Chapter 6 Statistical units and data items

Below is a provisional outline of Chapter 6 - Statistical Units and data items. The text follows broadly the recommendations adopted by the UN Statistical Commission for other areas of economic statistics. The preliminary text for the statistical units and their characteristics is provided in a separate document. The text contains a draft reference list of the data items relevant for energy statistics. It is based on the data items used in the main questionnaires on energy statistics (including the IEA/Eurostat/ECE Questionnaires and the UNSD Questionnaire) and the EU regulation on Energy Statistics. The Oslo Group is invited to provide guidance on the structure of the presentation of the data items and the scope of data items. As soon as InterEnerStat definitions of energy products and flows will become available the list will be updated.

A. Introduction

6.1. The objective of this chapter is to introduce the concept of *statistical units*, provide an overview of the different statistical units and provide recommendations on the statistical units to use for energy statistics….

6.2. Section E presents the list of data items of energy statistics recommended for collection and publication. Some of the data items may not be existent or they may be of minor importance for some countries. Compilers are encouraged to use the list of data items as reference in order to develop a list of data items in accordance with their own statistical circumstances, respondent load and available resources and having determined the data items should consistently use the definitions presented.

B. Statistical units

Provisional text provided in a separate document

C. Classification of statistical units by kinds of economic activity

Provisional text provided in a separate document

D. Characteristics of statistical units

Provisional text provided in a separate document

E. Data items

6.3. This section provides a reference list of data items for use in energy statistics. Some items may not be existent or may be a minor importance for some countries. **It is recommended** that countries select from that list the data items which are relevant for their national programmes of energy statistics in accordance with their own statistical circumstances, respondent load and available resources. **It is**

further recommended that, while developing their own national lists of data items, countries consistently use the definitions of products and flows presented in chapters 3 and 5.

6.4. There are different ways in which the list of data items for energy statistics could be organized and presented in IRES [**The Oslo group is invited to provide comments and further guidance on the current presentation of data items**]. The current presentation of the data items is intended for initiation of the discussion and should be carefully evaluated. Data items below are organized according to the following main categories of energy products: a) Coal and manufactured gases; b) Oil and oil products; c) Natural Gas; d) Electricity and Heat; and e) Renewables and wastes. This organization of data items reflects the organization of data collection strategies which often are designed along the major categories of products. It also reflects the presentation of aggregates in the Regulation of the European Parliament and of the Council on Energy Statistics[1] as well as the organization of the joint IEA/Eurostat/ECE Energy Statistics Questionnaires. However, there may be some overlap between these categories, since, for example, frequently oil and gas are exploited together and some products such as ethane and LPG can be manufactured both from crude oil and (wet) natural gas.

6.5. Within each main category of energy products, information is organized as follows: (a) characteristics of statistical units; (b) data items for the energy sector; and (c) data items for the consumption sector. The characteristics of statistical units are relevant for the energy and consumption sectors. They contain information on the type of statistical unit. Data items for the energy and consumption sectors are provided separately for physical units and monetary units. In addition, given their relevance for energy policies, information on the infrastructure of the energy sector related to the specific group of energy products is provided.

6.6. The distinction between data items for the energy sector and the consumption sector is intended to take into consideration that the different types of the information required for the two sectors.

F. Data items for Coal and Manufactured Gases

6.7. This section covers the list of data items for statistics on Coal and manufactured gases. The respective energy products that are identified in the list of data items include:

Anthracite	Patent Fuel/hard coal briquettes	Coke Oven Gas
Coking Coal	Coke Oven Coke	Blast Furnace Gas
Other Bituminous Coal	Gas Coke	Oxygen Steel Furnace Gas
Sub-bituminous Coal	Coal Tar	
Lignite/Brown Coal	BKB/PB/ lignite and peat briquettes	
Peat	Gas Works Gas	

1. Characteristics of Statistical units

Item Number	Item	
1.1	Identification code	
1.2	Location	
1.3	Kind-of-activity	
1.4	Period of operation	
	Type of economic organization	
	Size	
	Type of operation	

[1] Official Journal of the European Union L 304/1 14.11.2008

	Coal Mines	
	Coke ovens plants	
	Patent fuel plants	
	BKB plants	
	Gas Works	
	Blast furnace	
	Coal liquefaction plants	
	Oxygen steel furnace	
	For Blended Natural Gas	
	Others	
	Principal producing unit	
	Ancillary producing unit	

Employment

Item Number	Item	Units
	Total number of person employed	
	Average number of persons employed	
	Hours worked by employees	

2. Data items for the energy sector

Physical units

Item Number	Item	Units
	Production by energy products	tons, NCV, GCV
	Of which Underground production * (underground mining)	
	Of which Surface production* (open cast mining)	
	recovered slurries, middlings and other low-grade coal products, which cannot be classified according to type of coal. This includes coal recovered from waste piles and other waste receptacles*	
	From Other Sources (disaggregated by Oil, natural Gas, and Renewable)	
	Quantity of sales/deliveries to international bunkers	
	International marine bunkers (disaggregation between resident vs. non resident(??))	
	International aviation bunkers (disaggregation between resident vs. non resident(??))	
	Export (by energy products) (by destination)	
	Import (by energy products) (by origin)	
	Quantity of energy products used for non-energy purposes (by energy products)	
	Quantity of energy products used for final energy consumption purposes (by energy products)	
	Quantity of energy products transformed (by energy products) (by type of operation if more than one within establishment)	
	Coke ovens plants	
	Patent fuel plants	
	BKB plants	
	Gas Works	
	Blast furnace	
	Coal liquefaction plants	
	Oxygen steel furnace	
	For Blended Natural Gas	

	Others	
	Distribution losses (by energy products)	
	Quantity of stocks (inventories) of energy products	
	At the beginning of the period	
	At the end of the period	
	Changes in stocks	

* Not applicable for: Peat, Patent Fuel, Coke Oven Coke, Gas Coke, Coal Tar, BKB/PB, Gas Works Gas, Coke Oven Gas, Blast Furnace Gas, Oxygen Steel Furnace Gas

** Not applicable for: Anthracite, Coking Coal, Other Bituminous Coal, Sub-bituminous Coal, Lignite/Brown Coal. This item would include "supplies of fuel of which production is covered in other fuel energy balances, but for which consumption will occur in the coal energy balance. Further details of this second component include:

- of which from oil products (e.g.: petroleum coke addition to coking coal for coke ovens)
- of which from natural gas (e.g.: natural gas addition to gas works gas for direct final consumption)
- of which from renewables (e.g.: industrial waste as binding agent in the manufacturing of patent fuel)

Monetary data items

Item Number	Items	units
	Gross output at basic prices	value
	Of which: energy products	
	Sales for international bunkering	
	International marine bunkers (disaggregation resident vs. non resident??)	
	International aviation bunkers (disaggregation resident vs. non resident??)	
	Intermediate consumption at purchasers price	
	Cost of energy products purchased for (end use) energy purposes (by energy product)	
	Cost of energy products purchased for non-energy purposes (by energy product	
	Total Imports	
	Imports of energy products (by energy products) (by origin)	
	Total Exports	
	Exports of energy products (by energy products) (by destination)	
	Stocks (Inventories) of energy products	
	At the beginning of the period	
	At the end of the period	
	Change	

Infrastructure relevant to Coal and Manufactured Gases

Item Number	Data item	Units
	Gross fixed capital formation	Value

[Are there other relevant statistics on the infrastructure for Coal and Manufactured Gases?]

3. Data items for the consumption sector

Physical data items

Item Number	Item	Units

	Imports (by energy products)	Tons, NCV, GCV
	Exports (by energy products)	
	Quantity of energy products used for non-energy use (by energy products)	
	Quantity of energy products used for final energy consumption (by energy products)	
	Of which for transport	
	Of which: rail	
	Of which domestic navigation	
	Of which: others	
	Quantity of inventories (stocks) of energy products	
	At the beginning of the period	
	At the end of the period	
	Change	

Monetary data items

Item Number	Items	Units
	Value added	value
	Cost of energy products purchased for non-energy use	
	Cost of energy products purchased for final energy consumption	
	stocks (inventories) of energy products	
	At the beginning of the period	
	At the end of the period	
	Change	

[**NOTE for the consumption sector the monetary list of data items contains an item for "Value added". This information may be useful for compiling indicators such as energy intensity (e.g. Industrial energy intensities defined as use per unit of value added in the Industry). This item, however, can also be easily obtained from economic statistics provided that the underling sectors correspond. The Oslo Group is invited to provide views**]

G. Data items for Oil and Oil Products

6.8. This section covers the list of data items for statistics on Oil which cover the following petroleum products:

Crude Oil	**Finished products:**	Residual Fuel Oil
Natural Gas Liquids, *of which*	Refinery Gas (not liq.)	White Spirit and SBP
Ethane	Ethane	Lubricants
LPG	LPG	Bitumen Paraffin Waxes
Natural gasoline	Naphtha	Petroleum Coke
Plant condensate	Motor Gasoline	Other Oil Products
Naphtha	*Of which* Biogasoline	
NGL not elsewhere specified	Aviation Gasoline	
Refinery feedstocks	Gasoline Type Jet Fuel	
Additive/oxygenates	Other Kerosene	
Of which biofuels	Gas-Diesel Oil	
Other hydrocarbons	Transport Diesel	
Kerosene Type Jet Fuel	*Of which* Biodiesels	
	Heating and Other Gasoil	

1. Characteristics of Statistical units

Item Number	Item	
	Identification code	
	Location	
	Kind-of-activity	
	Period of operation	
	Type of economic organization	
	Size	
	Type of operation/conversion	
	Natural gas processing plants	
	Petroleum refineries	
	Electricity, CHP and heat plants	
	Electricity plants	
	Combined heat and power plants (CHP)	
	Heat plants	
	Gas Works/Gasification plants	
	Coke ovens	
	Blast furnace	
	Blended Natural Gas	
	Patent fuel plants	
	Not elsewhere specified – transformation	
	Principal producing unit	
	Ancillary producing unit	

Employment

Item Number	**Item**	**Units**
	Total number of person employed	
	Average number of persons employed	
	Hours worked by employees	

2. Data items for the energy sector

Physical data items

Item Number	**Item**	**Units**
	Production by energy products	Tons, NCV
	From Other Sources (disaggregated by Oil, natural Gas, and Renewable)**	
	Quantity of sales/deliveries to international bunkers	
	International marine bunkering (disaggregation resident vs. non resident?)	
	International aviation bunkering (disaggregation resident vs. non resident?)	
	Quantity of sales/deliveries to refineries (by energy products)	
	Export (by energy products) (by destination)	
	Import (by energy products) (by origin)	
	Products transferred (from, to)	
	Backflows from petrochemical industry	

	Refinery intake (by products) [only for ISIC 1920 – Manufacture of petroleum products]	
	Quantity of energy products used for non-energy purposes (by energy products)	
	Quantity of energy products used for final energy consumption (by energy products)	
	Quantity of energy products transformed (by energy products) (by type of operation if more than one within establishment)	
	Refineries losses	
	Product transferred	
	Recycled products	
	Distribution losses (by energy products)	
	Quantity of inventories (stocks) of energy products	
	At the beginning of the period	
	At the end of the period	
	Change	

** It includes the supply of Additives, Biofuels and Other hydrocarbons, such as (1) liquids produced from coal liquefaction plants, and the liquid output from coke ovens, (2) the biofuels which are for blending with transport fuels. These items correspond to the row "Other sources" in table 1 of the IEA Oil questionnaire.

Monetary data items

Item Number	Item	Units
	Gross output at basic prices	
	Of which: energy products	
	Sales of energy products for international bunkering (by energy products)	
	International marine bunkering (disaggregation resident vs. non resident?)	
	International aviation bunkering (disaggregation resident vs. non resident?)	
	Sales/deliveries to petroleum refineries (ISIC Rev. 4 Class 1920)	
	Intermediate consumption at purchasers price	
	Of which Cost of energy products purchased for (end use) energy purposes (by energy product)	
	Of which Cost of energy products purchased for non-energy purposes (by energy product	
	Total Imports	
	Imports of energy products (by energy products) (by origin)	
	Total Exports	
	Exports of energy products (by energy products) (by destination)	
	Inventories (stocks) of energy products	
	At the beginning of the period	
	At the end of the period	
	Change	

Infrastructure relevant to Oil and Oil Products

Item Number	Item	units
	Gross fixed capital formation	Value
	Refinery Capacity	Tons

3. Data items for the consumption sector

Physical data items

Item Number	Item	Units
	Imports (by energy products)	Tons, NCV, GCV
	Exports (by energy products)	
	Quantity of energy products used for non-energy use (by energy products)	
	Of which in transport	
	Quantity of energy products used for final energy consumption (by energy products)	
	Of which for transport	
	Of which: rail	
	Of which road	
	Of which domestic navigation	
	Of which domestic aviation	
	Of which pipeline transport	
	Of which: others	
	Quantity of inventories (stocks) of energy products	
	At the beginning of the period	
	At the end of the period	
	Change	

Monetary data items

Item Number	Items	Units
	Value added	value
	Cost of energy products purchased for non-energy use	
	Cost of energy products purchased for final energy consumption	
	stocks (inventories) of energy products	
	At the beginning of the period	
	At the end of the period	
	Change	

H. Data items for Natural gas

6.9. This section covers the list of data items for statistics on Natural Gas which cover the following products:

Natural Gas
Natural Gas Liquids, *of which*
- Ethane
- LPG
- Natural gasoline
- Plant condensate
- Naphtha
- NGL not elsewhere specified

1. Characteristics of Statistical units

Item Number	Item	
	Identification code	
	Location	
	Kind-of-activity	
	Period of operation	
	Type of economic organization	
	Size	
	Type of operation/conversion	
	Natural gas processing plants [ISIC 0620]	
	Electricity, CHP and heat plants [ISIC 351]	
	Electricity plants	
	Combined heat and power plants (CHP)	
	Heat plants	
	Gas Works/Gasification plants [ISIC 3520]	
	Coke ovens [ISIC 1910)	
	Blast furnace [ISIC 2410]	
	Gas-to-liquid	
	Not elsewhere specified – transformation	
	Principal producing unit	
	Ancillary producing unit	

Employment

Item Number	Item	
	Total number of person employed	
	Average number of persons employed	
	Hours worked by employees	

2. Data items for the energy sector

Physical data items

Item Number	Item	Unit
	Production	Terajoules
	Associated gas	
	Non-associated gas	
	Colliery gas	
	Of which from other sources	
	Re-injected	
	Flared	
	Vented	
	Extraction losses/shrinkage	
	Quantity of sales/deliveries to international bunkers	
	International marine bunkering (disaggregation resident vs. non resident?)	
	International aviation bunkering (disaggregation resident vs. non resident?)	
	Imports (by origin)	

	Export gas (by destination)	
	Total sales/deliveries	
	Quantity of natural gas used for non-energy purposes	
	Quantity of natural gas used for final energy consumption	
	Quantity of natural gas transformed (by type of operation if more than one within establishment)	
	Quantity of fuel blended with natural gas (*of which*: LPG, manufactured gas and biogas)**	
	Distribution losses (by energy products)	
	Stocks (inventories) of recoverable gas	
	At the beginning of the period	
	At the end of the period	
	Change	
	Stocks of Cushion gas at the end of the period	

** this refers to the use of fuel blended with natural gas and consumed as a blend. It includes LPG for upgrading the quality e.g. heat content; manufactured gas for blending with natural gas; and biogas for blending with natural gas. [not sure where the blending occur. If it occurs in the establishments extracting and manufacturing gas, then it would be collected as a use of the blending agents.]

Monetary data items

Item Number	Item	Unit
	Gross output at basic prices	
	Of which: Natural gas	
	Sales of natural gas for international bunkering	
	International marine bunkering (disaggregation resident vs. non resident?)	
	International aviation bunkering (disaggregation resident vs. non resident?)	
	Intermediate consumption at purchasers price	
	Of which Cost of Natural gas purchased for (end use) energy purposes (by energy product)	
	Of which Cost of Natural gas purchased for non-energy purposes (by energy product	
	Total Imports	
	Imports of Natural gas (by origin)	
	Total Exports	
	Exports of Natural gas (by destination)	
	Inventories (stocks) of recoverable gas*	
	At the beginning of the period	
	At the end of the period	
	Change	

* Stocks of recoverable gas refer to Recoverable natural gas stored in special storage facilities (Depleted oil and gas fields, Aquifers, Salt cavities, mixed caverns and others) as well as liquefied natural gas storage. Cushion gas is excluded. (IEA/Eurostat/ECE questionnaire).

Cushion gas: this refers to the total volume of gas required as a permanent inventory to maintain adequate underground storage reservoir pressures and deliverability rates throughout the output cycle. (IEA/Eurostat/ECE questionnaire)

Recoverable gas: this refers to the volume of gas in excess of cushion gas that is available for delivery during an input-output cycle. (IEA/Eurostat/ECE questionnaire)

Infrastructure relevant to natural gas

Item Number	Item	Unit

	Type of Gas storage capacity	
	Peak output	
	Working capacity	
	Capacity of Natural gas Processing Plants	

6.10. **Types of storage capacity**. There are three main types of storage in use (IEA/Eurostat/ECE questionnaire):

- **Depleted oil and gas fields** are naturally capable of containing the gas and have existing installations for the injection and withdrawal of the gas.
- **Aquifers** may be used as storage reservoirs provided that they have suitable geological characteristics. The porous sedimentary layer must be overlaid by an impermeable cap rock.
- **Salt cavities** may exist naturally or be formed by injecting water and removing the brine. They are generally smaller than the reservoirs provided by depleted oil and gas fields or aquifers but offer very good withdrawal rates and are well suited for peak-shaving requirements.

6.11. **Working gas capacity**. Working gas capacity is the total gas storage capacity minus cushion gas. (IEA/Eurostat/ECE questionnaire)

6.12. **Peak output.** Peak output is the maximum rate at which gas can be withdrawn from storage. (IEA/Eurostat/ECE questionnaire)

3. Data items for the consumption sector

Physical data items

Item Number	Item	Units
	Imports (by energy products)	Terajoules
	Exports (by energy products)	
	Quantity of energy products used for non-energy use (by energy products)	
	Of which in transport	
	Quantity of energy products used for final energy consumption (by energy products)	
	Of which for transport	
	Of which: rail	
	Of which road	
	Of which domestic navigation	
	Of which domestic aviation	
	Of which pipeline transport	
	Of which: others	
	Quantity of inventories (stocks) of energy products	
	At the beginning of the period	
	At the end of the period	
	Change	

Monetary data items

Item Number	Items	Units
	Value added	value
	Cost of energy products purchased for non-energy use	

	Cost of energy products purchased for final energy consumption	
	Stocks (inventories) of energy products	
	At the beginning of the period	
	At the end of the period	
	Change	

I. Data items for Electricity and Heat

6.13. The data items presented in this section relate to the generation and use of electricity and heat. The electricity and heat plants are classified according to the corresponding generation process. Table 1 shows the main categories of process.

Table 1: Classification of electricity and heat units

Nuclear Energy released by nuclear fission or nuclear fusion. (IEA/Eurostat/ECE Questionnaire)
Hydro [**Should it be split by small and large hydro?]** Potential and kinetic energy of water converted into electricity in hydroelectric plants. Pumped storage should be included. (IEA/Eurostat/ECE Questionnaire) (UNSD)
Pumped Hydro
Geothermal
Solar
Tide, Wave and Ocean
Wind
Combustible Fuels
Heat from Chemical Sources
Heat Pumps*
Electric Boilers*
Other Sources

* only for CHP and Heat only type of units

6.14. In energy statistics electricity and heat plants are also classified according to the type of plant (Electricity only, CHP and Heat only), as well as type of producer (main activity producer and autoproducer). The **main activity producers** are defined (in the IEA/Eurostat/ECE Questionnaire) as "undertakings [that] generate electricity and/or heat for sale to third parties, as their primary **[principal?]** activity. They may be privately or publicly owned. Note that the sale need not take place through the public grid". **Autoproducer** are defined as "undertakings [that] generate electricity and/or heat, wholly or partly for their own use as an activity which supports their primary activity. They may be privately or publicly owned".

6.15. The **main activity producers** correspond therefore to the establishments that carry out the activity of electricity generation as principal activity. The Autoproducers instead include establishments that carry out this activity as a secondary activity (they may sell the electricity generated) and as an ancillary activity (solely for the purpose of own consumption). The information on main activity producers and autoproducers is identified as a combination of data items: In the characteristics of statistical units information is available on the principal activity of the unit to allow

for the identification of the main activity and auto- producers. In the physical data items information is available on the electricity generated.

1. Characteristics of Statistical units

Item Number	Item	
	Identification code	
	Location	
	Kind-of-activity*	
	Period of operation	
	Type of economic organization	
	Size	
	Type of operation/conversion	
	Heat Pumps*	
	Electric Boilers*	
	Principal producing unit	
	Ancillary producing unit	

* for the electricity and heat plants this item should distinguish the type of process as identified in Table 1 as well as the breakdown of the energy sector/industries.

Employment

Item Number	Item	Unit
	Total number of person employed	
	Average number of persons employed	
	Hours worked by employees	

2. Data items for the energy sector

Physical data items

Item Number	Item	Unit
	Gross Production of electricity	
	Net Production of electricity	
	Gross Production of heat	
	Net Production of heat	
	Imports of electricity (by origin)	
	Export of electricity (by destination)	
	Sales of electricity (by type of consumer – **to break-down further?**)	
	Industrial	
	Commercial	
	Residential	
	Sales of heat	
	Quantity of electricity used	
	Of which: Use of electricity in Heat pumps* (transformation)	
	Of which: Use of electricity in Electric Boilers*(transformation)	
	Of which: Use of electricity in pump storage (transformation)	
	Quantity of heat used	
	Quantity of electricity purchased	

	Quantity of heat purchased	
	Transmission and distribution losses **[should they be separate items?]**	
	Quantity of combustible fuel used (by combustible fuel**) for electricity generation	
	Quantity of combustible fuel used (by combustible fuel**) for heat generation	

* This corresponds to the electricity used in heat pumps and electric boilers that generate heat for sale.

**Combustible fuels are: Anthracite, Coking Coal, Other Bituminous Coal, Sub-Bituminious Coal, Lignite, Peat, Coke Oven Gas, Blast Furnace And Oxygen Steel Furnace Gas, Other Coal Products (Solid), Residual Fuel Oil, Refinery Gas, Gas-Diesel Oil, Other Liquid Fossil Fuels, Natural Gas And Gas Works Gas, Solid Biomass, Industrial Waste, Municipal Waste (Renewable), Municipal Waste (Non-Renewable), Biogas, Bagasse, Vegetal Waste, Black Liquor (Pulp and Paper Waste), Fuelwood, Charcoal, Other Renewables And Wastes, Nuclear Heat.

Monetary data items

Item Number	Item	Unit
	Gross output at basic prices	value
	Total sales/deliveries	
	Intermediate consumption at purchasers price	
	Of which Cost of electricity purchased	
	Of which Cost of heat purchased	
	Of which Cost of fuel purchased	
	Total Imports	
	Imports of electricity (by origin)	
	Total Exports	
	Exports of electricity (by destination)	

Infrastructure relevant to electricity

Item Number	Item	Unit
	Net maximum capacity (by type of process - Table 1)	
	Net maximum capacity by type of fuel firing capability (single-fired and multi fired capacity)	
	Net maximum capacity by type of generation (for combustible fuels)*	
	Peak load	
	Peak load demand	
	Available capacity at time of peak	
	Date and Time of peak load occurrence	

*Steam, Internal Combustion, Gas Turbine, Combined Cycle, Other Type of Generation.

6.16. **Net Maximum Electrical Capacity**. The net maximum capacity is the maximum active power that can be supplied, continuously, with all plant running, at the point of outlet (i.e. after taking the power supplies for the station auxiliaries and allowing for the losses in those transformers considered integral to the station). This assumes no restriction of interconnection to the network. Does not include overload capacity that can only be sustained for a short period of time (e.g. internal combustion engines momentarily running above their rated capacity). The net maximum electricity-generating capacity represents the sum of all individual plants' maximum capacities available to run continuously throughout a prolonged period of operation in a day.

6.17. **Net Maximum Electrical Capacity by type of generation.** The following types of generation are distinguished:

- ***Steam****:* steam turbines are of two main types -- non-condensing (or open cycle), also called backpressure turbines, and condensing turbines (or closed cycle). In non-condensing turbines, the exhaust steam leaving the turbine is used either as co-generated process steam or, more rarely, released into the atmosphere. In a condensing turbine, the exhaust steam is condensed and the water thus formed supplies the feed water for the generator. The boilers supplying steam turbines can be fuelled by all forms of fossil fuels;
- ***Internal Combustion***: the internal combustion engines referred to in this heading are the engine based on the gasoline or diesel cycle, which work on the spark ignition or the compression ignition principle. Diesel-type engines can use a variety of fuels ranging from natural gas to liquid fuels;
- ***Gas Turbines***: the gas turbine uses high temperature, high pressure gas as fuel, in which part of the heat supplied by the gas is converted into rotational energy. Fuel can be natural gas, coal gases or liquid fuels;
- ***Combined Cycle***: the combined cycle system refers to electricity produced by coupling two heat engines in a sequence to drive generators. The heat discharged from one heat engine serves as the energy source for the next engine. The gas turbine is generally used as the first heat engine, and a conventional condensing steam turbine at the second stage.
- ***Other***

6.18. **Net Maximum Electrical Capacity by fuel firing capability.** The total net maximum capacity is further subdivided by fuel firing capability. Firing capability is separated into “single" fuel and “multiple” fuel categories. **Single-fired Capacity** refers to units equipped to burn only one fuel type on a continuous basis. Power stations consisting of several units burning different types of fuel but with each individual unit capable of burning only one fuel should be considered as single-fired and have their capacity divided accordingly among the following conventional fuel types: Coal and Coal Products, Liquid Fuels, Natural Gas, Peat, Combustible Renewables and Wastes. **Multi-fired Capacity** refers to units with supply access to more than one nominated type of fuel and capable of generating electricity using these fuel types either in alternation or in combination on a continuous basis. These units should be capable of generating their maximum capacity, or a large proportion thereof, using any one of the fuels nominated. A multi-fired unit can have either one boiler capable of using more than one fuel or two boilers, each using a different single fuel but feeding the same generator in alternation or simultaneously. Generally, multi-fired capacity will fall into dual-fired or tri-fired groups. This includes solids and liquids, solids and natural gas, liquids and natural gas, and solids, liquids and natural gas.

Peak Load

6.19. **Peak Load Demand**. The peak load demand is the highest simultaneous demand for electricity satisfied during the year. Note that the electricity supply at the time of peak demand may include demand satisfied by imported electricity or alternatively the demand may include exports of electricity. Total peak load on the national grid is not the sum of the peak loads during the year on every power station as they may occur at different times. Either synchronized or very frequent data must be available in order to measure the peak load demand. The former is likely to be gathered by the national grid authority, and the latter by some electricity-generating companies.

6.20. **Available Capacity at time of peak**. The available capacity of an installation at peak period is the maximum power at which it can be operated under the prevailing conditions at the time, assuming no external constraints. It depends on the technical state of the equipment and its ability to operate, and may differ from the Net Maximum Capacity due to lack of water for hydro capacity, plant maintenance, unanticipated shutdown, or other outages at the time of peak load.

6.21. **Date and time of peak load occurrence**. Date and time on which the peak load was reached.

3. Data items for the consumption sector

Physical data items

Item Number	Item	Unit
	Production of heat [**would this cover the autoproducers?]**	
	Production of electricity **[would this cover the autoproducers?]**	
	Imports of electricity	GWh
	Exports of electricity	
	Electricity used	
	Of which in transport	
	Of which: rail	
	Of which road	
	Of which domestic navigation	
	Of which domestic aviation	
	Of which pipeline transport	
	Of which: others	
	Heat used	

Monetary data items

Item No.	Items	Units
	Value added	value
	Cost of electricity purchased	
	Cost of heat purchased	

J. Data items for Renewable

6.22. Statistics on renewable energy cover the production, Imports, Exports, transformation and consumption of the following products:

Hydro Geothermal Solar Photovoltaic Solar Thermal Tide, Wave and Ocean Wind Fuelwood Charcoal Bagasse Vegetal Waste	Other Solid Biomass Industrial Waste (non-renewable)Municipal Waste (renewable and non-renewable) Biogas Landfill Gas Sewage Sludge Gas Other Biogas Liquid Biofuels Biogasoline/alcohol

Black Liquor (Pulp and Paper Waste)	Biodiesels Other Liquid Biofuels

6.23. Data items for the generation of electricity from renewable sources are covered in Section H. The focus here is on the following energy products: solid biomass, industrial and municipal waste, biogas and liquid biofuels.

1. Characteristics of Statistical units

Item Number	Item	
	Identification code	
	Location	
	Kind-of-activity*	
	Period of operation	
	Type of economic organization	
	Size	
	Type of operation/conversion	
	Main activity producers electricity plants	
	Main activity producers CHP plants	
	Main activity producers heat plants	
	Autoproducers electricity plants	
	Autoproducers CHP plants	
	Autoproducers heat plants	
	Patent fuel plants	
	….	
	Principal producing unit	
	Ancillary producing unit	

* for the electricity and heat plants this item should distinguish the type of process as identified in Table 1 as well as the breakdown of the energy sector/industries.

Employment

Item Number	Items	
	Total number of person employed	
	Average number of persons employed	
	Hours worked by employees	

2. Data items for the energy sector

Physical data items

Item Number	Items	Units
	Production (by energy products)	
	Imports (by origin) (by energy products)	
	Export (by destination) (by energy products)	
	Quantity of energy products used for final energy consumption	
	Quantity of energy products transformed (by type of operation if more than one within establishment)	
	Distribution losses	

	Stocks of energy products	
	At the beginning of the period	
	At the end of the period	
	Change	

Monetary data items

Item Number	Item	Units
	Gross output at basic prices	
	Total sales/deliveries	
	Intermediate consumption at purchasers price	
	Of which Cost of energy products purchased (by energy products)	
	Total Imports	
	Imports (by origin) (by energy products)	
	Total Exports	
	Exports (by destination) (by energy products)	

Infrastructure relevant to renewables

Item Number	Item	Units
	Solar Collectors Surface	
	Liquid Biofuels Plants Capacity	

6.24. **Solar Collectors Surface** refers to the surface of all solar collectors; glazed and unglazed collectors, flat-plate and vacuum tube with a liquid or air as the energy carrier.

6.25. **Liquid Biofuels Plants Capacity** refers to the production capacity, at the end of the year, in terms of tonnes of products per year.

3. Data items for the consumption sector

Physical data items

Item Number	Item	Unit
	Imports (by energy products)	GWh
	Exports (by energy products)	
	Quantity of energy products used for non-energy use (by energy products)	
	Of which in transport	
	Quantity of energy products used for final energy consumption (by energy products)	
	Of which for transport	
	Of which: rail	
	Of which road	
	Of which domestic navigation	
	Of which domestic aviation	
	Of which pipeline transport	
	Of which: others	
	Quantity of stocks (inventories) of energy products	
	At the beginning of the period	
	At the end of the period	

	Change	

Monetary data items

Item No.	Items	Units
	Value added	value
	Cost of electricity purchased	
	Cost of heat purchased	