaning.

Table 7.I for primary energy supply focuses on the energy flowing into the economy (domestic origin and imports) while Table 8 for end use table focuses on the amount of energy left after transformation losses for use by industries, households, inventory changes and exports. The transformation table, Table 7.II, shows how some of the primary energy supply is converted into secondary energy products, and how much energy is lost during the transformation processes.

All entries in the tables are in energy units (petajoules).

Since the focus is on presenting the primary energy products and to show the transformation into secondary products, the aggregation level of the energy products is somewhat different compared to the level shown in the previous tables. Electricity and heat, for instance, are shown both as primary energy, and as total (i.e. primary and secondary) electricity and total heat. Nuclear fuels are not shown in the tables, since electricity and heat produced by the nuclear power plants are included as supply of primary electricity and heat.

The row sums of table 7.I shows for the industries how much primary energy they supply. The figure in the last row and last column of the table (1 350 petajoules) represents the total primary supply of energy supplied from the national economy and the rest of the world.

The *transformation table* shows how energy products entering the economy via primary energy supply is converted into other energy products before they are used by industries or households for end energy use and for non-energy purposes.

Negative numbers in the transformation table correspond to energy products used by an industry for transformation processes while positive numbers correspond to output of secondary energy products.

By following a row in the transformation matrix, information is obtained about how much of the various energy products the corresponding industry uses (negative numbers) as intermediate inputs for the transformation, and how much of each secondary energy product is produced (positive numbers) by the same industry as a result of the conversion. A transformation from one energy product to another is normally associated with some losses of energy. The total amount of energy lost from each of the industries' transformation processes is shown in the last column. Since inputs and outputs of energy must balance, when account is taken for the transformation losses, each of the row sums (shown in the last column) is zero.

Primary electricity and heat are not transformed as such before it is used, but it is often delivered into the public grid before it is used. Therefore, it is normally not possible to determine who is using the primary electricity and heat and who is using the secondary electricity and heat. In the transformation table, the mix of the primary and secondary electricity is represented by a negative number in the intersection between the row for electricity generation and the column for primary electricity, etc. and an equivalent positive contribution to the output of electricity, total by the same industry. For primary heat delivered to the public grid the recording practice is analogous.

The columns of the transformation matrix show how the corresponding energy products are produced (positive numbers) as a result of the energy transformation processes or used (negative numbers) as inputs for the conversion. When all inputs and outputs for an energy product are subtracted and added, respectively, the total output, net, (called 2. Total transformation) from the transformation processes is obtained.

The amount of energy available for energy end use (shown in the last row of Table 7.II) is subsequently obtained by adding the total output, net, from the transformation to the primary energy supply (shown in the first row).

It should be noted that the amount of energy available for end use might be negative for some products. This is the case if the primary energy supply does not fully cover the total inputs actually used for the transformation processes, and the missing supply has been covered by drawing products from inventories instead.

The total loss of energy due to the conversions from one energy product to another is obtained by adding up the entries in the column for transformation losses. The numeric example shows a total transformation loss at 110 petajoules. Subtracting this from the total primary supply of energy gives the amount of energy, 1240 petajoules, which remain for end use by industries, households, exports and inventory changes.

End use of energy is defined as use of energy for other purposes than transformation into other energy products. For a specific energy product it is what is available after the energy transformation processes have taken place. Two main groups of end use of energy products exist: End use for energy purposes and end use for non-energy purposes. The use for non-energy purposes is shown as an *of which* item in Table 8.

For each energy product the end use for energy purposes is shown by industries and households. The figures represent the amount of energy which actually are used by the units, and excludes any distribution losses, which occur before the energy product has reached the units. Since the energy available for end use excludes the transformation losses as well, all losses are excluded from the end use.

Product for product the end use as shown in Table 8 matches the supply of energy available for end use as presented in the transformation table (Table 7.II).

Table 7. I and II: Primary supply of energy (incl. imports) and transformation into end use products

I. Supply of primary energy and imports

	1.1+1.2	1.3+1.4	2,1	2.2-2.15	3	4,1	5,1	6	4	5	
	Hard coal, lignite and peat	Coke and gas	Crude oil	Other oil products	Natural gas	Primary electricity	Primary heat	Waste and renewables	Total electricity	Total heat	**Total primary supply**
	petajoules										
A - Agriculture, forestry and fishing								50			**50**
B – Mining and quarrying	270		480		200						**950**
C.19 - Manufacture of coke and refined petroleum products											
C.2011 - Manufacture of basic chemicals											
D – Electricity, gas, steam and air conditioning supply						20	50				**70**
C. Other Manufacturing											
E - Water supply; etc.								20			**20**
F - Construction											
H - Transportation and storage											
Other Industries											
Total output	270		480		200	20	50	70			
Imports		20	130	50	30				30		**260**
of which purchased by residents abroad				5							**5**
Total supply of primary energy and imports	**270**	**20**	**610**	**50**	**230**	**20**	**50**	**70**	**30**		**1 350**

II. Transformation table

	1.1+1.2	1.3+1.4	2,1	2.2-2.15	3	4,1	5,1	6	4	5		
	Hard coal, lignite and peat	Coke and gas	Crude oil	Other oil products	Natural gas	Primary electricity	Primary heat	Waste and renewables	Total electricity	Total heat	Conversion losses	**Total**
	petajoules											
1. Total supply of primary energy and imports	**270**	**20**	**610**	**50**	**230**	**20**	**50**	**70**	**30**	**0**		**1350**
A - Agriculture, forestry and fishing												
B – Mining and quarrying												
C.19 - Manufacture of coke and refined petroleum products	- 50	50	- 540	520							20	
C.2011 - Manufacture of basic chemicals												
D.351 - Electric power generation, etc.	- 170			- 100	- 60	- 20		- 25	325		50	
D.352 - Manufacture of gas; distribution, etc.	- 10	10										
D.353 - Steam and air conditioning supply	- 90			- 110	- 30		- 50	- 25		265	40	
C. Other Manufacturing												
E - Water supply; etc.								- 10	5	5		
F - Construction												
H - Transportation and storage												
Other Industries												
2. Total transformation (primary to secondary)	- 320	60	- 540	310	- 90	- 20	- 50	- 60	330	270	110	0
of which transformation losses											110	110
Available for end use (1. + 2.)	**- 50**	**80**	**70**	**360**	**140**			**10**	**360**	**270**		**1 240**

Note: Grey cells indicate zero entries by definition.

Table 8. End use of energy products

End use of energy products

	1.1+1.2	1.3+1.4	2,1	2.2-2.15	3	4,1	5,1	6	4	5	
	Hard coal, lignite and peat	Coke and gas	Crude oil	Other oil products	Natural gas	Primary electricity	Primary heat	Waste and renewables	Total electricity	Total heat	**Total**
	petajoules										
A - Agriculture, forestry and fishing		10		20					20	10	**60**
B – Mining and quarrying				10					10	5	**25**
C.19 - Manufacture of coke and refined petroleum products				10					10	5	**25**
C.2011 - Manufacture of basic chemicals			60	40					30	10	**140**
of which use for non-energy purposes			*60*	*20*					*10*		***90***
D – Electricity, gas steam and air conditioning supply		10		10					20	10	**50**
C. Other Manufacturing		50	10	50	60				70	40	**280**
of which use for non-energy purposes			*10*								***10***
E - Water supply; etc.				20					20	10	**50**
F - Construction		10		30					10	10	**60**
H - Transportation and storage				50					20	10	**80**
Other Industries				20					40	50	**110**
Intermediate consumption total		80	70	260	60				250	160	**880**
Households' private consumption				80	50			10	90	100	**330**
Inventory changes	- 50			- 20							**- 70**
Exports				30	20				10		**60**
of which sold to non-residents on domestic territory				*7*							***7***
Total final consumption	- 50			90	70			10	100	100	**320**
Losses in distribution				10	10				10	10	**40**
Total end use	**- 50**	**80**	**70**	**360**	**140**			**10**	**360**	**270**	**1 240**
of which use for non-energy purposes	*- 50*		*70*	*40*	*30*				*30*	*10*	*130*

Note: Grey cells indicate zero entries by definition.

6.3 Energy use for combustion

Of the energy products used for energy purposes, only a part is used for combustion processes. Since combustion of energy products is the main source for CO_2-emissions and other types of air emission, it is appropriate to present this use of energy products separately in a use table as shown in Table 9 and 10.

Table 9: Use table for energy products used for combustion processes (mass or volume units)

	Use for combustion						
	1. Coal, peat and gas work gas, etc.	2. Oil	3. Natural Gas	4. Electricity	5. Heat	6. Waste and renewables	7. Nuclear fuels
	Tonnes	Toe	Mill Sm3	GWh	Joules	Tonnes	Tonnes
A - Agriculture, forestry and fishing							
B – Mining and quarrying							
C.19 - Manufacture of coke and refined petroleum products							
C.2011 - Manufacture of basic chemicals							
D – Electricity, gas steam and air conditioning supply							
C. Other Manufacturing							
E - Water supply; etc.							
F - Construction							
H - Transportation and storage							
Other Industries							
Intermediate consumption, total							
Domestic households' private consumption							
Inventory changes							
Exports							
of which							
sold to non-residents on domestic territory							
Total final consumption							
Losses in distribution							
Total use for combustion							
of which purchased by residents abroad							

Table 10: Use table for energy products used for combustion processes (petajoules)

	Use for combustion							
	1. Coal, peat and gas work gas, etc.	2. Oil	3. Natural Gas	4. Electricity	5. Heat	6. Waste and renewables	7. Nuclear fuels	Total use
	petajoules							
A - Agriculture, forestry and fishing								
B – Mining and quarrying								
C.19 - Manufacture of coke and refined petroleum products								
C.2011 - Manufacture of basic chemicals								
D – Electricity, gas steam and air conditioning supply								
C. Other Manufacturing								
E - Water supply; etc.								
F - Construction								
H - Transportation and storage								
Other Industries								
Intermediate consumption, total								
Domestic households' private consumption								
Inventory changes								
Exports								
of which								
sold to non-residents on domestic territory								
Total final consumption								
Losses in distribution								
Total use for combustion								
of which purchased by residents abroad								

7 Flows of energy in monetary units

7.1 Monetary supply table for energy

The monetary supply table, Table 11, for energy products shows the value of the domestic production of the different energy products and the value of imports valued at basic prices. The table also shows (1) the amount of taxes and subsidies charged in relation to each energy product, when it is sold to a purchaser, and (2) the sum of trade and transport margins related to each energy product. The value of the supply at purchasers' prices is obtained when the taxes minus subsidies on products and the margins are added to the basic prices. It should be noted that the concept of supply at purchasers' prices is an accounting concept, which as such is estimated and not directly realised or recorded by the producers of the energy products.

The supply table at basic prices corresponds directly to the supply table at physical quantities (Table 5). Dividing the entries in Table 11 by the corresponding entries in supply part of Table 5 gives the implicit basic energy prices per physical unit of energy supplied by industries and the rest of the world (imports). Similarly, the average taxes and subsidies, and average trade and transport margins per physical unit can be calculated for each energy product from the information included in Table 11 and Table 5.

Table 11: Supply table at basic prices with transformation to purchasers' prices

Supply of energy products

		1. Coal, peat and gas work gas, etc.	2. Oil	3. Natural Gas	4. Electricity	5. Heat	6. Waste and renewables	7. Nuclear fuels	**Supply at basic prices, total**
		Currency units							
Domestic output	A - Agriculture, forestry and fishing						200		**200**
	B – Mining and quarrying	1 350	2 880	1 200					**5 430**
	C.19 - Manufacture of coke and refined petroleum products	250	3 120						**3 370**
	C.2011 - Manufacture of basic chemicals D – Electricity, gas steam and air conditioning supply	50			2 415	2 205			**4 670**
	C. Other Manufacturing E - Water supply; etc.				35	35	80		**150**
	F - Construction H - Transportation and storage Other Industries								
	Total domestic output, basic prices	1 650	6 000	1 200	2 450	2 240	280		**13 820**
	Imports, c.i.f.	100	1 080	180	210				1 570
	of which purchased by residents abroad		587						**587**
Total supply at basic prices		**1 750**	**7 080**	**1 380**	**2 660**	**2 240**	**280**		**15 390**

Taxes and subsidies on energy products and trade and transport margins

		Currency units						
	Taxes on energy products	2 188	8 142	1 725	3 458	2 576	294	18 383
	Subsidies on energy products	- 500	- 700			- 200		-1 400
	Taxes, net	1 688	7 442	1 725	3 458	2 376	294	16 983
	Trade and transport margins	2 065	8 354	1 628	3 139	2 643	330	18 160
	Total supply at purchasers' prices	**5 503**	**22 876**	**4 733**	**9 257**	**7 259**	**904**	**50 533**

7.2 Monetary use tables for energy

The first use table, Table 12, is at purchasers' prices. It shows the amounts, which the users actually pay for the various energy products it uses. As in the physical use table (Table 5), the use is divided into intermediate consumption by industries and final use, i.e. private consumption, exports and inventory changes. In contrast to the physical use table, the monetary use table does not include any entries for losses, since what is paid from the use side is always received at the supply side (including the taxes and margins, which are received by government, and traders and distributors, respectively).

The total use at purchasers' prices is equal to the total supply at purchasers' prices for each energy product. This reflects the following general accounting identity for the monetary accounts:

Total supply at purchasers' prices = Imports, c.i.f. + Domestic production at basic prices + taxes, net on products + trade and transport margins
=
Total use at purchasers' prices = Exports + Intermediate use + Final use by consumers + Inventory changes

Table 12: Use table at purchasers' prices

Use of energy products at purchasers' prices

		1. Coal, peat and gas work gas, etc.	2. Oil	3. Natural Gas	4. Electricity	5. Heat	6. Waste and renewables	7. Nuclear fuels	**Total use**
		Currency units							
Inter-mediate consump-tion	A - Agriculture, forestry and fishing	157	391		500	234			**1 218**
	B – Mining and quarrying		196		250	117			**507**
	C.19 - Manufacture of coke and refined petroleum products	786	10 754		250	117			**12 481**
	C.2011 - Manufacture of basic chemicals		1 955		751	234			**2 841**
	D – Electricity, gas steam and air conditioning supply	4 245	4 302	1 936	1 001	1 405	646		**14 815**
	C. Other Manufacturing	943	1 173	1 291	1 751	937			**5 885**
	E - Water supply; etc.		391		500	244	129		**1 218**
	F - Construction	157	587		250	254			**1 218**
	H - Transportation and storage		978		500	204			**1 624**
	Other Industries		391		1 001	1 171			**2 232**
	Industries' use, total	6 289	21 117	3 227	6 755	4 918	775		**44 039**
Final use categories	Domestic households' private consumption		1 564	1 076	2 252	2 342	129		**6 697**
	Inventory changes	- 786	- 391						**-1 421**
	Exports		587	430	250				**1 218**
	of which sold to non-residents on domestic territory								
	Total final consumption	**- 786**	**1 760**	**1 506**	**2 502**	**2 342**	**129**		**6 494**
	Total use at purchasers' prices	**5 503**	**22 876**	**4 733**	**9 257**	**7 259**	**904**		**50 533**
	of which domestic use	5 503	22 290	4 733	9 257	7 259	904		**49 946**
	of which purchased by residents abroad		587						**587**

The following tables present a breakdown of the use at purchasers' prices into taxes, net, trade and transport margins, and use at basic prices.

The taxes minus subsidies paid in relation to each energy product are allocated to the users of the energy products in table 13. It is assumed that it is the users of the energy products, which in the end pay the taxes and receives the subsidies on products, since the taxes and subsidies affect the purchasers' price of energy. It should be noted, however, that the taxes and subsidies normally are collected or received by the producers or the wholesale and retail traders on behalf of the users. The allocation of the taxes and subsidies on products by users of the energy products is therefore based on assumptions and calculations, and not on observation about actual payments of taxes and subsidies on products.

The total of taxes, net on products in the use table, Table 13, corresponds to the total of taxes, net in the supply table, Table 11.

The tax table is useful for analysing the net tax burden related to the use of energy products. The table can be further broken down further by specific taxes and subsidies, e.g. tables corresponding to Table 13 can be set up for VAT, CO_2 taxes and other energy taxes.

Table 13: Taxes, net, on products allocated to use of energy products

Taxes, net related to use of energy products

		1. Coal, peat and gas work gas, etc.	2. Oil	3. Natural Gas	4. Electricity	5. Heat	6. Waste and renewables	7. Nuclear fuels	**Total use**
		Currency units							
Related to inter-mediate consump-tion	A - Agriculture, forestry and fishing	48	127		178	77			**430**
	B – Mining and quarrying		64		85	38			**187**
	C.19 - Manufacture of coke and refined petroleum products	241	3 498		86	38			**3 864**
	C.2011 - Manufacture of basic chemicals		636		275	77			**988**
	D – Electricity, gas steam and air conditioning supply	1 061	1 072	606	374	460	210		**3 783**
	C. Other Manufacturing	289	482	370	604	307			**2 052**
	E - Water supply; etc.		240		187	60	42		**529**
	F - Construction	48	191		93	83			**416**
	H - Transportation and storage		318		187	87			**592**
	Other Industries		127		374	383			**884**
	Taxes, net, on intermediate consumptionl	1 688	6 756	976	2 444	1 610	252		**13 725**
Related to final use categories	Domestic households' private consumption		546	692	971	766	42		**3 017**
	Inventory changes								
	Exports		141	57	43				**241**
	of which sold to non-residents on domestic territory								
	Taxes, net on final consumption		**687**	**749**	**1 015**	**766**	**42**		**3 259**
	Total taxes, net	**1 688**	**7 442**	**1 725**	**3 459**	**2 376**	**294**		**16 984**
	of which domestic use	1 688	7 442	1 725	3 459	2 376	294		**16 984**
	of which paid by residents abroad								

The trade and transport margins are allocated to the use of energy products in Table 14. The total of trade and transport margins in the use table corresponds to the total of margins in the supply table, Table 11. As in the case of taxes allocated to uses, the allocation of trade and transport margins has to be based on assumptions and calculations, since the allocation is not directly observable. If data is available, Table 14 can be subdivided into more tables showing the individual margins: wholesale trade margins, retailers' trade margins, and transport trade margins.

By subtracting the taxes, net on products (Table 13) and the trade and transport margins (Table 14) from the use at purchasers' prices (Table 12), a use table at basic prices, Table 15, is obtained. This table shows for each energy product and each of the user categories the total use of imported and domestically produced energy products. A further breakdown on separate tables for use of domestic produced energy products and imported energy products may be made by using information and assumptions on market shares, etc.

The accounting identity that total supply at basic prices (Table 11) is equal to total use at basic prices (Table 15) for each energy product is fulfilled. This can also be expressed by the identity:

Total supply at basic prices = Imports, c.i.f. + Domestic production at basic prices
=
Total use at basic prices = Exports at basic prices + Intermediate use at basic prices + Final use by consumers at basic prices + Inventory changes at basic prices

Table 14: Trade and transport margins allocated to use of energy products

Trade and transport margins related to use of energy products

		1. Coal, peat and gas work gas, etc.	2. Oil	3. Natural Gas	4. Electricity	5. Heat	6. Waste and renewables	7. Nuclear fuels	Total use
		Currency units							
Related to inter-mediate consump-tion	A - Agriculture, forestry and fishing	59	143		111	85			**460**
	B – Mining and quarrying		71		78	43			**200**
	C.19 - Manufacture of coke and refined petroleum products	295	3 877		78	43			**4 132**
	C.2011 - Manufacture of basic chemicals		714		200	85			**1 057**
	D – Electricity, gas steam and air conditioning supply	1 298	1 201	752	289	412	216		**3 938**
	C. Other Manufacturing	354	503	562	498	291			**2 087**
	E - Water supply; etc.		218		170	67	47		**445**
	F - Construction	59	289		85	93			**444**
	H - Transportation and storage		332		170	97			**633**
	Other Industries		143		339	376			**946**
	Margins on intermediate consumptionl	2 065	7 491	1 313	2 018	1 591	263		**14 341**
Related to final use categories	Domestic households' private consumption		705	261	1 081	1 053	67		**3 561**
	Inventory changes								
	Exports		158	54	39				**258**
	of which sold to non-residents on domestic territory								
	Margins on final consumption		**863**	**315**	**1 121**	**1 053**	**67**		**3 819**
	Total trade and transport margins	**2 065**	**8 354**	**1 628**	**3 139**	**2 643**	**330**		**18 160**
	of which domestic us	2 065	8 354	1 628	3 139	2 643	330		**18 160**
	of which paid by residents abroad								

Table 15: Use table at basic prices

Use table at basic prices

		1. Coal, peat and gas work gas, etc.	2. Oil	3. Natural Gas	4. Electricity	5. Heat	6. Waste and renewables	7. Nuclear fuels	Total use
		Currency units							
Inter-mediate consump-tion	A - Agriculture, forestry and fishing	50	121		211	72			**328**
	B – Mining and quarrying		61		87	36			**120**
	C.19 - Manufacture of coke and refined petroleum products	250	3 378		85	36			**4 485**
	C.2011 - Manufacture of basic chemicals		605		275	72			**797**
	D – Electricity, gas steam and air conditioning supply	1 886	2 029	579	338	534	220		**7 095**
	C. Other Manufacturing	300	188	359	649	339			**1 746**
	E - Water supply; etc.		- 67		144	118	40		**244**
	F - Construction	50	107		72	78			**357**
	H - Transportation and storage		328		144	21			**399**
	Other Industries		121		288	411			**403**
	Intermediate consumption at basic prices	2 536	6 870	938	2 292	1 717	260		**15 972**
Final use categories	Domestic households' private consumption		313	122	199	523	20		**118**
	Inventory changes	- 786	- 391						**-1 421**
	Exports		288	320	167				**719**
	of which sold to non-residents on domestic territory								
	Final consumption at basic prices	**- 786**	**210**	**442**	**367**	**523**	**20**		**- 583**
	Total use at basic prices	**1 750**	**7 080**	**1 380**	**2 659**	**2 240**	**280**		**15 389**
	of which domestic us	1 750	6 493	1 380	2 659	2 240	280		**14 802**
	of which paid by residents abroad		587						**587**

7.3 Energy used for energy purposes

The values of energy products used for energy purposes are presented in table 16. The use for energy purposes consists of the use for the direct provision of heat or electric power or for conversion into other energy products.

The values are in basic prices, and the table are thus a subset of Table 15, which includes the use for both energy purposes and non-energy purposes.

Table 16: Energy products at basic prices used for energy purposes

		Use for energy purposes							
		1. Coal and gas work gas, etc.	2. Oil	3. Natural Gas	4. Electricity	5. Heat	6. Waste and renewables	7. Nuclear fuels	Total use
		Currency units							
Use by national economy	A - Agriculture, forestry and fishing B – Mining and quarrying C.19 - Manufacture of coke and refined petroleum products C.2011 - Manufacture of basic chemicals D – Electricity, gas steam and air conditioning supply C. Other Manufacturing E - Water supply; etc. F - Construction H - Transportation and storage Other Industries								
	Industries' use, total								
	Domestic households' private consumption								
	Inventory changes								
Use by ROW	Exports								
	of which sold to non-residents on domestic territory								
	Total final consumption								
	Losses								
	Total use for energy purposes of which domestic use of which purchased by residents abroad								

Annex 1 Explanation of Table 1 accounting items

The accounting items included in Table 1 are explained below.

Opening stocks: The level of the resources at the beginning of the year. It is equal to the closing stock of the previous year.

Changes due to transactions:

Acquisitions less disposals of energy resources relate to the purchase and sale, barter or transfers in kind of natural energy resources. This item will normally be zero since energy resources are very often owned by governments and as such seldom realised.

Increases in stocks:

Discoveries include gross additions to the level of the resources and refer to findings of resources previously unknown.

Reappraisals (upwards): are often relevant if the account refer to a specific class or sub-category of resources. As more is learned about the characteristics of a particular oil well or mine, the estimate of the stock will be adjusted in the light of new knowledge. If the asset is bigger than expected, if it proves technically easier to extract than was previously thought, or if the price of the resource increases so that a greater quantity can be extracted economically, then there will be an upward reappraisal of the previously classified stock (e.g. from *other reserves* to *best estimate of reserves*). This may lead to a revision of the estimate of the total level or simply to a shift from one category to another.

If the necessary information is not available to separate new discoveries from reappraisals, the term "discoveries and reappraisals" should be used in full to cover the combined item.

Decreases of stocks

Extractions is the item used to record the quantities of the resource, which are removed finally from the deposit. In the case of natural gas, some of the extractions are re-injected into the deposit. The recording should then be net of the re-injected gas in order for the account to show what has been finally removed from the deposit. Quantities which are used by the extractor and thus are finally removed should be recorded as extraction. The same is valid for e.g. natural gas, which is not used as such by the extractor, but is flared for precautionary reasons.

Reappraisals **(downwards)** is a counterpart to the upward reappraisals, cf. above.

Other changes in stocks

Catastrophic losses cover the effects of earthquakes, volcanic eruptions, tidal waves, hurricanes, droughts, floods and other natural disasters as well as wars. Catastrophic losses are probably very seldom or never occurring in relation to energy resources. If a natural disaster changes the accessibility or conditions for extracting the natural resource this should be recorded as reappraisals and not as catastrophic losses. ***Uncompensated seizures*** rarely occur but can in theory take place.

Changes in classifications and structure involve no change in the volume of an asset but relate mainly to the reclassification of change of ownership from one institutional unit to another. Non-zero entries for this item is not likely, but could in principle happen if deposits are owned by units in the household sector, and these units change character and is reclassified into the non-financial corporations sector.

Closing stocks: The level of reserves at the end of the year. It is equal to the opening stock of the subsequent year.

Annex 2. Explanation of Table 2 accounting items

The various accounting items are explained below. In most cases only the closing and opening stock and the changes in inventories will be relevant to record.

Opening stocks (LS): The level of the inventories at the beginning of the year. It is equal to the closing stock of the previous year.

Changes in inventories (P52): This item records the difference between entries into and withdrawals from inventories. In addition recurrent losses are included in this net item. The recurrent losses include losses that normally take place and should be expected.

Catastrophic losses and uncompensated seizures **(K3 and K4)**: Catastrophic losses cover the effects of earthquakes, volcanic eruptions, tidal waves, hurricanes, droughts, floods and other natural disasters as well as wars. Conflagration of oil in pipelines falls under this category. *Uncompensated seizures* rarely occur but could take place.

Changes in classifications **(K6)** involve no change in the volume of an asset but relate mainly to the change of a unit from one institutional sector to another (e.g. the owner of the inventories moves from the household sector to the non-financial corporations sector). Also changes from work-in-progress to finished goods are recorded here.

Other changes in inventories n.e.c. **(K5)** If the assumption about the normal shrinkage of inventories is mistaken (cf. changes in inventories above) this should be corrected as other changes in inventories (cf. SNA 2008, 12.48)

Closing stocks (LE): The level of the inventories at the end of the year. It should be equal to the opening stock of the subsequent year.

Annex 3. Explanation of Table 3 accounting items

Below, the various accounting items of the monetary asset accounts are explained:

Opening stock is the value of the resources at the beginning of the year. It is equal to the closing stock of the previous year. The value excludes any costs of ownership transfer[4]

Changes due to transactions:

Acquisitions less disposals of energy resources is the value related to the corresponding physical flow explained in Chapter 3. This item will normally be zero.

If acquisitions or disposals actually take place between institutional sectors the value of the transaction, which should be recorded, is the value of the deposit itself, excluding any costs of ownership transfer. Costs of ownership transfer are regarded as fixed capital formation and are recorded separately in the capital account (SNA 2008, 10.97).

Increases in stocks:

Discoveries includes the value of gross additions to the stock of the resources and refer to the value of findings of resources previously unknown. It is the value related to the corresponding physical flow explained in Chapter 3.

Reappraisals (upwards) is the value related to the corresponding physical flow explained in Chapter 3. It should be noted, that this item might include effects of price changes, since price changes affect how much of the resource that actually has an economic value, i.e. which parts of the resource that can be expected to be extracted economically. It does on the other hand not include the effect on the total stock due to price changes, cf. the *revaluation* item below.

If the necessary information to separate new discoveries from reappraisals is not available, the term "discoveries and reappraisals" should be used in full to cover the combined item.

Decreases in stocks

Extraction is used to record the value of the corresponding physical flows explained in Chapter 3. It should be noted that the value is to be recorded as the value of the extracted resources before extraction i.e. in ground, and not as the value of the extracted products i.e. the sales value of the extracted resources. The sales value after extraction is higher since it has to allow for the extraction costs, and return to capital, etc.

Reappraisals **(downwards)** records the value of the corresponding physical flows explained in Chapter 3. It is the counterpart to the upward reappraisals, cf. above.

Other changes in stocks

Catastrophic losses and ***uncompensated seizures*** records the value of the corresponding physical flows explained in Chapter 3, section B.

Changes in classifications and structure records the value of the corresponding physical flows explained in Chapter 3. The item will often be zero.

Revaluation (holding gains and losses) is an item specific to the monetary asset account for energy resources, and is not found in the physical asset accounts. It reflects the effect of price changes on the value of the existing stock because the value of each unit of the stock increases or decreases as prices go up or down. It should be

[4] Note that this is a deviation form the SNA 2008 (13.16 and 13.34) in which the value of the asset include the capitalised costs of ownership transfer. Since acquisitions less disposals are values excluding the ownership transfer this implies an inconsistency in the accounts. This is solved here by excluding the cost of ownership transfer from all accounting items. Since ownership transfer of energy assets very seldom takes place this is in fact without any big significance.

noted that besides affecting the value of the existing stock, price changes might also affect how much of the resource that actually has an economic value, but these quantity/volume effects of the price changes are not accounted for as revaluation (holding gains and losses) but instead as *reclassification/reappraisals* under increases in stocks (if prices goes up) or decreases in stock (if prices go down).

Closing stock is the value of the stock of resources at the end of the year. It is equal to the opening stock of the subsequent year. The value excludes any costs of ownership transfer.

The method for actual valuation of the various accounting items is presented in a subsequent section in this chapter.

Annex 4. Explanation of Table 4 accounting items

The various accounting items are explained below. In most cases only the closing and opening stock (LS and LE) and the changes in inventories (P52) will be relevant to record.

Opening stocks (LS): The value of the inventories at the beginning of the year. It is equal to the value of the closing stock of the previous year.

Changes in inventories (P52): measures the value of the entries of energy products into inventories less the value of withdrawals and less the value of any recurrent losses of energy products held in inventories during the accounting period. (cf. SNA 2008 10.118). The recurrent losses include losses that normally takes place and should be expected.

Catastrophic losses and uncompensated seizures **(K3 and K4**). This item, records the effects on the value of inventories from earthquakes, volcanic eruptions, tidal waves, hurricanes, droughts, floods and other natural disasters as well as wars. Conflagration of oil in pipelines falls under this category. Uncompensated seizures rarely occur but could take place.

Changes in classifications **(K6)** involve no change in the value of the total inventories as such but relate mainly to the change of a unit from one institutional sector to another (e.g. the owner of the inventories moves from the household sector to the non-financial corporations sector). Also changes from work-in-progress to finished goods should be recorded here.

Other changes in inventories n.e.c. **(K5)** If the assumption about the value of normal shrinkage/recurrent losses of inventories is mistaken (cf. changes in inventories above) this should be corrected as other changes in inventories (cf. SNA rev1, 12.48)

Valuation changes (holding gains and losses) is an item specific to the monetary asset accounts and an equivalent is not found in the physical assets accounts for inventories. It reflects the effect of price changes on the value of the inventories during the period, see also textbox.

Closing stocks (LE): The value of the inventories at the end of the year. It should be equal to the value of the opening stock of the subsequent year.

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