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The Standard International Energy Product Classification (SIEC) and its relationship with the Central Product Classification (CPC)

UNSD

Purpose of this document

This document describes the relationship between the CPC Ver.2 and SIEC. It evaluates the links between detailed categories in both classifications to allow users to understand the matching or differing concepts involved, to understand the possibilities and limitations of linking the classifications and exchanging data.

In doing so, the paper highlights areas where detailed categories match and areas where matching of the classifications works at certain aggregated levels. In cases where no easy links exist, the underlying problems are discussed and, where possible, options to overcome them are presented.

The present document does not constitute a proposal of change to either CPC or SIEC. However, it is clear that in order to achieve better harmonization between the classifications, changes to both classifications will be necessary. If such harmonization is desired, the present document can serve as a guideline highlighting problem areas and possible solutions.

Table of contents

1. Introduction

The Standard International Energy Product Classification (SIEC) is a classification of products relevant for energy statistics which has been developed as part of the preparation of the International Recommendations for Energy Statistics (IRES). It is an important milestone in energy statistics as it represents the first internationally agreed classification of energy products based on a set of internationally agreed product definitions. With the recent adoption of IRES by the UN Statistical Commission at its 42nd session (February 2011), it is expected that SIEC will guide the collection and compilation of energy statistics at national and international level, enhance international comparability as well the integration of energy statistics with other statistical domains such as economic statistics.

The Central Product Classification (CPC) is a comprehensive and multipurpose classification of *all products*. Its main purpose is to provide a framework for international comparison of statistics on products. Among other roles, is intended to function as a basis for recompiling basic statistics from their original classifications into a standard classification for analytical use. However, it does not fully reflect and respond to the needs for detailed statistics on specific areas, such as energy products - energy products are often not explicitly identified within a CPC class and may sometimes cover different classes of CPC. SIEC was developed in order to reflect more appropriately the products relevant for a better understanding of the energy supply, availability and consumption in a country and thus provide the basis for sound policy making.

In the process of developing the International Recommendations for Energy Statistics (IRES), SIEC has gone through a wide consultation process with experts in energy statistics from countries and international and regional organizations, and involving the Expert Group on International Economic and Social Classifications. While many of the issues raised by the classifications expert group were addressed in the final version of SIEC, the link between SIEC with CPC remains as an important issue.

Since its inception in 1990, CPC has been largely built upon and influenced by the Harmonized System used in international trade, but has not been developed with a particular focus on the priorities of energy statistics. On the other hand, the concepts and definitions of energy statistics have seen little international standardization until recently. Historically, countries and institutions have had a certain common understanding of terminology, but there has been little in terms of exact definitions. The agreed definitions that form the basis of SIEC were only reached recently and with significant international effort. Because of this, the criteria and concepts used by CPC and SIEC are quite different, which leads to differing product definitions and hierarchies.

In some cases, the differences might reasonably be overcome, whereas in a few cases the underlying criteria are so different that it will be very difficult to reconcile the two systems.

Due to the different aggregations structures and different scopes of the two classifications, based on different needs, it cannot be expected that a simple link at all levels of the classifications can be constructed. Instead, the identification of matching components and alternative aggregations of products can provide a better tool for comparing data between both classifications.

This note analyses the correspondence between SIEC and CPC, based on their current definitions, identifies problematic areas and suggests ways in which CPC and SIEC could be adjusted to facilitate the correspondence between the two. This covers two main discussions: Chapter 3 which suggests the aggregates that could form the basic building blocks of an alternative aggregation; and Chapter 4 which presents a suggestion for organizing these building blocks into a new hierarchy of CPC. Annex 1 and Annex 2 present the SIEC-CPC and CPC-SIEC correspondences, respectively. Annex 3 gives a detailed review of the CPC divisions and their correspondence with SIEC according to the linking tables in Annex 1 and 2.

2. Initial observations and remarks

In general, the degree in which two classifications match depends on the level of detail considered, as well as in which direction one wants to convert data. It is worth to point out the following:

- A good match at the detailed level does *not* necessarily entail a good match at the higher levels (i.e. despite similar definitions for detailed-level categories, the higher-level aggregations are done according to differing criteria).
- A good match at higher levels does *not* necessarily entail a good match at the detailed level (i.e. higher-level categories may have similar scope, but disaggregated according to different criteria).
- It may be easier to convert data from classification A to classification B than in the opposite direction (i.e. although categories of A may be neatly aggregated into categories of B, the opposite needs not be true).

This means that when aiming to harmonize two classifications, it is important to have clearly determined *at which level of detail* and *in which direction* one wants to convert information.

This paper focuses on the link from SIEC to CPC, that is on converting data given according to SIEC into data expressed in terms of CPC[1]. It is further recognized that the level of detail in which this is possible depends on the exact type of energy product in question. This is why an alternative aggregation of CPC is sought. The categories of this alternative aggregation will in some cases be comparable to higher-level CPC categories, and in some cases comparable to lower-level ones. Also, in some cases, further disaggregation of CPC subclasses is shown to be necessary.

[1] All further references of CPC are meant to refer to CPC Ver. 2.

Table 1 presents an overview of the coverage of relevant CPC Divisions in terms of SIEC, showing whether a particular CPC Division is fully covered, partially covered or not at all covered by the scope of SIEC. The CPC divisions shown in this table indicate the scope of discussion in this document.

Table 1 - Coverage of relevant CPC Divisions in terms of SIEC

Not covered	Partially covered	Fully covered
02 – Live animals and animal products (excluding meat)	01 – Products of agriculture, horticulture and market gardening	11 – Coal and lignite; peat
04 – Fish and other fishing products	03 – Forestry and logging products	12 – Crude petroleum and natural gas
14 – Metal ores	17[2] – Electricity, town gas, steam and hot water	13 – Uranium and thorium ores and concentrates
15 – Stone, sand and clay	21 – Meat, fish, fruit, vegetables, oils and fats	
16 – Other minerals	31 – Products of wood, cork, straw and plaiting materials	
18 – Natural water	33[3] – Coke oven products; refined petroleum products; nuclear fuel	
22 – Dairy products and egg products	34 – Basic chemicals	
23 – Grain mill products, starches and starch products; other food products	35 – Other chemical products; man-made fibres	
24 – Beverages	39 – Wastes or scraps	
25 – Tobacco products		
26 – Yarn and thread; woven and tufted textile fabrics		
27 – Textile articles other than apparel		
28 – Knitted or crocheted fabrics; wearing apparel		
29 – Leather and leather products; footwear		
32 – Pulp, paper and paper products; printed matter and related articles		
36 – Rubber and plastics products		
37 – Glass and glass products and other non-metallic products n.e.c.		
38 – Furniture; other transportable goods n.e.c.		

[2] Not fully covered due to CPC 17400 – "Ice and snow", which SIEC does not consider.
[3] This Division would be fully covered if it were not for the subclasses 33630 and 33690 – both of which are related to nuclear fuels.

3. Building blocks

The goal is to use CPC and SIEC categories to construct new categories that are better suited for data conversion from SIEC to CPC. The very simplest of such cases arises when a SIEC category, or a group of SIEC categories, matches one-to-one with a CPC category. In such cases, data can be converted simply by adding up the values for the SIEC categories in question.

A related situation occurs when a single CPC subclass fully covers the scope of a SIEC class, but also includes products that are not covered by SIEC at all. In such a situation, one solution would be to subdivide this CPC subclass in order to isolate the component that is covered by SIEC. This approach could be defended at least in the case where the energy product in question is important in its own right.

A third situation is where a combination of related CPC classes corresponds one-to-one with one or a combination of SIEC classes. Thus, by defining building blocks that consists of these aggregates, one can obtain a good link without having to modify either classification. This situation arises for the fuelwood categories.

However, one might have a situation that is close to the one above, where one set of CPC classes together correspond to a set of SIEC classes, *but only approximately*. In this situation, although the scopes of the two aggregates would be very similar, they would not be identical. This situation arises for nuclear fuels, industrial waste, vegetal residues as well as for crude oil.

Finally, a complex situation may arise where a number of CPC categories can be combined to correspond to an aggregate of SIEC classes, but where the involved CPC categories are too diverse to make analytical sense as a separate aggregate. As explained later in this Chapter, this happens once, and involves commodities as diverse as peat, bitumen, lubricants and petroleum gases. In this case, a possible solution could be to simplify the linking table (consciously disregarding some minor links) and/or finding a way to break up a few key CPC or SIEC categories in order to disentangle the complex link graph. Whatever solution chosen, the goal is to end up with a set of more homogeneous and useful categories while minimizing the impact on the classifications themselves.

The different cases are described in more detail below, starting with the simplest and easiest one.

Cases involving only one CPC subclass

There are 19 cases where CPC subclasses can be seen as direct aggregates of SIEC classes. These cases are found in CPC Division 11, 12, 13, 17, 33, 34 and 39, and are summarized in Table 2 below:

Table 2 – Cases where a CPC subclass represent a simple aggregate of SIEC classes

CPC Division	CPC subclass title	CPC code	SIEC code	SIEC class title
11	Coal, not agglomerated	11010	0110	Anthracite
			0121	Coking coal
			0129	Other bituminous coal
	Briquettes and similar solid fuels manufactured from coal	11020	0320	Patent fuel
	Lignite, not agglomerated	11030	0210	Sub-bituminous coal
			0220	Lignite
	Lignite, agglomerated	11040	0330	Brown coal briquettes (BKB)
12	Natural gas, liquefied or in the gaseous state	12020	3000	Natural gas
	Bituminous or oil shale and tar sands	12030	2000	Oil shale / oil sands
13	Uranium and thorium ores and concentrates	13000	9110	Uranium and thorium ores
17	Electrical energy	17100	7000	Electricity
	Coal gas, water gas, producer gas and similar gases, other than petroleum gases and other gaseous hydrocarbons	17200	0350	Coke oven gas
			0360	Gas works gas (and other manufactured gases for distribution)
			0371	Blast furnace gas
			0372	Basic oxygen steel furnace gas
			0379	Other recovered gases
	Steam and hot water	17300	8000	Heat
33	Motor spirit (gasolene), including aviation spirit	33310	4651	Aviation gasoline
			4652	Motor gasoline
	Spirit type (gasolene type) jet fuel	33320	4653	Gasoline-type jet fuel
	Kerosene	33341	4669	Other kerosene
	Kerosene type jet fuel	33342	4661	Kerosene-type jet fuel
	Gas oils	33360	4671	Gas oil / diesel oil
			4672	Heavy gas oil
	Fuel oils n.e.c.	33370	4680	Fuel oil
	Propane and butanes, liquefied	33410	4630	Liquefied petroleum gases (LPG)
34	Wood charcoal	34510	5160	Charcoal
39	Municipal waste	39910	6200	Municipal waste

For these CPC subclasses, the linking situation is obviously very simple. Annex 3 gives some additional detail on each of the correspondences above. However, a couple of issues are worth to mention up front:

Regarding links with CPC 11010: The two classifications use slightly different definitions for anthracite and bituminous coal. CPC inherits the definitions of the Harmonized System, whereas SIEC use the internationally agreed definitions developed through the work on IRES. The differing definitions means that in some border cases, products classified as 'coal' of CPC subclass 11010 could be classified as 'sub-bituminous coal' or 'lignite' in SIEC (which are linked with CPC 11030). However, taking these rather technical definitional differences into account in the linking table might complicate the picture more than it is worth.

Regarding link with CPC 17300: This class has been linked one-to-one with the SIEC class for *heat.* The assumption here is that heat as a commercial product is almost always delivered to the consumer using water or steam as the energy carrier (not to be confused with delivering electricity for electrical heating), and that reciprocally, the CPC product 'steam and hot water' is valued mainly for the heat it carries. It could be argued whether or not this link is appropriate, but this is as close as CPC gets to a product category for 'heat'.

Regarding links with CPC 33310: There are some technical differences in the definitions used for gasoline and aviation spirit in CPC and in SIEC, regarding freezing point, distillation ranges, RON number etc. It is assumed that despite these differences, the two classifications are intending to refer to the same commercial products.

Regarding link with CPC 33360: The definitions in CPC and SIEC cite somewhat different distillation ranges, but other ambiguities in the text leaves room for the assumption that they cover the same set of products.

Regarding link with CPC 33370: Again, there definitions cite somewhat different technical specifications, but for statistical purposes it is assumed that the CPC-SIEC link is one-to-one.

Regarding link with CPC 33910: The definitions of municipal waste in the two classifications do not differ much, with the caveat that SIEC is only intended to classify the fraction of municipal waste that is used to produce energy.

In an alternative aggregation, each of the 18 CPC subclasses of Table 2 can be used as a building block of its own.

Other than those presented in Table 2, all other cases that involves only a single CPC subclass are of the kind where one single SIEC class is fully included in the CPC scope, but not the other way around. In other words, some parts of the CPC subclass are not relevant for SIEC. The following table presents the four situations where this happens:

Table 3: Other CPC subclasses linking to single SIEC classes, but having broader scope

CPC Division	CPC subclass title	CPC code	SIEC code	SIEC class title
33	Other radioactive elements and isotopes and compounds; alloys, dispersions,	33690	9200	Other nuclear fuels

	ceramic products and mixtures containing these elements, isotopes or compounds; radioactive residues			
35	Other chemical products n.e.c.	35490	5220	Biodiesel
39	Beet pulp, bagasse and other waste of sugar manufacture	39140	5120	Bagasse
	Residual lyes from the manufacture of wood pulp, including lignin sulphonates, but excluding tall oil	39230	5140	Black liquor

Each of these cases is described below.

CPC subclass 33690 is a residual category for nuclear materials that contains a large number of radioactive compounds and residues. The explanatory notes of SIEC 9200 is not detailed enough to outline to which extent these are covered, but it is presumed that only a subset of these substances are of any relevance to energy statistics.

CPC subclass 35490 is a residual class for chemical products that includes a hodge-podge of substances, most of which are completely unrelated to SIEC. However, this subclass specifically includes *biodiesel*, which is covered in SIEC class 5220[4].

CPC subclass 39140 contains various wastes from sugar manufacture. An important component of this waste is *bagasse*, which is often burned as a fuel and is separately represented in SIEC class 5120.

CPC subclass 39230 contains various waste products from the manufacture of wood pulp. This includes a substance known as 'black liquor', which is covered in SIEC class 5140. It is understood that the SIEC definition only covers part of what is found in this CPC subclass, but the situation is not completely clear. Annex 3 contains the full detail.

Common for all the correspondences in Table 3 is that data collected according to SIEC can still be converted to CPC, with the understanding that only part of the scopes of the involved CPC subclasses are relevant. However, in order to obtain real one-to-one correspondence, one could in some cases consider splitting out the relevant components of the CPC categories as separate subclasses. This could be considered for e.g. biodiesel and bagasse.

Even without splitting up categories, each of the CPC subclasses in Table 3 could be considered as building blocks in an alternative aggregation, but with the understanding that the matching SIEC categories are narrower in scope: data could still be converted from SIEC to CPC, but would only represent a part of the stated scope of the corresponding CPC subclasses.

Cases involving a cluster of CPC subclasses

[4] In the upcoming Harmonized System 2012, biodiesel will be separately identified with its own code. This makes it likely that an updated CPC would also have a separate category for biodiesel, which would lead to a one-to-one link with SIEC for this product.

There are six cases where an aggregate of CPC categories line up exactly or approximatively with one or an aggregate of SIEC categories. In five of these cases, the resulting aggregate is homogeneous enough to make analytical sense and could thus be used as a building block in the alternative aggregation. These cases are presented below, and concern fuelwood, nuclear fuels, crude oil, industrial waste and animal and vegetal residues, respectively. In the sixth case, the CPC aggregate is too complex to be useful by itself. This case will be presented separately in the following subheading.

Fuelwood, wood residues and by-products

There is only one instance where an aggregate of CPC subclasses appear to exactly match a set of SIEC classes (which in this instance happens to amount to a complete SIEC Group). This instance is presented in table 4 below, and concerns fuelwood, wood-residues and by-products.

Table 4: Fuelwood, wood residues and by-products

CPC Division	CPC subclass title	CPC code	SIEC code	SIEC class title	SIEC Group
03	Fuel wood, in logs, in billets, in twigs, in faggots or in similar forms	03130	5119	Other Fuelwood, wood residues and by-products	511 - Fuelwood, wood residues and by-products
31	Wood in chips or particles	31230			
39	Sawdust and wood waste and scrap	39280			
			5111	Wood pellets	

From this table, we see that SIEC Group 511 (which is made up of classes 5111 and 5119) can be matched with a set of three CPC subclasses taken from three different divisions of CPC. It is not possible to further divide up this aggregation, since SIEC 5119 links to all three of the involved CPC subclasses. This combination of CPC subclasses could be considered a basic building block in the alternative CPC aggregation that is proposed in this paper.

Again, it should be noted that the SIEC classes are intended to cover the fraction of such products used for energy purposes, whereas the CPC subclasses make no such restriction.

Uranium, plutonium and thorium

The second case involves nuclear fuels and is presented in Table 5 below. Contrary to the previous case on fuelwood, the coverage here is not complete – although the scope of SIEC class 9190 is completely in the CPC subclass cluster, the scope of the latter is yet broader. This is due to the inclusion of CPC subclass 33630, which is only partially within the scope of SIEC. This has been illustrated in Table 5 below by shading the corresponding row with a pattern.

Table 5: Uranium, plutonium and thorium (other than ores)

CPC Division	CPC subclass title	CPC code	SIEC code	SIEC class title

33	Natural uranium and its compounds; alloys, dispersions, ceramic products and mixtures containing natural uranium and its compounds	33610	9190	Other uranium, plutonium and thorium
	Uranium enriched in U235 and its compounds; plutonium and its compounds; alloys, dispersions, ceramic products and mixtures containing uranium enriched in U235, plutonium or compounds of these products	33620		
	Fuel elements (cartridges), non-irradiated, for nuclear reactors	33710		
	Spent (irradiated) fuel elements (cartridges) of nuclear reactors	33720		
	Uranium depleted in U235 and its compounds; thorium and its compounds; alloys, dispersions, ceramic products and mixtures containing uranium depleted in U235, thorium or compounds of these products	33630		

As can be seen, the CPC subclasses involved are all from CPC Division 33, and the single SIEC class involved is 9190.

Similar to the case regarding the CPC 33690 – SIEC 9200 link discussed under Table 3 above, it is here not completely clear to what extent SIEC 9190 covers the scope of 33630. The thorium compounds should probably be included, whereas the depleted uranium most likely is not covered.

An important observation is that 33630 and 33690 are the *only two categories* within CPC Division 33 that are not completely covered by SIEC.

Crude Oil

The other relatively simple cluster of CPC subclasses that approximately match a set of SIEC classes relates to crude oil, and is presented in Table 6 below. As in Table 5, the patterned row in Table 6 illustrates that the scope of this CPC subclass is not completely covered by SIEC.

Table 6 – Crude oil and hydrogen

CPC Division	CPC subclass title	CPC code	SIEC code	SIEC class title
34	Hydrogen, nitrogen, oxygen, carbon dioxide and rare gases; inorganic oxygen compounds of non-metals n.e.c.	34210	4500	Other hydrocarbons
12	Petroleum oils and oils obtained from bituminous minerals, crude	12010	4100	Conventional crude oil

SIEC makes a distinction between conventional crude oil, classified in 4100, and non-conventional oil (e.g. obtained from oil shale, generated synthetically from natural gas, etc.), which is classified in 4500. The category for crude oil in CPC, 12010 does not make this distinction. This situation could thus have been a simple case of Table 2, if it were not for the fact that SIEC 4500 also is the class for *hydrogen*, which CPC classifies in 34210, along with a number of other gases and substances that are of no relevance to SIEC.

Therefore, if one seeks to have aggregate categories on crude oil that links across the classifications in a one-to-one manner, it will be necessary to split out hydrogen as a separate subclass, either in SIEC or in CPC. If it is done in CPC[5], we would end up with an aggregate consisting of CPC 12010 and the new category for hydrogen, which would match perfectly in scope with SIEC 4100 + SIEC 4500. If it is done in SIEC, we would end up with CPC 12010 perfectly matching SIEC 4100 + SIEC 4500, as well as a new category for hydrogen that would be included in the scope of CPC 34210, but not cover it. Basically, the latter would be another case to add to Table 3 above.

For all the cases discussed above, more information on individual links is provided in Annex 3.

Industrial waste

Industrial waste in SIEC is defined in SIEC as non-renewable waste that is combusted with heat recovery in plants other than those used for incineration of municipal waste. As such, this is a definition that is non-specific in terms of substances, which makes it difficult to develop exhaustive correspondences with CPC. The current suggestion is to equate SIEC 6100 with CPC Group 392 – "Non-metal wastes or scraps", excluding the categories that have already been covered by other SIEC links (39230 for black liquor and 39280 for wood waste).

The working assumption is that this rough approximation might be good enough for some statistical purposes where the exact composition of the waste classified under 6100 is not known. In such cases, the contents of the SIEC category could be shoehorned into the aggregate of proposed CPC categories. However, it is recognized that materials from other parts of CPC might sometimes fall under the 6100 definition. If the composition of materials classified under 6100 in a given scenario is known, it would be more accurate to determine the link(s) that would be most appropriate for that situation.

To illustrate that the full scope of SIEC 6100 is not limited to the proposed CPC categories, the corresponding cell has been shaded. (Again, it is implicitly understood that SIEC only classifies the part of such waste that is actually combusted for energy-raising purposes).

[5] It is worth noting that hydrogen has its own separate code in the Harmonized System (2804.10), so that splitting up the CPC class would not introduce any split links with HS.

Table 7 - Industrial waste

CPC Group	CPC subclass title	CPC code	SIEC code	SIEC class title
392	Miscellaneous textile wastes	3921x[6]	6100	Industrial waste
	Waste of leather, leather dust, powder and flour	39220		
	Waste and scrap of paper or paperboard	39240		
	Waste, parings and scrap of rubber (except hard rubber) and powders and granules obtained therefrom	39250		
	Used pneumatic tyres of rubber	39260		
	Waste, parings and scrap of plastic	39270		
	Other non-metal waste or scrap	39290		

Animal and vegetal residues

This case is similar to the industrial waste above in that it involves SIEC categories that are defined relatively loosely in terms of specific substances. The end aggregate, which consists of five CPC subclasses on one hand and two SIEC classes on the other, covers animal and vegetal residues, which covers manure as well as animal and vegetal waste that can be combusted as a fuel. Again, as with industrial waste, it is understood that there might be items classified elsewhere in CPC that might also fall under this definition in some cases, so the below links could be seen as indicative when no further information is provided on the actual contents of the material classified under SIEC 5130 or 5150. Since the full scope of these two SIEC classes is not guaranteed to be covered by the proposed CPC classes, their cell in the table below are shaded.

Table 8 - Animal and vegetal residues

CPC Div.	CPC subclass title	CPC code	SIEC code	SIEC class title
01	Cereal straw, husks, unprepared, ground, pressed, or in the form of pellets.	01913	5150	Other vegetal material and residues
21	Oil-cake and other solid residues, of vegetable fats or oils	21710		
39	Bran and other residues from the working of cereals or legumes; vegetable materials and vegetable waste, vegetable residues and by-products, whether or not in the form of pellets, of a kind used in animal feeding n.e.c.	39120		
	Cocoa shells, husks, skins and other cocoa waste; coffee husks and skins	39150		
34	Excreta of animals useful for manure/fertilizer and fuel preparation	34654	5130	Animal waste

One comment should be mentioned regarding CPC subclass 34654 above: From the title of the subclass, it would be intuitive to conclude that it should only link with SIEC 5130 – "Animal waste", since there is nothing in the wording of the title that suggests it covers

[6] 3921x is here used as a shorthand for all subclasses under CPC class 3921 – "Misc. textile wastes"

any vegetal material. However, as with most other CPC categories, this subclass is defined in terms of the Harmonized System. Its scope should be equivalent with the scope of Harmonized System Heading 3101, which includes various kinds of animal *and* vegetable waste[7]. On the other hand, the definition of SIEC class 5130 is very clear that it covers only excreta of animals, meat and fish residues that are used as fuels when dried. This would not cover products of vegetal origin, which is why CPC 34654 also links with SIEC 5150 above.

Complex case involving a cluster of CPC subclasses

The following aggregate cannot be further broken up without either breaking CPC-SIEC links or disaggregating basic categories:

As the situation is more complex than before, this table is organized a little differently. The key principle is that CPC codes link to all the SIEC codes listed at their right. (However, two SIEC codes listed horizontally next to each other are not necessarily related in any other way).

Table 9 – Complex case of entangled categories

CPC Div.	CPC subclass title	CPC code	SIEC code(s)		
11	Peat	11050	1290	1110	
				1120	
				1210	
33	Coke and semi-coke of coal, of lignite or of peat; retort carbon	33100		0311	
				0312	
				0313	
				0314	
	Tar distilled from coal, from lignite or from peat, and other mineral tars	33200		0340	
	Petroleum jelly; paraffin wax, micro-crystalline petroleum wax, slack wax, ozokerite, lignite wax, peat wax, other mineral waxes, and similar products; petroleum coke, petroleum bitumen and other residues of petroleum oils or of oils obtained from bituminous materials	33500		4693	
				4695	
			4699	4694	0390
34	Oils and other products of the distillation of high temperature coal tar, and similar products; pitch and pitch coke, obtained from mineral tars	34540			
33	Other light petroleum oils […]	33330		4691	4640
	Other medium petroleum oils […]	33350			
	Lubricating petroleum oils and oils obtained from bituminous minerals, other heavy petroleum oils […]	33380		4692	

[7] The Harmonized System explanatory notes emphasize the use of these products as fertilizers, but the title of CPC subclass 34654 also recognizes the possible use of such products for fuel preparation.

	Ethylene, propylene, butylene, butadiene and other petroleum gases or gaseous hydrocarbons, except natural gas	33420	4200
			4620
			5311
			5312
			5319
			4610

Due to the number of SIEC classes involved and the fact that a number of them have scopes that stretch across several CPC categories, it was not possible to add SIEC titles to the diagram without compromising visual clarity. However, only the SIEC codes that link to multiple CPC subclasses are important for understanding how the aggregate is bound together[8]. These codes are:

- 0390 – "Other coal products"
- 1290 – "Other peat products"
- 4691 – "White spirit and special boiling point industrial spirits"
- 4694 – "Petroleum coke"
- 4699 – "Other oil products n.e.c."

The combined aggregate of CPC categories of Table 9 does not seem to make much analytical sense. Among other things, it covers peat, coke, tars, waxes, bitumen, naphtha, lubricants and various petroleum gases. It would therefore be beneficial to split it up in a number of more homogeneous sub-categories. However, this comes at the cost of either removing some links (those judged as least significant) or splitting up basic CPC or SIEC categories[9]. Some suggestions for how to do this are provided below.

First, one can observe that the only thing that connects CPC 33420 with the rest of the cluster in Table 9 is the common link with SIEC 4699 – "Other oil products n.e.c." As explained in Annex 3, the link between these two categories represents *ethylene, propylene, butylene and butadiene*[10]. There are three ways this category could be split away from the rest of the cluster:

1. One could remove the link altogether, arguing that these substances are not important enough to make any statistical difference (however, this is far from clear).
2. One could split out these substances from SIEC 4699 as a separate category. However, this would imply that these products are important enough in energy statistics to merit their own class (which, again, is far from clear)[11].

[8] A full list of SIEC codes with their respective titles can be found in Annex 1. Also, details on the specific links in Table 7 can be found in Annex 3.

[9] Basically, the choice of whether to remove a link or to split up a category could very much depend on the statistical importance of the product involved. If the product is relatively important, it is easier to argue it should be split out and separately identified; if it is insignificant, it is easier to argue that the link should be removed.

[10] In other words, the complete contents of Harmonized System code 2711.14.

[11] Also, as it took considerable effort to obtain international agreement on the product definitions used in SIEC in the first place, introducing additional modifications to the classification at this point might prove difficult.

3. One could split up CPC 33420 in two; one subclass that only contains ethylene, propylene, butylene and butadiene (which would remain linked with 4699 and thus aggregated with the cluster) and one subclass containing all the other leftover gaseous hydrocarbons (which would no longer link with 4699).

Another group of subclasses that might be separated from the rest of the aggregate consists of CPC subclasses 11050, 33100 and 33200. This is not too complicated, since they are only linked to the rest of the aggregate by being associated with SIEC code 1290 – "Other peat products", which is also linked to CPC 33500. The link between CPC 33500 and SIEC 1290 only represent peat wax, which could be considered statistically insignificant enough to justify removing this partial link.

Another opportunity arises in observing that the only thing that associates CPC subclasses 33500 and 34540 with 33330, 33350 and 33380 is the common link with SIEC 4699 – "Other oil products, n.e.c.". If it could be shown that the links from SIEC 4699 to either of these two groups are merely incidental, one might perhaps remove them. On the other hand, it would be harder to break 34540 apart from 33500, since they have three SIEC links in common. Moreover it is natural to consider 33330, 33350 and 33380 together as one aggregate, since they represent the residual classes for light oils, medium oils and heavy oils respectively.

The link between SIEC 4699 and CPC 33500 represents "other residues of petroleum oils". There are no direct examples of such residues cited, so it is not clear how significant these products are.

The link between SIEC 4699 and CPC 34540 represents pitch from oil products, as well as petroleum-derived products similar to the coal-derived products otherwise making up the contents of this subclass. Again, apart from the pitch, it is not all clear what these products would actually be.

The links between SIEC 4699 and CPC 33330 / 33350 / 33380 represents whatever leftover preparations constituted of "light oils", "medium oils" and "heavy oils", respectively. Although no particular example is mentioned (the CPC explanatory notes are very brief), it makes conceptual sense to link these to SIEC 4699, since they represent the residual categories for such oils, and since SIEC plays a similar role as residual category for oil products.

Taking the above into account, it is not easy to determine whether any of the links could be ignored or removed.

However, for the discussion of the rest of the paper, it is here assumed[12] that each of the three splits above could be carried out by:

- Breaking ethylene, propylene, butylene and butadiene out from 33420 as a separate CPC subclass

[12] This should not be taken as implying any recommendation – it is merely for the sake of argument and demonstration.

- Removing the link between CPC 33500 and SIEC 1290 (i.e. ignoring peat wax)
- Removing the links between CPC 33500 / 34540 and SIEC 4699.

This would leave us with three aggregated CPC-categories that could be used as building blocks in an alternative aggregation the might look like this:

Table 10: Sample disentanglement of cluster in Table 9

CPC component	Suggested title
11050 33100 33200	Peat; coke and semi-coke of coal, lignite or peat; retort carbon; tar distilled from coal, lignite or peat; other mineral tars
33500 34540	petroleum jelly; waxes; petroleum coke; petroleum bitumen; products of the distillation of high temperature coal tar; pitch and pitch coke, obtained from mineral tars
33330 33350 33380 *new subclass for ethylene, etc., split out of 33420*	Other petroleum oils; ethylene, propylene, butylene and butadiene
residual part of 33420	Other petroleum gases or gaseous hydrocarbons, except natural gas

Leftover SIEC categories (not involved in any of the above cases)

The cases reviewed in Table 2 – Table 9 cover the large majority of SIEC classes. However, there remain seven remaining SIEC classes with no strong links at all to SIEC. Two of these have been presented with tentative links to CPC, but these are best understood as indicators of incidental overlap rather than real links useful for data conversion. The other six remaining SIEC classes have no link with SIEC at all.

In several cases, the primary reason no good link exist is that SIEC use criteria that are not recognized in CPC. Some categories, such as 4300 and 5320, are defined on a different principle than pure product characteristics, and reflect inputs or outputs related to certain processes, where the actual composition is less relevant[13]. Also, a couple of the remaining SIEC classes are residual classes, which are often hard to compare across classifications.

The remaining SIEC classes are:

Table 11 – Leftover SIEC categories

CPC link(s)	SIEC code	SIEC class title	Comment

[13] While this breaks with the standard criteria used in CPC, such an approach has also been used in other classifications such as EBOPS, where in some cases special categories are defined by other overriding principles.

34131*, 34139*, 34170*	4400	Additives and oxygenates	In the context of energy statistics, “additives and oxygenates” refer to all compounds added to or blended with oil products to modify their property. As such the term may refer to a large and loosely defined group of chemicals and substances that could potentially be found across many CPC subclasses, especially in the division for chemicals. The proposed CPC links represent specific substances that have cited as examples in the SIEC definitions.
	5210	Biogasoline	In SIEC, biogasoline is described as a liquid fuel derived from biomass and used in spark-ignition internal combustion engines. Some common examples are cited (and these provide basis for the suggested CPC links). It is worth pointing out that biogasoline is chemically different from regular gasoline and as such does not neatly fit into the CPC gasoline categories. (Moreover, CPC usually does not consider the source of the raw material that goes into a product, so the classification does not separately define ‘bio’ products). An additional complication arises from the fact that biogasoline is typically blended with regular gasoline, blurring the line between this product and the additives of SIEC 4400.
N/A	4300	Refinery feedstocks	The term “refinery feedstocks” is used to collectively refer to various oils and gases that are destined to be used for further processing in a refinery. As such, they are rather identified by expected end use than by their intrinsic nature, and they can encompass several products that are otherwise found elsewhere in SIEC, e.g. naphtha and heavy oils. As CPC does not generally recognize end use as a defining criterion, there is no meaningful way to link SIEC 4300 with CPC.
N/A	5230	Bio jet kerosene	The same complications arise for bio jet kerosene as for biogasoline (c.f. comment to 5210 above).
N/A	5290	Other liquid biofuels	This is a residual category that does not give any specific examples. Generally, this class would have the same complications as those mentioned for biogasoline above.
N/A	5320	Biogases from thermal processes	According to the SIEC definition, biogases from thermal processes are obtained from gasification or pyrolysis of biomass, and consist of mixtures mainly composed of hydrogen and carbon monoxide. This means that, contrary to other biogases, these gases do not primarily consist of hydrocarbons, and as such it does not seem natural to link this class with CPC 33420.
N/A	9900	Other fuels n.e.c.	This class is the final residual category of SIEC, added at the end for conceptual reasons to cover any fuel which would fall under the stated scope of SIEC, without being covered by any of the other SIEC categories. No example is provided, and the contents are not further described.

As can be seen from the comments to these categories, linking them in any meaningful way to CPC is highly non-trivial, and would require substantial change in either classification.

For these pathological cases, the present document only aims to point out the problems, without attempting to suggest any solutions.

4. Higher-level aggregation

Using the building blocks suggested in the discussion of the tables of Chapter 3, Table 12 below presents an attempt to define a full-fledged alternative CPC aggregation for energy products, with categories that can be properly linked to SIEC. The proposed alternative aggregation contains two levels. The detailed level consists of the building blocks discussed in Chapter 3. A higher level is also proposed to introduce additional organization. The two first columns of Table 12 represent the higher level and the detailed level, respectively.

Comments regarding the detailed level

Whenever a building block of the alternative aggregation coincides with a single CPC category, the name of the CPC category is used. When the building block consists of more than one CPC subclass, a new name is suggested, with text in italics.

For the sake of this example, choices in the delineation of categories have been made according to the suggestions in Chapter 1. For instance, it has been assumed that hydrogen has been split out as a proper CPC subclass, and that the complex case presented in Table 9 has been resolved according to the suggestion of Table 10.

Comments regarding the higher level

The choice of higher level groupings was made according to the following considerations:

- Keep categories within the same CPC divisions together as far as reasonable
- Keep categories within the same SIEC sections together as far as reasonable
- Keep derived products together with their corresponding primary products (or in the case of petroleum, a separate category that immediately follows).
- List all fuels before listing electricity/heat

Since CPC does not generally identify 'bio' products separately, no attempt was made to create a high level heading for biofuels.

Other comments

A couple of caveats should be mentioned at this point. First, it is important to point out that in Table 12 below, the SIEC classes of Table 11 are *not* included. In other words, the proposed alternative aggregation does *not* cover all of SIEC. It would be impossible to do so without resolving the issues related to Table 11, which this out of scope of this paper.

Also, it should be emphasized that in certain cases, the CPC categories have a broader scope than the SIEC categories they are associated with. This is the case for all categories that were discussed in Table 3. In all these cases, the relevant component has been identified in the suggested building block title – for an example, see the category consisting of CPC subclass 35490 below.

In addition, as was mentioned in the discussion of Table 3 and 5, it is not clear exactly which radioactive compounds of CPC 33630 and 33690 are covered by SIEC, but it is assumed that some of them are not.

Table 12 – Suggested alternative aggregation

Suggested high-level alternative aggregate	Suggested building block title	CPC subclasses in building block	SIEC corresp.	CPC Divisions involved	Discussed in
Coal, lignite, peat and derived products	Coal, not agglomerated	11010	0110, 0212, 0129	11	Table 2
	Briquettes and similar solid fuels manufactured from coal	11020	0320	11	Table 2
	Lignite, not agglomerated	11030	0210, 0220	11	Table 2
	Lignite, agglomerated	11040	0330	11	Table 2
	Peat; coke and semi-coke of coal, lignite or peat; retort carbon; tar distilled from coal, lignite or peat; other mineral tars	11050, 33100, 33200	0311, 0312, 0313, 0314, 0340, 1110, 1120, 1210, 1290	11, 33	Table 10
Crude oil and natural gas; hydrogen	Natural gas, liquefied or in the gaseous state	12020	3000	12	Table 2
	Bituminous or oil shale and tar sands	12030	2000	12	Table 2
	Petroleum oils and oils obtained from bituminous minerals, crude; hydrogen	12010, *and new subclass for hydrogen*	4100, 4500	12, 34	Table 6
Refined petroleum products; products obtained from distillation of high temperature coal tar; biodiesel	Motor spirit (gasolene), including aviation spirit	33310	4651, 4652	33	Table 2
	Spirit type (gasolene type) jet fuel	33320	4653	33	Table 2
	Kerosene	33341	4669	33	Table 2
	Kerosene type jet fuel	33342	4661	33	Table 2
	Gas oils	33360	4671, 4672	33	Table 2

	Fuel oils n.e.c.	33370	4680	33	Table 2
	Propane and butanes, liquefied	33410	4630	33	Table 2
	Other petroleum oils; ethylene, propylene, butylene and butadiene	33330, 33350, 33380, *and new subclass for ethylene, etc.*	4640, 4691, 4692, 4699	33	Table 10
	Other petroleum gases or gaseous hydrocarbons, except natural gas	*new subclass for residual part of 33420*	4200, 4620	33	Table 10
	petroleum jelly; waxes; petroleum coke; petroleum bitumen; products of the distillation of high temperature coal tar; pitch and pitch coke, obtained from mineral tars	33500, 34540	0390, 4693, 4694, 4695 (1290 and 4699 omitted)	33, 34	Table 10
	Other chemical products n.e.c. *(biodiesel component)*	35490	5220	35	Table 3
Fuelwood and wood charcoal	*Fuel wood, wood residues and by-product*	03130, 31230, 39280	5111, 5119	03, 31, 39	Table 4
	Wood charcoal	34510	5160	34	Table 2
Combustible wastes (non-exhaustive)	Manure and other animal residues; other vegetal residues	01913, 21710, 34654, 39120, 39150	5130, 5150	01, 21, 34, 39	Table 8
	Industrial waste	3921x, 39220, 39240, 39250, 39260, 39270, 39290	6100	39	Table 7
	Municipal waste	39910	6200	39	Table 2
	Beet pulp, bagasse and other waste of sugar manufacture *(bagasse component)*	39140	5120	39	Table 3

	Residual lyes from the manufacture of wood pulp, including lignin sulphonates, but excluding tall oil *(black liquor component)*	39230	5140	39	Table 3
Uranium, plutonium and other nuclear fuels	Uranium and thorium ores and concentrates	13000	9110	13	Table 2
	Uranium, plutonium and thorium (excl. ores); other nuclear fuels	33610, 33620, 33630, 33690, 33710, 33720	9190, 9200	33	Table 5
Electricity and heat; manufactured gases	Electrical energy	17100	7000	17	Table 2
	Coal gas, water gas, producer gas and similar gases, other than petroleum gases and other gaseous hydrocarbons	17200	0350, 0360, 0371, 0372, 0379	17	Table 2
	Steam and hot water	17300	8000	17	Table 2

Annex 1:
SIEC-CPC correspondences

In the below correspondence table, 'x' denotes 'no available link'

Section/ Division/ Group	Class	Title	CPC link	HS Link
0		**Coal**		
01		Hard coal		
011	0110	Anthracite	11010*	2701.11
012		Bituminous coal		
	0121	Coking coal	11010*	2701.19
	0129	Other bituminous coal	11010*	2701.12
02		Brown coal		
021	0210	Sub-bituminous coal	11030*	2702.10*
022	0220	Lignite	11030*	2702.10*
03		Coal products		
031		Coal coke		
	0311	Coke oven coke	33100*	2704*
	0312	Gas coke	33100*	2704*
	0313	Coke breeze	33100*	2704*
	0314	Semi cokes	33100*	2704*
032	0320	Patent fuel	11020	2701.20
033	0330	Brown coal briquettes (BKB)	11040	2702.20
034	0340	Coal tar	33200*	2706
035	0350	Coke oven gas	17200*	2705*
036	0360	Gas works gas (and other manufactured gases for distribution)	17200*	2705*
037		Recovered gases		
	0371	Blast furnace gas	17200*	2705*
	0372	Basic oxygen steel furnace gas	17200*	2705*
	0379	Other recovered gases	17200*	2705*
039	0390	Other coal products	33500*	2712.90*
			34540*	2707*, 2708.10*, .20*
1		**Peat and peat products**		
11		Peat		
111	1110	Sod peat	11050*	2703*
112	1120	Milled peat	11050*	2703*
12		Peat products		
121	1210	Peat briquettes	11050*	2703*
129	1290	Other peat products	11050*	2703*
			33100*	2704*
			33200*	2706*
			33500*	2712.90*
2		**Oil shale / oil sands**		
20		**Oil shale / oil sands**		

200	2000	Oil shale / oil sands	12030	2714.10
3		**Natural gas**		
30		**Natural gas**		
300	3000	Natural gas	12020	2711.11, .21
4		**Oil**		
41		Conventional crude oil		
410	4100	Conventional crude oil	12010*	2709*
42		Natural gas liquids (NGL)		
420	4200	Natural gas liquids (NGL)	33420*	2711.19*, .29*
43		Refinery feedstocks		
430	4300	Refinery feedstocks	x	x
44		Additives and oxygenates		
440	4400	Additives and oxygenates	34131*	2207.20*,
			34139*	2905.11,
			34170*	2909.19*,
			others	others
45		Other hydrocarbons		
450	4500	Other hydrocarbons	12010*	2709*,
			34210*	2804.10
46		Oil products		
461	4610	Refinery gas	33420*	2711.29*,
462	4620	Ethane	33420*	2711.19*, .29*
463	4630	Liquefied petroleum gases (LPG)	33410	2711.12, .13
464	4640	Naphtha	33330*	2710.11*
465		Gasolines		
	4651	Aviation gasoline	33310*	2710.11*
	4652	Motor gasoline	33310*	2710.11*
	4653	Gasoline-type jet fuel	33320	2710.11*
466		Kerosenes		
	4661	Kerosene-type jet fuel	33342	2710.19*
	4669	Other kerosene	33341	2710.19*
467		Gas oil / diesel oil and Heavy gas oil		
	4671	Gas oil / Diesel oil	33360*	2710.19*
	4672	Heavy gas oil	33360*	2710.19*
468	4680	Fuel oil	33370	2710.19*
469		Other oil products		
	4691	White spirit and special boiling point industrial spirits	33350*	2710.11*
			33330*	2710.11*
	4692	Lubricants	33380*	2710.19*
	4693	Paraffin waxes	33500*	2712.20*
	4694	Petroleum coke	33500*	2713.11, .12,
			34540*	2708.20*
	4695	Bitumen	33500*	2713.20
	4699	Other oil products n.e.c.	33330*	2710.11*,
			33350*	2710.19*
			33380*	2710.19*
			33420*	2711.14
			33500*	2712.10*, .20*,.90*, 2713.90

			34540*	2707*, 2708.10*
5		**Biofuels**		
51		Solid biofuels		
511		Fuelwood, wood residues and by-products		
	5111	Wood pellets	39280*	4401.30*
	5119	Other Fuelwood, wood residues and by-products	03130 31230 39280*	4401.10, 4401.21, .22, 4401.30*
512	5120	Bagasse	39140*	2303.20*
513	5130	Animal waste	34654*	3101*
514	5140	Black liquor	39230*	3804.00*
515	5150	Other vegetal material and residues	39120* 39150* 01913 21710 34654*	2302* 0901.90*, 1802* 1213 2304 – 2306 3101
516	5160	Charcoal	34510	4402
52		Liquid biofuels		
521	5210	Biogasoline	34131* 34139* 34170*	2207.20*, 2905.11*, .13*, .14* 2909.19*
522	5220	Biodiesel	35490*	3824.90*
523	5230	Bio jet kerosene	x	x
529	5290	Other liquid biofuels	x	x
53		Biogases		
531		Biogases from anaerobic fermentation		
	5311	Landfill gas	33420*	2711.29*
	5312	Sewage sludge gas	33420*	2711.29*
	5319	Other biogases from anaerobic fermentation	33420*	2711.29*
532	5320	Biogases from thermal processes	x	x
6		**Waste**		
61		Industrial waste		
610	6100	Industrial waste	3921x 39220 39240 39250 39260 39270 39290	5003; 5103.20, .30; 5104; 5202; 5505; 6309; 6310 4115.20 4707 4004 4012.20 3915 2525.30; 2601
62		Municipal waste		
620	6200	Municipal waste	39910	3825.10
7		Electricity		
70		Electricity		
700	7000	Electricity	17100	2716
8		Heat		

80		Heat		
800	8000	Heat	17300	2201.90*
9		Nuclear fuels and other fuels n.e.c.		
91		Uranium, plutonium and thorium		
910	9110	Uranium and thoirum ores	13000	2612.10
	9190	Other uranium, plutonium and thorium	33610	2844.10,
			33620	2844.20,
			33630*	2844.30*
			33710	8401.30
			33720	2844.50
92		Other nuclear fuels		
920	9200	Other nuclear fuels	33690*	2844.40*
99		Other fuels n.e.c.		
990	9900	Other fuels n.e.c.	x	x

Annex 2:
CPC-SIEC correspondences

CPC Division	CPC Group	CPC Subclass title	CPC Subclass	SIEC link	SIEC Title
CPC Division 01 – Products of agriculture, horticulture and market gardening	**Group 019 – Forage product, fibres, living plants, cut flowers and flower buds, unmanufactured tobacco, and natural rubber**	Cereal straw, husks, unprepared, ground, pressed or in the form of pellets	01913	5150*	Other vegetal material and residues
CPC Division 03 - "Forestry and logging products" (partial, as 032 is not considered)	**Group 031 - Wood in the rough**	Fuel wood, in logs, in billets, in twigs, in faggots or in similar forms	03130	5119*	Other Fuelwood, wood residues and by-products
CPC Division 11 - "Coal and lignite; peat" (complete)	**Group 110 - *[idem]***	Coal, not agglomerated	11010	0110	Anthracite
				0121	Coking coal
				0129	Other bituminous coal
		Briquettes and similar solid fuels manufactured from coal	11020	0320	Patent fuel
		Lignite, not agglomerated	11030	0210	Sub-bituminous coal
				0220	Lignite
		Lignite, agglomerated	11040	0330	Brown coal briquettes (BKB)
		Peat	11050	1110	Sod peat
				1120	Milled peat
				1210	Peat briquettes
				1290*	Other peat products
CPC Division 12 - "Crude petroleum and natural gas" (complete)	**Group 120 - *[idem]***	Petroleum oils and oils obtained from bituminous minerals, crude	12010	4100	Conventional crude oil
			12010	4500*	Other hydrocarbons
		Natural gas, liquefied or in the gaseous state	12020	3000	Natural gas
		Bituminous or oil shale and tar sands	12030	2000	Oil shale / oil sands
CPC Division 13 - "Uranium and thorium ores and concentrates" (complete)	**Group 130 - *[idem]***	Uranium and thorium ores and concentrates	13000	9110	Uranium and thorium ores
CPC Division 17 - "Electricity, town gas, steam and hot water" (partial, since 17400 - "Ice and snow" is not considered")	**Group 171 - Electrical energy**	Electrical energy	17100	7000	Electricity
	Group 172 - Coal gas, water gas, producer gas and similar gases, other than petroleum gases and other gaseous hydrocarbons	Coal gas, water gas, producer gas and similar gases, other than petroleum gases and other gaseous hydrocarbons	17200	0350	Coke oven gas
				0360	Gas works gas (and other manufactured gases for distribution)
				0371	Blast furnace gas
				0372	Basic oxygen steel furnace gas
				0379	Other recovered gases

	Group 173 - Steam and hot water	Steam and hot water	17300	8000	Heat
CPC Division 21 – Meat, fish, fruit, vegetables, oils and fats	**Oil-cake and other residues resulting from the extraction of vegetable fats or oils; flours and meals of oil seeds or oleaginous fruits, except those of mustard; vegetable waxes, except triglycerides; degras; residues resulting from the treatment of fatty substances or animal or vegetable waxes**	Oil-cake and other solid residues, of vegetable fats or oils	21710	5150*	Other vegetal material and residues
CPC Division 31 - Products of wood, cork, straw and plaiting materials (partial)	**Group 312 - Wood continuously shaped along any of its edges or faces; wood wool; wood flour; wood in chips or particles**	Wood in chips or particles	31230	5119*	Other Fuelwood, wood residues and by-products
CPC Division 33 - Coke oven product; refined petroleum products; nuclear fuel (partial, since some nuclear materials are not included)	**Group 331 - Coke and semi-coke of coal, of lignite or peat; retort carbon (complete)**	Coke and semi-coke of coal, of lignite or of peat; retort carbon	33100	0311	Coke oven coke
				0312	Gas coke
				0313	Coke breeze
				0314	Semi cokes
				1290*	Other peat products
	Group 332 - Tar distilled from coal, from lignite or from peat, and other mineral tars (complete)	Tar distilled from coal, from lignite or from peat, and other mineral tars	33200	0340	Coal tar
				1290*	Other peat products
	Group 333 - Petroleum oils and oils obtained from bituminous materials, other than crude; preparations n.e.c. containing by weight 70% or more of these oils, such as oils being the basic constituents of the preparations (complete)	Motor spirit (gasolene), including aviation spirit	33310	4651	Aviation gasoline
				4652	Motor gasoline
		Spirit type (gasolene type) jet fuel	33320	4653	Gasoline-type jet fuel
		Other light petroleum oils and ligtht oils obtained from bituminous minerals (other than crude); light preparations n.e.c. containing not less than 70% by weight of petroleum oils or oils obtained from bituminous minerals (other than crude), these oils being the basic constituents of the preparations	33330	4640	Naphtha
				4699*	Other oil products n.e.c.
				4691*	White spirit and special boiling point industrial spirits
		Kerosene	33341	4669	Other kerosene
		Kerosene type jet fuel	33342	4661	Kerosene-type jet fuel
		Other medium petroleum oils and medium oils obtained from bituminous minerals (not kerosene), other than crude;	33350	4691*	White spirit and special boiling point industrial spirits

		medium preparations n.e.c. containing not less than 70% by weight of petroleum oils or oils obtained from bituminous minerals (other than crude), these oils being the basic constituents of the preparations.		4699*	Other oil products n.e.c.
		Gas oils	33360	4671	Gas oil / Diesel oil
				4672	Heavy gas oil
		Fuel oils n.e.c.	33370	4680	Fuel oil
		Lubricating petroleum oils and oils obtained from bituminous minerals, other heavy petroleum oils and heavy oils obtained from bituminous minerals (other than crude), and heavy preparations n.e.c. containing not less thant 70% by weight of petroleum oils or oils obtained from bituminous minerals (other than crude), these oils being the basic constituents of the preprarations.	33380	4692	Lubricants
				4699*	Other oil products n.e.c.
	Group 334 - Petroleum gases and other gaseous hydrocarbons, except natural gas (complete)	Propane and butane, liquefied	33410	4630	Liquefied petroleum gases (LPG)
		Ethylene, propylene, butylene, butadiene and other petroleum gases or gaseous hydrocarbons, except natural gas.	33420	4200	Natural gas liquids (NGL)
				4610	Refinery gas
				4620	Ethane
				4699*	Other oil products n.e.c.
				5311	Landfill gas
				5312	Sewage sludge gas
				5319	Other biogases from anaerobic fermentation
	Group 335 - Petroleum jelly; paraffin wax, micro-crystalline petroleum wax, slack wax, ozokerite, lignite wax, peat wax, other mineral waxes, and similar products; petroleum coke, petroleum bitumen and other residues of petroleum oils or of oils obtained from bituminous materials (complete)	Petroleum jelly; paraffin wax, micro-crystalline petroleum wax, slack wax, ozokerite, lignite wax, peat wax, other mineral waxes, and similar products; petroleum coke, petroleum bitumen and other residues of petroleum oils or of oils obtained from bituminous minerals.	33500	1290*	Other peat products
				4693	Paraffin waxes
				4695	Bitumen
				0390*	Other coal products
				4694*	Petroleum coke
				4699*	Other oil products n.e.c.
	Group 336 - Radioactive element and isotopes and compounds; alloys, dispersions, ceramic products and mixtures containing these elements, isotopes or	Natural uranium and its compounds; alloys, dispersions, ceramic products and mixtures containing natural uranium and its compounds.	33610	9190*	Other uranium, plutonium and thorium

	compounds; radioactive residues (complete?)	Uranium enriched in U235 and its compounds; plutonium and its compounts; alloys, dispersions, ceramic produucts and mixtures containing uranium enriched in 245, plutoinum or compounds of these products.	33620	9190*	Other uranium, plutonium and thorium
		Uranium depleted in U235 and its compounds; thorium and its compounds; alloys, dispersions, ceramic products and mixtures containing uranium depleted in U234, thorium or compounds of these products.	33630	9190*	Other uranium, plutonium and thorium
		Other radioactive elements and isotopes and compountds; alloys, dispersions, ceramic products and mixtures containing these elements, isotopes or compounds; radioactive residues.	33690	9200	Other nuclear fuels
	Group 337 - Fuel elements (cartridges), for or of nuclear reactors (complete?)	Fuel elements (Cartridges), non-irradiated, for nuclear reactors	33710	9190*	Other uranium, plutonium and thorium
		Spent (irradiated) fuel elements (cartridges) of nuclear reactors.	33720	9190*	Other uranium, plutonium and thorium
CPC Division 34 - Basic chemicals (partial)	**341 - Basic organic chemicals**	Ethyl alcohol and other spirits, denatured, of any strength	34131	4400*	Additives and oxygenates
				5210*	Biogasoline
		Other alcohols, phenols, phenol-alcohols, and their halogenated, sulphonated, nitrated or nitrosated derivatives; industrial fatty alcohols	34139	4400*	Additives and oxygenates
				5210*	Biogasoline
		Ethers, alcohol peroxides, ether peroxides, epoxides, acetals and hemiacetals, and their halogenated, sulphonated, nitrated or ntirosated derivatives; aldehyde-function compounds; ketone-function compounds and quinone-function compounds; enzymes; prepared enzymes n.e.c.; organic compounds n.e.c.	34170	5210*	Biogasoline
				4400*	Additives and oxygenates
	342 - Basic inorganic chemicals n.e.c.	Hydrogen, nitrogen, oxygen, carbon dioxide and rare gases; inorganic oxygen compounds of non-metals n.e.c.	34210	4500*	Other hydrocarbons

	345 - Miscellaneous basic chemical products	Wood charcoal	34510	5160	Charcoal
		Oils and other products of the distillation of high temperature coal tar, and similar products; pitch and pitch coke, obtained from mineral tars	34540	0390*	Other coal products
				4694*	Petroleum coke
				4699*	Other oil products n.e.c.
	346 - Fertilizers and pesticides	Excreta of animals useful for manure/fertilizer and fuel preparation	34654	5130	Animal waste
CPC Division 35 - Other chemical products; man-made fibres (partial)	**354 - Chemical products n.e.c.**	Other chemical products, n.e.c.	35490	5220	Biodiesels
Division 39 - Waste or scraps (partial)	**391 - Wastes from food and tobacco industry**	Bran and other residues from the working of cereals or legumes; vegetable materials and vegetable waste, vegetable residues and by-products, whether or not in the form of pellets, of a kind used in animal feeding n.e.c.	39120	5150*	Other vegetal material and residues
		Beet-pulp, bagasse and other waste of sugar manufacture	39140	5120	Bagasse
		Cocoa shells, husks, skins and other cocoa waste; coffee husks and skins	39150	5150*	Other vegetal material and residues
	392 - Non-metallic wastes or scraps	Miscellaneous textile wastes	3921x	6100	Industrial waste
		Waste of leather, leather dust, powder and flour	39220	6100	Industrial waste
		Residual lyes from the manufacture of wood pulp, including lignin sulphonates, but excluding tall oil	39230	5140	Black liquor
		Waste and scrap of paper or paperboard	39240	6100	Industrial waste
		Waste, parings and scrap of rubber (except hard rubber) and powders and granules therefrom	39250	6100	Industrial waste
		Used pneumatic tyres of rubber	39260	6100	Industrial waste
		Waste, parings and scrap of plastic	39270	6100	Industrial waste
		Sawdust and wood waste and scrap	39280	5111	Wood pellets
				5119*	Other Fuelwood, wood residues and by-products
		Other non-metallic waste or scrap	39290	6100	Industrial waste
	399 - Other wastes or scraps	Municipal waste	39910	6200	Municipal waste

SIEC Classes with no current link with CPC

4300	Refinery feedstocks
5230	Bio jet kerosene
5290	Other liquid biofuels
5320	Biogases from thermal processes
9900	Other fuels n.e.c.

Annex 3:
Detailed review of CPC-SIEC links, by CPC division

In this annex, each of the CPC divisions that overlap with SIEC is examined to give a detailed account of coverage and linking issues. The involved CPC divisions are 03, 11, 12, 13, 17, 31, 33, 34, 35 and 39. They are examined in turn. Division 33 is also examined closer at the group level, since this division involves a particularly large number of SIEC links.

Any reference to the Harmonized System in this document is referring to HS 2007. Any reference to CPC is referring to CPC 2.

Division 01 - Products of agriculture, horticulture and market gardening

The only CPC subclass of Division 01 that is linked with SIEC is 01913 – "Cereal straw, husks, unprepared, ground, pressed, or in the form of pellets". The scope of this subclass is assumed to be covered by SIEC 5150 – "Other vegetal material and residues". It is implicitly understood that SIEC only classifies these materials in their capacity as being usable as fuels.

Division 03 – Forestry and logging products

The only CPC subclass of Division 03 that is linked with SIEC is 03130 – "Fuelwood, in logs, in billets, in twigs, in faggots or in similar forms". This subclass is assumed to be completely covered by SIEC 5119 – "Other fuelwood, wood residues and by-products".

However, the inverse is not true. SIEC 5119 also links with other CPC categories in Division 31 and 39[14].

Division 11 – Coal and lignite; peat

The full scope of this Division is covered by SIEC Section 0 – "Coal" and SIEC Section 1 – "Peat". On the other hand, neither of these SIEC sections is fully covered by CPC Division 11, although Section 1 comes close to being so.

The exact match would be:

- SIEC Division 01 – "Hard coal"
- SIEC Division 02 – "Brown coal"
- SIEC Group 032 – "Patent fuel"
- SIEC Group 033 – "Brown coal briquettes"
- SIEC Division 11 – "Peat"

[14] 31230 – "Wood in chips or particles" (wholly covered); 39280

- SIEC Group 121 – “Peat briquettes”
- SIEC Group 129 – “Other Peat Product” (partial)

The two main distinctions for coal, both in CPC and SIEC, is between *hard coal* on one side and *brown coal/lignite* on the other, as well as between *non-agglomerated* and *agglomerated coal*. As seen below, there are differences in the exact definitions, but the idea is the same.

CPC does not disaggregate different forms of peat or peat products the way SIEC does. The scope of SIEC Section 1 – “Peat” corresponds to CPC 11050, but is slightly broader in scope, as its Group 129 also contains other energy products that derive from peat, such as peat coke, peat tar and peat wax.

CPC subclass by subclass

11010 – “Coal, not agglomerated”

This subclass is considered to link one-to-one with SIEC Division 01 – “Hard coal”. SIEC further subdivides this division into 0110 – “Anthracite”, 0121 – “Coking coal” and 0129 – “Other bituminous coal”.

The following differences in definitions should be pointed out:

Anthracite:

CPC inherits the Harmonized System definition, which says (Subheading note 1 to Chapter 27):

> *“[…] ‘anthracite’ means coal having a volatile matter limit […] not exceeding 14%”.*

SIEC uses the definition provided by InterEnerStat:

> *“A high-rank, hard coal with a gross calorific value (moist, ash-free basis) greater than or equal to 24 MJ/kg and a Vitrine mean Random Reflectance greater than or equal to 2.0 percent”.*

With the additional remark:

> *“It usually has less than 10% volatile matter, a high carbon content (86%-98%) and is non-agglomerating.”*

Bituminous coal:

CPC inherits the Harmonized System definition, which reads (Subheading note 2 to Chapter 27):

> *“[…], ‘bituminous coal’ means coal having a volatile matter limit […] exceeding 14% and a calorific value limit […] equal to or greater than 5.833 kcal/kg”.*

SIEC uses the definition provided by InterEnerStat:

> *“A medium-rank hard coal with either a GCV >= 24 MJ/kg and with a Vitrinite mean Random Reflectance < 2.0%, or GCV < 24 MJ/kg provided that the Vitrinite mean random reflectance >= 0.6 per cent.”*

With the additional remark:

"Bituminous coals are agglomerating and have a higher volatile matter and lower carbon content than anthracite […]."

The above differences in definitions may lead to some products classified as 11010 in CPC to be classified as sub-bituminous coal or lignite in SIEC Division 02 (which does not correspond with CPC 11010 but with CPC 11030), or vice versa. However, if these definitional differences were to be taken into account, it would further complicate the correspondence table.

11020 – "Briquettes and similar solid fuels manufactured from coal"

This subclass is considered to match one-to-one with SIEC 0320 – "Patent fuel".

11030 – "Lignite, not agglomerated"

This subclass is considered to link one-to-one with SIEC Division 02 – Brown coal. SIEC further subdivides this division into 0210 – "Sub-bituminous coal" and 0220 – "Lignite".

11040 – "Lignite, agglomerated"

This subclass is considered to link one-to-one with SIEC 0330 – "Brown coal briquettes (BKB)".

11050 – "Peat"

This subclass is considered to be fully contained within the scope of SIEC Section 1 – "Peat and peat products". This SIEC Section contains the following classes: 1110 – "Sod peat", 1120 – "Milled peat", 1210 – "Peat briquettes" and 1290 – "Other peat products". Of these, all except 1290 are considered to be fully covered by CPC 11050. On the other hand 1290 contains some other products that link to subclasses in other parts of CPC[15].

Division 12 – Crude petroleum and natural gas

CPC Division 12 consists of a single Group 120, which again is subdivided into the following classes:

12010 – "Petroleum oils and oils obtained from bituminous minerals, crude"

12020 – "Natural gas, liquefied or in the gaseous state"

12030 – "Bituminous or oil shale and tar sands"

The scope of this Division is covered by SIEC:

[15] Namely, 1290 links with CPC:
- 33100 (link intended to cover coke and semi-coke of peat)
- 33200 (link intended to cover peat tar)
- 33500 (link intended to cover peat wax)

Section 2 – “Oil shale / oil sands”
Section 3 – “Natural gas”
Division 41 – “Conventional crude oil”
Division 45 – “Other hydrocarbons” (partial)

SIEC Section 2 and 3 are fully within the scope of CPC Division 12, as is Division 41. The reason Division 45 is only partially within scope is because it also includes *hydrogen*.

Both SIEC and CPC make the basic distinctions between *crude oil*, *natural gas* and *bituminous shale/sands*. SIEC further distinguishes between *conventional crude oil* (4100) and *other hydrocarbons* (4500), where the latter represents oils obtained through less conventional techniques such as in-situ extraction of oil from shale. The category for other hydrocarbons also includes hydrogen.

The *condensates* included in CPC Division 12 / SIEC Division 41 are understood to differ from the *natural gas liquids* (NGLs) in SIEC Division 42 in that they constitute the fraction immediately separated from the oil/gas after extraction, whereas the NGLs are recovered further downstream in the natural gas processing plants. Consequently, the condensates consist mainly of pentanes and higher alkanes, whereas NGLs consist primarily of more volatile fractions.

CPC subclass by subclass

12010 – Petroleum oils and oils obtained from bituminous minerals, crude

This subclass is considered to be fully covered by SIEC 4100 – “Conventional crude oil” and SIEC 4500 – “Other hydrocarbons”. The link with SIEC 4500 is only partial, as that category also includes hydrogen. However, if one disregards the hydrogen component, SIEC 4100 and 4500 represent a breakdown of CPC 12010 into crude oil and condensates on one hand, and oils obtained by non-conventional techniques on the other.

12020 – Natural gas, liquefied or in the gaseous state

This subclass is considered to match one-to-one with SIEC Section 3 – “Natural gas”, which is not further disaggregated.

12030 Bituminous or oil shale and tar sands

This subclass is considered to match one-to-one with SIEC Section 2 – “Oil shale / oil sands”, which is not further disaggregated.

Division 13 – Uranium and thorium ores and concentrates

CPC Division 13 consists of a single Group 130, which again consists of a single class/subclass 13000 – "Uranium and thorium ores and concentrates". The scope of this Division is considered to match one-to-one with SIEC Class 9110 – "Uranium and thorium ores".

CPC subclass by subclass

13000 – Uranium and thorium ores and concentrates

This subclass is considered to be match one-to-one with SIEC 9110 – "Uranium and thorium ores".

Division 17 – Electricity, town gas, steam and hot water

Division 17 consists of 4 Group. Three of them are linked to SIEC.

- 171 – Electrical energy
- 172 – Coal gas, water gas, producer gas and similar gases, other than petroleum gases and other gaseous hydrocarbons
- 173 – Steam and hot water
- 174 – Ice and snow (not linked to SIEC)

The scope of this Division is covered by the following SIEC categories:

- Section 7 – "Electricity"
- Section 8 – "Heat"
- Group 035 – "Coke oven gas"
- Group 036 – "Gas works gas (and other manufactured gases for distribution)"
- Group 037 – "Recovered gases"

CPC Division 17 distinguishes between electricity, heat (in the form of steam/hot water) and gases. SIEC has its own sections for electricity and heat, which are not further subdivided. The SIEC class for heat does not predicate any specific energy carrier such as water or steam. However, with the assumption that commercial heat is usually delivered in the form of hot water or steam, one can for practical purposes assume that the CPC steam/hot water category (Group 173) is equivalent to the SIEC "Heat" category (Section 8).

Also, for practical purposes, it is assumed that the gases of CPC Group 172 are the same as those found in SIEC Group 035, 036 and 037; although it is not always clear-cut whether the definitions provided cover exactly the same items (see more detail below).

CPC subclass by subclass

17100 – Electrical energy

This subclass is considered to match one-to-one with SIEC Section 7 – "Electricity", which is not further disaggregated.

17200 – Coal gas, water gas, producer gas and similar gases, other than petroleum gases and other gaseous hydrocarbons

This subclass is considered to match exactly the combined scope of SIEC Group 035, 036 and 037.

The scope of CPC 17200 is described by the explanatory note of Harmonized System Heading 2705, which mentions "coal gas", "gas produced by underground gasification", "water gas", "producer gas", "similar gases" (such as "blast furnace gas") and "mixture of gases formed by cracking or reforming of mineral oils, petroleum gases or natural gases […]".

The corresponding SIEC classes are:

- 0350 – "Coke oven gas"
- 0360 – "Gas works gas"
- 0371 – "Blast furnace gas"
- 0372 – "Basic oxygen steel furnace gas"
- 0379 – "Other recovered gases"

Taking the explanatory notes of these SIEC classes into account, their combined content appear to correspond fairly well with the scope of CPC 1700 as described above, although the texts may not be precise enough for establishing this in perfect detail.

It should be noted that all these gases are classified in SIEC under Division 03 as "coal products". On the other hand, it is *not* the case that all the products in CPC 17200 are of coal origin (e.g. the gases derived from mineral oils, mentioned above). However, the definitions of some of the SIEC classes seem to accept this possibility as well[16].

17300 – Steam and hot water

This subclass is considered to match one-to-one with SIEC 8000 – "Heat", with the assumption that 'heat' as a commercial product in practice is provided by means of steam or hot water.

Division 21 – Oil-cake and other residues resulting from the extraction of vegetable fats and or oils; flours and meals of oil seeds or oleaginous fruits, except those of mustard; vegetable waxes, except triglycerides; degras; residues resulting from the treatment of fatty substances or animal or vegetable waxes

[16] For instance, the explanatory note for SIEC 0360 – "Gas works gas" contains products derived from *synthesis gas*, with a remark that this gas is obtained from "cracking hydrocarbons with high temperature steam", without specifying the origin of these hydrocarbons.

The only CPC subclass of Division 21 that is linked with SIEC is 21710 – "Oil-cake and other solid residues, of vegetable fats or oils". The scope of this subclass is assumed to be covered by SIEC 5150 – "Other vegetal material and residues", although one component mentioned in particular in the SIEC definitions is "olive pomace". It is implicitly understood that SIEC only classifies these materials in their capacity as being usable as fuels.

Division 31 – Products of wood, cork, straw and plaiting materials

The only CPC subclass of Division 31 that is linked with SIEC is 31230 – "Wood in chips or particles". This subclass is assumed to be completely covered by SIEC 5119 – "Other fuelwood, wood residues and by-products".

The definition of SIEC 5119 covers all fuelwood, wood residues and by-products, other than *wood pellets*, which has its own SIEC class. The definition of CPC 31230, which is equivalent to Harmonized System codes 4401.21 and 4401.22, seems to fit within this category.

It should be noted that the definition of HS 4401.21/.22 only mentions the use of these materials as being for the *production of cellulose pulp or fibre board*, whereas the SIEC category is only intended to cover materials to be used *for energy purposes*. However, as 31230 is the only category in CPC to classify wood chips and particles, and since CPC nowhere mentions wood chips and particles specifically intended for energy production, it is assumed that the CPC 31230 – SIEC 5119 link is the most appropriate[17]

Division 33 – Coke oven products; refined petroleum products; nuclear fuel

CPC Division 33 consists of seven Groups, all of which are linked to SIEC. Most of these groups involve a significant number of links, and for this reason they are individually examined under separate headings further below.

The seven groups are (names sometimes shortened for clarity):

- Group 331 – Coke and semi-coke of coal, of lignite or peat; retort carbon
- Group 332 – Tar distilled from coal, from lignite or from peat, and other mineral tars
- Group 333 – Petroleum oils […]
- Group 334 – Petroleum gases and other gaseous hydrocarbons, except natural gas
- Group 335 – Petroleum jelly; paraffin wax; […] other residues of petroleum oils […]

[17] In general, when the correspondence table between CPC and SIEC was developed, the *purpose of use* was not taken into consideration, as CPC does not usually consider end use as a criterion for defining categories.

- Group 336 – Radioactive elements and isotopes and compounds […]
- Group 337 – Fuel elements (cartridges) for or of nuclear reactors

Division 33, Group 331 – Coke and semi-coke of coal, of lignite or peat; retort carbon

Group 331 is not further subdivided, and thus consists of a single subclass 33100 with the same title.

The Group/subclass is linked to, and assumed to be fully covered by, the following SIEC categories:

- Group 031 – "Coal coke"
- Group/class 1290 – "Other peat products" (partial)

SIEC Group 031 is fully covered, and concerns all coke and semi-coke of coal and lignite. The link with SIEC 1290 is only partial, and represents coke and semi-coke of peat.

In CPC, the scope of 33100 is defined by Harmonized System Heading 2704, which covers all coke and semi-coke of coal or peat, as well as *retort carbon*. Pitch coke and petroleum coke is excluded.

In SIEC, Group 031 covers all coal coke. It is disaggregated *into coke oven coke, gas coke, coke breeze and semi-cokes*. Group/class 1290 covers all peat products other than peat briquettes. Logically, this would include cokes and semi-cokes of peat.

From these descriptions of scope, the only ambiguous item is *retort carbon*, which is never mentioned in SIEC. The current correspondence table makes the assumption that retort carbon would be found within SIEC 031, but it is also possible to argue that retort carbon does not belong in SIEC and that the link should thus be partial.

Division 33, Group 332 – Tar distilled from coal, from lignite or from peat, and other mineral tars

Group 332 is not further subdivided, and thus consists of the single subclass 33200 with the same title.

This group/subclass is linked to, and assumed to be fully covered by, the following SIEC categories:

- Class 0340 – "Coal tar"

- Class 1290 – “Other peat products” (partial)

SIEC class 0340 is fully covered, and concerns coal tar (which presumably also includes tars from lignite). The link with 1290 is only partial, and represents tars from peat.

In CPC, the scope of 33200 is completely defined by Harmonized System heading 2706, which covers *tars distilled from coal or lignite, tars distilled from peat,* and *other mineral tars, including reconstituted tars*.

The only item within this scope that is not clearly covered by the proposed SIEC links is “other mineral tars”. In the current correspondence table, it was assumed that this is a minor item that could be classified together with the coal tars of 0340. An alternative treatment would be to say that Group/subclass 33200 is only partially covered by SIEC, with the “other mineral tars” being out of scope.

Division 33, Group 333 – Petroleum oils and oils obtained from bituminous materials, other than crude; preparations n.e.c. containing by weight 70% or more of these oils such as oils being the basic constituents of the preparations

CPC Group 333 covers petroleum oils (other than crude) and derived products. The Group is subdivided into eight classes, some of which identify single products, and other of which refers to groups of products not elsewhere defined. The full scope of the Group is defined by Harmonized System Heading 2710, excluding the waste oils of 2710.91 and 2710.99. The distinction between subclasses within this Group is thus wholly provided within the CPC explanatory notes themselves, as the Harmonized System does not provide any further detail.

The contents of this group are all included within the scope of SIEC Division 46 – “Oil products”. The exact SIEC categories involved are:

- Group 464 – Naphtha
- Group 465 – Gasolines
- Group 466 – Kerosenes
- Group 467 – Gas oil / diesel oil and heavy gas oil
- Group 468 – Fuel oil
- Class 4691 – White spirit and special boiling point industrial spirits
- Class 4692 – Lubricants
- Class 4699 – Other oil products n.e.c. (partial)

From the above list, one can conclude that the majority of categories within SIEC Division 46 are covered[18]. Moreover, all of the categories listed over are fully covered by CPC Division 33, except 4699 for which the overlap is only partial.

The scope of CPC Group 333 is described (by the associated Harmonized System explanatory note) to include

- "Topped crudes" (where lighter fractions have been removed by distillation) and fractions by distillation. This would include petroleum spirit, white spirit, kerosene, gasoils, fuel oils, lubricating oils and white oils.
- Similar oils, predominantly non-aromatic. These can for instance be obtained by low temperature distillation of coal, or by hydrogenation.
- Mixed preparations predominantly consisting of the products above.

The scope of SIEC Division 46 is described as:

> *"Products obtained from crude oil, non-conventional oils or gases from oil and gas fields. They may be produced through the refining of conventional crude and non-conventional oils or during the separation of natural gas from gases extracted from oil or gas fields."*

From the descriptions of scope above, one can see that CPC Group 333 does include some oils that do not arise from the distillation of crude oil, such as oils obtained from the low temperature distillation of coal. However, the mention of 'non-conventional oils' in the scope of SIEC Division 46 might suggest that these items are covered there as well, providing some justification to the assumption that CPC Group 333 is wholly contained within SIEC Division 46.

CPC Group 333 and SIEC Division 46 do provide subcategories for many of the same, specific products, like motor spirit and kerosene. For these categories, the correspondence is fairly good. The residual categories are much more problematic.

CPC subclass by subclass

<u>33310 – Motor spirit (gasolene), including aviation spirit</u>

This subclass is considered to match the combined scope of SIEC classes 4651 – "Aviation gasoline" and 4652 – "Motor gasoline".

Although this perfect correspondence is proposed for statistical purposes, it is worth pointing out that there *are* some definitions in the technical definitions provided by CPC and SIEC:

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[18] In fact, the only SIEC Division 46 categories that are *not* covered are:
- Group 461 – Refinery gas
- Group 462 – Ethane
- Group 463 – Liquefied petroleum gases
- Class 4693 – Paraffin waxes
- Class 4694 – Petroleum coke
- Class 4695 – Bitumen

- CPC sets the distillation range of motor gasoline to 35°C - 220°C, whereas SIEC sets it to 25°C -220°C
- The CPC definitions refer to Research Octane Number (RON), the SIEC definitions do not.
- For aviation spirit, CPC refers to a freezing point of -60°C. SIEC does not make reference to freezing point, only to distillation range (25°C - 170°C).

33320 – Spirit type (gasolene type) jet fuel

This subclass is considered to match SIEC class 4653 – "Spirit type jet fuel" one-to-one. The technical definitions employed in the CPC and SIEC definitions are also very close, giving this one-to-one relationship a high level of confidence.

33330 – Other light petroleum oils and light oils obtained from bituminous minerals 9other than crude); light preparations n.e.c. containing not less than 70% by weight of petroleum oils or oils obtained from bituminous minerals (other than crude), these oils being the basic constituents of the preparations

This is the residual subclass for light oil products (cf. 33350 and 33380 for medium and heavy oil products, respectively). As a residual category, the scope has not been completely spelled out, but it specifically includes naphtha. In the correspondence table with SIEC, the scope of this class is assumed to be fully covered by SIEC:

- Class 4640 – Naphtha
- Class 4691 – White spirit and special boiling point industrial spirits (partial)
- Class 4699 – Other oil products, n.e.c. (partial)

The link with 4691 was introduced to account for the "special boiling point industrial spirits" part of that class (white spirit itself is classified to 33350). According to the SIEC explanatory notes, these spirits are described as "light oils".

The link with 4699 is provided as this would be the residual class in SIEC for light oil products not elsewhere found. No particular example is provided.

An overall problem when linking CPC 33330, 33350 and 33380 to SIEC is that CPC never provides any definition of what is considered "light", "medium" or "heavy" oils, leaving it up to the interpretation of the user.

33341 – Kerosene

This subclass is considered to match SIEC class 4669 – "Other kerosene" one-to-one.

SIEC defines the scope of 4669 to include all kerosene for purposes other than jet fuel (which has its own category, see below). CPC has a more technical definition, but has also singled out kerosene-type jet fuel as a separate subclass, so the scopes of CPC 33341 and SIEC 4669 are assumed to be identical.

33342 – Kerosene-type jet fuel

This subclass is considered to match SIEC class 4661 – “Kerosene-type jet fuel” one-to-one.

SIEC defines 4661 to cover kerosene blends suited to flight conditions, whereas CPC provides a more technical definition. It is however assumed that these two categories refer to the same product, and they are assumed to have identical scope.

33350 – Other medium petroleum oils and medium oils obtained from bituminous minerals (not kerosene), other than crude; other preparations n.e.c. containing not less than 70% by weight of petroleum oils or oils obtained from bituminous minerals (other than crude), these oils being the basic constituents of the preparations

This is the residual for medium oil products. (cf. 33330 and 33380 for light and heavy oil products, respectively). As a residual category, the scope has not been completely spelled out, but it specifically includes *white spirit*. In the correspondence table with SIEC, the scope of this class is assumed to be fully covered within SIEC:

- Class 4691 – White spirit and special boiling point industrial spirits (partial)
- Class 4699 – Other oil products n.e.c. (partial)

Although white spirit belongs to this subclass, the “special boiling point industrial spirits” referred to in the title of SIEC 4691 are rather linked with 33330 (cf. explanatory note for that subclass).

The partial link with SIEC 4699 is provided as this would be the residual class in SIEC for medium oil products not elsewhere found. No particular example is provided.

An overall problem when linking CPC 33330, 33350 and 33380 to SIEC is that CPC never provides any definition of what is considered “light”, “medium” or “heavy” oils, leaving it up to the interpretation of the user.

33360 – Gas oils

This subclass is considered to match SIEC Group 467 – “Gas oil / diesel oil and Heavy gas oil” one-to-one.

SIEC Group 467 is further disaggregated into:

- Class 4671 – “Gas oil / Diesel oil”
- Class 4672 – “Heavy gas oil”

The exact definitions provided by CPC and SIEC are similar, but not identical. The definition of scope for CPC 33360 includes:

- Gas-diesel oil, described as distilling between 200°C and 380°C, and with some additional conditions related to flash point, specific weight and percentages distilled at specific temperatures
- “middle distillates”

- Heavy oils obtained by blending, with some additional conditions regarding kinematic viscosity.

On the other hand, the definition of SIEC 467 includes:

- Gas oils, being middle distillates that distill between 160°C - 420°C.
- Blends of gas oil and fuel oils, distilling within 380°C - 540°C.

From the above, one can see that the distillation ranges cited in the two definitions for gas oil do not match exactly (the one used in CPC is narrower and included in the SIEC range). However, the additional mention of "middle distillates" in the CPC definition leaves room for the interpretation that the categories have the same total scope. This is what has been assumed in the correspondence table.

<u>33370 – Fuel oils n.e.c.</u>

This subclass is considered to match SIEC class 4692 – "Fuel oil" one-to-one.

The definitions of scope for CPC 33370 and SIEC 4692 are similar, but not identical. The CPC definition includes

- 'residual fuel oils', with
  - Kinematic viscosity > 27.5 at 38°C
  - Flash point > 50°C
  - Specific gravity > 0.9

The SIEC definition includes:

- 'residual fuel oils', with
  - Distillation range 350°C - 650°C
  - Kinematic viscosity between 6 and 55 at 100°C
  - Flash point > 60°C
  - Specific gravity > 0.95
- 'Heavy fuel oils', described as blended products based on residues from refinery processes

Although the technical definitions do not exactly match, they line up fairly closely. The figures for kinematic viscosity are not directly comparable, as they are given at different reference temperatures. For statistical purposes it might be permissible to claim that the CPC and SIEC category match one-to-one.

<u>33380 – Lubricating petroleum oils and oils obtained from bituminous minerals, other heavy petroleum oils and heavy oils obtained from bituminous minerals (other than crude), and heavy preparations n.e.c. containing not less than 70% by weight of petroleum oils or oils obtained from bituminous minerals (other than crude), these oils being the basic constituents of the preparations</u>

This subclass covers lubricants in addition to being the residual class for heavy oil products (cf. 33330 and 33350 for light and medium oil products, respectively). As a residual category, the scope has not been completely spelled out. In the correspondence table with SIEC, the scope of this class is assumed to be fully covered within SIEC:

- Class 4692 – "Lubricants"
- Class 4699 – "Other oil products, n.e.c." (partial)

All petroleum-based lubricating oils are included here, making the link with 4692 complete. The partial link with 4699 is provided as this would be the residual class in SIEC for heavy oil products not elsewhere found. No particular example is provided.

An overall problem when linking CPC 33330, 33350 and 33380 to SIEC is that CPC never provides any definition of what is considered "light", "medium" or "heavy" oils, leaving it up to the interpretation of the user.

Division 33, Group 334 – Petroleum gases and other gaseous hydrocarbons, except natural gas

CPC Group 334 covers petroleum gases and other gaseous hydrocarbons. It is completely covered by SIEC, but is divided between Section 4 – "Oil" and SIEC Section 5 – "Biofuels". More specifically, it is assumed to match the following set of SIEC categories:

- Division 42 – "Natural gas liquids (NGL)"
- Class 4610 – "Refinery gas"
- Class 4620 – "Ethane"
- Class 4630 – "Liquefied petroleum gases"
- Class 4699 – "Other oil products n.e.c." (partial)
- Group 531 – "Biogases from anaerobic fermentation"

The full scope of CPC Group 334 is described by Harmonized System Heading 2711, with the exclusion of natural gas (2711.11 and 2711.21). According to the Heading notes, this includes **crude**[19] gaseous hydrocarbons obtained

- As natural gases; or
- From petroleum; or
- Produced chemically

CPC Group 334 separates out liquefied propane and butane as its own category, 33410, while everything else is found in 33420.

SIEC does not have any high-level common category for all petroleum gases or gaseous hydrocarbons. They are divided based on processing (crude, refined) as well as source (fossil or

[19] However, *methane* and *propane* is included, even when pure

biological). The consequence is that CPC Group 334 ends up linking with differing Sections, Divisions and Groups of SIEC.

SIEC Division 42 represents natural gas liquids (NGLs) and is not further subdivided. It should be totally covered by the scope of CPC 33420.

Some of the oil products in SIEC Division 46 are relevant, namely 4610 – "Refinery gas" (which is assumed to have a primary hydrocarbon component), 4620 – "Ethane", 4630 – "Liquefied petroleum gases" and any leftover item covered by the residual Class 4699 (which includes, inter alia, *ethylene, propylene, butylene* and *butadiene*).

All biogases from anaerobic fermentation are covered by Group 531, and split according to origin (landfill, sewage, other). They have in common that they are composed primarily of mixes of methane and carbon dioxide[20].

Note that contrary to SIEC Group 531, SIEC Group 532 has *not* been included. The reason is that the gases of 532 are in the SIEC definition described as being composed mainly of hydrogen and carbon monoxide, which are not hydrocarbons.

CPC subclass by subclass

33410 – Propane and butane, liquefied

This subclass is considered to match one-to-one with SIEC 4630 – Liquefied petroleum gases.

33420 - Ethylene, propylene, butylene, butadiene and other petroleum gases or gaseous hydrocarbons, except natural gas

The scope of this subclass is considered to be covered by the following SIEC categories:

- Division 42 – "Natural gas liquids (NGL)"
- Class 4610 – "Refinery gas"
- Class 4620 – "Ethane"
- Class 4699 – "Other oil products n.e.c." (partial)
- Group 531 – "Biogases from anaerobic fermentation"

For more details on these links, refer to the general discussion of CPC Group 334 above.

[20] In their pure state, *methane* should be classified with natural gas and *carbon dioxide* would belong to the chemical division of CPC, but as a mix they do not easily belong in either. Since CPC conceptually should cover all products in SIEC, it was proposed as a compromise to associate the mix with CPC 33420. This can be defended on the grounds that:

- 33420 plays the role as a residual class for gaseous hydrocarbons
- The energy component of the biogases from anaerobic fermentation is primarily methane, which is a hydrocarbon
- The methane in these biogases is not pure enough to be classified as natural gas
- The Harmonized System index does contain some methane items for 2711.29, which is part of the definition of CPC 33420.

Division 33, Group 335 – Petroleum jelly; paraffin wax, micro-crystalline petroleum wax, slack wax, ozokerite, lignite wax, peat wax, other mineral waxes, and similar products; petroleum coke, petroleum bitumen and other residues of petroleum oils or of oils obtained from bituminous minerals

This Group contains a mixed bag of hydrocarbon-based products, including waxes, petroleum coke, bitumen and oil residues. The scope is defined by the contents of Harmonized System Headings 2712 (for waxes, etc.) and 2713 (for petroleum coke, etc.). It is not further subdivided.

The products covered by this Group are all found within SIEC, but divided between Section 0 – "Coal", Section 1 – "Peat and peat products" and Section 4 – "Oil". The detailed list of matching SIEC categories is:

- Class 0390 – "Other coal products" (partial)
- Class 1290 – "Other peat" (partial)
- Class 4693 – "Paraffin waxes"
- Class 4694 – "Petroleum coke" (partial)
- Class 4695 – "Bitumen"
- Class 4699 – "Other oil products" (partial)

The predominant part of the scope of CPC Group 335 can be assumed to be found within SIEC Group 469 – "Other oil products". The links to Section 0 and Section 1 are somewhat incidental; the link to 0390 represents lignite wax, and the link to 1290 represents peat wax).

The reason the link with SIEC Class 4694 is only partial is that this class also includes calcined coke obtained from coal-derived pitch coke. This SIEC class has therefore also been linked to CPC 34540 – "[…]; pitch and pitch coke, obtained from mineral tars".

Division 33, Group 336 – Radioactive elements and isotopes and compounds; alloys, dispersions, ceramic products and mixtures containing these elements, isotopes or compounds; radioactive residues

The scope of this Group is the same as for Harmonized System Heading 2844, excluding the spent fuel elements of 2844.50. This means that the group consists of:

- Natural uranium (+ compounds and mixtures)
- Enriched uranium (+ compounds and mixtures)

- Depleted uranium (+ compounds and mixtures)
- Thorium (+ compounds and mixtures)
- Other radioactive elements (+ compounds and mixtures)

The Group is linked to SIEC Class 9190 – "Other uranium, plutonium and thorium" and 9200 – "Other nuclear fuels". It is understood that these SIEC classes do not cover most of, but not the complete scope of, this Group. In other words, some products that remain within the scope of this Group are assumed to be outside scope of SIEC. It is not quite clear which products are in and which are out, but they have in common that they would be classified in CPC 33630 or 33640.

CPC disaggregates Group 336 into subclasses for

- Natural uranium, compounds and mixtures (33610)
- Enriched uranium, plutonium, compounds and mixtures (33620)
- Thorium, depleted uranium, compounds and mixtures (33630)
- Other radioactive elements and residues (33690)

SIEC, on the other hand, has three categories for nuclear materials: one for uranium and plutonium ores (9110), one for all other uranium, plutonium and thorium (9190), and a residual class (9200) for all other nuclear fuels or materials. Whereas SIEC 9110 is associated with CPC Division 13, the two other nuclear categories (9190 and 9200) are contained within CPC Group 336 and 337.

CPC subclass by subclass

33610 – Natural uranium and its compounds; alloys, dispersions, ceramic products and mixtures containing natural uranium and its compounds

This subclass contains natural uranium as well as compounds and mixtures thereof.

It is considered to be fully covered within SIEC 9190 – "Other uranium, plutonium and thorium".

33620 – Uranium enriched in U235 and its compounds; plutonium and its compounds; alloys, dispersions, ceramic products and mixtures containing uranium enriched in U235, plutonium or compounds of these products

This subclass contains

- Enriched uranium (as well as compounds/mixtures)
- Plutonium (as well as compounds/mixtures)

The subclass is considered to be fully covered by SIEC 9190 – "Other uranium, plutonium and thorium".

33630 – Uranium depleted in U235 and its compounds; thorium and its compounds; alloys, dispersions, ceramic products and mixtures containing uranium depleted in U235, thorium or compounds of these products

This subclass contains

- Depleted uranium (as well as compounds/mixtures)
- Thorium (as well as compounds/mixtures)

This class is considered *partially* covered by SIEC 9190 – "Other uranium, plutonium and thorium". Thorium is covered, but most likely not depleted uranium.

33690 – Other radioactive elements and isotopes and compounds; alloys, dispersions, ceramic products and mixtures containing these elements, isotopes or compounds; radioactive residues

This subclass contains

- Radioactive elements other than uranium, plutonium or thorium (as well as compounds/mixtures)
- Radioactive residues

This class is considered *partially* covered by SIEC 9200 – "Other nuclear fuels". It is not clear which of its products are covered.

Division 33, Group 337 – Fuel elements (cartridges), for or of nuclear reactors

This Group consists of fuel elements for nuclear reactors. It consists of the two subclasses:

- 33710 – "Fuel elements (cartridges), non-irradiated, for nuclear reactors"
- 33720 – "Spent (irradiated) fuel elements (cartridges) of nuclear reactors"

The exact scope for each of these subclasses are defined in terms of HS Codes (8401.30 for 33710 and 2844.50 for 33720).

The scopes of both subclasses within this group are assumed to be fully covered by SIEC 9190 – "Other uranium, plutonium and thorium".

Division 34 – Basic chemicals

CPC Division 34 contains all kinds of basic chemicals, only a handful of which are relevant in the context of energy statistics. Most of the overlap between CPC Division 34 and SIEC is thus incidental and not usefully described in terms of high-level categories, but rather in terms of each specific overlap. The concerned SIEC Sections are primarily 4 – "Oil" and 5 – "Biofuels", although in one case Section 0 – "Coal" is also involved.

However, in a few cases, there seems to be meaningful correspondences. This is the case for wood charcoal (CPC 34510), the products of distillation of high temperature coal tar, etc. (CPC 34540) and manure (CPC 34654).

CPC subclass by subclass

34131 – Ethyl alcohol and other spirits, denatured, of any strength

Overlap with SIEC include:

- Class 4410 – "Additives and oxygenates" – for ethyl alcohols intended to be used as additives
- Class 5210 – "Biogasoline" for ethyl alcohols intended for use as biogasoline.

Remark: One might ask where the line between SIEC 4410 and SIEC 5210 is drawn in this case, since biogasoline is typically added to regular gasoline and could as such also be considered an additive.

34139 – Other alcohols, phenols, phenol-alcohols, and their halogenated, sulphonated, nitrated or nitrosated derivatives; industrial fatty alcohols

Overlap with SIEC include:

- Class 4410 – "Additives and oxygenates" – for *methanol* intended to be used as an additive
- Class 5210 – "Biogasoline" – for methanol and butanol intended for use as biogasoline.

Moreover, the same remark regarding SIEC 4410 and 5210 can be made here as under CPC 34131 above.

34170 – Ethers, alcohol peroxides, ether peroxides, epoxides, acetals and hemiacetals, and their halogenated, sulphonated, nitrated or nitrosated derivatives; aldehyde-function compounds; ketone-function compounds and quinone-function compounds; enzymes; prepared enzymes n.e.c.; organic compounds n.e.c.

Overlap with SIEC include:

- Class 4410 – "Additives and oxygenates" – for ethyl tert-butyl ether (ETBE) and methyl tert-butyl ether (MTBE) to be used as additives
- Class 5210 – "Biogasoline" - for ethyl tert-butyl ether (ETBE) and methyl tert-butyl ether (MTBE) to be used as biogasoline

Moreover, the same remark regarding SIEC 4410 and 5210 can be made here as under CPC 34131 above.

34210 – Hydrogen, nitrogen, oxygen, carbon dioxide and rare gases; inorganic oxygen compounds of non-metals, n.e.c.

Overlap with SIEC include:

- Class 4500 – “Other hydrocarbons” – for hydrogen gas to be used as a fuel

34510 – Wood charcoal

Although this CPC subclass might contain some products not primarily intended for energy purposes, it is practical to assume a one-to-one overlap between this subclass and SIEC 5160 – “Charcoal”.

34540 – Oils and other products of the distillation of high temperature coal tar, and similar products; pitch and pitch coke, obtained from mineral tars

This class can be assumed to be completely covered by the following SIEC categories:

- Class 0390 – “Other coal products” (partial)
- Class 4699 – “Other oil products n.e.c.” (partial)
- Class 4694 – “Petroleum coke” (partial)

The partial link with SIEC 0390 represents products from the distillation of coal tar, coal pitch and coal pitch coke.

The partial link with 4694 represents pitch coke from petroleum products.

The partial link with 4699 represents other products made from oil that are similar to the coal products of this class, as well as pitch from oil products.

34654 – Excreta of animals useful for manure/fertilizer and fuel preparation

This CPC subclass is equivalent with Heading 3101 of the Harmonized system. It includes various kinds of animal and vegetable waste, which are described by the Harmonized System explanatory notes to be useful primarily for fertilizer purposes. However, the title of the CPC subclass also recognizes the possible use of such products for fuel preparation.

SIEC Class 5130 – “Animal waste” can be considered to be covered wholly by the scope of CPC 34654. The inverse is not true, since the SIEC class only covers excreta of animals, meat and fish residues that are useful as fuels when dried, whereas CPC 34654 may also contain vegetable waste and materials that may be useful for fertilizer while serving no useful purpose as fuels.

Division 35 – Other chemical products; man-made fibres

The only CPC subclass of Division 35 that is linked with SIEC is 35490 – “Other chemical products, n.e.c.”, as the description of its scope[21] contains (among many other things) a reference to “mono-alkyl esters of long chain fatty acid”, further described as “biodiesel”. This would correspond with the definition of biodiesel in SIEC 5220 – “Biodiesel”, thus introducing a link between these categories.

[21] In terms of Harmonized System codes

Although it is not clear whether the SIEC category is completely covered by this single CPC subclass, it has been assumed for simplicity.

Division 39 – Wastes or scraps

As with Division 34, much of overlap between Division 39 and SIEC is incidental and most usefully described in terms of specific overlaps rather than comparing high-level categories.

However, in some cases there are good overlaps and even one-to-one correspondence in the case of municipal waste. Also, the entire Group 392 – "Non-metal wastes or scraps" is covered. Most of this group is covered by SIEC – 6100 – "Industrial waste", but 39230 is covered (partially or wholly) by SIEC 5140 – "Black liquor", and 39280 is covered by SIEC 5111 – "Wood pellets" and 5119 – "Other fuelwood […]".

The SIEC sections for which there are points of overlap include 5 – "Biofuels" and 6 – "Waste".

CPC subclass by subclass

39120 – Bran and other residues from the working of cereals or legumes; vegetable materials and vegetable waste, vegetable residues and by-products, whether or not in the form of pellets, of a kind used in animal feeding n.e.c.

This subclass is defined as the union of Harmonized System Headings 2302 and 2308. The explanatory notes to 2308 specifically state that the Heading only classifies products intended for animal feeding, which leaves it out of scope of SIEC. However, the remaining Heading is:

- Harmonized System Heading 2302 – "Bran, sharps and other residues, whether or not in the form of pellets, derived from the sifting, milling and other working of cereals or leguminous plants."

These bran residues can fall under the scope of SIEC 5150 – "Other vegetal material and residues", which is the justification for the current link. However, it is clear that this would only amount to a small share of the scope of this Class. Moreover, not all bran and residues will be intended or fit for energy production anyway, making this link very incidental.

NB: In the IRES draft as presented to the Statistical Commission in February 2011, there was also a proposed link between CPC 39120 and SIEC 6100 – "Industrial waste". This link has been suppressed in the present paper, as the SIEC definition of industrial waste only includes non-renewable materials.

39140 – Beet-pulp, bagasse and other waste of sugar manufacture

The scope of SIEC Class 5120 – "Bagasse" is completely covered by the scope of this CPC subclass. However, the scope of CPC 39140 extends beyond the scope of SIEC 5120, since it not only contains bagasse, but also sugar beet pulp and other waste from sugar manufacturing.

39150 – Cocoa shells, husks, skins and other cocoa waste; coffee husks and skins

Similarly to CPC 39120 above, this CPC subclass may contribute another minor component to the scope of SIEC 5150 – "Other vegetal material and residues". This component would consist of cocoa and coffee waste that is used for energy purposes.

3921x – Miscellaneous textile wastes

By merit of being part of CPC Group 392 – "Non-metallic wastes or scraps", and not being linked to any other SIEC category, this class, along with all its subclasses, is considered to be covered by SIEC 6100 – "Industrial waste".

39220 – Waste of leather, leather dust, powder and flour

By merit of being part of CPC Group 392 – "Non-metallic wastes or scraps", and not being linked to any other SIEC category, this class is considered to be covered by SIEC 6100 – "Industrial waste".

39230 – Residual lyes from the manufacture of wood pulp, including lignin sulphonates, but excluding tall oil

This subclass, which corresponds to Harmonized System Heading 3804, consists of two components:

- Residual lyes from the manufacture of wood pulp *by the sulphite process*
- Residual lyes from the manufacture of wood pulp *by the soda or sulphate process*.

The SIEC definition of black liquor (Class 5140) refers to the residues from the soda/sulphate process, so the second item above seems to indicate an overlap. It is not clear whether the first component (residual lyes resulting from the sulphite process) would be included as well. The link is currently considered partial, and the SIEC category is considered to fit within the CPC category, but not cover all of it.

39240 – Waste and scrap of paper or paperboard

By merit of being part of CPC Group 392 – "Non-metallic wastes or scraps", and not being linked to any other SIEC category, this class is considered to be covered by SIEC 6100 – "Industrial waste".

39250 – Waste, parings and scrap of rubber (except hard rubber) and powders and granules therefrom

By merit of being part of CPC Group 392 – “Non-metallic wastes or scraps”, and not being linked to any other SIEC category, this class is considered to be covered by SIEC 6100 – “Industrial waste”.

39260 – Used pneumatic tyres of rubber

By merit of being part of CPC Group 392 – “Non-metallic wastes or scraps”, and not being linked to any other SIEC category, this class, is considered to be covered by SIEC 6100 – “Industrial waste”.

39270 – Waste, parings and scrap of plastic

By merit of being part of CPC Group 392 – “Non-metallic wastes or scraps”, and not being linked to any other SIEC category, this class is considered to be covered by SIEC 6100 – “Industrial waste”.

39280 – Sawdust and wood waste and scrap

This subclass is considered to be fully covered by the following SIEC categories:

- 5111 – “Wood pellets”
- 5119 – “Other fuelwood, wood residues and by-products” (partial)

Whereas SIEC Class 5111 is considered to be fully covered by the scope of CPC 39280, the 5119 link is partial. This is because 5119 is considered to also fully cover CPC 03130 – “Fuel wood, in logs, in billets, in twigs, in faggots or in similar forms.”

39290 – Other non-metallic waste or scrap

By merit of being part of CPC Group 392 – “Non-metallic wastes or scraps”, and not being linked to any other SIEC category, this class is considered to be covered by SIEC 6100 – “Industrial waste”.

39910 – Municipal waste

This subclass is considered to match SIEC Class 6200 – “Municipal waste” one-to-one, with the implicit understanding that the SIEC category only classifies the component of municipal waste that is combusted or otherwise utilized for energy purposes.