



United Nations Statistics Division

# International Classifications for Energy Statistics

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Workshop on Energy Statistics for ASEAN Countries

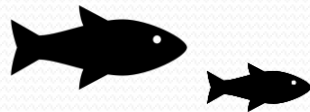
21-23 November 2017  
Kuala Lumpur, Malaysia



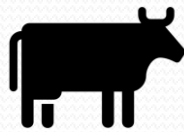
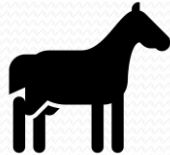
<http://unstats.un.org/unsd/energy>

# Classifications

- Provide clear definitions of objects to be measured



- Provide a structure to place measured objects in context



- Allow statistics compiled to be comparable across programs

- Help identify related concepts and objects
- Help defining relationships



# Classifications

- Are the language that links statistical programmes
- For energy statistics:
  - Allows links to other economic statistics
  - Allows links to data from other sources (e.g. administrative trade sources)

# Classifications in energy statistics

- Key applications:
  - Energy products
  - Industries of energy producers and energy users (Energy industries, Energy consumers)
- Classifications are based on international agreements reached as part of the development of IRES

# Energy industries and energy consumers

- Units to be classified are economic actors
  - Establishment, enterprise
- Definition of these units is based on industry concepts
- Classification based on: ISIC
  - International Standard Industrial Classification of All Economic Activities

# Energy industries

- Definition: Only those economic units whose principal activity is the primary energy production, the transformation of energy or the distribution of energy
  - i.e. not all units producing energy etc. are included here

<b>Energy industry</b>	<b>ISIC Rev. 4</b>
Electricity and heat plants <sup>a</sup>	Division: 35 - Electricity, gas, steam and air conditioning supply
Pumped storage plants	
Coal mines	Division: 05 - Mining of coal and lignite
Coke ovens	Group: 191 - Manufacture of coke oven products
Coal liquefaction plants	Group: 192 - Manufacture of refined petroleum products
Patent fuel plants	Group: 192 - Manufacture of refined petroleum products
Brown coal briquette plants	Group: 192 - Manufacture of refined petroleum products
Gas works <sup>b</sup> (and other conversion to gases)	Group: 3520 - Manufacture of gas; distribution of gaseous fuels through mains
Gas separation plants	Division: 06 – Extraction of crude petroleum and natural gas
Gas to liquid (GTL) plants	Group: 192 – Manufacture of refined petroleum products
LNG plants / regasification plants	Group: 091 - Support activities for petroleum and natural gas extraction Class: 5221 - Service activities incidental to land transportation
Blast furnaces	Group: 241 - Manufacture of basic iron and steel
Oil and gas extraction	Division: 06 - Extraction of crude petroleum and natural gas Group: 0910 – Support activities for petroleum and natural gas extraction
Oil refineries	Division: 19 - Manufacture of coke and refined petroleum products
Charcoal plants <sup>c</sup>	Class: 2011 - Manufacture of basic chemicals
Biogas production plants <sup>d</sup>	Group: 352 - Manufacture of gas; distribution of gaseous fuels through mains
Nuclear fuel extraction and fuel processing	Class 0721 - Mining of uranium and thorium ores Class: 2011 - Manufacture of basic chemicals
Other energy industry n.e.s. <sup>e</sup>	Class: 0892 – Extraction of peat ....

# Energy industries

- These units naturally fall into certain ISIC categories
  - But do not always cover them completely (e.g. LNG plants / regasification plants fall into ISIC class 5221)
  - Class: 5221 - Service activities incidental to land transportation
- The detail recommended for data collection in IRES goes beyond the ISIC class detail in some cases



Energy consumers	Correspondence to ISIC Rev. 4
Manufacturing, construction and non-fuel mining industries	
Iron and steel	ISIC Group 241 and Class 2431. <sup>1</sup>
Chemical and petrochemical	ISIC Divisions 20 and 21, excluding ISIC 2011. <sup>2</sup>
Non-ferrous metals	ISIC Group 242 and Class 2432
Non-metallic minerals	ISIC Division 23.
Transport equipment	ISIC Divisions 29 and 30
Machinery	ISIC Divisions 25, 26, 27 and 28. Fabricated metal products, machinery and equipment other than transport equipment.
Mining and quarrying	ISIC Divisions 07 and 08 and Group 099, excluding the mining of uranium and thorium ores (Class 0721) and the extraction of peat (Class 0892).
Food and tobacco	ISIC Divisions 10, 11 and 12
Paper, pulp and print	ISIC Divisions 17 and 18. Includes production of recorded media.
Wood and wood products (Other than pulp & paper)	ISIC Division 16
Textile and leather	ISIC Divisions 13, 14 and 15
Construction	ISIC Divisions 41, 42 and 43
Industries not elsewhere specified	ISIC Divisions 22, 31, 32
Household	ISIC Divisions 97 and 98
Commerce and public services	ISIC divisions:33, 36-39, 45-96 and 99, excluding ISIC 8422
Agriculture, Forestry	ISIC Divisions 01 and 02
Fishing	ISIC Divisions 03
Defence activities	ISIC Class 8422

# Energy consumers

- Groupings defined on the basis of ISIC
  - Consumption for transportation purposes is excluded and grouped by mode of transport
- Excludes units categorized as Energy industries
  - Whose energy consumption is classified as “own use”
- IRES recommends minimum set of groupings
- **However:** Data at detailed ISIC level would be important for all industries and collection is encouraged

# Energy producers and consumers

- Groupings reflect a separation in producers and users based on existing industry concepts
  - Not a reflection of individual unit's activities (main, secondary and ancillary activities)
  - But: allocation is fairly straightforward
- Groupings defined through detailed and aggregated ISIC categories
- Data at detailed level is of interest

# Energy products - SIEC

- SIEC – Standard International Energy Product Classification
- Provides the basis for data collection and analysis at the detailed product level
- Based on work carried out by InterEnerStat to define energy products
- Introduced in IRES
- Harmonizes previously used definitions by participating agencies
  - Reduces ambiguity
  - Reduces response burden due to conflicting requests
  - Improves comparability of data

# SIEC

- We will look at:
  - Scope
  - Structure
  - Detail
  - Links to other classifications
  - Issues for future work

# SIEC scope

- **Fuels** that are produced/generated by an economic unit (including households), and are used or might be used as sources of energy
  - All fossil fuels, whether or not used for energy purposes<sup>1</sup>
  - Products derived from fossil fuels when they are used (or intended to be used) as fuels
  - Products derived from fossil fuels that are used (or intended to be used) for non-energy purposes only if they are the output of energy industries<sup>2</sup>
  - Biofuels
- **Electricity** that is **generated** by an economic unit (including households)
- **Heat** that is **generated and sold** to third parties by an economic unit

1 – Exceptions: peat, natural bitumen

2 - lubricants are in scope, plastics are not

# SIEC structure

- SIEC groups energy products in 4 levels of successively detailed categories
- Coding system is numerical
- SIEC covers primary and secondary energy products, but this distinction is not embedded in the structure

# SIEC structure

- Top level:
  - 0 Coal
  - 1 Peat and peat products
  - 2 Oil shale / oil sands
  - 3 Natural gas
  - 4 Oil
  - 5 Biofuels
  - 6 Industrial waste
  - 7 Electricity
  - 8 Heat
  - 9 Nuclear fuels and other fuels n.e.c.



# SIEC structure

- Example of detail:
  - **5 Biofuels**
    - **51 Solid biofuels**
      - 511 Fuelwood, wood residues and by-products
        - 5111 Wood pellets
        - 5119 Other Fuelwood, wood residues and by-products
      - 512 Bagasse
      - 513 Animal waste
      - 514 Black liquor
      - 515 Other vegetal material and residues
      - 516 Charcoal
    - **52 Liquid biofuels**
      - ...

# SIEC detail

- Clear and detailed definitions for each product
- Based on work of InterEnerStat
- Reflect consensus based on previously existing definitions
- Based on detail of information currently collected

# SIEC definitions (example)

- **4652 Motor gasoline**

- A mixture of some aromatics (e.g., benzene and toluene) and aliphatic hydrocarbons in the C<sub>5</sub> to C<sub>12</sub> range. The distillation range is 25°C to 220°C.
- *Remark:* Additives are blended to improve octane rating, improve combustion performance, reduce oxidation during storage, maintain cleanliness of the engine and improve capture of pollutants by catalytic converters in the exhaust system. Motor gasoline may also contain biogasoline products.

# SIEC definitions (example)

- **5111 Wood pellets**

- Wood pellets are a cylindrical product which has been agglomerated from wood residues by compression with or without the addition of a small quantity of binder. The pellets have a diameter not exceeding 25 mm and a length not exceeding 45 mm.

**Table 3.1: Standard International Energy Product Classification (SIEC)**

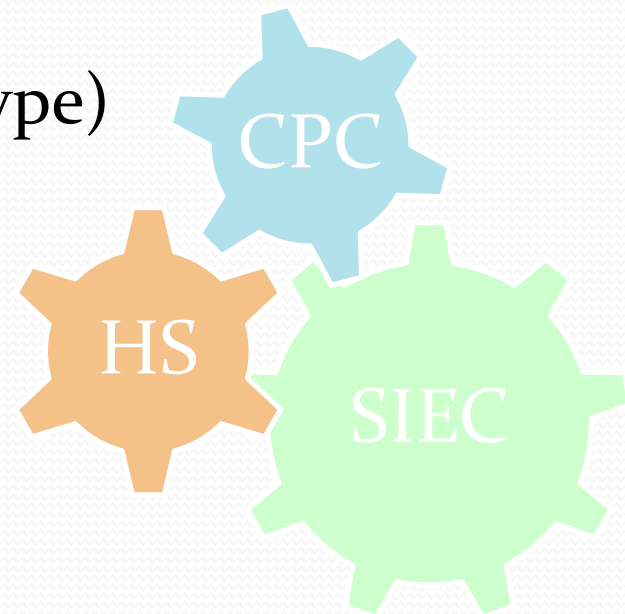
SIEC Headings		Correspondences		
Section / Division / Group	Class		CPC Ver.2	HS 2007
<b>0</b>		<b>Coal</b>		
<b>01</b>		<b>Hard coal</b>		
011	0110	Anthracite	11010*	2701.11
012		Bituminous coal		
	0121	Coking coal	11010*	2701.19
	0129	Other bituminous coal	11010*	2701.12
<b>02</b>		<b>Brown coal</b>		
021	0210	Sub-bituminous coal	11030*	2702.10*
022	0220	Lignite	11030*	2702.10*
<b>03</b>		<b>Coal products</b>		
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*, 34540*	2707, 2708.10*, .20*, 2712.90*
<b>1</b>		<b>Peat and peat products</b>		
<b>11</b>		<b>Peat</b>		
111	1110	Sod peat	11050*	2703*
112	1120	Milled peat	11050*	2703*
<b>12</b>		<b>Peat products</b>		
121	1210	Peat briquettes	11050*	2703*
129	1290	Other peat products	11050*, 33100*, 33200*, 33500*	2703*, 2704*, 2706*, 2712.90*
<b>2</b>		<b>Oil shale / oil sands</b>		
20		<b>Oil shale / oil sands</b>		
200	2000	Oil shale / oil sands	12030	2714.10
<b>3</b>		<b>Natural gas</b>		
30		<b>Natural gas</b>		
300	3000	Natural gas	12020	2711.11, .21
<b>4</b>		<b>Oil</b>		
41		<b>Conventional crude oil</b>		
410	4100	Conventional crude oil	12010*	2709*
42		<b>Natural gas liquids (NGL)</b>		

# SIEC links to other classifications

- Links to other classifications facilitate comparison with data from other programs and sources, e.g.
  - Trade
  - Environmental accounting
  - Industry statistics
- Most important links:
  - CPC (Central Product Classification)
  - HS (Harmonized System)

# SIEC links to CPC and HS

- HS 2710.11: “Light oils and preparations”
- CPC 33310 and 33320: “Motor spirit (gasolene), including aviation spirit” ; “spirit type (gasolene type) jet fuel”
- SIEC 465: “gasolines”



HS	2710.11*		
CPC	33310	33320	
SIEC	4651	4652	4653

# SIEC links to CPC, HS

- Links to CPC and HS are shown in the classification (in IRES)
- Categories do not always match
  - Specific use/needs of energy statistics (SIEC) compared to more general use of product statistics (CPC)
  - Different requirements for detail
    - Agricultural products
  - Existing agreements on product detail
    - Oil products in HS



# SIEC links to CPC, HS

<b>SIEC</b>			<b>CPC</b>	<b>HS</b>
<b>01</b>		<b>Hard coal</b>		
011	0110	Anthracite	11010*	2701.11
012		Bituminous coal		
	0121	Coking coal	11010*	2701.19
	0129	Other bituminous coal	11010*	2701.12
<b>02</b>		<b>Brown coal</b>		
021	0210	Sub-bituminous coal	11030*	2702.10*
022	0220	Lignite	11030*	2702.10*

# SIEC links to CPC, HS

- Limited detail in HS in some areas:
  - 2710.1 Petroleum oils and oils obtained from bituminous minerals (other than crude) and preparations not elsewhere specified or included, containing by weight 70 % or more of petroleum oils or of oils obtained from bituminous minerals, these oils being the basic constituents of the preparations, other than waste oils:
    - 2710.11 - Light oils and preparations
    - 2710.19 - Other
  - 2710.9 Waste oils

# SIEC links to CPC, HS

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*
	4692	Lubricants	33380*	2710.19*
	4693	Paraffin waxes	33500*	2712.20*
	4694	Petroleum coke	33500*, 34540*	2713.11, .12, 2708.20*
	4695	Bitumen	33500*	2713.20
	4699	Other oil products n.e.c.	33330*, 33500*, 34540*	2708.10*, 2710.11*, 2712.10*, .20*, .90*, 2713.90

# SIEC links to CPC, HS

- Links are being discussed in the Expert Group on International Classifications
  - Intent is to improve relationship between SIEC and CPC
  - Link at most detailed level not always possible
  - Suitable aggregates are sought
  - Future proposals for HS are possible
  - Example for recent progress: biodiesel\*

\* Current HS definition of biodiesel can include up to 70% of oil from fossil origin

# Other classifications

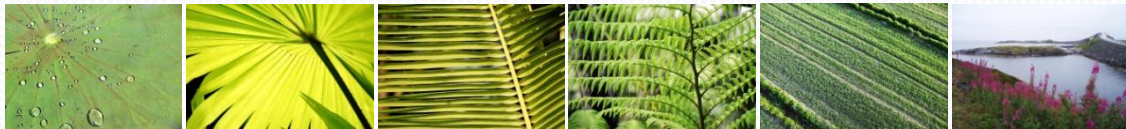
- SIEC and the classifications of energy producers and consumers are most prominent classifications in IRES
- Energy statistics makes use of others as well (explicit classifications or lists)
  - Classification of underground resources
    - Part of SEEA-energy, based on UNFC (UN Framework Classification for Fossil Energy and Mineral Resources)
  - Modes of transport
    - IRES table 5.4

# Issues for future work

- Improving links to between SIEC and CPC / HS is a priority
- Process has started as part of the review for CPC Ver.2.1
- Difficulties encountered include:
  - Definition issues around biofuels
  - Mix of product and flow concept for some SIEC products (e.g., LPG from crude and as an NGL)
  - How realistic is product detail for trade statistics
  - Better link may require adjustments to SIEC definitions



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**Thank you.**

<http://unstats.un.org/unsd/energy/>