

ENERGY STATISTICS OF NON-OECD COUNTRIES

DOCUMENTATION FOR BEYOND 2020 FILES

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1. CHANGES FROM LAST EDITION

Methodology

International aviation bunkers

In October 2008, the IEA hosted the 3rd meeting of InterEnerStat. This group is made up of 24 international organizations that collect or use energy statistics. One of the objectives of the group is to improve the quality of energy data by harmonizing definitions for energy sources and flows. As a result of this meeting, the IEA has decided to align its energy statistics and balances with most other international organizations and to treat international aviation bunkers in the same way as international marine bunkers. Starting with this edition, international aviation bunkers is no longer included in the transport sector at the country level. It is subtracted out of supply in the same way as international marine bunkers.

Preliminary 2008 estimates

This edition includes preliminary estimates of 2008 data for a selection of products and flows: production, trade and supply for primary coal products; production and trade for natural gas; and production for primary oil data. These data are partial and will be subject to revision in future editions.

Geographical coverage

Indonesia, which left OPEC in 2009, was removed from the OPEC region (Memo: OPEC).

Changes in tables

In the Energy Statistics table, the flow From other sources: renewables (OSRENEW) was added.

In the Oil Demand by Product table, all individual OECD countries were added, and the short name for the flow International Marine Bunkers (BUNKERS) was changed to MARBUNK.

The Conversion Factors table now shows data both in kJ/kg and toe/t, previously reported in two different tables.

Country names

Country names for Libya, Syria and Russia were changed to Libyan Arab Jamahiriya, Syrian Arab Republic and Russian Federation, in agreement with the official nomenclature of the United Nations. Also, the country name for Former USSR was changed to Former Soviet Union.

Short names for Memo: Opec (OPEC), Former Soviet Union (FORMERUSSR), Former Soviet Union (if no detail) (USSRND) were changed to OPEC12, FSUREG and FSUND.

2. FLOW DEFINITIONS

| Supply | | |
|------------------------------------|-------------------|--|
| Flow | Short name | Definition |
| Production | INDPROD | Refers to the quantities of fuels extracted or produced, calculated after any operation for removal of inert matter or impurities (e.g. sulphur from natural gas). For “other hydrocarbons” (shown with crude oil), production should include synthetic crude oil (including mineral oil extracted from bituminous minerals such as oil shale and tar sands, etc.). Production of secondary oil products represents the gross refinery output. Secondary coal products and gases represent the output from coke ovens, gas works, blast furnaces and other transformation processes. |
| From other sources – coal | OSCOAL | Refers to both primary energy that has not been accounted for under production and secondary energy that has been accounted for in the production of another fuel. For example, under primary coal: recovered slurries, middlings, recuperated coal dust and other low-grade coal products that cannot be classified according to type of coal from which they are obtained; under gas works gas: natural gas, refinery gas, and LPG, that are treated or mixed in gas works (i.e. gas works gas produced from sources other than coal). |
| From other sources - natural gas | OSNATGAS | Refers to both primary energy that has not been accounted for under production and secondary energy that has been accounted for in the production of another fuel. |
| From other sources - oil products | OSOIL | Refers to both primary energy that has not been accounted for under production and secondary energy that has been accounted for in the production of another fuel. For example, under additives: benzol, alcohol and methanol produced from natural gas; under refinery feedstocks: backflows from the petrochemical industry used as refinery feedstocks; under “other hydrocarbons” (included with crude oil): liquids obtained from coal liquefaction and GTL plants. |
| From other sources - renewables | OSRENEW | Refers to both primary energy that has not been accounted for under production and secondary energy that has been accounted for in the production of another fuel. |
| From other sources - non-specified | OSNONSPEC | Refers to both primary energy that has not been accounted for under production and secondary energy that has been accounted for in the production of another fuel. This flow is used if the source is not |

| Supply | | |
|--------------------------------|-------------------|--|
| Flow | Short name | Definition |
| | | known. |
| Imports | IMPORTS | <p>Comprises amounts having crossed the national territorial boundaries of the country whether or not customs clearance has taken place.</p> <p><i>For coal:</i> Imports comprise the amount of fuels obtained from other countries, whether or not there is an economic or customs union between the relevant countries. Coal in transit should not be included.</p> <p><i>For oil and gas:</i> Quantities of crude oil and oil products imported under processing agreements (i.e. refining on account) are included. Quantities of oil in transit are excluded. Crude oil, NGL and natural gas are reported as coming from the country of origin; refinery feedstocks and oil products are reported as coming from the country of last consignment.</p> <p><i>For electricity:</i> Amounts are considered as imported when they have crossed the national territorial boundaries of the country. If electricity is “wheeled” or transited through a country, the amount is shown as both an import and an export.</p> |
| Exports | EXPORTS | <p>Comprises amounts having crossed the national territorial boundaries of the country whether or not customs clearance has taken place.</p> <p><i>For coal:</i> Exports comprise the amount of fuels supplied to other countries, whether or not there is an economic or customs union between the relevant countries. Coal in transit should not be included.</p> <p><i>For oil and gas:</i> Quantities of crude oil and oil products exported under processing agreements (i.e. refining on account) are included. Re-exports of oil imported for processing within bonded areas are shown as an export of product from the processing country to the final destination.</p> <p><i>For electricity:</i> Amounts are considered as exported when they have crossed the national territorial boundaries of the country. If electricity is “wheeled” or transited through a country, the amount is shown as both an import and an export.</p> |
| International marine bunkers | MARBUNK | <p>Covers those quantities delivered to ships of all flags that are engaged in international navigation. The international navigation may take place at sea, on inland lakes and waterways, and in coastal waters. Consumption by ships engaged in domestic navigation is excluded. The domestic/split is determined on the basis of port of departure and port of arrival, and not by the flag or nationality of the ship. Consumption by fishing vessels and by military forces is also excluded. See definitions of <i>transport</i>, <i>fishing</i>, and <i>non-specified “other sectors”</i>.</p> |
| International aviation bunkers | AVBUNK | <p>Includes deliveries of aviation fuels to aircrafts for international aviation. Fuels used by airlines for their road vehicles are excluded. The domestic/international split should be determined on the basis of departure and landing locations and not by the nationality of the airline. For many countries this incorrectly excludes fuel used by domestically owned carriers for their international departures.</p> |

| Supply | | |
|-------------------------|-------------------|---|
| Flow | Short name | Definition |
| Stock changes | STOCKCHA | Reflects the difference between opening stock levels on the first day of the year and closing levels on the last day of the year of stocks on national territory held by producers, importers, energy transformation industries and large consumers. Oil and gas stock changes in pipelines are not taken into account. With the exception of large users mentioned above, changes in final users' stocks are not taken into account. A stock build is shown as a negative number, and a stock draw as a positive number. |
| Domestic supply | DOMSUP | Defined as <i>production + from other sources + imports - exports - international marine bunkers - international aviation bunkers ± stock changes</i> . |
| Transfers | TRANSFER | Comprises <i>interproduct transfers, products transferred</i> and <i>recycled products</i> . <i>Interproduct transfers</i> results from reclassification of products either because their specification has changed or because they are blended into another product, e.g. kerosene may be reclassified as gasoil after blending with the latter in order to meet its winter diesel specification. The net balance of <i>interproduct transfers</i> is zero. <i>Products transferred</i> is intended for petroleum products imported for further processing in refineries. For example, fuel oil imported for upgrading in a refinery is transferred to the feedstocks category. <i>Recycled products</i> are finished products which pass a second time through the marketing network, after having been once delivered to final consumers (e.g. used lubricants which are reprocessed). |
| Statistical differences | STATDIFF | Defined as <i>deliveries to final consumption + use for transformation and consumption within the energy sector + distribution losses - domestic supply - transfers</i> . Statistical differences arise because the data for the individual components of supply are often derived from different data sources by the national administration. Furthermore, the inclusion of changes in some large consumers' stocks in the supply part of the balance introduces distortions which also contribute to the statistical differences. |

| Transformation sector | | |
|---|-------------------|--|
| Flow | Short name | Definition |
| Transformation sector | TOTTRANF | The transformation sector comprises the conversion of primary forms of energy to secondary and further transformation (e.g. coking coal to coke, crude oil to petroleum products, and heavy fuel oil to electricity). |
| Main activity producer electricity plants | MAINELEC | Refers to plants which are designed to produce electricity only. If one or more units of the plant is a CHP unit (and the inputs and outputs can not be distinguished on a unit basis) then the whole plant is designated as a CHP plant. Main activity producers (formerly referred to as public supply undertakings) generate electricity for sale to third parties, as their primary activity. They may be privately or publicly owned. Note that the sale need not take place through the public grid. |
| Autoproducer electricity plants | AUTOELEC | Refers to plants which are designed to produce electricity only. If one or more units of the plant is a CHP unit (and the inputs and outputs can not be distinguished on a unit basis) then the whole plant is designated as a CHP plant. Autoproducer undertakings generate electricity wholly or partly for their own use as an activity which supports their primary activity. They may be privately or publicly owned. |
| Main activity producer CHP plants | MAINCHP | Refers to plants which are designed to produce both heat and electricity (sometimes referred to as co-generation power stations). If possible, fuel inputs and electricity/outputs are on a unit basis rather than on a plant basis. However, if data are not available on a unit basis, the convention for defining a CHP plant noted above should be adopted. Main activity producers (formerly referred to as public supply undertakings) generate electricity and/or heat for sale to third parties, as their primary activity. They may be privately or publicly owned. Note that the sale need not take place through the public grid. |
| Autoproducer CHP plants | AUTOCHP | Refers to plants which are designed to produce both heat and electricity (sometimes referred to as co-generation power stations). If possible, fuel inputs and electricity/outputs are on a unit basis rather than on a plant basis. However, if data are not available on a unit basis, the convention for defining a CHP plant noted above should be adopted. Note that for autoproducer CHP plants, all fuel inputs to electricity production are taken into account, while only the part of fuel inputs to heat sold is shown. Fuel inputs for the production of heat consumed within the autoproducer's establishment are not included here but are included with figures for the final consumption of fuels in the appropriate consuming sector. Autoproducer undertakings 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. |

| Transformation sector | | |
|--|-------------------|--|
| Flow | Short name | Definition |
| Main activity producer heat plants | MAINHEAT | Refers to plants (including heat pumps and electric boilers) designed to produce heat only and who sell heat to a third party (e.g. residential, commercial or industrial consumers) under the provisions of a contract. Main activity producers (formerly referred to as public supply undertakings) generate heat for sale to third parties, as their primary activity. They may be privately or publicly owned. Note that the sale need not take place through the public grid. |
| Autoproducer heat plants | AUTOHEAT | Refers to plants (including heat pumps and electric boilers) designed to produce heat only and who sell heat to a third party (e.g. residential, commercial or industrial consumers) under the provisions of a contract. Autoproducer undertakings generate heat, wholly or partly for their own use as an activity which supports their primary activity. They may be privately or publicly owned. |
| Heat pumps | THEAT | Includes heat produced by heat pumps in the transformation sector. Heat pumps that are operated within the residential sector where the heat is not sold are not considered a transformation process and are not included here – the electricity consumption would appear as residential use. |
| Electric boilers | TBOILER | Includes electric boilers used to produce heat. |
| Chemical heat for electricity production | TELE | Includes heat from chemical processes that is used to generate electricity. |
| Blast furnaces | TBLASTFUR | Includes the production of town gas, blast furnace gas and oxygen steel furnace gas. The production of pig-iron from iron ore in blast furnaces uses fuels for supporting the blast furnace charge and providing heat and carbon for the reduction of the iron ore. Accounting for the calorific content of the fuels entering the process is a complex matter as transformation (into blast furnace gas) and consumption (heat of combustion) occur simultaneously. Some carbon is also retained in the pig-iron; almost all of this reappears later in the oxygen steel furnace gas (or converter gas) when the pig-iron is converted to steel. In the 1992/annual questionnaires, Member Countries were asked for the first time to report in the <i>transformation sector</i> the quantities of all fuels (e.g. pulverised coal injection [PCI] coal, coke oven coke, natural gas and oil) entering blast furnaces and the quantity of blast furnace gas and oxygen steel furnace gas produced. The Secretariat then needed to split these inputs into the transformation and consumption components. The transformation component is shown in the row <i>blast furnaces/works</i> in the column appropriate for the fuel, and the consumption component is shown in the row <i>iron and steel</i> , in the column appropriate for the fuel. The Secretariat decided to assume a transformation efficiency such that the carbon input into the blast furnaces should equal the carbon output. This is roughly equivalent to assuming an energy transformation efficiency of 40%. |
| Gas works | TGASWKS | Includes the manufacture of town gas. |
| Coke ovens | TCKOEOVS | Includes the manufacture of coke and coke oven gas. |

| Transformation sector | | |
|---|-------------------|---|
| Flow | Short name | Definition |
| Patent fuel plants | TPATFUEL | Includes the manufacture of patent fuels. |
| BKB plants | TBKB | Includes the manufacture of BKB. |
| Petroleum refineries | TREFINER | Includes the manufacture of finished petroleum products. |
| Petrochemical industry | TPETCHEM | Covers backflows returned from the petrochemical sector. Note that backflows from oil products that are used for non-energy purposes (i.e. white spirit and lubricants) are not included here, but in non-energy use. |
| Coal liquefaction plants | TCOALLIQ | Includes coal, oil and tar sands used to produce synthetic oil. |
| Gas-to-liquids (GTL) plants | TGTL | Includes natural gas used as feedstock for the conversion to liquids, e.g. the quantities of fuel entering the methanol product process for transformation into methanol. |
| For blended natural gas | TBLENDGAS | Includes other gases that are blended with natural gas. |
| Charcoal production plants | TCHARCOAL | Includes the transformation of solid biomass into charcoal. |
| Non-specified (transformation) in the detailed balances | TNONSPEC | Includes other non-specified transformation. |

| Energy sector and distribution losses | | |
|--|-------------------|--|
| Flow | Short name | Definition |
| Energy sector | TOTENGY | The energy sector covers the amount of fuels used by the energy producing industries (e.g. for heating, lighting and operation of all equipment used in the extraction process, for traction and for distribution). Energy producing industries' own use includes energy consumed by transformation industries for heating, pumping, traction and lighting purposes [ISIC Divisions 10, 11, 12, 23 and 40]. |
| Coal mines | EMINES | Represents the energy which is used directly within the coal industry for hard coal and lignite mining. It excludes coal burned in pithead power stations (included under electricity plants in the transformation sector) and free allocations to miners and their families (considered as part of household consumption and therefore included under residential). |
| Oil and gas extraction | EOILGASEX | Represents the energy which is used for oil and gas extraction. Flared gas is not included. |
| Blast furnaces | EBLASTFUR | Represents the energy which is used in blast furnaces. |
| Gas works | EGASWKS | Represents the energy which is used in gas works. |
| Gasification plants for biogas | EBIOGAS | Represents own consumption of biogas necessary to support temperatures needed for anaerobic fermentation. |
| Coke ovens | ECOKEOVS | Represents the energy used in coke ovens. |
| Patent fuel plants | EPATFUEL | Represents the energy used in patent fuel plants. |
| BKB plants | EBKB | Represents the energy used in BKB plants. |
| Petroleum refineries | EREFINER | Represents the energy used in petroleum refineries. |
| Coal liquefaction plants | ECOALLIQ | Represents the energy used in coal liquefaction plants. |
| Liquefaction (LNG) / regasification plants | ELNG | Represents the energy used in LNG and regasification plants. |
| Gas-to-liquids (GTL) plants | EGTL | Represents the energy used in gas-to-liquids plants. |
| Own use in electricity, CHP and heat plants | EPOWERPLT | Represents the energy used in main activity producer electricity, CHP and heat plants. |
| Used for pumped storage | EPUMPST | Represents electricity consumed in hydro-electric plants for pumped storage. |
| Nuclear industry | ENUC | Represents the energy used in the nuclear industry. |
| Charcoal production plants | ECHARCOAL | Represents the energy used in charcoal production plants. |
| Non-specified (energy) | ENONSPEC | Represents use in non-specified energy sector. |
| Distribution losses | DISTLOSS | Losses in gas distribution, electricity transmission and coal transport. |

| Final consumption | | |
|----------------------------|------------|---|
| Flow | Short name | Definition |
| Final consumption | FINCONS | <p>Equal to the sum of the consumption in the end-use sectors. Energy used for transformation and for own use of the energy producing industries is excluded. Final consumption reflects for the most part deliveries to consumers (see note on <i>stock changes</i>).</p> <p>Backflows from the petrochemical industry are not included in final consumption (see <i>from other sources</i> under supply and <i>petrochemical industry</i> in the transformation sector).</p> <p>Starting with the 2009 edition, international aviation bunkers is no longer included in final consumption at the country level.</p> |
| Industry sector | TOTIND | Consumption of the industry sector is specified in the following sub-sectors (energy used for transport by industry is not included here but is reported under transport): |
| Iron and steel | IRONSTL | [ISIC Group 271 and Class 2731] |
| Chemical and petrochemical | CHEMICAL | [ISIC Division 24] Excluding petrochemical feedstocks. |
| Non-ferrous metals | NONFERR | [ISIC Group 272 and Class 2732] Basic industries. |
| Non-metallic minerals | NONMET | [ISIC Division 26] Such as glass, ceramic, cement, etc. |
| Transport equipment | TRANSEQ | [ISIC Divisions 34 and 35] |
| Machinery | MACHINE | [ISIC Divisions 28, 29, 30, 31 and 32] Fabricated metal products, machinery and equipment other than transport equipment. |
| Mining and quarrying | MINING | [ISIC Divisions 13 and 14] Mining (excluding fuels) and quarrying. |
| Food and tobacco | FOODPRO | [ISIC Divisions 15 and 16] |
| Paper, pulp and print | PAPERPRO | [ISIC Divisions 21 and 22] |
| Wood and wood products | WOODPRO | [ISIC Division 20] Wood and wood products other than pulp and paper. |
| Construction | CONSTRUC | [ISIC Division 45] |
| Textile and leather | TEXTILES | [ISIC Divisions 17, 18 and 19] |
| Non-specified (industry) | INONSPEC | [ISIC Divisions 25, 33, 36 and 37] Any manufacturing industry not included above. Note: Most countries have difficulties supplying an industrial breakdown for all fuels. In these cases, the <i>non-specified</i> industry row has been used. Regional aggregates of industrial consumption should therefore be used with caution. |
| Transport sector | TOTTRANS | Consumption in the transport sector covers all transport activity (in mobile engines) regardless of the economic sector to which it is contributing [ISIC Divisions 60, 61 and 62], and is divided into the following sub-sectors: |

| Final consumption | | |
|--------------------------|-------------------|---|
| Flow | Short name | Definition |
| World aviation bunkers | WORLDAV | <p>Only for the world total, world aviation bunkers covers fuels delivered to aircrafts of all countries that are engaged in international aviation. Fuels used by airlines for their road vehicles, consumption for domestic aviation and military forces should be excluded. The domestic/international split should be determined on the basis of departure and landing locations and not by the nationality of the airline. For many countries this incorrectly excludes fuel used by domestically owned carriers for their international departures.</p> <p>World aviation bunkers is not applicable for individual countries and regions and it is included in the transport sector for the world total.</p> <p>World total primary energy supply includes international aviation bunkers and international aviation bunkers;</p> |
| Domestic aviation | DOMESAIR | <p>Includes deliveries of aviation fuels to aircraft for domestic aviation - commercial, private, agricultural, etc. It includes use for purposes other than flying, e.g. bench testing of engines, but not airline use of fuel for road transport. The domestic/split should be determined on the basis of departure and landing locations and not by the nationality of the airline. Note that this may include journeys of considerable length between two airports in a country (e.g. San Francisco to Honolulu). For many countries this incorrectly includes fuel used by domestically owned carriers for outbound international traffic;</p> |
| Road | ROAD | <p>Includes fuels used in road vehicles as well as agricultural and industrial highway use. Excludes military consumption as well as motor gasoline used in stationary engines and diesel oil for use in tractors that are not for highway use;</p> |
| Rail | RAIL | <p>Includes quantities used in rail traffic, including industrial railways;</p> |
| Pipeline transport | PIPELINE | <p>Includes energy used in the support and operation of pipelines transporting gases, liquids, slurries and other commodities, including the energy used for pump stations and maintenance of the pipeline. Energy for the pipeline distribution of natural or manufactured gas, hot water or steam (ISIC Division 40) from the distributor to final users is excluded and should be reported in the <i>energy sector</i>, while the energy used for the final distribution of water (ISIC Division 41) to household, industrial, commercial and other users should be included in <i>commercial/services</i>. Losses occurring during the transport between distributor and final users should be reported as <i>distribution losses</i>;</p> |

| Final consumption | | |
|--------------------------------|-------------------|--|
| Flow | Short name | Definition |
| World marine bunkers | WORLDMAR | <p>Only for the world total, world marine bunkers covers fuels to ships of all flags that are engaged in international navigation. The international navigation may take place at sea, on inland lakes and waterways, and in coastal waters. Consumption by ships engaged in domestic navigation is excluded. The domestic/international split is determined on the basis of port of departure and port of arrival, and not by the flag or nationality of the ship. Consumption by fishing vessels and by military forces is also excluded.</p> <p>World marine bunkers is not applicable for individual countries and regions and is included in the transport sector for the world total.</p> <p>World total primary energy supply includes international marine bunkers and international aviation bunkers.</p> |
| Domestic navigation | DOMESNAV | <p>Includes fuels delivered to vessels of all flags not engaged in international navigation (see <i>international marine bunkers</i>). The domestic/international split should be determined on the basis of port of departure and port of arrival and not by the flag or nationality of the ship. Note that this may include journeys of considerable length between two ports in a country (e.g. San Francisco to Honolulu). Fuel used for ocean, coastal and inland fishing and military consumption are excluded;</p> |
| Non-specified (transport) | TRNONSPE | <p>Includes all transport not elsewhere specified. Note: <i>International marine bunkers</i> and <i>International aviation bunkers</i> are shown in <i>Supply</i> and are not included in the transport sector as part of final consumption at the country level.</p> |
| Other sectors | TOTOTHER | <p>Includes residential, commercial/public services, agriculture/, fishing and non-specified (other).</p> |
| Residential | RESIDENT | <p>Includes consumption by households, excluding fuels used for transport. Includes households with employed persons [ISIC Division 95] which is a small part of total residential consumption.</p> |
| Commercial and public services | COMMPUB | <p>[ISIC Divisions 41, 50-52, 55, 63-67, 70-75, 80, 85, 90-93 and 99]</p> |
| Agriculture/forestry | AGRICULT | <p>Includes deliveries to users classified as agriculture, hunting and forestry by the ISIC, and therefore includes energy consumed by such users whether for traction (excluding agricultural highway use), power or heating (agricultural and domestic) [ISIC Divisions 01 and 02].</p> |
| Fishing | FISHING | <p>Includes fuels used for inland, coastal and deep-sea fishing. Fishing covers fuels delivered to ships of all flags that have refuelled in the country (including international fishing) as well as energy used in the fishing industry [ISIC Division 05]. <i>Prior to last year, fishing was included with agriculture/forestry and this may continue to be the case for some countries.</i></p> |

| Final consumption | | |
|--|-------------------|--|
| Flow | Short name | Definition |
| Non-specified (other) | ONONSPEC | Includes all fuel use not elsewhere specified as well as consumption in the above-designated categories for which separate figures have not been provided. Military fuel use for all mobile and stationary consumption is included here (e.g. ships, aircraft, road and energy used in living quarters) regardless of whether the fuel delivered is for the military of that country or for the military of another country. |
| Non-energy use | NONENUSE | Non-energy use covers those fuels that are used as raw materials in the different sectors and are not consumed as a fuel or transformed into another fuel. Non-energy use is shown separately in final consumption under the heading non-energy use. The energy/non-energy split for the petroleum products is determined based on information submitted by each country. |
| Non-energy use ind./transf./energy | NEINTREN | Non-energy in industry sector, transformation sector and energy sector. |
| <i>Memo: feedstock use in petrochemical industry</i> | <i>NECHEM</i> | The petrochemical industry includes cracking and reforming processes for the purpose of producing ethylene, propylene, butylene, synthesis gas, aromatics, butadiene and other hydrocarbon-based raw materials in processes such as steam cracking, aromatics plants and steam reforming [part of ISIC Group 241]. |
| Non-energy use in transport | NETRANS | Non-energy use in the transport sector. |
| Non-energy use in other sectors | NEOTHER | Non-energy use in other sectors. |

| Electricity output (GWh) | | |
|--|-------------------|---|
| Flow | Short name | Definition |
| Electricity output in GWh | ELOUTPUT | Shows the total number of GWh generated by power plants separated into electricity plants and CHP plants. Electricity production for hydro pumped storage is also given separately for main activity producers and autoproducers. |
| Electricity output-main activity producer electricity plants | ELMAINE | |
| Electricity output-autoproducer electricity plants | ELAUTOE | |
| Electricity output-main activity producer CHP plants | ELMAINC | |
| Electricity output-autoproducer CHP plants | ELAUTOC | |
| Main activity producers – pumped hydro production (GWh) | MHYDPUMP | |
| Autoproducer – pumped hydro production (GWh) | AHYDPUMP | |

| Heat output (TJ) | | |
|--|-------------------|---|
| Flow | Short name | Definition |
| Heat output in TJ | HEATOUT | Shows the total amount of TJ generated by power plants separated into CHP plants and heat plants. |
| Heat output-main activity producer CHP plants | HEMAINC | |
| Heat output-autoproducer CHP plants | HEAUTOE | |
| Heat output-main activity producer heat plants | HEMAINH | |
| Heat output-autoproducer heat plants | HEAUTOH | |

| Net calorific values | | |
|--|-------------------|---|
| Expressed both in tonne of oil equivalent / tonne and in kilojoules / kilogramme | | |
| Flow | Short name | Definition |
| Average net calorific value | NAVERAGE | |
| NCV of production | NINDPROD | |
| NCV of imports | NIMPORTS | |
| NCV of exports | NEXPORTS | |
| NCV of coke ovens | NCOKEOVS | |
| NCV of blast furnaces | NBLAST | |
| NCV in main activity producers | NMAIN | |
| NCV in industry | NIND | |
| NCV for other uses | NOTHER | |
| Barrels per tonne | BBLTON | Available for oil products, expressed in barrels/tonne. |

| Oil demand | | |
|--|-------------------|--|
| Expressed in thousand barrels/day (converted from kt using values of barrels/tonne) | | |
| Flow | Short name | Definition |
| Net inland consumption | NETDELIC | Obtained from above flows, as: DOMSUP+TRANSFER+STATDIFF-TPETCHEM- TREFINER-TCOALLIQ-TGTL-EREFINER. Note that in this table net inland consumption includes interna- tional aviation bunkers for all countries. |
| Refinery fuel | REFFUEL | Equal to EREFINER. |
| International marine bunkers | MARBUNK | Equal to MARBUNK. |
| Demand | DEMAND | Sum of the previous three flows. Note that in this table demand includes international marine and aviation bun- kers for all countries. |

3. PRODUCT DEFINITIONS

| Coal and peat | | |
|---|------------|--|
| The fuels in this section are expressed in thousand tonnes. | | |
| Product | Short name | Definition |
| Hard coal (if no detail) | HARDCOAL | This item is only used if the detailed breakdown is not available. It includes anthracite, coking coal, other bituminous coal and (depending on the country) also may include sub-bituminous coal. |
| Brown coal (if no detail) | BROWN | This item is only used if the detailed breakdown is not available. It includes lignite and (depending on the country) also may include sub-bituminous coal. |
| Anthracite | ANTCOAL | Anthracite is a high rank coal used for industrial and residential applications. It is generally less than 10% volatile matter and a high carbon content (about 90% fixed carbon). Its gross calorific value is greater than 23 865 kJ/kg (5 700 kcal/kg) on an ash-free but moist basis. |
| Coking coal | COKCOAL | Coking coal refers to coal with a quality that allows the production of a coke suitable to support a blast furnace charge. Its gross calorific value is greater than 23 865 kJ/kg (5 700 kcal/kg) on an ash-free but moist basis. |
| Other bituminous coal | BITCOAL | Other bituminous coal is used for steam raising and space heating purposes and includes all bituminous coal that is not included under coking coal. It is usually more than 10% volatile matter and a relatively high carbon content (less than 90% fixed carbon). Its gross calorific value is greater than 23 865 kJ/kg (5 700 kcal/kg) on an ash-free but moist basis. |
| Sub-bituminous coal | SUBCOAL | Non-agglomerating coals with a gross calorific value between 17 435 kJ/kg (4 165 kcal/kg) and 23 865 kJ/kg (5 700 kcal/kg) containing more than 31% volatile matter on a dry mineral matter free basis. |
| Lignite/brown coal | LIGNITE | Lignite/coal is a non-agglomerating coal with a gross calorific value of less than 17 435 kJ/kg (4 165 kcal/kg), and greater than 31% volatile matter on a dry mineral matter free basis. Oil shale and tar sands produced and combusted directly are included in this category. Oil shale and tar sands used as inputs for other transformation processes are also included here (this includes the portion consumed in the transformation process). Shale oil and other products derived from liquefaction are included in <i>from other sources</i> under crude oil (<i>other hydrocarbons</i>). |

| Coal and peat | | |
|---|------------|--|
| The fuels in this section are expressed in thousand tonnes. | | |
| Product | Short name | Definition |
| Peat | PEAT | Peat is a combustible soft, porous or compressed, fossil sedimentary deposit of plant origin with high water content (up to 90% in the raw state), easily cut, of light to dark brown colour. Peat used for non-energy purposes is not included. |
| Patent fuel | PATFUEL | Patent fuel is a composition fuel manufactured from hard coal fines with the addition of a binding agent. The amount of patent fuel produced is, therefore, slightly higher than the actual amount of coal consumed in the transformation process. Consumption of patent fuels during the patent fuel manufacturing process is included under <i>other energy sector</i> . |
| Coke oven coke and lignite coke | OVENCOKE | Coke oven coke is the solid product obtained from the carbonisation of coal, principally coking coal, at high temperature. It is low in moisture content and volatile matter. Coke oven coke is used mainly in the iron and steel industry, acting as energy source and chemical agent. Also included are semi-coke (a solid product obtained from the carbonisation of coal at a low temperature), lignite coke (a semi-coke made from lignite/coal), coke breeze and foundry coke. The heading <i>other energy sector</i> includes the consumption at the coking plants themselves. Consumption in the <i>iron and steel industry</i> does not include coke converted into blast furnace gas. To obtain the total consumption of coke oven coke in the iron and steel industry, the quantities converted into blast furnace gas have to be added (these are included in <i>blast furnaces/works</i>). |
| Gas coke | GASCOKE | Gas coke is a by-product of hard coal used for the production of town gas in gas works. Gas coke is used for heating purposes. <i>Other energy sector</i> includes the consumption of gas coke at gas works. |
| Coal tar | COALTAR | Coal tar is a result of the destructive distillation of bituminous coal. Coal tar is the liquid by-product of the distillation of coal to make coke in the coke oven process. Coal tar can be further distilled into different organic products (e.g. benzene, toluene, naphthalene), which normally would be reported as a feedstock to the petrochemical industry. |
| BKB/peat briquettes | BKB | BKB are composition fuels manufactured from lignite/coal, produced by briquetting under high pressure. These figures include peat briquettes, dried lignite fines and dust. The heading <i>other energy sector</i> includes consumption by briquetting plants. |

| Crude, NGL, refinery feedstocks | | |
|---|-------------------|--|
| The fuels in this section are expressed in thousand tonnes. | | |
| Product | Short name | Definition |
| Crude/NGL/feedstocks (if no detail) | CRNGFEED | This item is only used if the detailed breakdown is not available. It includes crude oil, natural gas liquids, refinery feedstocks, additives/blending components and other hydrocarbons. |
| Crude oil | CRUDEOIL | Crude oil is a mineral oil consisting of a mixture of hydrocarbons of natural origin and associated impurities, such as sulphur. It exists in the liquid phase under normal surface temperatures and pressure and its physical characteristics (density, viscosity, etc.) are highly variable. It includes field or lease condensates (separator liquids) which are recovered from associated and non-associated gas where it is commingled with the commercial crude oil stream. |
| Natural gas liquids | NGL | NGLs are the liquid or liquefied hydrocarbons produced in the manufacture, purification and stabilisation of natural gas. These are those portions of natural gas which are recovered as liquids in separators, field facilities, or gas processing plants. NGLs include but are not limited to ethane, propane, butane, pentane, natural gasoline and condensate. |
| Refinery feedstocks | REFFEEDS | A refinery feedstock is a processed oil destined for further processing (e.g. straight run fuel oil or vacuum gas oil) other than blending in the refining industry. It is transformed into one or more components and/finished products. This definition covers those finished products imported for refinery intake and those returned from the petrochemical industry to the refining industry. |
| Additives/blending components | ADDITIVE | Additives are non-hydrocarbon substances added to or blended with a product to modify its properties, for example, to improve its combustion characteristics. Alcohols and ethers (MTBE, methyl tertiary-butyl ether) and chemical alloys such as tetraethyl lead are included here. The biomass fractions of biogasoline, biodiesel and ethanol are not included here, but under liquid biomass. This differs from the presentation of additives in the <i>Oil Information</i> publication. |
| Other hydrocarbons | NONCRUDE | Other hydrocarbons, including emulsified oils (e.g. orimulsion), synthetic crude oil, mineral oils extracted from bituminous minerals such as oil shale, bituminous sand, etc. and liquids from coal liquefaction, are included here. |

Petroleum products

The fuels in this section are expressed in thousand tonnes.

Petroleum products are any oil-based products which can be obtained by distillation and are normally used outside the refining industry. The exceptions to this are those finished products which are classified as refinery feedstocks.

Production of petroleum products shows gross refinery output for each product.

Refinery fuel (row *petroleum refineries*, under *energy sector*) represents consumption of petroleum products, both intermediate and finished, within refineries, e.g. for heating, lighting, traction, etc.

| Product | Short name | Definition |
|---------------------------|------------|--|
| Refinery gas | REFINGAS | Refinery gas is defined as non-condensable gas obtained during distillation of crude oil or treatment of oil products (e.g. cracking) in refineries. It consists mainly of hydrogen, methane, ethane and olefins. It also includes gases which are returned from the petrochemical industry. Refinery gas production refers to gross production. Own consumption is shown separately under <i>petroleum refineries</i> in the <i>energy sector</i> . |
| Ethane | ETHANE | Ethane is a naturally gaseous straight-chain hydrocarbon (C ₂ H ₆). It is a colourless paraffinic gas which is extracted from natural gas and refinery gas streams. |
| Liquefied petroleum gases | LPG | Liquefied petroleum gases are the light hydrocarbon fraction of the paraffin series, derived from refinery processes, crude oil stabilisation plants and natural gas processing plants, comprising propane (C ₃ H ₈) and butane (C ₄ H ₁₀) or a combination of the two. They could also include propylene, butylene, isobutene and isobutylene. LPG are normally liquefied under pressure for transportation and storage. |
| Motor gasoline | MOTORGAS | Motor gasoline is light hydrocarbon oil for use in internal combustion engines such as motor vehicles, excluding aircraft. Motor gasoline is distilled between 35°C and 215°C and is used as a fuel for land based spark ignition engines. Motor gasoline may include additives, oxygenates and octane enhancers, including lead compounds such as TEL (tetraethyl lead) and TML (tetramethyl lead). Motor gasoline does not include the liquid biofuel or ethanol blended with gasoline - see liquid biomass. This differs from the presentation of motor gasoline in the <i>Oil Information</i> publication. |
| Aviation gasoline | AVGAS | Aviation gasoline is motor spirit prepared especially for aviation piston engines, with an octane number suited to the engine, a freezing point of -60°C, and a distillation range usually within the limits of 30°C and 180°C. |
| Gasoline type jet fuel | JETGAS | Gasoline type jet fuel includes all light hydrocarbon oils for use in aviation turbine power units, which distil between 100°C and 250°C. This fuel is obtained by blending kerosenes and gasoline or naphthas in such a way that the aromatic content does not exceed 25% in volume, and the vapour pressure is between 13.7 kPa and 20.6 kPa. Additives can be included to improve fuel stability and combustibility. |

Petroleum products

The fuels in this section are expressed in thousand tonnes.

Petroleum products are any oil-based products which can be obtained by distillation and are normally used outside the refining industry. The exceptions to this are those finished products which are classified as refinery feedstocks.

Production of petroleum products shows gross refinery output for each product.

Refinery fuel (row *petroleum refineries*, under *energy sector*) represents consumption of petroleum products, both intermediate and finished, within refineries, e.g. for heating, lighting, traction, etc.

| Product | Short name | Definition |
|------------------------|------------|--|
| Kerosene type jet fuel | JETKERO | Kerosene type jet fuel is a medium distillate used for aviation turbine power units. It has the same distillation characteristics and flash point as kerosene (between 150°C and 300°C but not generally above 250°C). In addition, it has particular specifications (such as freezing point) which are established by the International Air Transport Association (IATA). It includes kerosene blending components. |
| Kerosene | OTHKERO | Kerosene (other than kerosene used for aircraft transport which is included with aviation fuels) comprises refined petroleum distillate intermediate in volatility between gasoline and gas/oil. It is a medium oil distilling between 150°C and 300°C. |
| Gas/diesel oil | GASDIES | Gas/oil includes heavy gas oils. Gas oils are obtained from the lowest fraction from atmospheric distillation of crude oil, while heavy gas oils are obtained by vacuum redistillation of the residual from atmospheric distillation. Gas/oil distils between 180°C and 380°C. Several grades are available depending on uses: diesel oil for diesel compression ignition (cars, trucks, marine, etc.), light heating oil for industrial and commercial uses, and other gas oil including heavy gas oils which distil between 380°C and 540°C and which are used as petrochemical feedstocks. Gas/diesel oil does not include the liquid biofuel blended with gas/diesel oil – see liquid biomass. This differs from the presentation of gas/diesel oil in the <i>Oil Information</i> publication. |
| Heavy fuel oil | RESFUEL | Heavy fuel oil defines oils that make up the distillation residue. It comprises all residual fuel oils, including those obtained by blending. Its kinematic viscosity is above 10 cSt at 80°C. The flash point is always above 50°C and the density is always higher than 0.90 kg/l. |
| Naphtha | NAPHTHA | Naphtha is a feedstock destined either for the petrochemical industry (e.g. ethylene manufacture or aromatics production) or for gasoline production by reforming or isomerisation within the refinery. Naphtha comprises material that distils between 30°C and 210°C. Naphtha imported for blending is shown as an import of naphtha, and then shown in the transfers row as a negative entry for naphtha and a positive entry for the corresponding finished product (e.g. gasoline). |

Petroleum products

The fuels in this section are expressed in thousand tonnes.

Petroleum products are any oil-based products which can be obtained by distillation and are normally used outside the refining industry. The exceptions to this are those finished products which are classified as refinery feedstocks.

Production of petroleum products shows gross refinery output for each product.

Refinery fuel (row *petroleum refineries*, under *energy sector*) represents consumption of petroleum products, both intermediate and finished, within refineries, e.g. for heating, lighting, traction, etc.

| Product | Short name | Definition |
|----------------------------------|------------|---|
| White spirit & SBP | WHITESP | White spirit and SBP are refined distillate intermediates with a distillation in the naphtha/range. White Spirit has a flash point above 30°C and a distillation range of 135°C to 200°C. Industrial Spirit (SBP) comprises light oils distilling between 30°C and 200°C, with a temperature difference between 5% volume and 90% volume distillation points, including losses, of not more than 60°C. In other words, SBP is a light oil of narrower cut than motor spirit. There are seven or eight grades of industrial spirit, depending on the position of the cut in the distillation range defined above. |
| Lubricants | LUBRIC | Lubricants are hydrocarbons produced from distillate or residue; they are mainly used to reduce friction between bearing surfaces. This category includes all finished grades of lubricating oil, from spindle oil to cylinder oil, and those used in greases, including motor oils and all grades of lubricating oil base stocks. |
| Bitumen | BITUMEN | Bitumen is a solid, semi-solid or viscous hydrocarbon with a colloidal structure that is brown to black in colour. It is obtained by vacuum distillation of oil residues from atmospheric distillation of crude oil. Bitumen is often referred to as asphalt and is primarily used for surfacing of roads and for roofing material. This category includes fluidised and cut back bitumen. |
| Paraffin waxes | PARWAX | Paraffin waxes are saturated aliphatic hydrocarbons. These waxes are residues extracted when dewaxing lubricant oils, and they have a crystalline structure which is more or less fine according to the grade. Their main characteristics are that they are colourless, odourless and translucent, with a melting point above 45°C. |
| Petroleum coke | PETCOKE | Petroleum coke is defined as a black solid residue, obtained mainly by cracking and carbonising of petroleum derived feedstocks, vacuum bottoms, tar and pitches in processes such as delayed coking or fluid coking. It consists mainly of carbon (90 to 95%) and has a low ash content. It is used as a feedstock in coke ovens for the steel industry, for heating purposes, for electrode manufacture and for production of chemicals. The two most important qualities are "green coke" and "calcinated coke". This category also includes "catalyst coke" deposited on the catalyst during refining processes: this coke is not recoverable and is usually burned as refinery fuel. |
| Non-specified petroleum products | ONONSPEC | Other petroleum products not classified above (e.g. tar, sulphur and grease) are included here. This category also includes aromatics (e.g. BTX or benzene, toluene and xylene) and olefins (e.g. propylene) produced within refineries. |

Gases

The gases in this section are expressed in terajoules on a **gross calorific value** basis.

| Product | Short name | Definition |
|--------------------------|------------|--|
| Natural gas | NATGAS | <p>Natural gas comprises gases, occurring in underground deposits, whether liquefied or gaseous, consisting mainly of methane. It includes both "non-associated" gas originating from fields producing only hydrocarbons in gaseous form, and "associated" gas produced in association with crude oil as well as methane recovered from coal mines (colliery gas) or from coal seams (coal seam gas).</p> <p>Production represents dry marketable production within national boundaries, including offshore production and is measured after purification and extraction of NGL and sulphur. It includes gas consumed by gas processing plants and gas transported by pipeline. Quantities of gas that are re-injected, vented or flared are excluded.</p> |
| Gas works gas | GASWKSGS | <p>Gas works gas covers all types of gas produced in public utility or private plants, whose main purpose is the manufacture, transport and distribution of gas. It includes gas produced by carbonisation (including gas produced by coke ovens and transferred to gas works), by total gasification (with or without enrichment with oil products) and by reforming and simple mixing of gases and/air.</p> |
| Coke oven gas | COKEOVGS | <p>Coke oven gas is obtained as a by-product of the manufacture of coke oven coke for the production of iron and steel.</p> |
| Blast furnace gas | BLFURGS | <p>Blast furnace gas is produced during the combustion of coke in blast furnaces in the iron and steel industry. It is recovered and used as a fuel, partly within the plant and partly in other steel industry processes or in power stations equipped to burn it.</p> |
| Oxygen steel furnace gas | OXYSTGS | <p>Oxygen steel furnace gas is obtained as a by-product of the production of steel in an oxygen furnace and is recovered on leaving the furnace. Oxygen steel furnace gas is also known as converter gas, LD gas or BOS gas.</p> |

Combustible renewables and wastes

See definitions below for units.

| Product | Short name | Definition |
|---------------------------------|------------|---|
| Industrial waste | INDWASTE | Expressed in terajoules on a net calorific value basis. Industrial waste of non-renewable origin consists of solid and liquid products (e.g. tyres) combusted directly, usually in specialised plants, to produce heat and/power. Renewable industrial waste is not included here, but with solid biomass, biogas or liquid biomass. |
| Municipal waste (renewable) | MUNWASTER | Expressed in terajoules on a net calorific value basis. Municipal waste consists of products that are combusted directly to produce heat and/power and comprises wastes produced by households, industry, hospitals and the tertiary sector that are collected by local authorities for incineration at specific installations. Municipal waste is split into renewable and non-renewable. |
| Municipal waste (non-renewable) | MUNWASTEN | Expressed in terajoules on a net calorific value basis. Municipal waste consists of products that are combusted directly to produce heat and/power and comprises wastes produced by households, industry, hospitals and the tertiary sector that are collected by local authorities for incineration at specific installations. Municipal waste is split into renewable and non-renewable. |
| Primary solid biomass | SBIOMASS | Expressed in terajoules on a net calorific value basis. Primary solid biomass is defined as any plant matter used directly as fuel or converted into other forms before combustion. This covers a multitude of woody materials generated by industrial process or provided directly by forestry and agriculture (firewood, wood chips, bark, sawdust, shavings, chips, sulphite lyes <i>also known as black liquor</i> , animal materials/ and other solid biomass). |
| Biogas | GBIOMASS | Expressed in terajoules on a net calorific value basis. Biogas is derived principally from the anaerobic fermentation of biomass and solid wastes and combusted to produce heat and/power. Included in this category are landfill gas, sludge gas and other biogas such as biogas produced from the anaerobic fermentation of animal slurries and of wastes in abattoirs, breweries and other agro-food industries. |
| Biogasoline | BIOGASOL | Expressed in thousand tonnes. Biogasoline includes bioethanol (ethanol produced from biomass and/or the biodegradable fraction of waste), biomethanol (methanol produced from biomass and/or the biodegradable fraction of waste), bioETBE (ethyl-tertio-butyl-ether produced on the basis of bioethanol; the percentage by volume of bioETBE that is calculated as biofuel is 47%) and bioMTBE (methyl-tertio-butyl-ether produced on the basis of biomethanol: the percentage by volume of bioMTBE that is calculated as biofuel is 36%). Biogasoline includes the amounts that are blended into the gasoline - it does not include the total volume of gasoline into which the biogasoline is blended. |

Combustible renewables and wastes

See definitions below for units.

| | | |
|--|-----------|---|
| Biodiesels | BIODIESEL | Expressed in thousand tonnes. Biodiesels includes biodiesel (a methyl-ester produced from vegetable or animal oil, of diesel quality), biodimethylether (dimethylether produced from biomass), Fischer Tropsh (Fischer Tropsh produced from biomass), cold pressed bio-oil (oil produced from oil seed through mechanical processing only) and all other liquid biofuels which are added to, blended with or used straight as transport diesel. Biodiesels includes the amounts that are blended into the diesel - it does not include the total volume of diesel into which the biodiesel is blended. |
| Other liquid biofuels | OBIOLIQ | Expressed in thousand tonnes. Other liquid biofuels includes liquid biofuels not reported in either biogasoline or biodiesels. |
| Non-specified primary biomass and wastes | RENEWNS | Expressed in terajoules on a net calorific value basis. This item is used when the detailed breakdown for primary combustible renewables and wastes is not available. |
| Charcoal | CHARCOAL | Expressed in thousand tonnes. Charcoal produced from solid biomass is included here. Since charcoal is a secondary product, its treatment is slightly different than that of the other primary biomass. Production of charcoal (an output in the transformation process) is offset by the inputs of primary biomass into the charcoal production process. The losses from this process are included in the row <i>other transformation sector</i> . Other supply (e.g. trade and stock changes) as well as consumption are aggregated directly with the primary biomass. In most countries, only the primary biomass is reported. |

Electricity and heat

Electricity is expressed in gigawatt hours and heat is expressed in terajoules.
Direct use of geothermal and solar thermal is in terajoules on a **net calorific value** basis.

| Product | Short name | Definition |
|--|------------|---|
| Elec/heat output from non-spec. manuf. gases | MANGAS | This item is only used if the detailed breakdown is not available. It includes coke oven gas, blast furnace gas and oxygen steel furnace gas. Gas works gas is not included here. |
| Heat output from non-specified comb. fuels | HEATNS | This item is only used if the detailed breakdown is not available. |
| Nuclear | NUCLEAR | Energy released by nuclear fission or nuclear fusion. |
| Hydro | HYDRO | Hydro power represents the potential and kinetic energy of water converted into electricity in hydroelectric plants. |
| Geothermal | GEO THERM | Geothermal energy is the energy available as heat emitted from within the earth's crust, usually in the form of hot water or steam. It is exploited at suitable sites: <ul style="list-style-type: none"> • for electricity generation using dry stream or high enthalpy brine after flashing • directly as heat for district heating, agriculture, etc. |
| Solar photovoltaics | SOLARPV | Electricity from photovoltaic cells. |
| Solar thermal | SOLARTH | Solar energy is the solar radiation exploited for hot water production and electricity generation, by: <ul style="list-style-type: none"> • flat plate collectors, mainly of the thermosyphon type, for domestic hot water or for the seasonal heating of swimming pools • solar thermal-electric plants Passive solar energy for the direct heating, cooling and lighting of dwellings or other buildings is not included. |
| Tide, wave and ocean | TIDE | Tide, wave and ocean represents the mechanical energy derived from tidal movement, wave motion or ocean current and exploited for electricity generation. |
| Wind | WIND | Wind energy represents the kinetic energy of wind exploited for electricity generation in wind turbines. |
| Heat pumps | HEATPUMP | Heat pumps should include the inputs and outputs to heat pumps corresponding to the amount of heat that is sold to third parties. |
| Electric boilers | BOILER | Electric boilers should include the inputs and outputs to electric boilers corresponding to the amount of heat that is sold to third parties. |
| Heat from chemical sources | CHEMHEAT | Heat from chemical sources corresponds to heat originating from processes without input energy, such as a chemical reaction (e.g. the treatment of zinc oxide ore with hydrochloric acid). Note that waste heat originating from energy driven processes is not considered as a primary energy source and is included with the heat produced from the corresponding fuel. |
| Other sources | OTHER | Other sources includes production not included elsewhere such as |

Electricity and heat

Electricity is expressed in gigawatt hours and heat is expressed in terajoules.
Direct use of geothermal and solar thermal is in terajoules on a **net calorific value** basis.

| Product | Short name | Definition |
|-------------|------------|---|
| | | fuel cells. |
| Electricity | ELECTR | <p>Gross electricity production is measured at the terminals of all alternator sets in a station; it therefore includes the energy taken by station auxiliaries and losses in transformers that are considered integral parts of the station.</p> <p>The difference between gross and net production is generally estimated as 7% for conventional thermal stations, 1% for hydro stations, and 6% for nuclear, geothermal and solar stations. Production in hydro stations includes production from pumped storage plants.</p> |
| Heat | HEAT | <p>Heat production includes all heat produced by main activity producer CHP and heat plants, as well as heat sold by autoproducer CHP and heat plants to third parties.</p> <p>Fuels used to produce quantities of heat for sale are included in the transformation sector under the rows <i>CHP plants</i> and <i>Heat plants</i>. The use of fuels for heat which is not sold is included under the sectors in which the fuel use occurs.</p> |

| Oil demand | | |
|--|-------------------|---|
| Expressed in thousand barrels/day (converted from kt using values of barrels/tonne) | | |
| Flow | Short name | Definition |
| NGL/LPG | NGL/LPG | NGL+LPG+ETHANE |
| Naphtha | NAPHTHA | NAPHTHA |
| Motor gasoline | MOTORGAS | MOTORGAS+ADDITIVE+BIOGASOL+OBIOLIQ |
| Aviation fuels | JETKERO | JETKERO+AVGAS+JETGAS |
| Kerosene | OTHKERO | OTHKERO |
| Gas/diesel oil | GASDIES | GASDIES+BIODIESEL |
| Heavy fuel oil | RESFUEL | RESFUEL |
| Other products | OPRODS | WHITESP+LUBRIC+BITUMEN+PARWAX+ PETCOKE+ONONSPEC+CRUDEOIL+NONCRUDE +REFINGAS |
| Total products | TOTPRODS | Sum of all products. |

4. GEOGRAPHICAL COVERAGE

| Countries and regions | | |
|-----------------------|------------|---|
| Flow | Short name | Definition |
| World | WORLD | Includes OECD Total, non-OECD Total, World marine bunkers and World aviation bunkers. |
| OECD Total | OECDTOT | <p>Includes Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States.</p> <p>Within the OECD:</p> <ul style="list-style-type: none"> • Australia excludes the overseas territories; • Denmark excludes Greenland and the Danish Faroes, except prior to 1990, where data on oil for Greenland were included with the Danish statistics. The Administration is planning to revise the series back to 1974 to exclude these amounts. • France includes Monaco, and excludes the following overseas departments and territories: Guadeloupe, Guyana, Martinique, New Caledonia, French Polynesia, Reunion and Saint Pierre Miquelon; • Germany includes the new federal states of Germany from 1970 onwards; • Italy includes San Marino and the Vatican; • Japan includes Okinawa; • The Netherlands excludes Suriname and the Netherlands Antilles; • Portugal includes the Azores and Madeira; • Spain includes the Canary Islands; • Switzerland includes Liechtenstein for oil data; • United States includes the 50 states and the District of Columbia. Oil statistics as well as coal trade statistics also include Puerto Rico¹, Guam, the Virgin Islands, American Samoa, Johnston Atoll, Midway Islands, Wake Island and the Northern Mariana Islands. |

1. Natural gas data for Puerto Rico are included under Other Latin America.

| | | |
|-----------------------------|----------|--|
| Africa | AFRICA | Includes Algeria, Angola, Benin, Botswana (from 1981), Cameroon, Congo, Democratic Republic of Congo, Côte d'Ivoire, Egypt, Eritrea, Ethiopia, Gabon, Ghana, Kenya, Libyan Arab Jamahiriya, Morocco, Mozambique, Namibia (from 1991), Nigeria, Senegal, South Africa, Sudan, United Republic of Tanzania, Togo, Tunisia, Zambia, Zimbabwe and Other Africa. |
| Latin America | LATAMER | Includes Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Netherlands Antilles, Nicaragua, Panama, Paraguay, Peru, Trinidad and Tobago, Uruguay, Venezuela and Other Latin America. |
| Middle East | MIDEAST | Includes Bahrain, Islamic Republic of Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, United Arab Emirates and Yemen. |
| Non-OECD Europe | NOECDEUR | Includes Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus ² , Gibraltar, Former Yugoslav Republic of Macedonia (FYROM), Malta, Romania, Serbia ³ and Slovenia. |
| Former Soviet Union | FSUREG | Includes Former Soviet Union (if no detail), Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan. |
| Asia (excluding China) | ASIA | Includes Bangladesh, Brunei Darussalam, Cambodia (from 1995), Chinese Taipei, India, Indonesia, DPR of Korea, Malaysia, Mongolia (from 1985), Myanmar, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Thailand, Vietnam and Other Asia. |
| China (including Hong Kong) | CHINAREG | Includes the People's Republic of China and Hong Kong (China). |
| World marine bunkers | WORLDMAR | Due to the structure of the database, World marine bunkers are reported both as a flow and as an entity similar to a country or a region. World marine bunkers represents the sum of International marine bunkers from all countries. Therefore, World marine bunkers is not applicable for individual countries and regions, and it is included in the transport sector for the world total. |
| World aviation bunkers | WORLDAV | Due to the structure of the database, World aviation bunkers is reported both as a flow and as an entity similar to a country or a region. World aviation bunkers represents the sum of International aviation bunkers from all countries. Therefore, World aviation bunkers is not applicable for individual countries and regions, and it is included in the transport sector for the world total. |
| Albania | ALBANIA | |
| Algeria | ALGERIA | |
| Angola | ANGOLA | |

2. See the note on Cyprus in Section 6, Country notes and sources.

3. Serbia includes Montenegro until 2004 and Kosovo until 1999.

| | | |
|------------------------------|-----------------|--|
| Argentina | ARGENTINA | |
| Armenia | ARMENIA | Data for Armenia are available starting in 1990. Prior to that, they are included in Former Soviet Union. |
| Azerbaijan | AZERBAIJAN | Data for Azerbaijan are available starting in 1990. Prior to that, they are included in Former Soviet Union. |
| Bahrain | BAHRAIN | |
| Bangladesh | BANGLA- DESH | |
| Belarus | BELARUS | Data for Belarus are available starting in 1990. Prior to that, they are included in Former Soviet Union. |
| Benin | BENIN | |
| Bolivia | BOLIVIA | |
| Bosnia and Herzegovina | BOSNIAHERZ | Data for Bosnia and Herzegovina are available starting in 1990. Prior to that, they are included in Former Yugoslavia. |
| Botswana | BOTSWANA | Data for Botswana are available from 1981. Prior to that, they are included in Other Africa. |
| Brazil | BRAZIL | |
| Brunei Darussalam | BRUNEI | |
| Bulgaria | BULGARIA | |
| Cambodia | CAMBODIA | Data for Cambodia are available starting in 1995. Prior to that, they are included in Other Asia. |
| Cameroon | CAMEROON | |
| Chile | CHILE | |
| People's Republic of China | CHINA | |
| Chinese Taipei | TAIPEI | |
| Colombia | COLOMBIA | |
| Congo | CONGO | |
| Democratic Republic of Congo | CONGOREP | |
| Costa Rica | COSTARICA | |
| Côte d'Ivoire | COTEIVOIRE | |
| Croatia | CROATIA | Data for Croatia are available starting in 1990. Prior to that, they are included in Former Yugoslavia. |
| Cuba | CUBA | |
| Cyprus | CYPRUS | |
| Dominican Republic | DOMINI- CANR | |

| | | |
|---------------------------------------|-----------------|--|
| Ecuador | ECUADOR | |
| Egypt | EGYPT | |
| El Salvador | ELSALVA- DOR | |
| Eritrea | ERITREA | Data for Eritrea are available from 1992. Prior to that, they are included in Ethiopia. |
| Estonia | ESTONIA | Data for Estonia are available starting in 1990. Prior to that, they are included in Former Soviet Union. |
| Ethiopia | ETHIOPIA | Ethiopia includes Eritrea prior to 1992. |
| Gabon | GABON | |
| Georgia | GEORGIA | Data for Georgia are available starting in 1990. Prior to that, they are included in Former Soviet Union. |
| Ghana | GHANA | |
| Gibraltar | GIBRALTAR | |
| Guatemala | GUATEMALA | |
| Haiti | HAITI | |
| Honduras | HONDURAS | |
| Hong Kong, China | HONGKONG | |
| India | INDIA | |
| Indonesia | INDONESIA | |
| Islamic Republic of Iran | IRAN | |
| Iraq | IRAQ | |
| Israel | ISRAEL | |
| Jamaica | JAMAICA | |
| Jordan | JORDAN | |
| Kazakhstan | KAZAKH- STAN | Data for Kazakhstan are available starting in 1990. Prior to that, they are included in Former Soviet Union. |
| Kenya | KENYA | |
| Democratic People's Republic of Korea | KOREADPR | |
| Kuwait | KUWAIT | |
| Kyrgyzstan | KYR- GYZSTAN | Data for Kyrgyzstan are available starting in 1990. Prior to that, they are included in Former Soviet Union. |
| Latvia | LATVIA | Data for Latvia are available starting in 1990. Prior to that, they are included in Former Soviet Union. |
| Lebanon | LEBANON | |

| | | |
|-----------------------------------|------------|---|
| Libyan Arab Jamahiriya | LIBYA | |
| Lithuania | LITHUANIA | Data for Lithuania are available starting in 1990. Prior to that, they are included in Former Soviet Union. |
| Former Yugoslav Rep. of Macedonia | FYROM | Data for FYROM are available starting in 1990. Prior to that, they are included in Former Yugoslavia. |
| Malaysia | MALAYSIA | |
| Malta | MALTA | |
| Republic of Moldova | MOLDOVA | Data for Moldova are available starting in 1990. Prior to that, they are included in Former Soviet Union. |
| Mongolia | MONGOLIA | Data for Mongolia are available starting in 1985. Prior to that, they are included in Other Asia. |
| Morocco | MOROCCO | |
| Mozambique | MOZAMBIQUE | |
| Myanmar | MYANMMAR | |
| Namibia | NAMIBIA | Data for Namibia are available starting in 1991. Prior to that, data are included in Other Africa. |
| Nepal | NEPAL | |
| Netherlands Antilles | NANTILLES | |
| Nicaragua | NICARAGUA | |
| Nigeria | NIGERIA | |
| Oman | OMAN | |
| Pakistan | PAKISTAN | |
| Panama | PANAMA | |
| Paraguay | PARAGUAY | |
| Peru | PERU | |
| Philippines | PHILIPPINE | |
| Qatar | QATAR | |
| Romania | ROMANIA | |
| Russian Federation | RUSSIA | Data for Russia are available starting in 1990. Prior to that, they are included in Former Soviet Union. |
| Saudi Arabia | SAUDIARABI | |
| Senegal | SENEGAL | |
| Serbia | SERBIA | Data for Serbia are available starting in 1990. Prior to that, they are included in Former Yugoslavia. Serbia includes Montenegro until 2004 and Kosovo until 1999. |
| Singapore | SINGAPORE | |

| | | |
|------------------------------------|-------------|--|
| Slovenia | SLOVENIA | Data for Slovenia are available starting in 1990. Prior to that, they are included in Former Yugoslavia. |
| South Africa | SOUTHAFRIC | |
| Sri Lanka | SRILANKA | |
| Sudan | SUDAN | |
| Syrian Arab Republic | SYRIA | |
| Tajikistan | TAJIKISTAN | Data for Tajikistan are available starting in 1990. Prior to that, they are included in Former Soviet Union. |
| United Republic of Tanzania | TANZANIA | |
| Thailand | THAILAND | |
| Togo | TOGO | |
| Trinidad and Tobago | TRINIDAD | |
| Tunisia | TUNISIA | |
| Turkmenistan | TURKMENIST | Data for Turkmenistan are available starting in 1990. Prior to that, they are included in Former Soviet Union. |
| Ukraine | UKRAINE | Data for Ukraine are available starting in 1990. Prior to that, they are included in Former Soviet Union. |
| United Arab Emirates | UAE | |
| Uruguay | URUGUAY | |
| Uzbekistan | UZBEKISTAN | Data for Uzbekistan are available starting in 1990. Prior to that, they are included in Former Soviet Union. |
| Venezuela | VENEZUELA | |
| Vietnam | VIETNAM | |
| Yemen | YEMEN | |
| Zambia | ZAMBIA | |
| Zimbabwe | ZIMBABWE | |
| Former Soviet Union (if no detail) | FSUND | Before 1990, includes Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan. |
| Former Yugoslavia (if no detail) | YUGOND | Before 1990, includes Bosnia and Herzegovina, Croatia, the Former Yugoslav Republic of Macedonia, Slovenia, Serbia. |
| Other Africa | OTHEREAFRIC | Includes Botswana (until 1980), Burkina Faso, Burundi, Cape Verde, Central African Republic, Chad, Comoros, Djibouti, Equatorial Guinea, Gambia, Guinea, Guinea-Bissau, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Namibia (until 1990), Niger, Reunion, Rwanda, Sao Tome and Principe, Seychelles, Sierra Leone, Somalia, Swaziland and Uganda. |

| | | |
|--|------------|--|
| Other Latin America | OTHERLATIN | Includes Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, British Virgin Islands, Cayman Islands, Dominica, Falkland Islands, French Guyana, Grenada, Guadeloupe, Guyana, Martinique, Montserrat, Puerto Rico ⁴ (for natural gas), St. Kitts and Nevis, Saint Lucia, Saint Pierre et Miquelon, St. Vincent and the Grenadines, Suriname, and Turks and Caicos Islands. |
| Other Asia | OTHERASIA | Includes Afghanistan, Bhutan, Cambodia (until 1994), Cook Islands, East Timor, Fiji, French Polynesia, Kiribati, Laos, Macau, Maldives, Mongolia (until 1984), New Caledonia, Papua New Guinea, Samoa, Solomon Islands, Tonga and Vanuatu. |
| Memo: Non-OECD Total | NOECDTOT | Includes Africa, Latin America, Asia, Non-OECD Europe, Middle East, China Region and Former Soviet Union. |
| Memo: European Union - 27 | EU27 | Includes Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, the Slovak Republic, Slovenia, Spain, Sweden and the United Kingdom. Please note that in the interest of having comparable data, all these countries are included since 1990 despite different entry dates into the European Union. |
| Memo: Former Yugoslavia | MYUGO | Includes Former Yugoslavia (if no detail), Bosnia and Herzegovina, Croatia, Former Yugoslav Republic of Macedonia, Slovenia and Serbia. |
| Memo: OPEC | OPEC12 | Includes Algeria, Angola, Ecuador, Indonesia, Iran, Iraq, Kuwait, Libyan Arab Jamahiriya, Nigeria, Qatar, Saudi Arabia, the United Arab Emirates and Venezuela. |
| <p>Please note that the following countries have not been considered due to lack of data:</p> <ul style="list-style-type: none"> • Non-OECD Europe: Liechtenstein⁵ (except for oil data), Montenegro⁶ (after 2004); • Africa: Saint Helena and Western Sahara; • America: Anguilla; • Asia and Oceania: Christmas Island, Nauru, Niue and Palau. | | |

4. Oil statistics as well as coal trade statistics for Puerto Rico are included under the United States.

5. Oil data for Liechtenstein are included under Switzerland.

6. Data for Montenegro are included under Serbia until 2004.

5. ISSUES OF DATA QUALITY

Methodology

Considerable effort has been made to ensure that the data presented in this publication adhere to the IEA definitions reported in Section 2, Flow definitions, and Section 3, Product definitions. These definitions are used by most of the international organisations that collect energy statistics.

Nevertheless, energy statistics at the national level are often collected using criteria and definitions which differ, sometimes considerably, from those of international organisations. The IEA Secretariat has identified these differences and, where possible, adjusted the data to meet international definitions.

Recognised anomalies occurring in specific countries are presented in Section 6, Country notes and sources. Country notes present the most important deviations from the IEA methodology, and are by no means a comprehensive list of anomalies by country.

Estimation

In addition to adjustments compensating for differences in definitions, estimations are sometimes required to complete major aggregates, when key statistics are missing.

The Secretariat has aimed to provide all the elements of commodity balances down to the level of final consumption, for all countries and years. Providing all the elements of supply, as well as all inputs and outputs of the main transformation activities (such as oil refining and electricity generation), has often required estimations. Estimations have been generally made after consultation with national statistical offices, oil

companies, electricity utilities and national energy experts.

Time series and political changes

Commodity balances for the individual countries of the Former Soviet Union and the Former Yugoslavia have been constructed since 1990, and are not available for previous years. These balances are generally based on official submissions, but some estimations have been made by the Secretariat.

Energy statistics for some countries undergo continuous changes in their coverage or methodology. Consequently, “breaks in series” are considered to be unavoidable.

The IEA Secretariat reviews its databases each year. In the light of new assessments, important revisions may be made to time series of individual countries during the course of this review. Therefore, some data in this publication have been substantially revised with respect to previous editions. Please always consult Section 6, Country notes and sources.

Classification of fuel uses

National statistical sources often lack adequate information on the consumption of fuels in different categories of end use. Many countries do not conduct annual surveys of consumption in the main sectors of economic activity, and published data may be based on out-of-date surveys. Therefore, sectoral disaggregation of consumption should generally be interpreted with caution.

In transition economies (Eastern European countries and countries of the Former Soviet Union) and in China, the

sectoral classification of fuel consumption before the reforms of the 1990's significantly differed from that of market economies. Sectoral consumption was defined according to the economic branch of the user, rather than according to the purpose or use of the fuel. For example, consumption of gasoline in the vehicle fleet of an enterprise attached to the economic branch 'Iron and steel' was classified as consumption in the 'Iron and steel' industry itself.

Where possible, data have been adjusted to fit international classifications. For example, all gasoline is assumed to be consumed in the 'Transport' sector. However, it has not been possible to reclassify products other than gasoline and jet fuel as easily, and few other adjustments have been made to the other products.

Imports and exports

For a given product, imports and exports may not sum up to zero at the world level for a number of reasons. Fuels may be classified differently (i.e. residual fuel oil exports may be reported as refinery feedstocks by the importing country; NGL exports may be reported as LPG by the importing country, etc.). Other possible reasons include discrepancies in conversion factors, inclusion of international marine bunkers in exports, timing differences, data reported on a fiscal year basis instead of calendar year for certain countries, and underreporting of imports and exports for fiscal reasons.

Specific issues by fuel

Oil

The IEA Secretariat collects comprehensive statistics for oil supply and use, including oil for own use of refineries, oil delivered to international bunkers, and oil used as petrochemical feedstock. National statistics often do not report all these amounts.

Reported production of refined products may refer to net rather than gross refinery output; consumption of oil products may be limited to sales to domestic markets, and may not include deliveries to international shipping or aircraft. Oil consumed as petrochemical feedstock in integrated refinery/petrochemical complexes is often not included in available official statistics.

Where possible, the Secretariat has estimated those unreported data, in consultation with the oil industry. In the absence of any other indication, refinery fuel

use is estimated to be about 5% of refinery throughput, and equally split between refinery gas and heavy fuel oil. For a description of some adjustments made to the sectoral consumption of oil products, see the above section 'Classification of fuel uses'.

Natural gas

Natural gas should be comprised mainly of methane; other gases, such as ethane and heavier hydrocarbons, should be reported under the heading of 'oil'. The IEA defines natural gas production as the marketable production, i.e. net of field losses, flaring, venting and re-injection.

However, the lack of adequate definitions makes it difficult or impossible to identify all quantities of gas at all different stages of its separation into dry gas (methane) and heavier fractions. National data for natural gas not always explicitly show separate quantities for field losses, flaring, venting and re-injection.

Natural gas supply and demand statistics are normally reported in volumetric units, and it is difficult to obtain accurate data on the calorific value. In the absence of specific information, the IEA generally applies an average gross calorific value of 38 TJ/million m³.

Reliable consumption data for natural gas at a disaggregated level are often difficult to find. This is especially true for some of the largest natural gas consuming countries in the Middle East. Therefore, industrial use of natural gas for these countries is frequently missing from the data published here.

Electricity

The IEA classification shows 'main activity producers' separately from 'autoproducers' of electricity and heat. As defined in Section 2, Flow definitions, an autoproducer of electricity is an establishment which, in addition to its main activities, generates electricity wholly or partly for its own use. For non-OECD countries, data on autoproducers are not always known. In such cases, the quantities of fuels used as input to electricity are reported instead under the appropriate end-use sector.

When statistics of production of electricity from combustible renewables and waste are available, they are included in total electricity production. However, these data are not comprehensive; for example, much of the electricity generated from waste biomass in sugar refining facilities remains unreported.

When unreported, inputs of fuels for electricity generation are estimated using information on electricity output, fuel efficiency and type of generation capacity.

Heat

For heat, transition economies (Eastern European countries and countries of the Former Soviet Union) and China used to adopt a different methodology from that adopted in market economies. They allocated the transformation of primary fuels (coal, oil and gas) by industry into heat *for consumption on site* to the transformation activity 'heat production', not to industrial consumption, as in the IEA methodology⁷. The transformation output of *Heat* was then allocated to the various end use sectors. The losses occurring in the transformation of fuels into heat in industry were not included in final consumption of industry.

Although a number of countries have recently switched to the practice of international organisations, this important issue reduces the possibility of cross-country comparisons for sectoral end use consumption between transition economies and market economies.

Combustible renewables and waste

The IEA publishes data on production, domestic supply and consumption of combustible renewables and waste for all non-OECD countries and all regions.

Data are often based on secondary sources, and may be of questionable quality, which makes comparisons between countries difficult. For many countries, historical data derive from surveys which were often irregular, irreconcilable, and conducted at a local rather than national level.

Where historical series were incomplete or unavailable, they were estimated using a methodology consistent with the projection framework of the IEA's 1998 edition of *World Energy Outlook* (September 1998). First, nation-wide domestic supply per capita of biomass and wastes was compiled or estimated for 1995. Then, per capita supply for the years 1971 to

1994 was estimated using a log/log equation with either GDP per capita or percentage of urban population as exogenous variable, depending on the region. Finally, supply of total biomass and waste after 1996 was estimated assuming a growth rate either constant, or equal to the population growth, or based on the 1971-1994 trend.

Those estimated time-series should be treated very cautiously. The chart below provides a broad indication of the estimation methodology and of the data quality by region.

| Region | Main source of data | Data quality | Exogenous variables |
|---------------------|----------------------------------|----------------|------------------------|
| Africa | FAO database and AfDB | low | population growth rate |
| Latin America | national and OLADE | high | none |
| Asia | surveys | high to low | population growth rate |
| Non-OECD Europe | questionnaires and FAO | high to medium | none |
| Former Soviet Union | National, questionnaires and FAO | high to medium | none |
| Middle East | FAO | medium to low | none |

Given the importance of vegetal fuels in the energy picture of many developing countries, balances down to final consumption by end-use for individual products or product categories have been compiled for all countries.

The IEA hopes that the inclusion of these data will encourage national administrations and other agencies active in the field to enhance level and quality of data collection and coverage for biomass data. More details on the methodology used by country may be provided on request, and comments are welcome.

7. For autoproducer plants, the international methodology restricts the inclusion of heat in transformation sector to that sold to third parties. See definition in Section 2, Flow definitions.

6. COUNTRY NOTES AND SOURCES

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The United Nations Energy Statistics Database, United Nations Statistical Office, New York, 2008.

World Development Indicators 2008, The World Bank, Washington, 2009.

Note:

The OLADE database was used for several Latin American countries.

The UN database was the only source of information for time series of the countries not listed individually and included in the regions Other Africa, Other Latin America and Other Asia. It was also used in a number of other countries as a complementary source.

Albania

For 1993, large quantities of oil, widely reported to have moved through Albania into former Yugoslavia, may not be included in oil trade. Although estimated to represent up to 100 per cent of domestic consumption levels, no reliable figures for this trade were available.

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Secretariat estimates.

Sources up to 2004:

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The UN Energy Statistics Database.

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UN ECE annual energy questionnaires and Secretariat estimates.

Algeria

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Angola

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Anuario Estadístico de la República Argentina 1970-1981, Instituto Nacional de Estadística y Censos, Secretaria de Planificación, Buenos Aires, 1982.

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Armenia

Data for Armenia are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Sources 1992-2007:

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Sources 1990-1991:

Secretariat estimates.

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Azerbaijan

Data for Azerbaijan are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Sources 1992-2007:

Direct communications with the State Committee of Statistics and the Ministry of Economics of Azerbaijan, Baku.

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Direct communication with the Joint Power Co-ordination Centre (JPCC).

Statistical Yearbook of BiH, Federation of Bosnia and Herzegovina Federal Office of Statistics, Sarajevo, 2008.

International Management Group, "Power generation and transmission system in Bosnia Herzegovina", Sarajevo, November 2000, *European Commission*.

Energy Outlook, Sarajevo, December 2001, Federal Ministry of Energy, Mining and Industry.

The UN Energy Statistics Database.

Botswana

Data for Botswana are available from 1981. Prior to that, they are included in Other Africa.

Sources 1981-2007:

Secretariat estimates.

Energy Statistics, *Central Statistics Office, Republic of Botswana*.

Direct communication with the Energy Affairs Division, Ministry of Minerals, Energy and Water Affairs, Gaborone.

Brazil

In the IEA balance, anhydrous ethanol is reported under "Biogasoline", while hydrated ethanol is reported under "Other liquid biofuels"⁸.

In this edition, time series of solar-thermal heat were included for the first time (see "Sources").

Sources 1971-2007:

Direct communication with the Ministério de Minas e Energia, Brasilia.

Solar Heat Worldwide, various editions up to 2008.

Brunei Darussalam

Sources 2007:

Direct communication with the Prime Minister's Office, Strategic Planning Division.

Direct communication to the secretariat from the Prime Minister's Office, Department of Electrical Services.

Secretariat estimates.

Sources 1992-2005:

APEC Energy Database, Tokyo, 2007.

Direct communication with the UN Statistics Division, the Office of the Prime Minister, Petroleum Unit, the Asia Pacific Energy Research Centre, Tokyo, 2007, the Ministry of Development, Electrical Services Department.

Brunei Statistical Yearbook, 1992 to 1994, Ministry of Finance, Statistics Section, Brunei Darussalam, 1993, 1995.

Sources up to 1991:

Fifth National Development Plan 1986-1990, Ministry of Finance, Economic Planning Unit, Bandar Seri Bagawan, 1985.

8. The national energy balance of Brazil shows bioethanol as two separate products: anhydrous ethanol ("álcool anidro", i.e. nearly pure ethanol, containing less than 1% of water) and hydrated ethanol ("álcool hidratado", i.e. a blend of ethanol and water, in the proportion of about 95% to 5%, generally obtained from conventional distillation). While anhydrous ethanol is blended with gasoline (the blend sold at the pump generally contains 20-25% of ethanol), hydrated ethanol is sold at separate pumps as a product by itself (álcool) to be used in flex fuel cars, i.e. vehicles that can run on any mix of gasoline and ethanol.

Sources for Combustible renewables and waste:
The UN Energy Statistics Database.

Bulgaria

Sources 1992-2007:

Direct communication with the National Statistical Institute, Sofia.

UN ECE annual energy questionnaires.

Energy Balances, National Statistical Institute, Sofia, 1995.

Sources up to 1991:

Energy Development of Bulgaria, Government of Bulgaria, Sofia, 1980 and 1984.

Energy in Bulgaria, Government of Bulgaria, Sofia, 1980 to 1983.

General Statistics in the Republic of Bulgaria 1989/1990, Government of Bulgaria, Sofia, 1991.

Sources for Combustible renewables and waste:

The UN Energy Statistics Database and UN ECE annual energy questionnaires.

Cambodia

Data for Cambodia are available starting in 1995. Prior to that, they are included in Other Asia.

Sources 2006-2007:

Report on Power Sector, Electricity Authority of Cambodia, 2006, 2007.

Direct communication with the Electricity Authority of Cambodia, Phnom Penh.

Secretariat estimates.

APEC annual energy statistics questionnaires, 2006.

Sources up to 2005:

Direct communication with the Department of Energy, Ministry of Industry, Mines and Energy, and the Corporate Planning and Projects Department, Electricité du Cambodge.

Statistical Handbook, Electricité du Cambodge, various issues, Phnom Penh.

Cameroon

Sources 1971-2007:

Direct communication with the Ministère de l'Energie et de l'Eau.

Direct communication with the Société Nationale de Raffinage (SONARA).

Direct communication with the Société Nationale d'Electricité du Cameroun (AES – SONEL).

The UN Energy Statistics Database.

Sources for Combustible renewables and waste:

Secretariat estimates based on 1991 data from *Forests and Biomass Sub-sector in Africa*, African Energy Programme of the African Development Bank, Abidjan, 1996.

Chile

In this edition, time series 1990-2006 were significantly revised based on the new submission of IEA/Eurostat/UNECE annual questionnaires provided by the national administration of Chile. Revisions are also expected in the next edition, as the national administration is currently working to make their data collection closer to international methodologies for energy statistics and to generally improve their data quality.

A significant increase in electricity generation from oil products was reported for 2007 as a consequence of decreased availability of natural gas and hydro generation in the country.

Sources 1990-2007:

Direct communication with the Comisión Nacional de Energía, Santiago.

UN ECE annual questionnaires.

Sources up to 1989:

Balance Nacional de Energía 1977-1996, Comisión Nacional de Energía, Santiago, September 1997.

Balance de Energía 1973 - 1992, Comisión Nacional de Energía, Santiago, 1993, 1975-1994, Santiago, 1995.

Compendio Estadístico Chile 1985, Ministerio de Economía, Fomento y Reconstrucción, Instituto Nacional de Estadísticas, Santiago, 1986.

Sources for Combustible renewables and waste:

Comisión Nacional de Energía, OLADE.

People's Republic of China

Time series for liquid biofuels were included for the first time in this year's edition. Time series for wind, solar photovoltaic and solar thermal generation are based on Secretariat estimates. Neither of those time series is reported in the national energy balance of China.

The IEA data of coal production for the years 1990 to 2003 are estimates and do not represent official data released by the Chinese government. Those estimates were based on the assumption that coal consumption statistics are more reliable than coal production statistics, and that the production-consumption relationship should maintain a balance over time.

Sources 1990-2007:

Energy Balances of China, State Statistical Bureau.

Direct communication with the Energy Research Institute (NDRC).

Solar Heat Worldwide, various editions up to 2008.

China Wind Power Report, 2007-2008.

Secretariat estimates.

Sources up to 1990:

Electric Industry in China in 1987, Ministry of Water Resources and Electric Power, Department of Planning, Beijing, 1988.

Outline of Rational Utilization and Conservation of Energy in China, Bureau of Energy Conservation State Planning Commission, Beijing, June 1987.

China Coal Industry Yearbook, Ministry of Coal Industry, People's Republic of China, Beijing, 1983, 1984, 1985 and 2000.

Energy in China 1989, Ministry of Energy, People's Republic of China, Beijing, 1990.

China: A Statistics Survey 1975-1984, State Statistical Bureau, Beijing, 1985.

China Petro-Chemical Corporation (SINOPEC) Annual Report, SINOPEC, Beijing, 1987.

Almanac of China's Foreign Economic Relations and Trade, The Editorial Board of the Almanac, Beijing, 1986.

Sources for Combustible renewables and waste:

Secretariat estimates based on a per capita average consumption from various surveys and studies.

Chinese Taipei

In this edition, data for the period 1982-2006 were revised based on new balances submitted by the Bureau of Energy. Breaks in time series may occur between 1981 and 1982.

Sources 1982-2007:

Energy Balances in Taiwan, Bureau of Energy, Ministry of Economic Affairs, Taipei.

Direct communication with the electricity utilities.

Yearbook of Energy Statistics, Ministry of Trade Industry and Energy, Taipei, 1996.

Sources up to 1981:

The Energy Situation in Taiwan, Ministry of Economic Affairs, Energy Committee, Taipei, 1986, 1987, 1988 and 1992.

Industry of Free China 1975-1985, Council for Economic Planning and Development, Taipei, 1986.

Taiwan Statistical Data Book 1954-1985, Council for Economic Planning and Development, Taipei, 1986.

Energy Policy for the Taiwan Area, Ministry of Economic Affairs, Energy Committee, Taipei, 1984.

Energy Balances in Taiwan, Ministry of Economic Affairs, Taipei, 1980 to 1981.

Sources for Combustible renewables and waste:

The UN Energy Statistics Database and Secretariat estimates.

Colombia

Sources 1992-2007:

Direct communication with the Ministry of Mines and Energy, Energy Information Department, Bogotá.

Statistics 1996-2007, Sistema de Información Eléctrico Colombiano, Ministry of Mines and Energy.

Sources up to 1991:

Boletín Minero-Energético, Ministerio de Minas y Energía, Bogotá, December 1991.

Estadísticas Minero-Energéticas 1940-1990, Ministerio de Minas y Energía, Bogotá, 1990.

Estadísticas Básicas del Sector Carbón, Carbocol, Oficina de Planeación, Bogotá, various editions from 1980 to 1988.

Colombia Estadística 1985, DANE, Bogotá, 1970 to 1983 and 1987.

Empresa Colombiana de Petróleos, Informe Anual, Empresa Colombiana de Petróleos, Bogotá, 1979, 1980, 1981 and 1985.

Estadísticas de la Industria Petrolera Colombiana Bogota 1979-1984, Empresa Colombiana de Petróleos, Bogotá, 1985.

Informe Estadístico Sector Eléctrico Colombiano, Government of Colombia, Bogotá, 1987 and 1988.

La Electrificación en Colombia 1984-1985, Instituto Colombiano de Energía Eléctrica, Bogotá, 1986.

Balances Energéticos 1975-1986, Ministerio de Minas y Energía, Bogotá, 1987.

Energía y Minas Para el Progreso Social 1982-1986, Ministerio de Minas y Energía, Bogotá, 1987.

Sources for Combustible renewables and waste:

Ministry of Mines and Energy, Energy Information Department.

Congo

Sources 1971-2007:

Direct communication with the Ministère de l'Énergie et de l'Hydraulique, 2000 to 2008.

Direct communication with the Agence de Régulation de l'Aval Pétrolier, 2008.

Secretariat estimates.

Sources for Combustible renewables and waste up to 1993 except for Other solid biomass:

Secretariat estimates based on 1991 data from *Forests and Biomass Sub-sector in Africa*, African Energy Programme of the African Development Bank, Abidjan, 1996.

Democratic Republic of Congo

Sources up to 2007:

Direct communication with the Ministère de l'Énergie, Kinshasa Gombe.

Secretariat estimates.

Commission Nationale de l'Énergie, Ministère de l'Énergie, 2005.

WEC-IEA Joint Energy Reporting Format for Africa, 1999 to 2000.

The UN Energy Statistics Database.

L'Énergie en Afrique, IEPE/ENDA, Paris, 1995, in turn sourced from the *Annuaire Statistique Énergétique 1990*, Communauté Economique des Pays des Grands Lacs, Bujumbura, 1990.

Sources for Combustible renewables and waste:

Secretariat estimates based on 1991 data from *Forests and Biomass Sub-sector in Africa*, African Energy Programme of the African Development Bank, Abidjan, 1996.

Costa Rica

Sources up to 2007:

Direct communication with the Ministerio del Ambiente y Energía, San José.

Côte d'Ivoire

Time series for primary solid biomass and charcoal were revised for the period 2004-2006 based on newly available information. Breaks in time series may occur between 2003 and 2004.

Sources 2005-2007:

IEA/WEC Questionnaire submitted by the Direction de l'énergie, Abidjan.

Direct communication with the Direction de l'énergie, Abidjan.

Secretariat estimates.

Sources 2002-2004:

Direct communication with the Ministry of Mines and Energy, Abidjan, 2005-2006, and Secretariat estimates.

Sources 1992-2001:

Direct communication to the Secretariat from oil industry and the Ministry of Energy, Abidjan, July 2003.

Direct communication to the Secretariat from SIR, Societe Ivoirienne de Raffinage, 2004.

La Côte d'Ivoire en chiffres, Ministère de l'Économie et des Finances, 1996-97 edition.

L'Énergie en Afrique, IEPE/ENDA, Paris, 1995, in turn sourced from the Ministère des Mines et de l'Énergie, Abidjan.

The UN Energy Statistics Database.

Sources up to 1991:

Études & Conjoncture 1982 - 1986, Ministère de l'Économie et des Finances, Direction de la Planification et de la Prévision, Abidjan, 1987.

Sources for Combustible renewables and waste:

Secretariat estimates based on 1991 data from *Forests and Biomass Sub-sector in Africa*, African Energy Programme of the African Development Bank, Abidjan, 1996.

Croatia

Data for Croatia are available starting in 1990. Prior to that, they are included in Former Yugoslavia.

Sources 1990-2007:

Direct communication with the Energy Institute "Hrvoje Požar", Zagreb.

Direct communication with the Central Bureau of Statistics, Zagreb.

UN ECE annual energy questionnaires.

Secretariat estimates.

Cuba

Breaks in time series may occur between 2001 and 2002 due to revisions based on more detailed data available.

Sources up to 2007:

Anuario Estadístico de Cuba 1996 to 2007, Oficina Nacional de Estadísticas, Edición 1998 to 2008.

SIEE, OLADE.

Secretariat estimates.

Compendio estadístico de energía de Cuba 1989, Comité Estatal de Estadísticas, Havana, 1989.

Anuario Estadístico de Cuba, Comité Estatal de Estadísticas, Havana, various editions from 1978 to 1987.

Sources for Combustible renewables and waste:

SIEE, OLADE.

Anuario Estadístico de Cuba 1996, Oficina Nacional de Estadísticas, Havana, 1998.

Cyprus

Note by Turkey:

With respect to Cyprus, Turkey reserves its position as stated in its declaration of 1 May 2004. The information in the report under the heading Cyprus relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC).

Note by all the European Union Member States of the OECD and the European Commission:

The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this report relates to the area under the effective control of the Government of the Republic of Cyprus.

Sources 1994-2007:

Direct communication with the statistical service of Cyprus, Nicosia.

UN ECE annual energy questionnaires.

Electricity Authority of Cyprus Annual Report 1996, Electricity Authority of Cyprus, Nicosia, 1997.

Sources up to 1993:

Electricity Authority of Cyprus Annual Report 1988, 1992, Electricity Authority of Cyprus, Nicosia, 1989 and 1993.

Industrial Statistics 1988, Ministry of Finance, Department of Statistics, Nicosia, 1989.

Sources for Combustible renewables and waste:

UN ECE annual energy questionnaires and Secretariat estimates.

Note: Data on electricity generation from solar thermal and heat production from municipal waste and wood have been submitted for the first time for the year 2004.

Dominican Republic

Sources 1971-2007:

SIEE, OLADE.

The LNG Industry, International Group of Liquefied Natural Gas Importers (GIIGNL), various editions up to 2008.

Ecuador

Sources 1999-2007:

Direct communication with the Ministerio de Minas y Petr6leos, Quito.

Estadística del Sector Electrico Ecuatoriano, Conelec, Consejo Nacional de Electricidad, various editions up to 2007.

Informe Estadístico Gerencial, Petroecuador, Empresa Estatal Petr6leos del Ecuador, various editions up to 2008.

SIEE, OLADE.

Sources 1990-1998:

SIEE, OLADE.

Sources up to 1989:

Ministerio de Energia y Minas.

Cuentas Nacionales, Banco Central del Ecuador, Quito, various editions from 1982 to 1987.

Memoria 1980-1984, Banco Central del Ecuador, Quito, 1985.

Ecuadorian Energy Balances 1974-1986, Instituto Nacional de Energía, Quito, 1987.

Informacion Estadística Mensual, No. 1610, Instituto Nacional de Energía, Quito, 1988.

Plan Maestro de Electrificación de Ecuador, Ministerio de Energía y Minas, Quito, 1989.

Sources for Combustible renewables and waste:

SIEE, OLADE.

Egypt

Data are reported on a fiscal year basis.

Sources 1992-2007:

Direct communication with the Organisation for Energy Planning, Cairo.

WEC-IEA Joint Energy Reporting Format for Africa, 2000 to 2007.

Secretariat estimates.

Direct submission to the Secretariat from the Ministry of Petroleum.

Annual Report 1995, 1997, 1998, 1999, Ministry of Petroleum, Egyptian General Petroleum Corporation, Cairo, 1996, 1998, 1999 and 2000.

Annual Report of Electricity Statistics 1996/1997 to 1999/2000, Ministry of Electricity and Energy, Egyptian Electricity Authority, Cairo, 1998 to 2003.

Arab Oil and Gas, The Arab Petroleum Research Center, Paris, October 1997.

Middle East Economic Survey, Middle East Petroleum and Economic Publications, Nicosia, February 1994, June 1996, March 1998.

A Survey of the Egyptian Oil Industry 1993, Embassy of the United States of America in Cairo, Cairo, 1994.

Sources up to 1991:

Annual Report of Electricity Statistics 1990/1991, Ministry of Electricity and Energy, Egyptian Electricity Authority, Cairo, 1992.

Statistical Yearbook of the Arab Republic of Egypt, Central Agency for Public Mobilisation and Statistics, Cairo, 1977 to 1986.

L'Electricité, l'Energie, et le Pétrole, République Arabe d'Egypte, Organisme Général de l'Information, Cairo, 1990.

Annual Report, The Egyptian General Petroleum Corporation, Cairo, 1985.

Sources for Combustible renewables and waste:

The UN Energy Statistics Database and Secretariat estimates.

El Salvador

In this edition, historical time series for combustible renewables and waste were revised to reduce discrepancies between supply and consumption and to ensure the continuity of trends.

Sources 1971-2007:

Direct communication with the Ministerio de Economía, Dirección de Hidrocarburos y Minas, San Salvador, Superintendencia General de Electricidad y Telecomunicaciones (SIGET).

SIEE, OLADE.

Secretariat estimates.

Sources for Combustible renewables and waste:

SIEE, OLADE.

Eritrea

Data for Eritrea are available from 1992. Prior to that, they are included in Ethiopia.

Sources 1992-2007:

Direct Communication with the Ministry of Energy and Mines, State of Eritrea.

Estonia

Data for Estonia are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Oil shale is reported under lignite/brown coal.

Sources 1990-2007:

Direct communication with Statistics Estonia, Tallinn.

UN ECE annual energy questionnaires.

Sources for Combustible renewables and waste:

UN ECE annual energy questionnaires and Secretariat estimates.

Ethiopia

Ethiopia energy data include Eritrea from 1971 to 1991. From 1992, the two countries are reported separately.

Sources 1992-2007:

Direct communication with the Ministry of Mines and Energy, Addis Ababa, 2004 to 2009.

Direct communication with the Energy Development Follow-up and Expansion Department of the Ministry of Infrastructure, Addis Ababa, 2004 and 2005.

Direct communication with the Ministry of Finance and Economic Development, Addis Ababa, 1998 to 2003.

The UN Energy Statistics Database.

Sources up to 1991:

Due to the change of data source, there might be a break in time series in 1990.

Ten Years of Petroleum Imports, Refinery Products, and Exports, Ministry of Mines & Energy, Addis Ababa, 1989.

Energy Balance for the Year 1984, Ministry of Mines & Energy, Addis Ababa, 1985.

1983 Annual Report, National Bank of Ethiopia, Addis Ababa, 1984.

Quarterly Bulletin, National Bank of Ethiopia, Addis Ababa, various editions from 1980 to 1985.

Sources for Combustible renewables and waste:

Secretariat estimates based on 1992 data from Eshetu, L. and Bogale, W., *Power Restructuring in Ethiopia*, AFREPREN, Nairobi, 1996.

Gabon

Sources 1992-2007:

Direct communication with the Direction Générale De L'Energie, 2003 to 2008.

Secretariat estimates.

Direct communication with the Société Gabonaise de Raffinage, Port Gentil, 1997, 2000-2006, 2008-2009.

Tableau de Bord de l'Economie, Situation 1997, Perspectives 1998-1999, Direction Générale de l'Economie, Ministère des Finance, de l'Economie, du Budget et des participations, chargé de la privatisation, Mai 1998.

Rapport d'Activité, Banque Gabonaise de Développement, Libreville, 1985, 1990, 1992 and 1993.

The UN Energy Statistics Database.

Sources up to 1991:

Tableau de Bord de l'Economie, Situation 1983 Perspective 1984-85, Ministère de l'Economie et des Finances, Direction Générale de l'Economie, Libreville, 1984.

Sources for Combustible renewables and waste:

Secretariat estimates based on 1991 data from *Forests and Biomass Sub-sector in Africa*, African Energy Programme of the African Development Bank, Abidjan, 1996.

Georgia

Data for Georgia are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Data for 2006 were revised based on a new submission of energy balances by the national administration.

Breaks in time series between 2005 and 2006 may occur for some products.

Sources 2001-2007:

Direct communication with the Energy Efficiency Centre, Tbilisi.

UN ECE annual energy questionnaires. submitted by the State Department of Statistics of Georgia, Industry, Energy and Water Supply Division, 2005.

Sources 1990-2000:

Official Energy Balance of Georgia 1990-1999, 2000-2004, Ministry of Economy and Ministry of Energy, Tbilisi.

Secretariat estimates.

Ghana

Sources 1992-2007:

Detailed Statistics of Petroleum Products Consumption 1999-2008, National Petroleum Authority, Accra, 2009.

Direct communication with the Energy Commission, Accra, 2004 and 2008.

Secretariat estimates.

National Energy Statistics, Ministry of Energy and Mines, Accra, 2000.

Quarterly Digest of Statistics, Government of Ghana, Statistical Services, Accra, March 1990, March 1991, March 1992, March 1995.

Energy Balances, Volta River Authority, Accra, various editions from 1970 to 1985.

Sources for Combustible renewables and waste:

Ministry of Mines and Energy, *the UN Energy Statistics Database* and Secretariat estimates.

Gibraltar

Own use of electricity includes transmission and distribution losses and public lighting.

Sources up to 2007:

Gibraltar Electricity Authority and Secretariat estimates.

Guatemala

The output of petroleum products was zero in 2003 and 2004 due to refinery closure.

Sources 2004-2007:

OLADE and direct communication with the Dirección Nacional de Energía Ministerio de Energía.

Sources 1999-2003:

SIEE, OLADE.

Sources up to 1998:

OLADE and direct communication with the Dirección Nacional de Energía Ministerio de Energía.

Haiti

Sources 2007:

Direct communication with the Table Sectorielle Énergie Électrique, Ministère des Travaux Publics, Transports et Communications, Haiti.

Secretariat estimates.

Sources 2005-2006:

SIEE, OLADE.

Sources up to 2004:

Direct communication with the Bureau des Mines et de l'Énergie.

Honduras

Sources up to 2007:

Direct communication with the Empresa Nacional de Energía Eléctrica, Comayagua.

Direct Communication with the Secretariat de Recursos Naturales y del Ambiente, Tegucigalpa.

SIEE, OLADE.

Hong Kong, China

Sources up to 2007:

Hong Kong Energy Statistics - Annual Report, Census and Statistics Department, Hong Kong, various editions up to 2007.

Direct communication with the Hongkong Electric Company, Ltd.

China Light and Power - Annual Report 2007, China Light and Power Group, Hong Kong, 2008.

Hong Kong Monthly Digest of Statistics, Census and Statistics Department, Hong Kong, various editions to 1994.

Sources for Combustible renewables and waste:

The UN Energy Statistics Database, Hong Kong Energy Statistics - Annual Report 2003 and Secretariat estimates.

India

Data are reported on a fiscal year basis.

Time series of solar thermal heat and of coke oven gas were estimated by the Secretariat.

Sources 1992-2007:

Direct communication with the Coal Controller's Organisation of the Ministry of Coal.

Direct communication with the Ministry of Petroleum and Natural Gas.

Direct communication with the Central Electricity Authority of the Ministry of Power.

Direct communication with the Central Statistical Organisation of the Ministry of Planning and Programme Implementation.

Direct communication with the Ministry of New and Renewable Energy.

Coal Directory of India, 1992-1993 to 2007-2008, Coal Controller's Organization, Ministry of Coal, Kolkata, 1994 to 2008.

Indian Petroleum and Natural Gas Statistics 2000-01 to 2007-08, Ministry of Petroleum and Natural Gas, New Delhi, 2002 to 2009.

Basic Statistics on Indian Petroleum and Natural Gas Statistic, various editions up to 2007-08, Ministry of Petroleum and Natural Gas, New Delhi, 2009.

Energy Statistics 2000-2001 to 2007-2008, Central Statistical Organisation, Ministry of Statistics and Programme Implementation, 2002 to 2009.

All India Electricity Statistics General Review 1998-99, 2000-01 to 2006-07, Central Electricity Authority, Ministry of Power, New Delhi, 2000, 2002 to 2008.

Solar Heat Worldwide, various editions up to 2008.

Annual Review of Coal Statistics, various issues from 1993-1994 to 1998-1999, Coal Controller's Organization, Ministry of Coal, Kolkata, 1995-2000.

Energy Data Directory, Yearbook "TEDDY", and Annual Report, Tata Energy Research Institute "TERI", New Delhi, 1986-1988, 1990, 1994-2000.

General Review, Public Electricity Supply, India Statistics, Central Electricity Authority, New Delhi, 1982 to 1985, 1995-1998, 2000-2004.

Monthly Abstract of Statistics, Ministry of Planning, Central Statistics Organisation, Department of Statistics, New Delhi, various editions from 1984 to March 1998, 1998-2000.

Annual Report 1994-1996, 1998-1999, Ministry of Energy, Department of Non-Conventional Energy, New Delhi, 1996 and 1999.

Annual Report 1993-1994, 1998-1999, Ministry of Petroleum and Natural Gas, New Delhi, 1995, 2000.

General Review, Public Electricity Supply, India Statistics, Central Electricity Authority, New Delhi, 1982 to 1985, 1995-1998.

India's Energy Sector, July 1995, Center for Monitoring Indian Economy PVT Ltd., Bombay, 1995.

Monthly Review of the Indian Economy, Center for Monitoring Indian Economy PVT Ltd., New Delhi, various issues from 1994 to June 1999.

Sources up to 1991:

Indian Oil Corporation Limited 1987-88 Annual Report, Indian Oil Corporation Limited, New Delhi, 1989-1992.

Report 1986-87, Ministry of Energy, Department of Coal, New Delhi, 1981 to 1987.

Annual Report 1986-1987, Ministry of Energy, Department of Non-Conventional Energy, New Delhi, 1987.

Economic Survey, Ministry of Finance, New Delhi, various editions from 1975 to 1986.

Statistical Outline of India, Ministry of Finance, New Delhi, 1983, 1984, 1986, 1987.

Monthly Coal Bulletin, vol xxxvi no.2., Ministry of Labour, Directorate General of Mines Safety, New Delhi, February 1986.

Sources for Combustible renewables and waste:

Direct communication to the Secretariat from the Ministry of Non-conventional Energy Sources, Government of India.

Secretariat estimates based on a per capita average consumption from various surveys and studies.

Indonesia

The Secretariat has modified official Indonesian statistics for 2000-2007 hard coal production and exports to account for activities under regional jurisdiction that could not be incorporated into the official national statistics.

Sources 1992-2007:

Indonesia Mineral and Coal Statistics 1997 to 2008, Directorate of Coal and Mineral Resources, Jakarta, 1998 to 2008.

Handbook of Indonesia's Energy Economy Statistics, Centre for Energy Information, Ministry of Energy and Mineral Resources, Jakarta, various editions up to 2009.

Oil and Gas Statistics of Indonesia, Directorate General Oil and Gas, Jakarta, various editions 1981 to 2009.

PLN Annual Report, 2006, PT.PLN (Persero), Jakarta, various editions up to 2008.

APEC annual energy statistics questionnaires.

Secretariat estimates.

Direct communication with Directorate General of Coal and Mineral Resources, Directorate General Oil and Gas, and Directorate General of Electricity and Energy Utilisation of the Ministry of Energy and Mineral Resources.

Direct communication with the Centre for Energy Information.

Direct communication with the Indonesian Institute for Energy Economics, 2004 and 2005.

Direct communication with the ASEAN Centre for Energy, 2005.

Statistics on Electricity and Energy, 1998 to 2004, Directorate General of Electricity and Energy Utilisation, Jakarta, 1999 to 2005.

The Petroleum Report Indonesia, various editions, U.S. Embassy in Jakarta, Jakarta, 1986 to 2006.

Oil and Gas Data Information, 6th Edition, Directorate General Oil and Gas, Jakarta, 2002.

Statistik Perminyakan Indonesia 1995 to 1999, Indonesia Oil and Gas Statistics, Directorate General of Oil and Gas, 2001.

Neraca energy 2000, Energy Balance of Indonesia 2000, Asean Center for Energy.

Mining and Energy Yearbook, 1998, Ministry of Mines and Energy, Jakarta, 1998.

Sources up to 1991:

Indonesian Financial Statistics, Bank of Indonesia, Jakarta, 1982.

Indikator Ekonomi 1980-1985, Biro Pusat Statistik, Jakarta, 1986.

Statistical Yearbook of Indonesia, Biro Pusat Statistik, Jakarta, 1978 to 1984 and 1992.

Statistik Pertambangan Umum, 1973 - 1985, Biro Pusat Statistik, Jakarta, 1986.

Energy Planning for Development in Indonesia, Directorate General for Power, Ministry of Mines and Energy, Jakarta, 1981.

Commercial Information, Electric Power Corporation, Perusahaan Umum Listrik Negara, Jakarta, 1984, 1985.

Sources for Combustible renewables and waste:

The UN Energy Statistics Database and Secretariat estimates.

Islamic Republic of Iran

Sources 2004-2007:

Direct communication with the Ministry of Energy, Teheran.

Iran Statistical Yearbook, Statistical Centre of Iran, Teheran, various editions up to 2006.

Secretariat estimates.

Sources 1992-2003:

Direct communication with the Ministry of Energy, Office of Deputy Minister for Energy, Teheran, 1998, 2001 to 2005.

Direct communication with the Ministry of Petroleum, 1999.

Electric Power in Iran, Ministry of Energy, Power Planning Bureau, Statistics Section, Teheran, 1992.

Sources up to 1991:

Electric Power in Iran, Ministry of Energy, Power Planning Bureau, Statistics Section, Teheran, 1967 to 1977, 1988, 1990, 1991.

Ministry of Energy, Office of Deputy Minister for Energy, Teheran, 1971 to 1991.

Sources for Combustible renewables and waste:

The UN Energy Statistics Database, Forestry Statistics, FAO, 2000, Rome, and Secretariat estimates.

Iraq

Sources 1998-2007:

Direct communication with the Ministry of Planning and Development Cooperation and with the Central Organization for Statistics and Information Technology.

OPEC Annual Statistical Bulletin, various editions up to 2007.

OAPC Statistical Yearbook, various editions up to 2008.

Secretariat estimates.

Iraq Weekly Status Report, US Department of State 2003 to 2004.

Sources up to 1997:

The UN Energy Statistics Database and Secretariat estimates.

Israel

For confidentiality reasons, 2007 data for crude oil and oil products were not available, and were estimated by the Secretariat. Also, data for kerosene and jet kerosene are reported as aggregated for the whole time series.

Sources 2005 - 2007:

Energy Database, Ministry of Energy and Infrastructure, Central Bureau of Statistics, Jerusalem, 2008.

Statistical Report, Year 2007, Israel Electric Corporation Ltd.

Secretariat estimates.

Sources 1992-2004:

UN ECE annual energy questionnaires, 1998 to 2004.

Direct communication with the Central Bureau of Statistics (CBS), International Trade, Energy and Databank Sector, Israel.

Direct communication with the Ministry of Energy and Infrastructure, Jerusalem.

Energy in Israel, Ministry of Energy and Infrastructure, Central Bureau of Statistics, Jerusalem, 1992, 1993, 1994, 1995, 1996, 1997.

Statistical Report 1993, 1994, 1995, the Israel Electric Corporation, Haifa, April 1994, May 1995, April 1996.

Statistical Results 1992, the Israel Electric Corporation, Haifa, June 1993.

Sources up to 1991:

Energy in Israel, Ministry of Energy and Infrastructure, Central Bureau of Statistics, Jerusalem, 1975 to 1991.

Statistical Abstract of Israel, Ministry of Energy and Infrastructure, Central Bureau of Statistics, Jerusalem, 1985.

Supplement to Monthly Bulletin of Statistics, Ministry of Energy and Infrastructure, Central Bureau of Statistics, Jerusalem, various editions from 1984 to 1986.

Sources for Combustible renewables and waste:

Forestry Statistics, FAO, 2000, Rome, and Secretariat estimates.

Jamaica

Sources 2007:

Import Statistics 2006-2007, Petrojam limited.

Petroleum Industry Consumption Statistics Jamaica 2006-2007, Petroleum Corporation of Jamaica.

Direct communication with the Office of Utilities Regulation, Jamaica.

Secretariat estimates.

Sources 1991 to 2006:

SIEE, OLADE.

Secretariat estimates.

Sources up to 1990:

National Energy Outlook 1985-1989, Petroleum Corporation of Jamaica, Economics and Planning Division, Kingston, 1985.

Energy and Economic Review, Petroleum Corporation of Jamaica, Energy Economics Department, Kingston, September 1986, December 1986 and March 1987.

Production Statistics 1988, Planning Institute of Jamaica, Kingston, 1989.

Statistical Digest, Research and Development Division, Bank of Jamaica, Kingston, 1984, 1985, 1986, 1989, 1990.

Sources for Combustible renewables and waste:
SIEE, OLADE.

Jordan

Sources 2005-2007:

Direct communication with the Ministry of Energy and Mineral Resources, Amman.

Secretariat estimates.

Annual Report 2005, 2006, 2007 National Electric Power Company, Amman, 2006 to 2008.

Sources 1992-2004:

Direct communication with the National Electric Power Company, Amman.

Secretariat estimates.

Annual Report 1995, 1996, 1998, 1999, 2000, 2001, 2002, 2003, 2004 National Electric Power Company, Amman, 1996, 1997, 1999 to 2004.

Annual Report 1992, 1993, Jordan Electricity Authority, Amman, 1993, 1994.

Energy and Electricity in Jordan 1992, 1993, 1994, 1995, Jordan Electricity Authority, Amman, 1993 to 1996.

Statistical Yearbook, 1994, Department of Statistics, Amman, 1995.

44th Annual Report for the year ending 31st December 1999, Jordan Petroleum Refinery Company, Amman, 2000.

Sources up to 1991:

Monthly Statistical Bulletin, Central Bank of Jordan, Department of Research Studies, Amman, various issues.

Statistical Yearbook, Department of Statistics, Amman, 1985, 1986 and 1988.

1986 Annual Report, Ministry of Energy and Mineral Resources, Amman, 1987.

1989 Annual Report, Ministry of Energy and Mineral Resources, Amman, 1990.

Sources for Combustible renewables and waste:

Forestry Statistics, FAO, Rome, 2000, and Secretariat estimates.

Kazakhstan

Data for Kazakhstan are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Sources 1993 to 2007:

Direct communication with the Statistical Agency, Astana.

UN ECE annual energy questionnaires, 1993, 1995, 1997 to 2007.

Fuel and energy balance of Kazakhstan Republic for Years 2000 – 2007, Statistical Agency of Kazakhstan Republic, various editions up to 2008.

Secretariat estimates.

Sources 1990-1992:

Secretariat estimates.

Sources for Combustible renewables and waste:

Forestry Statistics, FAO, Rome, 2000.

Kenya

As of 2001 data, electricity data are reported on a fiscal year basis, beginning on the 1st of July and ending on the 30 June of the subsequent year.

Sources 2006-2007:

Direct communication with AFREPREN, Nairobi.

Economic Survey, 2007 and 2008, Central Bureau of Statistics, Nairobi.

Kenya, Facts and figures, 2006 Edition, Central Bureau of Statistics, Nairobi.

Annual Report and Accounts, 2006/07, 2007/08 the Kenya Power & Lighting Company Limited.

Secretariat estimates based on various Kenyan sources.

Sources 2005:

Secretariat estimates based on various Kenyan sources.

Sources 1992-2004:

Direct communication with the Ministry of Energy, Nairobi.

Economic Survey, 1995 to 2004, Central Bureau of Statistics, Nairobi.

Annual Report and Accounts, 2001/02, 2002/03, 2003/2004, 2004, 2005, the Kenya Power & Lighting Company Limited.

The UN Energy Statistics Database.

Sources up to 1991:

Economic Survey, Government of Kenya, Nairobi, 1989.

Economic Survey 1991, Ministry of Planning and National Development, Central Bureau of Statistics, Nairobi, 1992.

Kenya Statistical Digest, Ministry of Planning and National Development, Central Bureau of Statistics, Nairobi, 1988.

Sources for Combustible renewables and waste:

Data for 2000 are based on a research carried out by the Ministry of Energy on consumption of biomass. The results of this research were published as part of a National Energy Policy initiative.

Secretariat estimates based on 1991 data from *Forests and Biomass Sub-sector in Africa*, African Energy Programme of the African Development Bank, Abidjan, 1996.

Democratic People's Republic of Korea

Sources 1971 - 2007:

Direct communication with various Korean sources, 2002 to 2009.

Secretariat estimates.

The UN Energy Statistics Database.

Sources for Combustible renewables and waste:

The UN Energy Statistics Database.

Kuwait

Data include 50 per cent of the crude oil output of the Neutral Zone.

Sources 1992-2007:

Direct communication with the Ministry of Oil, Economic Affairs, Energy Research, Safat, 2005, 2007, and 2008.

OPEC *Annual Statistical Bulletin*, various editions up to 2007.

The UN Energy Statistics Database.

Direct communication to the Secretariat from the Ministry of Oil, Safat, the Ministry of Planning and the Ministry of Electricity & Water, Kuwait City.

Monthly Digest of Statistics, Ministry of Planning, Central Statistical Office, Kuwait, 1999.

A Survey of the Kuwait Oil Industry, Embassy of the United States of America in Kuwait City, Kuwait, 1993.

Twelfth Annual Report 1991-1992, Kuwait Petroleum Corporation, Kuwait, 1993.

Sources up to 1991:

Quarterly Statistical Bulletin, Central Bank of Kuwait, Kuwait, various editions from 1986 and 1987.

The Kuwaiti Economy, Central Bank of Kuwait, Kuwait, various editions from 1980 to 1985.

Annual Statistical Abstract, Ministry of Planning, Central Statistical Office, Kuwait, 1986 and 1989.

Monthly Digest of Statistics, Ministry of Planning, Central Statistical Office, Kuwait, various editions from 1986 to 1990.

Economic and Financial Bulletin Monthly, Central Bank of Kuwait, Kuwait, various editions from 1983 to 1986.

Kuwait in Figures, The National Bank of Kuwait, Kuwait, 1986, 1987.

Sources for Combustible renewables and waste:

Forestry Statistics, FAO, Rome, 2001, and Secretariat estimates.

Kyrgyzstan

Data for Kyrgyzstan are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Sources 2007:

The UN Energy Statistics Database.

CIS and East European Energy Databook, Eastern Block Research Ltd, 2008.

Direct communication with the National Statistical Committee of Kyrgyzstan, Bishkek.

Secretariat estimates.

Sources 1993 to 2006:

UN ECE annual energy questionnaires, 1993 to 2006.

CIS and East European Energy Databook, Eastern Block Research Ltd, various editions up to 2007.

Asian Development Bank.

Secretariat estimates.

Sources 1990-2002:

Secretariat estimates.

Sources for Combustible renewables and waste:

The UN Energy Statistics Database.

Latvia

Data for Latvia are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Sources 1990-2007:

Direct communication with Statistics Latvia, Riga.

UN ECE annual questionnaires.

Balance of Latvian Energy, EC PHARE Project Implementation Unit, Ministry of Economics, Department of Energy, Riga, 1994.

Secretariat estimates.

Lebanon

Sources up to 2007:

L'Énergie au Liban, Les Bilans Énergétiques, 1994 to 2007, Association Libanaise pour la Maîtrise de l'Énergie, Beirut.

L'Énergie au Liban, le Défi, Association Libanaise pour la Maîtrise de l'Énergie, Beirut, December 1996.

Sources for Combustible renewables and waste:

Forestry Statistics, FAO, Rome, 2000, and Secretariat estimates.

Libyan Arab Jamahiriya

Sources 1971 – 2007:

OPEC *Annual Statistical Bulletin*, various editions up to 2007.

OAPEC Statistical Yearbook, various editions up to 2008.

General Electricity Company (GECOL).

Statistiques d'Electricité du COMELEC, 2006, 2007, Comité Maghrébin de l'Electricité.

Secretariat estimates.

Statistical Abstract of Libya, 19th vol, Government of Libya, Tripoli, 1983.

Sources for Combustible renewables and waste:

The *UN Energy Statistics Database* and Secretariat estimates.

Lithuania

Data for Lithuania are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Sources 1990 – 2007:

Direct communication with Statistics Lithuania, Vilnius.

UN ECE annual energy questionnaires.

Former Yugoslav Republic of Macedonia (FYROM)

Data for FYROM are available starting in 1990. Prior to that, they are included in Former Yugoslavia.

Sources 1990 – 2007:

Direct communication with the State Statistical Office of Macedonia, Department for Environment, Energy and Transport, Skopje.

UN ECE annual energy questionnaires, 1993 to 1995, 1999 to 2007.

Secretariat estimates.

Sources for Combustible renewables and waste:

UN ECE annual energy questionnaires, Secretariat estimates and the *UN Energy Statistics Database* and *Forestry Statistics*, FAO, Rome, 2000.

Malaysia

Sources 2000 – 2007:

Direct communication with the Malaysia Energy Centre (PTM), Kuala Lumpur.

National Energy Balance Malaysia, Ministry of Energy, Water and Communication, Kuala Lumpur, 2002 to 2007.

Sources up to 2000:

Direct communication with Petroliam Nasional Berhad, Kuala Lumpur, April 2001.

Sources for Combustible renewables and waste:

Secretariat estimates.

The *UN Energy Statistics Database* and *Forestry Statistics*, FAO, Rome, 2002.

Malta

In this edition, time series for international marine bunkers have been revised for the period 2000-2006, based on newly available information from the national administration.

Sources 1971 – 2007:

Direct communication with the Central Office of Statistics, Valletta.

UN ECE annual questionnaire on Oil, 1995 to 1998, 2000, 2001, 2005. 2006 and 2007.

UN ECE annual questionnaire on Electricity and heat, 1994 to 1998, 2000, 2001, 2003, 2005, 2006 and 2007.

UN ECE annual questionnaire on Coal, 1994, 1995.

Solar Heat Worldwide, various editions up to 2008.

Secretariat estimates.

Republic of Moldova

Data for Moldova are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Sources 2006-2007:

Direct communication with the National Bureau of Statistics of the Republic of Moldova, Chisinau.

UN ECE annual energy questionnaires.

Sources 2005:

Secretariat estimates.

Sources 1992-2004:

UN ECE annual questionnaire on Electricity and heat, 1991 to 2004.

UN ECE annual questionnaire on Natural gas, 1991 to 2004.

UN ECE annual questionnaire on Coal, 1992 to 2004.

UN ECE annual questionnaire on Oil, 1993 to 1998, 2001 to 2004.

Direct communication with the Ministry of Industry and Energy, July 1992.

Sources 1990-1991:

Secretariat estimates.

Sources for Combustible renewables and waste:

The UN Energy Statistics Database.

Mongolia

Data for Mongolia are available starting in 1985. Prior to that, they are included in Other Asia.

Sources 1985 to 2007:

Mongolian Statistical Yearbook, National Statistical Office, Ulanbataar, various issues up to 2008.

Mongolian Statistical Bulletin, December 2007, National Statistical Office, Ulanbataar, 2008.

Asian Development Bank.

Secretariat estimates.

Sources for Combustible renewables and waste:

FAO wood energy database.

Secretariat estimates.

Morocco

In this edition, time series 2004-2006 were revised based on new more detailed energy balances submitted by the Ministère de l'Énergie et des Mines. Breaks in time series may occur for some products. To ensure continuity of trends, time series for consumption of gas/diesel oil, residual fuel oil and LPG were revised backwards to 1971.

Sources 1992-2007:

Direct communication with the Ministère de l'Énergie et des Mines - Direction des Mines, Rabat.

Annuaire Statistique du Maroc, Haut-Commissariat au Plan, Direction de la Statistique, Rabat, 1980, 1984, 1986 to 2007.

Electricity consumption by economic sector from direct communication from Office National de l'Électricité, Casablanca.

Sources up to 1991:

Rapport d'Activité 1992, Office National de l'Électricité, Casablanca, 1993.

Le Maroc en Chiffres 1986, Ministère du Plan, Direction de la Statistique, Rabat, 1987.

Rapport Annuel, Office National de Recherches et d'Exploitations Pétrolières, Maroc, 1984.

Rapport d'Activité du Secteur Pétrolier 1983, Ministère de l'Énergie et des Mines, Direction de l'Énergie, Rabat, 1984.

Rapport sur les Données Énergétiques Nationales 1979-1981, Ministère de l'Énergie et des Mines, Rabat, 1982.

Sources for Combustible renewables and waste:

The UN Energy Statistics Database and Secretariat estimates.

Mozambique

Sources 1992-2007:

Direct communication with the Ministério da Energia, Maputo.

Direct communication with the Electricidade de Moçambique.

Secretariat estimates.

Annual Statistical Yearbook 1993, 1994, 1995, Eskom, Johannesburg, 1994, 1995, 1996, citing Electricidade de Mozambique, Maputo, as source.

The UN Energy Statistics Database.

Sources for Combustible renewables and waste:

Secretariat estimates based on 1991 data from *Forests and Biomass Sub-sector in Africa*, African Energy Programme of the African Development Bank, Abidjan, 1996.

Myanmar

Sources 1992-2007:

Secretariat estimates.

Direct communications with the Ministry of Energy, Planning Department, Rangoon.

Review of the Financial Economic and Social Conditions, Ministry of National Planning and Economic Development, Central Statistical Organization, Rangoon, 1995, 1996.

Statistical Yearbook, Ministry of National Planning and Economic Development, Central Statistical Organization, Rangoon, 1995, 1996.

The UN Energy Statistics Database.

The ASEAN Energy Statistics Database.

Sources up to 1991:

Sectoral Energy Demand in Myanmar, UNDP Economic and Social Commission for Asia and The Pacific, Bangkok, 1992.

Selected Monthly Economic Indicators, paper no. 3, Ministry of Planning and Finance, Central Statistical Organization, Rangoon, 1989.

Sources for Combustible renewables and waste:

Wood data have been submitted by the Ministry of Energy, from 1985 to 2003.

Secretariat estimates based on 1990 data from *UNDP Sixth Country Programme Union of Myanmar*, World Bank, Programme Sectoral Review of Energy, by Sousing John, et. al., Washington, D.C., 1991.

Namibia

Data for Namibia are available starting in 1991. Prior to that, data are included in Other Africa.

Sources 1991-2007:

Secretariat estimates.

Direct communications with the Ministry of Mines and Energy, Windhoek.

NamPower Annual Report 2004, 2008 – Namibia Power Corporation.

Sources for Combustible renewables and waste:

Secretariat estimates.

Nepal

Energy statistics are reported on a fiscal year basis.

Sources 2007:

Secretariat estimates.

Key Indicators 2008, Asian Development Bank.

Direct communication with the Water and Energy Commission Secretariat (WECS), Ministry of Water Resources, 2004.

Sources for Combustible renewables and waste:

Water and Energy Commission Secretariat (WECS), Ministry of Water Resources.

Netherlands Antilles

Sources 1997-2007:

Direct communication with the Central Bureau of Statistics.

Direct communication with La Isla Refinery.

Secretariat estimates.

Sources up to 1996:

The UN Energy Statistics Database.

Nicaragua

Sources up to 2007:

Estadísticas de los Hidrocarburos, Ministerio de Energía y Minas, 2008.

Balance Energetico Nacional, Ministerio de Energía y Minas, 2006.

Balance Energetico Nacional, Comision Nacional de Energía (CNE), Direccion de Políticas Energeticas, 2000 to 2005.

Estadísticas des Suministro de los Hidrocarburos, Instituto Nicaraguense de Energía, 1999 to 2004.

Informe Annual 1996: Datos Estadísticos del Sector Electrico, INE, Managua, 1999.

SIEE, OLADE.

Sources for Combustible renewables and waste:

SIEE, OLADE up to 1998.

Balance Energetico Nacional, Comision Nacional de Energía (CNE) for 1999 onwards.

Nigeria

Statistical differences may include oil products smuggled into neighbouring countries.

Sources 1992-2007:

Annual Petroleum Bulletin, 1998 to 2007, NNPC, Nigerian National Petroleum Corporation.

Statistical Bulletin, Central Bank of Nigeria, Abuja, 2003 to 2009.

Secretariat estimates.

Monthly Petroleum Bulletin for 2000, NNPC, Nigerian National Petroleum Corporation.

OPEC Annual Statistical Bulletin, various editions up to 2007.

Secretariat estimates.

Annual Report and Statement of Accounts 1995, Central Bank of Nigeria, Lagos, 1996.

Nigerian Petroleum News, Energy Publications, monthly reports, various issues up to May 1998.

Sources up to 1991:

Annual Report and Statement of Accounts, Central Bank of Nigeria, Lagos, various editions from 1981 to 1987.

Basic Energy Statistics for Nigeria, Nigerian National Petroleum Corporation, Lagos, 1984.

NNPC Annual Statistical Bulletin, Nigerian National Petroleum Corporation, Lagos, 1983 to 1987.

The Economic and Financial Review, Central Bank of Nigeria, Lagos, various editions.

Sources for Combustible renewables and waste:

Secretariat estimates based on 1991 data from *Forests and Biomass Sub-sector in Africa*, African Energy Programme of the African Development Bank, Abidjan, 1996.

Oman

Sources 1992-2007:

Statistical Yearbook, Ministry of National Economy various editions from 1999 to 2009.

Direct communication with the Ministry of National Economy, Muscat.

Direct communication with the Ministry of Oil and Gas.

Direct communication with the Ministry of Petroleum and Minerals, Muscat, 1997 1998 and 1999.

Direct communication with the Ministry of Electricity & Water, Office of the Under Secretary, Ruwi, 1998 to 2001.

Quarterly Bulletin December 1994, Central Bank of Oman, Muscat, 1995.

Annual Report 1992, Central Bank of Oman, Muscat, 1993.

Statistical Yearbook, 1994, 1995, 1996, 1997, Ministry of Development, Muscat, 1995 to 1998.

Sources up to 1991:

Quarterly Bulletin, Central Bank of Oman, Muscat, 1986, 1987, 1989 and 1995.

Annual Report to His Majesty the Sultan of Oman, Department of Information and Public Affairs, Petroleum Development, Muscat, 1981, 1982, and 1984.

Oman Facts and Figures 1986, Directorate General of National Statistics, Development Council, Technical Secretariat, Muscat, 1987.

Quarterly Bulletin on Main Economic Indicators, Directorate General of National Statistics, Muscat, 1989.

Statistical Yearbook, Directorate General of National Statistics, Development Council, Muscat, 1985, 1986, 1988 and 1992.

Pakistan

Sources 1992-2007:

Energy Yearbook, Hydrocarbon Development Institute of Pakistan, Ministry of Petroleum and Natural Resources, Islamabad, various editions from 1979 to 2008.

Pakistan Economic Survey 1994-1995, 1996, 1997, Government of Pakistan, Finance Division, Islamabad, 1995, 1997, 1998.

Statistical Supplement 1993/1994, Finance Division, Economic Adviser's Wing, Government of Pakistan, Islamabad, 1995.

Sources up to 1991:

Monthly Statistical Bulletin, no. 12, Federal Bureau of Statistics, Islamabad, December 1989.

1986 Bulletin, The State Bank of Pakistan, Islamabad, 1987.

Sources for Combustible renewables and waste:

Secretariat estimates based on 1991 data from *Household Energy Strategy Study (HESS)* of 1991.

Panama

Export figures for gas/diesel oil and residual fuel oil may include international marine bunkers and international aviation bunkers figures for jet kerosene may include exports. The national administration is working to revise time series for kerosene.

From 2003 onwards, there has been no output of petroleum products, due to refinery closure.

Sources up to 2007:

SIEE, OLADE.

Compendio Estadístico Energético 1970-2007, Ministerio de Economía y Finanzas, Comisión de Política Energética.

Paraguay

The Itaipu hydroelectric plant, operating since 1984 and located on the Paraná River (which forms the border of Brazil and Paraguay) was formed as a joint venture between Eletrobrás and the Paraguayan government. Production is shared equally between Brazil and Paraguay.

The output of petroleum products was zero in 2006 and 2007 due to refinery closure.

Sources 1971-2007:

Balance Energetico Nacional, 1971-2007, Vice-ministerio de Energia y Minas, Ministerio de Obras Públicas y Comunicaciones.

Direct communication with the Ministerio de Obras Públicas y Comunicaciones.

Sources for Combustible renewables and waste:

Direct communication with the Non-Conventional Energy Department of Ministerio de Obras Públicas y Comunicaciones.

Peru

Sources 1971-2007:

Direct communication with the Ministerio de Energía y Minas, Oficina Técnica de Energía, Lima.

Balance Nacional de Energía.

Philippines

Time series 1990-2006 were revised based on a new submission of energy balances by the Department of Energy. Breaks in time series may occur for some products. To ensure continuity of trends, time series for gas/diesel oil, wood and charcoal were revised backwards to 1971.

Sources 1990-2007:

Energy Commodity Account (ECA) and Overall Energy Balance (OEB) 1990-2007 submitted by the Department of Energy, Manila.

Philippine Energy Bulletin 1996, 1997, 1998, 1999.

Sources up to 1989:

Direct communication with the Office of Energy Affairs, Metro Manila.

APEC Energy Statistics 1994, Tokyo, October 1996.

1990 Power Development Program (1990-2005), National Power Corporation, Manila, 1990.

Philippine Medium-term Energy Plan 1988-1992, Office of Energy Affairs, Manila, 1989.

Philippine Statistical Yearbook 1977-1983, National Economic and Development Authority, Manila, 1978-1984.

1985 and 1989 Annual Report, National Power Corporation, Manila, 1986, 1990.

Philippine Economic Indicators, National Economic and Development Authority, Manila, various editions of 1985.

Accomplishment Report: Energy Self-Reliance 1973-1983, Ministry of Energy, Manila, 1984.

Industrial Energy Profiles 1972-1979, vol. 1-4, Ministry of Energy, Manila, 1980.

National Energy Program, Ministry of Energy, Manila, 1982-1987 and 1986-1990.

Philippine Statistics 1974-1981, Ministry of Energy, Manila, 1982.

Energy Statistics, National Economic and Development Authority, Manila, 1983.

Quarterly Review, Office of Energy Affairs, Manila, various editions.

UN Energy Statistics Database.

Secretariat estimates.

Qatar

Autoproducer electricity includes generation by desalination plants since 1988.

Sources 1992-2007:

Direct communication with Qatar Petroleum.

Energy Statistics 2004-2007, Qatar Petroleum, Doha.

Statistics Report, Qatar General Electricity and Water Corporation, 2005 to 2007.

Annual Statistical Abstract, Presidency of the Council of Ministers, Central Statistical Office, Doha, 1994 to 2000.

The UN Energy Statistics Database.

Natural Gas in the World, Cedigaz, Paris, various editions up to 2009.

Secretariat estimates.

Sources up to 1991:

Qatar General Petroleum Corporation 1981-1985, General Petroleum Corporation, Doha, 1986.

Economic Survey of Qatar 1990, Ministry of Economy and Commerce, Department of Economic Affairs, Doha, 1991.

Statistical Report 1987 Electricity & Water, Ministry of Electricity, Doha, 1988.

State of Qatar Seventh Annual Report 1983, Qatar Monetary Agency, Department of Research and Statistics, Doha, 1984.

Sources for Combustible renewables and waste:

Forestry Statistics, FAO, Rome, 2000, and Secretariat estimates.

Romania

Data on quantities of coke oven coke used into blast furnaces do not correspond to the official submission of the national administration, as they have been estimated by the Secretariat to ensure a carbon balance in the blast furnace transformation.

Sources 1992-2007:

Direct communication with the National Institute of Statistics, Bucharest.

UN ECE annual energy questionnaires.

Buletin Statistic de Informare Publica, Comisia Nationala Pentru Statistica, Bucharest, various issues to June 1995.

Renel Information Bulletin, Romanian Electricity Authority, Bucharest, 1990, 1991, 1992, 1993, 1994.

Sources up to 1991:

Anuarul Statistic al Republicii Socialiste Romania, Comisia Nationala Pentru Statistica, Bucharest, 1984, 1985, 1986, 1990, 1991.

Sources for Combustible renewables and waste:

UN ECE annual energy questionnaires and Secretariat estimates.

Russian Federation

Data for the Russian Federation are available starting in 1990. Prior to that, they are included in Former Soviet Union.

In 2007, the Federal State Statistics Service has introduced a new classification, the Russian Classification of Economic Activities (OKVED), oriented towards the harmonization with the Statistical Classification of Economic Activities in the European Community (NACE Rev.1). Data for the years prior to 2005 were submitted to the Secretariat according to the Russian Classification of the Industries of the Economy (OK-ONKH). Therefore, breaks in time series for final consumption sectors may occur between 2004 and 2005.

Sources 1990-2007:

Direct communication with the Department of Foreign Statistics and International Cooperation from the Federal State Statistics Service (Rosstat), Moscow, Russian Federation.

UN ECE annual energy questionnaires.

Secretariat estimates.

Energy trade: direct communication with the Federal State Statistics Service, July 1994.

Statistical Yearbook of Russia 1994. The State Committee of Statistics, Moscow, 1994.

The Russian Federation in 1992, Statistical Yearbook, The Federal State Statistics Service, Moscow, 1993.

Russian Federation External Trade, annual and quarterly various editions, the Federal State Statistics Service, Moscow.

Statistical Bulletin, various editions, The State Committee of Statistics of the CIS, Moscow, 1993, 1994.

Statistical Bulletin n° 3, The Federal State Statistics Service, Moscow, 1992.

Fuel and Energy Balance of Russia 1990, The Federal State Statistics Service, Moscow, 1991.

Energetika, Energo-Atomisdat, Moscow, 1981 to 1987.

Sources for Combustible renewables and waste:

The Federal State Statistics Service and Secretariat estimates.

Saudi Arabia

The data for crude oil production include 50 per cent of the output of the Neutral Zone.

Natural gas consumption in the oil refineries may include quantities used for oil and gas extraction and for electricity generation in oil refineries.

Electricity production from autoproducers includes generation by desalination plants since 1979.

Sources 1992-2007:

Ministry of Petroleum and Mineral Resources, 2008.

Annual Reports, Saudi Aramco, various issues.

Direct communication with the Saudi Electricity Company.

Annual Report, Saudi Arabian Monetary Agency, Research and Statistics Department, Riyadh, 2008.

Middle East Petroleum Databook, FACTS Global Energy Group, 2008.

Electricity Growth and Development in the Kingdom of Saudi Arabia up to the year from 1416H. (1996G.), 1420 H (1999/2000G) and 1423/1424 H (2003G), Ministry of Industry and Electricity, Riyadh, 1997, 1998, 1999, 2004.

OAPEC Statistical Yearbook, various editions up to 2008.

OPEC Annual Statistical Bulletin, various editions up to 2007.

Secretariat estimates.

Direct communication from the Central Department of Statistics of the Ministry of Planning and oil industry sources.

A Survey of the Saudi Arabian Oil Industry 1993, Embassy of the United States of America in Riyadh, Riyadh, January 1994.

Sources up to 1991:

Annual Reports, ARAMCO, various issues.

Petroleum Statistical Bulletin 1983, Ministry of Petroleum and Mineral Resources, Riyadh, 1984.

Achievement of the Development Plans 1970-1984, Ministry of Planning, Riyadh, 1985.

The 1st, 2nd, 3rd and 4th Development Plans, Ministry of Planning, Riyadh, 1970, 1975, 1980 and 1985.

Annual Report, Saudi Arabian Monetary Agency, Research and Statistics Department, Riyadh, 1984, 1985, 1986, 1988, 1989.

Statistical Summary, Saudi Arabian Monetary Agency, Research and Statistics Department, Riyadh, 1986.

Sources for Combustible renewables and waste:

Forestry Statistics, FAO, Rome, 2000, and Secretariat estimates.

Senegal

Data on electricity generation from solid biomass have been submitted for the first time in 2005. Due to changes in data sources, there could be breaks in series between 2002 and 2003.

Sources 2000-2007:

Bilans énergétiques du Sénégal 2003, 2004, 2005, 2006, Direction de l'Energie, Dakar.

Secretariat estimates.

Sources 1992-1999:

Direct communication with the Ministère de l'Energie, des Mines et de l'Industrie, Direction de l'Energie, Dakar, 1997 to 2002.

Direct communication with the Ministère de l'Energie, des Mines et de l'Hydraulique, Comité National des Hydrocarbures, Dakar, 2002.

Direct communication from oil industry sources, Société Africaine de raffinage.

Direct communication from electricity industry sources, SENELEC.

Report of Senegal on the Inventory of Greenhouse Gases Sources, Ministère de l'Environnement et de la Protection de la Nature, Dakar, 1994.

Direct communication to the Secretariat from ENDA - Energy Program, Dakar, 1997.

The UN Energy Statistics Database.

Sources up to 1991:

Situation Economique 1985, Ministère de l'Economie et des Finances, Direction de la Statistique, Senegal, 1986.

Sources for Combustible renewables and waste:

Secretariat estimates based on 1994 data from *Forests and Biomass Sub-sector in Africa*, African Energy Programme of the African Development Bank, Abidjan, 1996, and from direct communication with ENDA, Senegal.

Serbia

Data for Serbia are available starting in 1990. Prior to that, they are included in Former Yugoslavia.

Data for Serbia include Montenegro until 2004 and Kosovo until 1999.

Breaks in time series for oil products and natural gas may appear between 2006 and 2007 because of newly available data for 2007 (see Sources).

Sources 1990-2007:

Direct communication with the Statistical Office of the Republic of Serbia, Belgrade, Serbia.

UNECE annual energy questionnaires on Coal, Electricity and Heat, 2004 to 2007.

Pilot study: *Energy Balances, 2007 - Oil and Derivates of Oil, Natural Gas, Geothermal Energy and Energy Balance of the Republic of Serbia*, Statistical Office of the Republic of Serbia, Belgrade, 2009.

Secretariat estimates.

Direct communication with the Federal Ministry of Economy, Belgrade, 2001 and 2002.

Singapore

Electricity generation from liquid fuels may include quantities from orimulsion, waste and manufactured gases.

Sources 1992-2007:

Direct communication with the IE Singapore Resource Centre.

Data from Energy Market Authority and Singapore Maritime Port Authority.

Secretariat estimates.

Yearbook of Statistics Singapore 1993, 1995, 1996, 2003, 2007, Department of Statistics, Singapore, 1994, 1996, 1997, 2004, 2008.

Direct submissions from oil industry sources.

The Strategist Oil Report, Singapore, various issues up to March 1999.

Singapore Trade Statistics, Department of Statistics, Singapore, various editions from 1985 to 1995 and from 2000 to 2007.

Petroleum in Singapore 1993/1994, Petroleum Intelligence Weekly, Singapore, 1994.

AEEMTRC, 1996.

The UN Energy Statistics Database.

Sources up to 1991:

Monthly Digest of Statistics, Department of Statistics, Singapore, various editions from 1987 to 1989.

Yearbook of Statistics Singapore 1975/1985, Department of Statistics, Singapore, 1986.

ASEAN Oil Movements and Factors Affecting Intra-ASEAN Oil Trade, Institute of Southeast Asian Studies, Singapore, 1988.

The Changing Structure of the Oil Market and Its Implications for Singapore's Oil Industry, Institute of Southeast Asian Studies, Singapore, 1988.

Public Utilities Board Annual Report (1986 and 1989), Public Utilities Board, Singapore, 1987 and 1990.

Sources for Combustible renewables and waste:

The UN Energy Statistics Database and Secretariat estimates.

Slovenia

Data for Slovenia are available starting in 1990. Prior to that, they are included in Former Yugoslavia.

A new energy data collection system was implemented in January 2001, causing some breaks in time series between 1999 and 2000.

Sources 1993-2007:

Direct communication with the Statistical Office of the Republic of Slovenia, Ljubljana.

UN ECE annual energy questionnaires.

South Africa

Sources 2007:

Statistical release on electricity generated and available for distribution, Statistics South Africa, (December 2007).

Annual report 2006, South Africa Petroleum Industry Association (SAPIA).

Eskom Annual Report, Electricity Supply Commission (ESKOM), South Africa, 2008.

Secretariat estimates.

Sources 1992-2006:

Energy balances submitted to the Secretariat from the Department of Minerals and Energy, 2003 to 2007.

Electricity generated and available for distribution, Statistics South Africa, various editions up to 2007.

Direct submission from the Institute for Energy Studies, Rand Afrikaans University, Pretoria, 1998 to 2001.

Digest of South African Energy Statistics 1998.

Direct submissions from the Energy Research Institute, University of Cape Town.

Eskom Annual Report, Electricity Supply Commission (ESKOM), South Africa, 1989 to 1994.

Statistical Yearbook, Electricity Supply Commission (ESKOM), South Africa, 1983 to 1994.

South Africa's Mineral Industry, Department of Mineral and Energy Affairs, Braamfontein, 1995.

South African Energy Statistics, 1950-1993, Department of Mineral and Energy Affairs, Pretoria, 1995.

Wholesale Trade Sales of Petroleum Products, Central Statistical Service, Pretoria, 1995.

South African Coal Statistics 1994, South African Coal Report, Randburg, 1995.

Energy Balances in South Africa 1970-1993, Energy Research Institute, Plumstead, 1995.

Sources up to 1991:

Statistical News Release 1981-1985, Central Statistical Service, South Africa, various editions from 1986 to 1989.

Annual Report Energy Affairs 1985, Department of Mineral and Energy Affairs, Pretoria, 1986.

Energy Projections for South Africa (1985 Balance), Institute for Energy Studies, Rand Afrikaans University, South Africa, 1986.

Sources for Combustible renewables and waste:

South African Energy Statistics 1950-1989, No. 1, National Energy Council, Pretoria, 1989, and Secretariat estimates.

Former Soviet Union

Data for individual countries of the Former Soviet Union are available starting in 1990, and most of the information on 1990 and 1991 was estimated by the IEA Secretariat. Because of large breaks in reporting occurred in the early 1990's, breaks may occur in 1990 for all regional totals.

Coal production statistics refer to unwashed and un-screened coal up to 1990. IEA coal statistics normally refer to coal after washing and screening for the removal of inorganic matter. Also, see notes under 'Classification of Fuel Uses' and 'Heat', in Part I.1, Issues of data quality.

The commodity balances presented for the Former Soviet Union include Secretariat estimates of fuel consumption in the main categories of transformation. These estimates are based on secondary sources and on isolated references in FSU literature.

In old editions of this publication, intra-FSU trade was excluded.

Sources up to 1989:

Statistical Yearbook, The State Committee for Statistics of the USSR, Moscow, various editions from 1980 to 1989.

External Trade of the Independent Republics and the Baltic States, 1990 and 1991, the State Committee of Statistics of the CIS, Moscow, 1992.

External Trade of the USSR, annual and quarterly, various editions, The State Committee of Statistics of the USSR, Moscow, 1986 to 1990.

CIR Staff Paper no. 14, 28, 29, 30, 32 and 36, Center for International Research, U.S. Bureau of the Census, Washington, 1986, 1987 and 1988.

Yearbook on Foreign Trade, The Ministry of Foreign Trade, Moscow, 1986.

Sri Lanka

In this edition, historical data were revised for the period 2000-2006 based on newly available energy balances provided by the Sri Lanka Sustainable Energy Authority. Breaks in time series may occur between 1999 and 2000.

Sources 1992-2007:

Direct communication with the Sri Lanka Sustainable Energy Authority, Colombo.

Sri Lanka Energy Balances 2000-2007.

The UN Energy Statistics Database.

Direct communication with the Department of Census and Statistics, 2003 to 2006.

Annual Report 1993, Central Bank of Sri Lanka, Colombo, July 1994.

Direct communication with the Ceylon Electricity Board, *Sri Lanka Energy Balances, 1994*.

The UN Energy Statistics Database.

Sources up to 1991:

Energy Balance Sheet 1991, 1992, Energy Unit, Ceylon Electricity Board, Colombo, 1992, 1993.

Bulletin 1989, Central Bank of Sri Lanka, Colombo, July 1989.

Bulletin (monthly), Central Bank of Sri Lanka, Colombo, May 1992.

Sectoral Energy Demand in Sri Lanka, UNDP Economic and Social Commission for Asia and The Pacific, Bangkok, 1992.

External Trade Statistics 1992, Government of Sri Lanka, Colombo, 1993.

Sources for Combustible renewables and waste:

Energy Conservation Fund and Ceylon Electricity Board.

Sudan

In this edition, time series for combustible renewables and waste and petroleum products were revised for the period 2000-2005, based on newly available information from the Ministry of Energy and Mines.

Sources 1992-2007:

Direct communication with the Ministry of Energy and Mines, Khartoum.

Sudan Energy Handbook 2006, Ministry of Energy and Mines.

Secretariat estimates.

Sources up to 1991:

Foreign Trade Statistical Digest 1990, Government of Sudan, Khartoum, 1991.

Sources for Combustible renewables and waste:

Secretariat estimates based on 1990 data from Bhagavan, M.R., Editor, *Energy Utilities and Institutions in Africa*, AFREPREN, Nairobi, 1996.

Syrian Arab Republic

Sources 1992-2007:

OAPEC Statistical Yearbook, various editions up to 2008.

Natural Gas in the World, Cedigaz, Paris, various editions up to 2009.

Secretariat estimates.

The UN Energy Statistics Database.

Quarterly Bulletin, Central Bank of Syria, Research Department, Damascus, 2001.

Statistical Abstract 1992-1998, Office of the Prime Minister, Central Bureau of Statistics, Damascus, 1993, 1996, 1997, 1998, 1999.

Sources up to 1991:

Quarterly Bulletin, Central Bank of Syria, Research Department, Damascus, 1984.

Sources for Combustible renewables and waste:

Forestry Statistics, FAO, Rome, 2000, and Secretariat estimates.

Tajikistan

Data for Tajikistan are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Sources 1990-2007:

Direct communication with the State Committee on Statistics, Republic of Tajikistan, Dushanbe.

UN ECE annual questionnaires, 1991 to 2007.

CIS and East European Energy Databook, Eastern Block Research Ltd, various editions up to 2008.

Secretariat estimates.

Industry of Tajikistan, Statistics, the State Committee on Statistics of the Republic of Tajikistan, 2004.

Tanzania, United Republic of

Sources up to 2007:

Secretariat estimates.

The Economic Survey 2003, 2004, 2005, 2006, 2007 The President's Office - Planning and Privatization, Dar Es Salaam – Tanzania.

Annual Report 2007, Orca Exploration Group Inc.

Direct communication with the Ministry of Energy and Minerals and the electricity utility.

Tanzanian Economic Trends, Economic Research Bureau, University of Dar-es-Salaam, 1991.

Sources for Combustible renewables and waste:

Secretariat estimates based on 1990 data from *Energy Statistics Yearbook 1990*, SADC, Luanda, 1992.

Thailand

Sources 2002-2007:

Electric Power in Thailand, Ministry of Energy, Department of Alternative Energy Development and Efficiency, 2002 to 2007.

Oil and Thailand, Ministry of Energy, Department of Alternative Energy Development and Efficiency, 2002 to 2007.

Thailand Energy Situation, Ministry of Energy, Department of Alternative Energy Development and Efficiency, 2002 to 2007.

Sources up to 2001:

Electric Power in Thailand, Ministry of Science, Technology and Energy, National Energy Administration, Bangkok, 1985, 1986, 1988 to 2001.

Oil and Thailand, Ministry of Science, Technology and Energy, National Energy Administration, Bangkok, 1979 to 2001.

Thailand Energy Situation, Ministry of Science, Technology and Energy, National Energy Administration, Bangkok, 1978 to 2001.

Sources for Combustible renewables and waste:

Thailand Energy Situation, Ministry of Energy, Department of Alternative Energy Development and Efficiency, 2002 to 2006.

Togo

Sources 1999 to 2007:

Direct communication with the Ministère de l'Équipement, des Mines, de l'Énergie et des Postes et Télécommunications, 2009.

Bilans Énergétiques du Togo 2007, 2006, 2005, 2004, 2003, 2002, 2001, 2000, 1999.

Sources up to 1999:

Secretariat estimates.

Trinidad and Tobago

Sources 1992-2007:

Direct communication with the Ministry of Energy and Natural Resources, Port of Spain.

SIEE, OLADE.

Natural Gas in the World, Cedigaz, Paris, various editions up to 2009.

Annual Economic Survey 1994, 1995, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, Central Bank of Trinidad and Tobago, Port of Spain, 1995 to 2007.

Petroleum Industry Monthly Bulletin, Ministry of Energy and Natural Resources, Port of Spain, various issues up to 1999.

Sources up to 1991:

Annual Statistical Digest, Central Statistical Office, Port of Spain, 1983, 1984.

History and Forecast, Electricity Commission, Port of Spain, 1987.

Annual Report, Ministry of Energy and Natural Resources, Port of Spain, 1985, 1986.

The National Energy Balances 1979-1983, Ministry of Energy and Natural Resources, Port of Spain, 1984.

Trinidad and Tobago Electricity Commission Annual Report, Trinidad and Tobago Electricity Commission, Port of Spain, 1984, 1985.

Sources for Combustible renewables and waste:

SIEE, OLADE.

Tunisia

A significant increase in crude oil production was reported for 2007 due to the start up of several new development wells and the beginning of production of the Oudna field.

Sources 1992 to 2007:

Direct communication with the Observatoire National de l'Énergie, Agence Nationale pour la Maîtrise de l'Énergie, Tunis.

Société Tunisienne de l'Électricité et du Gaz, Rapport Annuel 2007.

Statistiques d'Électricité du COMELEC, 2006, 2007, Comité Maghrébin de l'Électricité.

Sources up to 1991:

Bilan Energétique de l'Année 1991, Banque Centrale de Tunisie, Tunis, September 1992.

Rapport d'Activité 1990, Observatoire National de l'Energie, Agence pour la Maîtrise de l'Energie, Tunis, 1991.

Rapport Annuel 1990, Banque Centrale de Tunisie, Tunis, 1991.

Activités du Secteur Pétrolier en Tunisie, Banque Centrale de Tunisie, Tunis, 1987.

Statistiques Financières, Banque Centrale de Tunisie, Tunis, 1986.

Entreprise Tunisienne d'Activités Pétrolières (ETAP), Tunis, 1987.

Annuaire Statistique de la Tunisie, Institut National de la Statistique, Ministère du Plan, Tunis, 1985, 1986.

L'Economie de la Tunisie en Chiffres, Institut National de la Statistique, Tunis, 1984, 1985.

Activités et Comptes de Gestion, Société Tunisienne de l'Electricité et du Gaz, Tunis, 1987.

Sources for Combustible renewables and waste:

Secretariat estimates based on 1991 data from *Analyse du Bilan de Bois d'Energie et Identification d'un Plan d'Action*, Ministry of Agriculture, Tunis, 1998.

Turkmenistan

Data for Turkmenistan are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Sources up to 2007:

CIS and East European Energy Databook, Eastern Block Research Ltd, various editions up to 2008.

Asian Development Bank.

Natural Gas in the World, Cedigaz, Paris, various editions up to 2009.

Secretariat estimates.

Direct communication with the National Institute on Statistics and Forecasting of Turkmenistan, November 1999 and January 2001.

Ukraine

Data for Ukraine are available starting in 1990. Prior to that, they are included in Former Soviet Union.

The State Statistics Committee submitted detailed final consumption data for coal and natural gas for the

first time in 2006. Therefore, breaks in time series may occur between 2003 and 2004.

Official Ukrainian coal statistics refer to unwashed and unscreened coal prior to 1995. IEA statistics normally refer to coal after washing and screening for the removal of inorganic matter. Therefore, the IEA revised Ukrainian coal supply and demand statistics downward to reflect levels of washed coal.

Sources 1992-2007:

Direct communication with the State Statistics Committee of Ukraine, Kiev 2004 to 2009.

UN ECE annual questionnaire on Coal, 1991, 1992 and 1995 to 2007.

UN ECE annual questionnaire on Oil, 1992 and 1995 to 2007.

UN ECE annual questionnaire on Natural gas, 1992 and 1995 to 2007.

UN ECE annual questionnaire on Electricity and heat, 1991, 1992, and 1994 to 2007.

Secretariat estimates.

Direct communication with the Ministry of Statistics, the Coal Ministry, the National Dispatching Company, 1995.

Coal: Direct communications with from the State Mining University of Ukraine, 1995, 1996.

Natural Gas: Direct communication with Ukrgazprom, February 1995.

Direct communication with the Ministry of Statistics of the Ukraine, July 1994.

Ukraine in 1992, Statistical Handbook, Ministry of Statistics of the Ukraine, Kiev, 1993.

Ukraine Power Demand and Supply Options, The World Bank, Washington, 1993.

Power Industry in Ukraine, Ministry of Power and Electrification, Kiev, 1994.

Energy Issues Paper, Ministry of Economy, March 1995.

Ukraine Energy Sector Statistical Review 1993, 1994, 1995, 1996, 1997, The World Bank Regional Office, Kiev, 1994, 1995, 1996, 1997, 1998.

Global Energy Saving Strategy for Ukraine, Commission of the European Communities, TACIS, Madrid, July 1995.

Sources 1990-1991:

Secretariat estimates.

Sources for Combustible renewables and waste:

Statistical Office in Kiev, The World Bank and Secretariat estimates.

United Arab Emirates

Sources 1993-2007:

OPEC *Annual Statistical Bulletin*, various editions up to 2007.

OAPEC *Statistical Yearbook*, various editions up to 2008.

Natural Gas in the World, Cedigaz, Paris, various editions up to 2009.

Secretariat estimates.

Statistical Yearbook 1995, 1996, 1998, Department of Planning, Abu Dhabi, 1998, 2001.

Direct communications with the Ministry of Electricity and Water, Abu Dhabi, March 2001.

The UN Energy Statistics Database.

Sources up to 1992:

Annual Report 1998, Ministry of Electricity & Water, Dubai.

Abu Dhabi National Oil Company, 1985 Annual Report, Abu Dhabi National Oil Company, Abu Dhabi, 1986.

United Arab Emirates Statistical Review 1981, Ministry of Petroleum and Mineral Resources, Abu Dhabi, 1982.

Annual Statistical Abstract, Ministry of Planning, Central Statistical Department, Abu Dhabi, various editions from 1980 to 1993.

Sources for Combustible renewables and waste:

Forestry Statistics, FAO, Rome, 2001, and Secretariat estimates.

Uruguay

The power produced from the Salto Grande hydroelectric plant, operating since 1980 and located on the Uruguay River (natural border of Argentina and Uruguay), is equally shared between the two countries. Electricity exports include power produced in Salto Grande and exported to Argentina.

Sources 1990-2007:

Balance Energetico Nacional, Ministerio de Industria, Energía y Minería, Dirección Nacional de Energía, Montevideo, 1971 to 2007.

Sources for Combustible renewables and waste:

Dirección Nacional de Energía and SIEE, OLADE.

Uzbekistan

Data for Uzbekistan are available starting in 1990. Prior to that, they are included in Former Soviet Union.

Up to 1994, crude oil includes NGL.

Sources 1990-2007:

Asian Development Bank.

CIS and East European Energy Databook, Eastern Block Research Ltd, various editions up to 2008.

Secretariat estimates.

Direct communications to the Secretariat from the Institute of Power Engineering and Automation, Academy of Sciences of Uzbekistan 1994, 1996, 1998 to 2003.

UN ECE annual energy questionnaires, 1995 to 1997.

Venezuela

Sources up to 2007:

Balance Energético de Venezuela, Dirección de Planificación Energética, Ministerio de Energía y Minas.

SIEE, OLADE.

Estadísticas consolidadas, Cámara Venezolana de la Industria Eléctrica, 1996-2007.

Petróleo y Otros Datos Estadísticos, Dirección General Sectorial de Hidrocarburos, Caracas, 1993- 2004, 2007.

Estadísticas consolidadas, Cámara Venezolana de la Industria Eléctrica, 2006.

Transformando la energía en desarrollo social, CVG EDELCA Informe Anual 2006.

Petróleo y Otros Datos Estadísticos, Dirección General Sectorial de Hidrocarburos, Dirección de Planificación y Economía de Hidrocarburos, Caracas, 1983 to 1991.

Balance Energetico Consolidado de Venezuela 1970-1984, Ministerio de Energía y Minas, Dirección General Sectorial de Energía, División de Programación Energética, Caracas, 1986.

Compendio Estadístico del Sector Eléctrico, Ministerio de Energía y Minas, Dirección de Electricidad, Carbón y Otras Energías, Caracas, 1984, 1989, 1990, 1991.

Memoria y Cuenta, Ministerio de Energía y Minas, Caracas, 1991.

Petróleos de Venezuela S.A. 1985 Annual Report,
Petróleos de Venezuela, Caracas, 1991.

Sources for Combustible renewables and waste:

The UN Energy Statistics Database.

Vietnam

Data for 2006 were revised based on a new submission available. For electricity, output by source was estimated by the Secretariat. Large volumes of coal exports were reclassified from bituminous coal to anthracite, after comparison with reports on coal trade.

Sources 1992-2007:

Direct communications with the Institute of Energy and the Ministry of Industry.

APEC annual energy statistics questionnaires.

Secretariat estimates.

Annual Report 2006, Petrovietnam, Vietnam national Oil and Gas Group.

Direct communications with the Center for Energy-Environment Research and Development, Pathumthami, 1997 to 1999.

Direct communication with the oil industry.

Sectoral Energy Demand in Vietnam, UNDP Economic and Social Commission for Asia and the Pacific, Bangkok, 1992.

Energy Commodity Account of Vietnam 1992, Asian Development Bank, Manila, 1994.

World Economic Problems (20), National Centre for Social Sciences of the S.R. Vietnam, Institute of World Economy, Hanoi, 1993.

Vietnam Energy Review, Institute of Energy, Hanoi, 1995, 1997, 1998.

Sources for Combustible renewables and waste:

Secretariat estimates based on 1992 data from *Vietnam Rural and Household Energy Issues and Options: Report No. 161/94*, The World Bank, ES-MAP, Washington, D.C., 1994.

Yemen

Sources 1992-2007:

Oil & Gas in Figures 2001 – 2007, Ministry of Oil & Minerals, Statistics Technical Committee, Republic of Yemen, Yemen, 2008.

Oil, Gas and Minerals Statistics, Annual Bulletin 2001, 2002, 2003, 2004, 2005 and 2006 Ministry of Oil & Minerals, Statistics Technical Committee, Republic of Yemen, Yemen, 2001 to 2007.

Statistical Yearbook 1993 to 1998, 2005, 2006, 2007 Ministry of Planning and Development, Central Statistical Organization, Republic of Yemen, Yemen, 1994 to 1999 and 2004, 2006, 2007, 2008.

Statistical Bulletin 2006, 2007 Arab Union of Producers, Transporters and Distributors of Electricity, Jordan, 2007, 2008.

OAPEC Statistical Yearbook, various editions up to 2008.

Secretariat estimates.

Direct communications to the Secretariat from the Yemen General Oil and Gas Corporation, the Public Electricity Corporation, and the National Information Center, Sana'a, 2001.

Statistical Indicators in the Electricity Sector, Ministry of Planning and Development, Central Statistical Organization, Republic of Yemen, Yemen, 1993.

Sources up to 1991:

Statistical Yearbook, Government of Yemen Arab Republic, Yemen, 1988.

Sources for Combustible renewables and waste:

The UN Energy Statistics Database.

Forestry Statistics, FAO, Rome, 2000, and Secretariat estimates.

Former Yugoslavia

Data for individual countries of the Former Yugoslavia are available starting in 1990, and most of the information on 1990 and 1991 was estimated by the IEA Secretariat. Because of large breaks in reporting occurred in the early 1990's, breaks may occur in 1990 for all regional totals.

Sources 1990 to 2007:

From 1990 onwards, the statistics for the Former Yugoslavia have been calculated by adding together the basic statistics of the individual countries: Croatia, Slovenia, Former Yugoslav Republic of Macedonia, Bosnia-Herzegovina, and Serbia⁹. In the case of the latter two, the quality of data beyond basic production

⁹. Serbia includes Montenegro until 2004 and Kosovo until 1999.

flows is questionable. Oil imports into Former Yugoslavia, breaking the UN embargo of Serbia are theoretically included, although the absolute levels of this trade are not known with any certainty.

Sources up to 1989:

Statisticki Godisnjak Jugoslavije, Socijalistička Federativna Republika Jugoslavija, Savezni Zavod Za Statistiku, Beograd, 1985 to 1991.

Indeks, Socijalistička Federativna Republika Jugoslavija, Beograd, 1990, 1991, 1992.

Zambia

Sources 1971-2007:

The World Bank.

Secretariat estimates.

Economic Report 2003, Ministry of Finance, Republic of Zambia.

Energy Statistics Bulletin 1980-1999, The Department of Energy, Lusaka, 2000.

Direct communication to the Secretariat from oil and coal industry sources, and Secretariats estimates.

AFREPEN, 2002.

Annual Statistical Yearbook 1993, 1994, 1995 (Consumption in Zambia 1978-1983), Eskom, Lusaka, 1984.

Sources for Combustible renewables and waste:

Secretariat estimates based on 1991 data from *Forests and Biomass Sub-sector in Africa*, African Energy Programme of the African Development Bank, Abidjan, 1996.

Zimbabwe

Sources 2006-2007:

Secretariat estimates.

Sources 1996-2005:

Secretariat estimates.

Direct communication with the Ministry of Energy and Power Development, 2007.

Direct communication with the Zimbabwe Electricity Supply Authority (ZESA), 2003, 2005, 2006.

African Economic Outlook 2004, OECD, Paris, 2004.

Direct communication to the Secretariat from the Department of Energy Resources and Development, February 2002, AFREPEN, 2002.

Direct communication to the Secretariat from the Ministry of Environment and Tourism, Harare, 1999, 2000.

Direct communication to the Secretariat from the electricity utility.

Electricity Statistics Information, Central Statistical Office, Causeway, February 1998.

Sources 1992-1995:

Eskom Annual Statistical Yearbook 1993, 1994, 1995, Johannesburg, 1994, 1995, 1996, citing Zimbabwe Electricity Supply Authority, Harare as source.

The UN Energy Statistics Database.

Sources up to 1991:

Zimbabwe Statistical Yearbook 1986, Central Statistical Office, Harare, 1990.

Quarterly Digest of Statistics, Central Statistical Office, Harare, 1990.

Zimbabwe Electricity Supply Authority Annual Report, Zimbabwe Electricity Supply Authority, Harare, 1986 to 1991.

Sources for Combustible renewables and waste:

Secretariat estimates based on 1991 data from *Forests and Biomass Sub-sector in Africa*, African Energy Programme of the African Development Bank, Abidjan, 1996.

Other Africa, Other Latin America and Other Asia

The series for these regions are obtained by adding data corresponding to their individual countries (see lists in Section 4, Geographical coverage). As a consequence, intra-regional trade is included as part of total trade. Therefore, trade is likely to be overstated.

7. ABBREVIATIONS

| | |
|------------------|---|
| Btu: | British thermal unit |
| GWh: | gigawatt hour |
| kcal: | kilocalorie |
| kg: | kilogramme |
| kJ: | kilojoule |
| kt: | kilotonne |
| Mt: | million tonnes |
| m ³ : | cubic metre |
| t: | metric ton = tonne = 1000 kg |
| TJ: | terajoule |
| toe: | tonne of oil equivalent = 10 ⁷ kcal |
| CHP: | combined heat and power |
| GCV: | gross calorific value |
| GDP | gross domestic product |
| HHV: | higher heating value = GCV |
| NCV: | net calorific value |
| PPP: | purchasing power parity |
| TFC: | total final consumption |
| TPES: | total primary energy supply |
| AfDB | African Development Bank |
| EU-27: | European Union - 27 |
| FAO: | Food and Agriculture Organisation of the United Nations |
| IEA: | International Energy Agency |
| OECD: | Organisation for Economic Co-Operation and Development |
| OLADE: | Organización Latinoamericana de Energía |
| UN: | United Nations |
| .. | not available |
| - | nil |
| x | not applicable |