

**EM1: ENERGY CONSUMPTION BY TYPE AND YEAR****H****Concepts and Definitions**

*Energy consumption* refers to all the energy used for heat, power, and electricity generation, regardless of where the energy was produced.

**Types of Fuels**

*Solid fuels* include hard coal, lignite, peat, patent fuel, lignite briquettes, peat briquettes, coke and bituminous sands.

*Liquid fuels* include crude oil, natural gas liquids, plant condensate, gasoline, petroleum products, jet fuel, kerosene, liquefied petroleum gas, refinery gas, feedstock, naphtha, lubricants, gas/diesel oils and residual (heavy) fuel oils and bitumen.

*Gaseous fuels* include natural gas and other petroleum gases, such as gasworks gas, coke oven gas and blast furnace gas.

*Primary electricity* refers to electricity generated by noncombustible energy sources and includes electrical energy of geothermal, hydro, nuclear, tide, wind, wave/ocean and solar origin.

Traditional fuels include estimates of the consumption of charcoal, fuel wood and bagasse.

- *Charcoal* is solid residue consisting mainly of carbon and obtained by the destructive distillation of wood in the absence of air.
- *Fuel wood* is all wood in the rough that is used for fuel purposes.
- *Bagasse* is the cellulosic residue left after sugar is extracted from sugar cane.

*Energy Statistics: Definitions, Units of Measure, and Conversion Factors* (see [http://unstats.un.org/unsd/publication/SeriesF/SeriesF\\_44E.pdf](http://unstats.un.org/unsd/publication/SeriesF/SeriesF_44E.pdf) [last accessed: July 2nd 2009]).

**Method of Computation**

The data on energy consumption refer to the apparent energy consumption of the population. The data is derived using the formula:

$$\text{Energy consumption} = \text{energy production} + \text{energy imports} - \text{energy exports} - \text{bunkers} \\ \pm \text{stock changes}$$

**Indicator Relevance**

Energy use is a key aspect of consumption and production. Traditionally, energy has been regarded as the engine of

economic progress. However, its production, consumption, and by-products have resulted in major impacts on the environment. Energy consumption by year and type, therefore, gives an indication of the amount and types of fuel used in a year which allows for crucial estimations of the environmental impacts.

Moreover, energy consumption by type and year gives an indication of the amount of fossil fuels used in any given year. This is important since consumption of fossil fuels is a major contributor to global warming and air pollution. Fossil fuel resources should be conserved to support long term development and to reduce the negative environmental impacts. Consumption of fossil fuels can be reduced by regulating energy prices, which will internalise environmental and social costs, manage demand, encourage the development of alternative renewable energy sources, and hence, reduce the negative environmental impacts resulting from the consumption of fossil fuels.

Fuel consumption is highly dependent on urban land use density and the fuel efficiency of the vehicle fleet. Increasing fuel consumption may be the consequence of suburbanization of the work force, increasing income and car ownership, and reduction of passenger numbers per vehicle. This indicator, energy consumption by type and year, also provides, therefore, indirect information about urban congestion and contamination of land and water.

**Data Assessment**

The concept of energy consumption by type and year is harmonized across the region since all reporting Member States followed the internationally recommended definition of energy consumption.

Of the fourteen (14) Member States who usually provide data, only eight (8) provided data for this indicator and the data provided were sparse with very little detail. In addition, only one of the Associate Members of the Community provided data for this indicator.

**Data Sources**

Please refer **Appendix 1.5.1** for the sources of the data on the energy consumption of Member States/Associate Members by type and year.

**Evaluation**

The Bahamas, Dominica and Jamaica reported consumption of *liquid fuels* as shown in **Table 5.1**. In 1990, The Bahamas reported 1.8 million barrels of fuel compared to 3.7 million barrels in 2003. Consumption of *liquid fuels* grew for the years 1998 (2.5 million barrels), 1999 (2.8 million barrels) and 2000 (3.6 million barrels) but declined in 2001 to 3.4 million barrels and increased thereafter to 3.6 million barrels in 2002 and further to 3.7 million barrels in 2003.

In Dominica 27.3 thousand cubic metres of *liquid fuels* (*Kerosene, Diesel and Gasoline*) were consumed in 1990 compared to 98 thousand cubic metres in 2004 representing an increase of 27.9 per cent. 1.8 million cubic metres of *liquid fuels* was reported in 1995, a very significant increase as compared to the period 1999 to 2003, when average consumption was recorded at 43 thousand cubic metres.

Jamaica reported 22.8 million barrels of fuel in 1998 as compared to the provisional estimate of 26.2 million barrels in 2004. The average consumption of *liquid fuels* for this Member State during the period 1998 to 2004 stood at 24.2 million barrels of fuel with the largest quantity consumed in 2005 (25.5 million barrels).

An analysis of *Gaseous Fluids* in **Table 5.1** for reporting countries, Dominica and Grenada, reveals that in 1995, Dominica consumed 1.3 million kilograms of gaseous fuels compared to 1.9 million kilograms in 2004. The highest consumption for Dominica was recorded in 1999 at 2.7 million kilogram with an average consumption of 2.0 million kilogram for the years 1990, 1995, 1998 to 2004. For Grenada, a reported consumption of 26.7 Imperial gallons of gaseous fuels for 2002 compared to 27.8 Imperial gallons in the following year representing an increase of 4 per cent.

Eight (8) Member States and Associate Members reported on the consumption of *primary electricity*, all of which showed increases in usage over the period for which data was submitted. The Bahamas reported 770 thousand megawatt-hour (MWh) consumption in 1990 compared to 1,462 thousand MWh in 2003, a 94.8 per cent increase in consumption over the period. Belize reported 153 thousand MWh in 1995 compared to 308 thousand MWh in 2003, an increase of 101.3 per cent, over the period. Dominica reported 31 thousand MWh in 1990 compared to 66 thousand MWh in 2004, an increase of 116.3 per cent. For the period 1999 to 2004, primary electricity consumption in Grenada increased by 19.3 per cent from 105 thousand metric tonnes in 1999 to 126 thousand metric tons in 2004. Jamaica reported 1,998 thousand MWh consumption in 1995 which increased by 48.8 per cent to 2,974 thousand MWh in 2004, based on the provisional estimate submitted. Saint Lucia reported 197 thousand MWh consumption in 1995 compared to 309 thousand MWh in 2004, an increase of 56.9 per cent. St Vincent and the Grenadines reported 42 thousand MWh consumption in 1990 compared to 106.5 thousand MWh in 2004 to an increase of more than one and a half times or 152 per cent. Bermuda was the only Associate Member that submitted data for this indicator. In 1999 this country reported 522 thousand MWh consumption compared to 590 thousand MWh in 2003, an increase of 12.9 per cent.

For traditional fuels Belize and Jamaica were the only two countries to submit data. Belize submitted data for 2002 on the use of *fuelwood* and *bagasse*. Jamaica reported 224 thousand of barrels oil equivalent of *charcoal* consumption in 2000 compared to 196 thousand of barrel oil equivalent, a drop of 14.3 per cent in 2004, based on the provisional estimate provided. The data showed that the consumption fluctuated, increasing in 2001 (227 thousand of barrel oil equivalent) and 2002 (230 thousand of barrel oil equivalent) when compared to 2000 followed by a decrease in consumption in 2003 (207 thousand of barrel oil equivalent) and 2004 (196 thousand of barrel oil

equivalent). In 2000, Jamaica reported 681 thousands of barrel oil equivalent consumption of *fuel wood* compared to 585 thousands of barrel oil equivalent in 2004, a provisional estimate. *Fuelwood* consumption reported also fluctuated for the period of data reported; showing an increase of 1.9 per cent from 2000 to 2001 followed a decline of 15.7 per cent to the end of the period. The consumption of *bagasse* increased by 11.7 per cent in 2001 compared to 2000 (650 thousands of barrel of oil equivalent) followed by declines of 8.7 per cent in 2002 and 9.5 per cent in 2003 and an increase of 15.9 per cent in 2004, based on a provisional estimate.

Table 5.1 - Energy consumption by type and year: 1990, 1995, 1998-2004

| Country | Year | Solid Fuels | Liquid Fuels               | Gaseous Fuels    | Primary electricity | Traditional fuels |                |          |
|---------|------|-------------|----------------------------|------------------|---------------------|-------------------|----------------|----------|
|         |      |             |                            |                  |                     | Charcoal          | Fuelwood       | Bagasse  |
| BS      |      |             | '000 barrels               |                  | MWh                 |                   |                |          |
|         | 1990 | ...         | 1,775                      | ...              | 770,000             | n/a               | n/a            | n/a      |
|         | 1995 | ...         | 2,698                      | ...              | 949,000             | n/a               | n/a            | n/a      |
|         | 1998 | ...         | 2,486                      | ...              | 1,130,000           | n/a               | n/a            | n/a      |
|         | 1999 | ...         | 2,776                      | ...              | 1,219,000           | n/a               | n/a            | n/a      |
|         | 2000 | ...         | 3,618                      | ...              | 1,281,000           | n/a               | n/a            | n/a      |
|         | 2001 | ...         | 3,460                      | ...              | 1,343,000           | n/a               | n/a            | n/a      |
|         | 2002 | ...         | 3,598                      | ...              | 1,399,000           | n/a               | n/a            | n/a      |
| 2003    | ...  | 3,661       | ...                        | 1,462,000        | n/a                 | n/a               | n/a            |          |
| BZ      |      |             |                            |                  | MWh                 | tonne             | m <sup>3</sup> | tonne    |
|         | 1995 | ...         | ...                        | ...              | 152,931             | ...               | ...            | ...      |
|         | 1998 | ...         | ...                        | ...              | 186,731             | ...               | ...            | ...      |
|         | 1999 | ...         | ...                        | ...              | 198,799             | ...               | ...            | ...      |
|         | 2000 | ...         | ...                        | ...              | 229,352             | ...               | ...            | ...      |
|         | 2001 | ...         | ...                        | ...              | 256,715             | ...               | ...            | ...      |
|         | 2002 | ...         | ...                        | ...              | 278,946             | ...               | 118,244        | 286,127  |
|         | 2003 | ...         | ...                        | ...              | 307,553             | ...               | ...            | ...      |
| DM      |      |             | m <sup>3</sup>             | '000 kgs         | MWh                 |                   |                |          |
|         | 1990 | ...         | 27,322                     | 1,295            | 30,697              | ...               | ...            | ...      |
|         | 1995 | ...         | 1,830,163                  | 1,567            | 45,125              | ...               | ...            | ...      |
|         | 1998 | ...         | ...                        | 2,133            | 57,294              | ...               | ...            | ...      |
|         | 1999 | ...         | 42,060                     | 2,699            | 60,594              | ...               | ...            | ...      |
|         | 2000 | ...         | 46,181                     | 2,318            | 62,005              | ...               | ...            | ...      |
|         | 2001 | ...         | 43,775                     | 2,040            | 63,914              | ...               | ...            | ...      |
|         | 2002 | ...         | 38,751                     | 2,300            | 64,194              | ...               | ...            | ...      |
|         | 2003 | ...         | 45,305                     | 2,147            | 62,735              | ...               | ...            | ...      |
| 2004    | ...  | 97,968      | 1,940                      | 66,419           | ...                 | ...               | ...            |          |
| GD      |      |             |                            | Imperial gallons | tonne               |                   |                |          |
|         | 1999 | ...         | ...                        | ...              | 105,210             | ...               | ...            | ...      |
|         | 2000 | ...         | ...                        | ...              | 113,348             | ...               | ...            | ...      |
|         | 2001 | ...         | ...                        | ...              | 123,918             | ...               | ...            | ...      |
|         | 2002 | ...         | ...                        | 26,676           | 129,214             | ...               | ...            | ...      |
|         | 2003 | ...         | ...                        | 27,765           | 138,292             | ...               | ...            | ...      |
| 2004    | ...  | ...         | ...                        | 125,511          | ...                 | ...               | ...            |          |
| JM      |      |             | '000 barrels <sup>a/</sup> |                  | MWh                 | '000 boe          | '000 boe       | '000 boe |
|         | 1995 | ...         | ...                        | ...              | 1,998,000           | ...               | ...            | ...      |
|         | 1998 | ...         | 22,797                     | ...              | ...                 | ...               | ...            | ...      |
|         | 1999 | ...         | 23,423                     | ...              | 2,576,200           | ...               | ...            | ...      |
|         | 2000 | ...         | 23,824                     | ...              | 2,738,900           | 224               | 681            | 650      |
|         | 2001 | ...         | 23,766                     | ...              | 2,793,300           | 227               | 694            | 726      |
|         | 2002 | ...         | 24,790                     | ...              | 2,896,500           | 230               | 650            | 663      |
|         | 2003 | ...         | 25,500                     | ...              | 2,998,300           | 207               | 650            | 600      |
| 2004p   | ...  | 25,180      | ...                        | 2,974,000        | 196                 | 585               | 695            |          |
| LC      |      |             |                            |                  | MWh                 |                   |                |          |
|         | 1995 | ...         | ...                        | ...              | 196,574             | ...               | ...            | ...      |
|         | 1998 | ...         | ...                        | ...              | 235,881             | ...               | ...            | ...      |
|         | 1999 | ...         | ...                        | ...              | 256,195             | ...               | ...            | ...      |
|         | 2000 | ...         | ...                        | ...              | 276,745             | ...               | ...            | ...      |
|         | 2001 | ...         | ...                        | ...              | 286,539             | ...               | ...            | ...      |
|         | 2002 | ...         | ...                        | ...              | 285,713             | ...               | ...            | ...      |
|         | 2003 | ...         | ...                        | ...              | 298,983             | ...               | ...            | ...      |
| 2004    | ...  | ...         | ...                        | 308,540          | ...                 | ...               | ...            |          |

Table 5.1 - Energy consumption by type and year: 1990, 1995, 1998-2004

| Country                  | Year | Solid Fuels | Liquid Fuels | Gaseous Fuels | Primary electricity | Traditional fuels |          |         |
|--------------------------|------|-------------|--------------|---------------|---------------------|-------------------|----------|---------|
|                          |      |             |              |               |                     | Charcoal          | Fuelwood | Bagasse |
| <b>VC</b>                |      |             |              |               | <b>MWh</b>          |                   |          |         |
|                          | 1990 | ...         | ...          | ...           | 42,269              | ...               | ...      | ...     |
|                          | 1995 | ...         | ...          | ...           | 62,141              | ...               | ...      | ...     |
|                          | 1998 | ...         | ...          | ...           | 74,598              | ...               | ...      | ...     |
|                          | 1999 | ...         | ...          | ...           | 77,900              | ...               | ...      | ...     |
|                          | 2000 | ...         | ...          | ...           | 82,049              | ...               | ...      | ...     |
|                          | 2001 | ...         | ...          | ...           | 86,604              | ...               | ...      | ...     |
|                          | 2002 | ...         | ...          | ...           | 89,824              | ...               | ...      | ...     |
|                          | 2003 | ...         | ...          | ...           | 95,430              | ...               | ...      | ...     |
| 2004                     | ...  | ...         | ...          | 106,523       | ...                 | ...               | ...      |         |
| <b>ASSOCIATE MEMBERS</b> |      |             |              |               |                     |                   |          |         |
| <b>BM</b>                |      |             |              |               | <b>MWh</b>          |                   |          |         |
|                          | 1999 | ...         | ...          | ...           | 522,470             | ...               | ...      | ...     |
|                          | 2000 | ...         | ...          | ...           | 535,335             | ...               | ...      | ...     |
|                          | 2001 | ...         | ...          | ...           | 553,920             | ...               | ...      | ...     |
|                          | 2002 | ...         | ...          | ...           | 574,726             | ...               | ...      | ...     |
| 2003                     | ...  | ...         | ...          | 590,032       | ...                 | ...               | ...      |         |

**EM2: MDG 8: ENSURE ENVIRONMENTAL SUSTAINABILITY****Number of Households by Type of Fuel used for cooking****Proportion of population using solid fuels****H**

**Target 9: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources**

**Concepts and Definitions**

*The household* is defined as follows: (a) a one-person household, defined as an arrangement in which one person makes provisions for his or her own food or other essentials for living without combining with any other person to form part of a multi-person household; and (b) a multi-person household, defined as a group of two or more persons living together who make common provisions for food or other essentials for living. The persons in the group may pool their incomes and have a common budget. They may be related or unrelated or a combination of both related and unrelated. (Please refer to the *United Nations Principles and Recommendations for Population and Housing Censuses, Revision 1 (1997)*.)

*Fuel* is defined as combustible matter used to maintain fire, such as coal, wood, oil, or gas, in order to create heat or power.

*Fuel used for cooking* refers to the fuel used predominantly for the preparation of principal meals.

*The number of households by type of fuel used for cooking* describes the types of fuels that households use for cooking.

**Types of Cooking Fuel**

*Charcoal* is a solid residue that consists mainly of carbon and is obtained by the destructive distillation of wood in the absence of air.

*Wood* refers to all wood in the rough that is used for fuel.

*Liquefied Petroleum Gas (LPG)/Gas* is a combination of hydrocarbons (propane, butane and ethane) which are gaseous under conditions of normal temperature and pressure, but are liquefied by compression or cooling to facilitate storage, handling and transportation.

*Kerosene* is medium oil that is distilled between 150°C and 300°C. It is used as an illuminant and as a fuel and is often referred to as burning oil, vaporizing oil, power kerosene or illuminating oil.

*Electricity* is an electric current used as a source of power.

*Other* refers to types of cooking fuel not mentioned above.

#### Method of Computation

The number of households by type of fuel used for cooking is classified from data obtained from Member States/Associate Members according to the categories: None, Charcoal, Wood, LPG/Gas, Kerosene, Electricity, Not Stated and Other.

#### Indicator Relevance

The proportion of households using solid fuels is one of the indicators for monitoring the Millennium Development Goals. There are important linkages between household solid fuel use, indoor air pollution, deforestation, soil erosion and greenhouse gas emissions. The type of fuel and its participation in cooking tasks are important predictors of exposure to indoor air pollution.

#### Data Assessment

The number of households by type of fuel used for cooking was obtained from data submitted by Member States/Associate Members. All reporting countries followed the internationally recommended concept of fuel used for cooking. This indicator is, therefore, regionally and internationally conceptually harmonized.

#### Data Sources

Please refer to **Appendix 1.5.2** for the sources of the data on the number of households in Member States/Associate Members by type of fuel used for cooking.

#### Evaluation

**Tables 5.2(a)** and **5.2(b)** present the number of households by type of fuel used for cooking for the 2000 Round of Census in the CARICOM Region. The total number of households for the thirteen (13) reporting Member States was 1.7 million of which *LPG/Gas* (78.3 per cent) was the preferred type of fuel used for cooking. Other significant types of fuel used in Member States were, *Wood* (6.3 per cent), *Kerosene* (5.4 per cent) and *Charcoal* (4.2 per cent) and *Electricity* (3.1 per cent). Three (3) Associate Members consisting 19,370 households, reported 77.8 per cent of households using *LPG/Gas* as the main type of fuel used for cooking followed by *Electricity* (18.9 per cent).

Six (6) Member States and two (2) Associate Members reported *LPG/Gas* usage above 90 per cent with Antigua and Barbuda reporting the highest among Member States at 95.7 per cent followed by Montserrat with 94.8 per cent. The British Virgin Islands reported the highest percentage of households using *LPG/Gas* for cooking at 94.1 among Associate Members followed by Anguilla (93 per cent).

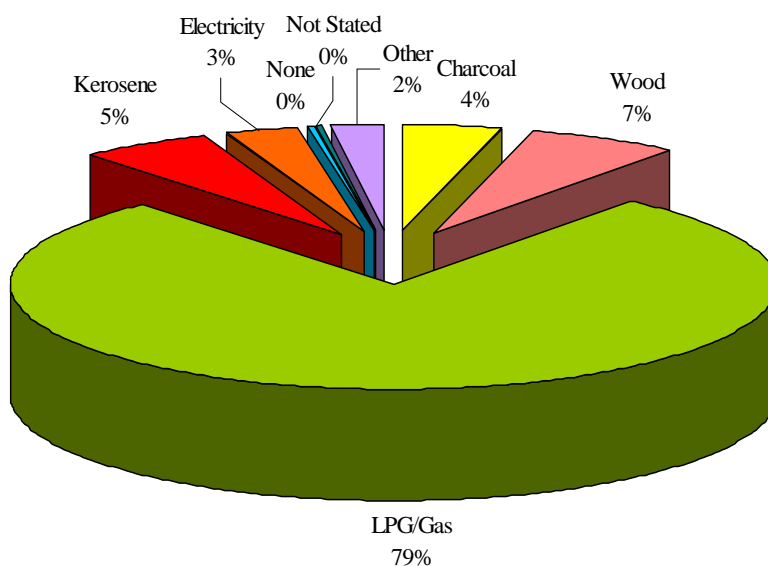
Table 5.2 (a) Number of Households by Type of Fuel used for Cooking: 2000 Round of Census

| Country  | Year | Charcoal      | Wood           | LPG/Gas          | Kerosene      | Electricity   | None         | Not Stated   | Other         | Total            |
|--|------|---------------|----------------|------------------|---------------|---------------|--------------|--------------|---------------|------------------|
| AG   | 2001 | 318           | 88             | 19,612           | 34            | 135           |              |              | 263           | 20,450           |
| BS   | 2000 | 293           | 388            | 65,126           | 898           | 19,563        |              |              | 1,474         | 87,742           |
| BB   | 2000 | 72            |                | 65,172           | 1,883         | 2,491         |              | 2,257        | 11,151        | 83,026           |
| DM   | 2001 | 3,510         |                | 18,054           | 308           | 67            |              |              | 420           | 22,359           |
| GD   | 2001 | 943           | 1,319          | 30,611           | 205           | 61            |              |              | 337           | 33,476           |
| GY   | 2002 | 1,143         | 23,982         | 71,660           | 82,158        | 2,600         |              | 110          | 956           | 182,609          |
| JM   | 2001 | 36,148        | 80,686         | 597,578          | 3,009         | 11,958        |              |              | 18,947        | 748,326          |
| MS   | 2001 | 38            | 41             | 2,207            | 3             | 11            |              |              | 29            | 2,329            |
| KN   | 2001 | 159           | 233            | 14,521           | 140           | 393           |              |              | 234           | 15,680           |
| LC   | 2001 | 5,702         |                | 40,055           | 94            | 189           |              |              | 1,084         | 47,124           |
| VC   | 2001 | 1,182         | 917            | 27,318           | 128           | 317           |              |              | 400           | 30,262           |
| SR   | 2004 | 19,941        |                | 97,166           | 916           | 993           |              | 3,329        | 1,118         | 123,463          |
| TT   | 2000 | 2,237         |                | 282,408          | 1,555         | 13,219        | 1,710        | 2,435        | 307           | 303,871          |
| <b>TOTAL MEMBER STATES</b>                       |      | <b>71,686</b> | <b>107,654</b> | <b>1,331,488</b> | <b>91,331</b> | <b>51,997</b> | <b>1,710</b> | <b>8,131</b> | <b>36,720</b> | <b>1,700,717</b> |
| <b>ASSOCIATE MEMBERS</b>                         |      |               |                |                  |               |               |              |              |               |                  |
| AI   | 2001 | 51            |                | 3,469            | 3             | 45            |              | 127          | 35            | 3,730            |
| VG   | 2001 | 21            | 6              | 7,894            | 5             | 403           |              |              | 57            | 8,386            |
| TC   | 2001 | 217           | 0              | 3,712            | 112           | 3,213         |              | 0            | 0             | 7,254            |
| <b>TOTAL ASSOCIATE MEMBERS</b>                   |      | <b>289</b>    | <b>6</b>       | <b>15,075</b>    | <b>120</b>    | <b>3,661</b>  | <b>0</b>     | <b>127</b>   | <b>92</b>     | <b>19,370</b>    |
| <b>TOTAL MEMBER STATES AND ASSOCIATE MEMBERS</b> |      | <b>71,975</b> | <b>107,660</b> | <b>1,346,563</b> | <b>91,451</b> | <b>55,658</b> | <b>1,710</b> | <b>8,258</b> | <b>36,812</b> | <b>1,720,087</b> |

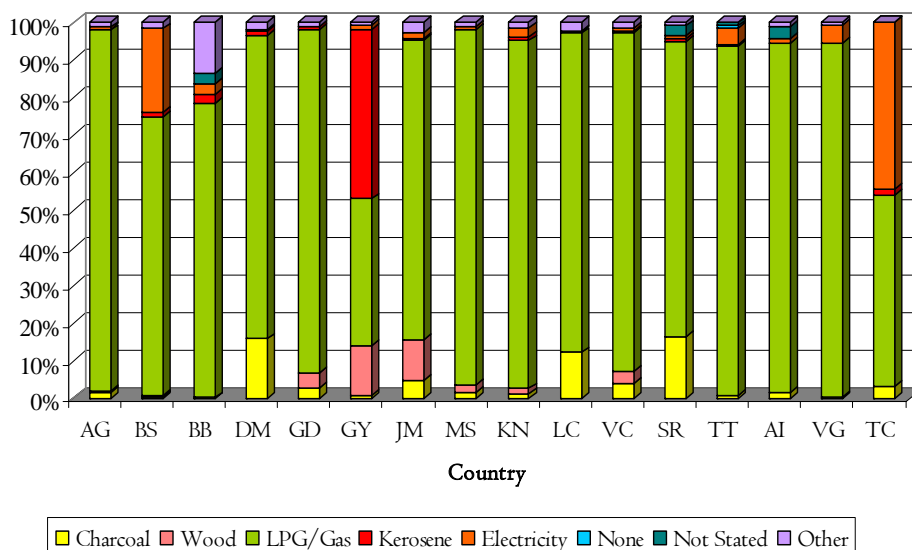
Table 5.2 (b) Percentage Distribution of Households by Type of Fuel used for Cooking: 2000 Round of Census

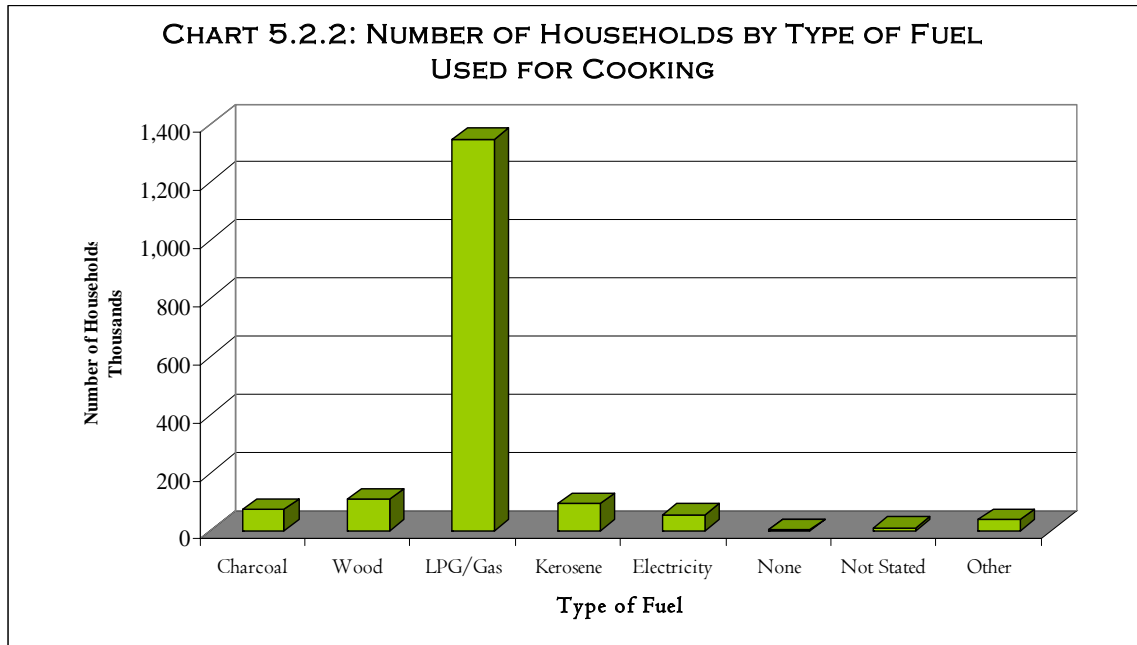
| Country  | Year | Charcoal   | Wood       | LPG/Gas     | Kerosene   | Electricity | None       | Not Stated | Other      | Total        |
|--|------|------------|------------|-------------|------------|-------------|------------|------------|------------|--------------|
| AG   | 2001 | 1.6        | 0.4        | 95.9        | 0.2        | 0.7         |            |            | 1.3        | 100.0        |
| BS   | 2000 | 0.3        | 0.4        | 74.2        | 1.0        | 22.3        |            |            | 1.7        | 100.0        |
| BB   | 2000 | 0.1        |            | 78.5        | 2.3        | 3.0         |            | 2.7        | 13.4       | 100.0        |
| DM   | 2001 | 15.7       |            | 80.7        | 1.4        | 0.3         |            |            | 1.9        | 100.0        |
| GD   | 2001 | 2.8        | 3.9        | 91.4        | 0.6        | 0.2         |            |            | 1.0        | 100.0        |
| GY   | 2002 | 0.6        | 13.1       | 39.2        | 45.0       | 1.4         |            | 0.1        | 0.5        | 100.0        |
| JM   | 2001 | 4.8        | 10.8       | 79.9        | 0.4        | 1.6         |            |            | 2.5        | 100.0        |
| MS   | 2001 | 1.6        | 1.8        | 94.8        | 0.1        | 0.5         |            |            | 1.2        | 100.0        |
| KN   | 2001 | 1.0        | 1.5        | 92.6        | 0.9        | 2.5         |            |            | 1.5        | 100.0        |
| LC   | 2001 | 12.1       |            | 85.0        | 0.2        | 0.4         |            |            | 2.3        | 100.0        |
| VC   | 2001 | 3.9        | 3.0        | 90.3        | 0.4        | 1.0         |            | 0.0        | 1.3        | 100.0        |
| SR   | 2004 | 16.2       |            | 78.7        | 0.7        | 0.8         |            | 2.7        | 0.9        | 100.0        |
| TT   | 2000 | 0.7        |            | 92.9        | 0.5        | 4.4         | 0.6        | 0.8        | 0.1        | 100.0        |
| <b>TOTAL MEMBER STATES</b>                       |      | <b>4.2</b> | <b>6.3</b> | <b>78.3</b> | <b>5.4</b> | <b>3.1</b>  | <b>0.1</b> | <b>0.5</b> | <b>2.2</b> | <b>100.0</b> |
| <b>ASSOCIATE MEMBERS</b>                         |      |            |            |             |            |             |            |            |            |              |
| AI   | 2001 | 1.4        |            | 93.0        | 0.1        | 1.2         | 0.0        | 3.4        | 0.9        | 100.0        |
| VG   | 2001 | 0.3        | 0.1        | 94.1        | 0.1        | 4.8         |            |            | 0.7        | 100.0        |
| TC   | 2001 | 3.0        | 0.0        | 51.2        | 1.5        | 44.3        |            | 0.0        | 0.0        | 100.0        |
| <b>TOTAL ASSOCIATE MEMBERS</b>                   |      | <b>1.5</b> | <b>0.0</b> | <b>77.8</b> | <b>0.6</b> | <b>18.9</b> | <b>0.0</b> | <b>0.7</b> | <b>0.5</b> | <b>100.0</b> |
| <b>TOTAL MEMBER STATES AND ASSOCIATE MEMBERS</b> |      | <b>4.2</b> | <b>6.3</b> | <b>78.3</b> | <b>5.3</b> | <b>3.2</b>  | <b>0.1</b> | <b>0.5</b> | <b>2.1</b> | <b>100.0</b> |

**CHART 5.2.1 (A): PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY TYPE OF FUEL USED FOR COOKING**



**CHART 5.2.1 (B): PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY TYPE OF FUEL USED FOR COOKING AND MEMBER STATE/ASSOCIATE MEMBER**





**EM3: NUMBER OF HOUSEHOLDS BY TYPE OF FUEL USED FOR LIGHTING****H****Concepts and Definitions**

*The household* is defined as follows: (a) a one-person household, defined as an arrangement in which one person makes provisions for his or her own food or other essentials for living without combining with any other person to form part of a multi-person household; and (b) a multi-person household, defined as a group of two or more persons living together who make common provisions for food or other essentials for living. The persons in the group may pool their incomes and have a common budget. They may be related or unrelated or a combination of both related and unrelated. (*Please refer to the United Nations Principles and Recommendations for Population and Housing Censuses, Revision 1 (1997).*)

*Type of lighting* refers to the source of lighting predominantly used by occupants of a housing unit.

*The number of households by type of lighting* describes the types of fuels that members of households use for lighting.

**Types of Fuel Used for Lighting**

*Gas* is a combination of hydrocarbons (propane, butane and ethane) which are gaseous under conditions of normal temperature and pressure, but are liquefied by compression or cooling to facilitate storage, handling and transportation.

*Kerosene* is medium oil that is distilled between 150°C and 300°C. It is used as an illuminant and as a fuel and is often referred to as burning oil, vaporizing oil, power kerosene or illuminating oil.

*Electricity* is an electric current used as a source of power.

*Other* is other types of lighting fuel not so far mentioned.

**Method of Computation**

Data for this indicator were obtained from Member States/Associate Members according to the categories: Gas, Kerosene, Electricity, Not Stated and Other as defined under concepts and definitions.

**Indicator Relevance**

Household lighting energy use is increasing due to the construction of larger homes and the installation of more light

fittings per home. Most homes could probably reduce the amount of energy they use for lighting by 50 percent or more. The average household's energy use is responsible for about eight tonnes of carbon dioxide (CO<sub>2</sub>), the main greenhouse gas, per year

**Data Assessment**

The number of households by type of fuel used for lighting was obtained from data submitted by Member States/Associate Members. All reporting countries followed the internationally recommended concept of fuel used for lighting. This indicator is, therefore, regionally and internationally conceptually harmonized.

**Data Sources**

Please refer to **Appendix 1.5.3** for the sources of the data on the number of households in Member States/Associate Members by type of fuel used for lighting.

**Evaluation**

*Tables 5.3 (a) and (b)* revealed that *electricity* provided lighting to 86.7 per cent of the 1.6 million households in the Region. *Kerosene* followed with 165,301 or 10.3 per cent of households reporting use of this type of fuel for lighting. The percentage use of *electricity* was higher for Associate Member States which reported 96.8 per cent of households as compared to 86.6 per cent of households for Member States. Among Associate Members, 99.2 per cent of households in The British Virgin Islands reportedly used *electricity* as the main type of fuel used for lighting whilst among Member States, 96.5 percent of Barbados households used this type of fuel for lighting. Guyana reported the lowest proportion of households using *electricity* as the main source of lighting although this Member State reported the highest proportion of households using *kerosene* as their main source of lighting. A small percentage of households in the Region (0.8 per cent) used *Gas* for lighting although Guyana reported 5.4 per cent of households using this type of fuel as the main source of lighting.

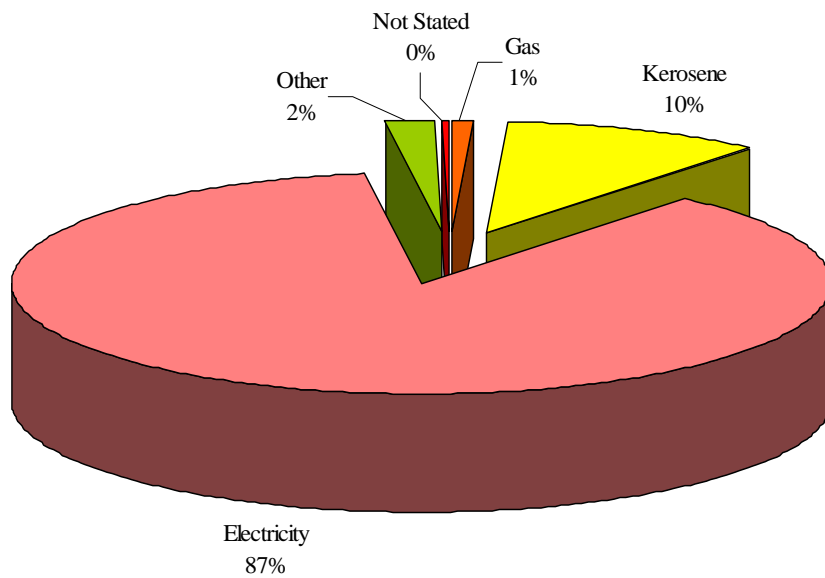
Table 5.3 (a) Number of Households by Type of Fuel used for lighting: 2000 Round of Census

| Country  | Year | Gas           | Kerosene       | Electricity      | Other         | Not Stated   | Total All Households |
|--|------|---------------|----------------|------------------|---------------|--------------|----------------------|
| AG   | 2001 | 61            | 564            | 19,236           | 421           | 168          | 20,450               |
| BS   | 2000 | 837           | 0              | 84,115           | 2,790         | 0            | 87,742               |
| BB   | 2000 | 69            | 1,807          | 80,126           | 465           | 559          | 83,026               |
| BZ   | 2000 | 1,068         | 6,859          | 42,417           | 1,488         | 113          | 51,945               |
| DM   | 2001 | 58            | 1,764          | 19,237           | 1,300         | 0            | 22,359               |
| GD   | 2001 | 58            | 3,720          | 28,885           | 813           | 0            | 33,476               |
| GY   | 2002 | 9,821         | 44,301         | 124,874          | 3,411         | 202          | 182,609              |
| JM   | 2001 | 0             | 79,066         | 651,405          | 17,855        | 0            | 748,326              |
| MS   | 2001 | 0             | 24             | 2,233            | 46            | 26           | 2,329                |
| KN   | 2001 | 54            | 655            | 14,665           | 177           | 129          | 15,680               |
| VC   | 2001 | 71            | 3,877          | 24,940           | 1,113         | 261          | 30,262               |
| TT   | 2000 | 711           | 22,392         | 277,413          | 1,546         | 1,809        | 303,871              |
| <b>TOTAL MEMBER STATES</b>                       |      | <b>12,808</b> | <b>165,029</b> | <b>1,369,546</b> | <b>31,425</b> | <b>3,267</b> | <b>1,582,075</b>     |
| <b>ASSOCIATE MEMBERS</b>                         |      |               |                |                  |               |              |                      |
| AI   | 2001 | 1             | 95             | 3,491            | 33            | 110          | 3,730                |
| VG   | 2001 | 30            | 11             | 8,320            | 18            | 7            | 8,386                |
| TC   | 2001 | 21            | 167            | 6,938            | 128           | 0            | 7,254                |
| <b>TOTAL ASSOCIATE MEMBERS</b>                   |      | <b>42</b>     | <b>272</b>     | <b>18,760</b>    | <b>179</b>    | <b>117</b>   | <b>19,370</b>        |
| <b>TOTAL MEMBER STATES AND ASSOCIATE MEMBERS</b> |      | <b>12,850</b> | <b>165,301</b> | <b>1,388,306</b> | <b>31,604</b> | <b>3,384</b> | <b>1,601,445</b>     |

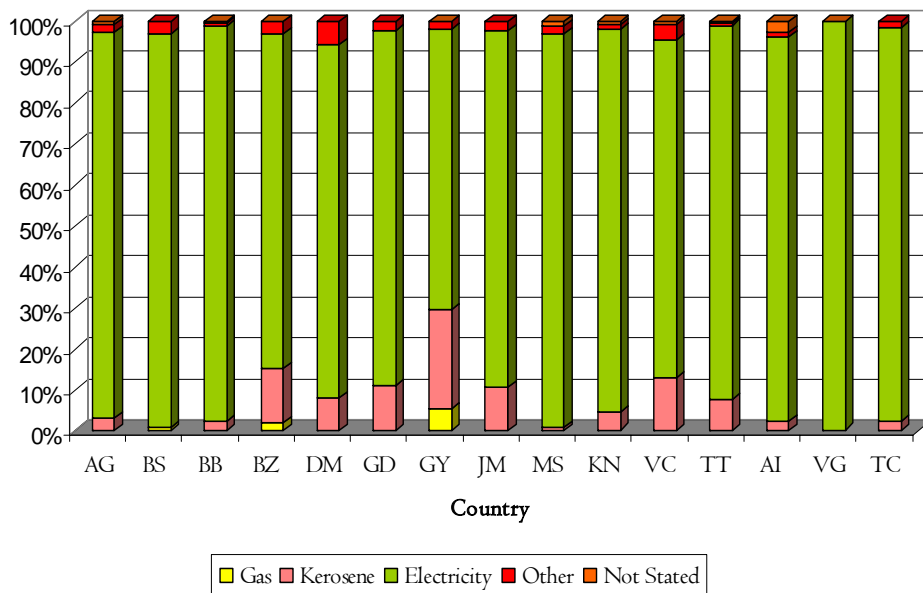
Table 5.3 (b) Percentage distribution of Households by Type of Fuel used for lighting: 2000 Round of Census

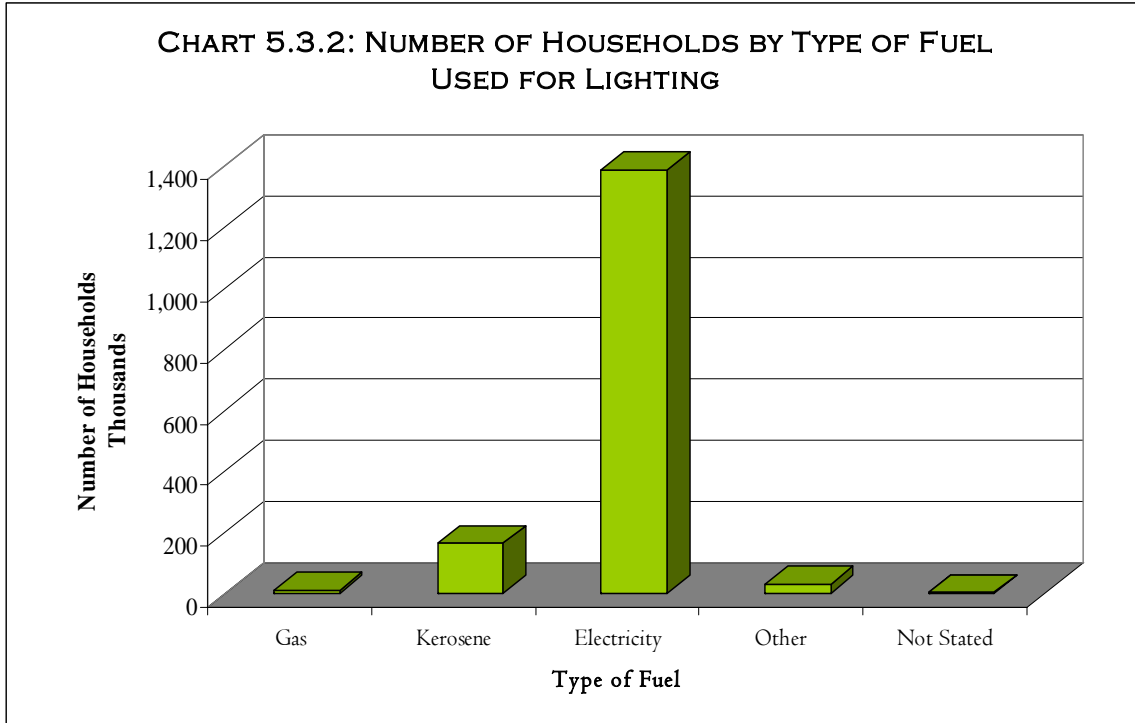
| Country  | Year | Gas        | Kerosene    | Electricity | Other      | Not Stated | Total All Households |
|--|------|------------|-------------|-------------|------------|------------|----------------------|
| AG   | 2001 | 0.3        | 2.8         | 94.1        | 2.1        | 0.8        | 100.0                |
| BS   | 2000 | 1.0        | 0.0         | 95.9        | 3.2        | 0.0        | 100.0                |
| BB   | 2000 | 0.1        | 2.2         | 96.5        | 0.6        | 0.7        | 100.0                |
| BZ   | 2000 | 2.1        | 13.2        | 81.7        | 2.9        | 0.2        | 100.0                |
| DM   | 2001 | 0.3        | 7.9         | 86.0        | 5.8        | 0.0        | 100.0                |
| GD   | 2001 | 0.2        | 11.1        | 86.3        | 2.4        | 0.0        | 100.0                |
| GY   | 2002 | 5.4        | 24.3        | 68.4        | 1.9        | 0.1        | 100.0                |
| JM   | 2001 | 0.0        | 10.6        | 87.0        | 2.4        | 0.0        | 100.0                |
| MS   | 2001 | 0.0        | 1.0         | 95.9        | 2.0        | 1.1        | 100.0                |
| KN   | 2001 | 0.3        | 4.2         | 93.5        | 1.1        | 0.8        | 100.0                |
| VC   | 2001 | 0.2        | 12.8        | 82.4        | 3.7        | 0.9        | 100.0                |
| TT   | 2000 | 0.2        | 7.4         | 91.3        | 0.5        | 0.6        | 100.0                |
| <b>TOTAL MEMBER STATES</b>                       |      | <b>0.8</b> | <b>10.4</b> | <b>86.6</b> | <b>2.0</b> | <b>0.2</b> | <b>100.0</b>         |
| <b>ASSOCIATE MEMBERS</b>                         |      |            |             |             |            |            |                      |
| AI   | 2001 | 0.0        | 2.5         | 93.6        | 0.9        | 2.9        | 100.0                |
| VG   | 2001 | 0.4        | 0.1         | 99.2        | 0.2        | 0.1        | 100.0                |
| TC   | 2001 | 0.3        | 2.3         | 95.6        | 1.8        | 0.0        | 100.0                |
| <b>TOTAL ASSOCIATE MEMBERS</b>                   |      | <b>0.3</b> | <b>1.4</b>  | <b>96.8</b> | <b>0.9</b> | <b>0.6</b> | <b>100.0</b>         |
| <b>TOTAL MEMBER STATES AND ASSOCIATE MEMBERS</b> |      | <b>0.8</b> | <b>10.3</b> | <b>86.7</b> | <b>2.0</b> | <b>0.2</b> | <b>100.0</b>         |

**CHART 5.3.1(A): PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY TYPE OF FUEL USED FOR LIGHTING**



**CHART 5.3.1(B): PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY TYPE OF FUEL USED FOR LIGHTING AND MEMBER STATE/ASSOCIATE MEMBER**





**EM4: MINERAL PRODUCTION BY TYPE****H****Concepts and Definitions**

A *mineral* is defined as any of a class of substances occurring in nature, usually comprising inorganic substances, as quartz or feldspar, of definite chemical composition and usually of definite crystalline structure. They, however, sometimes also include rocks formed by these substances, as well as certain natural products of organic origin, such as asphalt or coal.

**Types of Minerals**

*Gold* is a soft, yellow, corrosion-resistant element. It is the most malleable and ductile metal, occurring in veins and alluvial deposits and recovered by mining or by panning or sluicing.

*Silver* is a lustrous, white, ductile, malleable, metallic element, occurring both uncombined and in ores, such as argentite.

*Aluminium* is a silvery-white, ductile, metallic element and is the most abundant in the earth's crust. It is found in combination, chiefly in bauxite.

*Bauxite* is the principal ore of aluminium, composed mainly of hydrous aluminium oxides and aluminium hydroxides.

*Sand/Gravel* is small loose grains of worn or disintegrated rock or an unconsolidated mixture of rock fragments and pebbles.

*Limestone* is a common sedimentary rock consisting mostly of calcium carbonate,  $\text{CaCO}_3$ . It is used as a building stone and in the manufacture of lime, carbon dioxide, and cement.

*Salt* is a crystalline compound, sodium chloride,  $\text{NaCl}$ , which occurs as a mineral.

*Clay* is a fine-grained, firm, earthy material that is plastic when wet and hardens when heated. It consists primarily of hydrated silicates of aluminium and is widely used in making bricks, tiles, and pottery.

*Crushed Stone* is a concretioned earthy or mineral matter (rock) that is quarried and worked into a specific size and shape for a particular purpose.

A *diamond* is an extremely hard, highly refractive crystalline form of carbon that is usually colourless and is used as a gemstone and in abrasives, cutting tools, and other applications.

*Gypsum*, hydrated calcium sulphate ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ), is a very common mineral occurring in crystals and in masses. It is soft enough to be scratched by the fingernail and is used to make plaster of Paris, as an ornamental material and as a fertilizer.

*Anhydrite* is a colourless, white, grey, blue, or lilac mineral of anhydrous calcium sulphate ( $\text{CaSO}_4$ ), occurring as layers in gypsum deposits.

*Marble* is a metamorphic rock formed by alteration of limestone or dolomite, often irregularly coloured by impurities, and used especially in architecture and sculpture.

*Silica Sand* is the dioxide form of silicon,  $\text{SiO}_2$ , occurring especially as quartz sand, flint, and agate. It is usually used in the form of its prepared white powder chiefly in the manufacture of glass, water glass, ceramics, and abrasives.

*Stone* is the hard, mineral substance of which rock consists.

*Clay/Fill* is a fine-grained, firm earthy material that is plastic when wet and hardens when heated. It consists primarily of hydrated silicates of aluminium and is widely used for making bricks, tiles, and pottery.

*Lime sand & Silt* are sedimentary materials consisting of very fine particles intermediate in size between sand and clay.

*Dolomite*, essentially  $\text{CaMg}(\text{CO}_3)_2$ , is a white or light-coloured mineral that is used in fertilizers, as a furnace refractory, and as a construction and ceramic material.

*Limestone (Marble Grade)* is a common sedimentary rock that consists mostly of calcium carbonate,  $\text{CaCO}_3$ . It is used as a building stone and in the manufacture of lime, carbon dioxide, and cement.

*Crude Oil* is unrefined petroleum, which is a thick, flammable, yellow-to-black mixture of gaseous, liquid, and solid hydrocarbons that occurs naturally beneath the earth's surface.

*Natural gas* comprises gases, occurring in underground deposits, whether liquefied or gaseous, consisting mainly of methane.

*Other* refers to some other type of mineral not so far mentioned.

#### Method of Computation

Mineral production by type is classified from data obtained from Member States/Associate Members according to the categories: Gold, Silver, Aluminium, Bauxite, Sand/Gravel, Limestone, Salt, Clay, Crushed Stone, Diamond, Gypsum & Anhydrite, Marble, Silica Sand, Stone, Clay/Fill, Lime sand & Silt, Pridge sand, Dolomite, Limestone (Marble Grade), Crude Oil and Natural Gas and Other as defined in the forgoing section.

**Indicator Relevance**

Unsustainable exploitation of minerals will cause depletion in the long term, which can ultimately have a great impact on the economy of a country. The activities associated with mineral production, such as explosions, drilling and smelting, are a major source of air, water and soil pollution caused by the discharges of mineral wastes or mine tailings. For example, aluminium and iron production accounts for over 5 per cent of anthropogenic greenhouse gas (GHG) emissions worldwide. Alumina production is also associated with emission of dust and corrosive materials and creation of large amounts of alkaline mud ("red mud"). Dust and caustic soda contamination are also significant environmental concerns associated with the refining process. The biggest problem of smelting operations (processing alumina into aluminium) is fluoride emissions. In addition, these activities can also cause loss of habitats of wildlife. (*Trends in Consumption and Production: Selected Minerals* "Discussion Paper of the United Nations Department of Economic and Social Affairs.")

**Data Assessment**

This indicator, mineral production by type, is conceptually harmonized since the internationally recommended definition for a mineral was followed. Eight Member States provided data for this indicator. Those Member States were The Bahamas, Belize, Dominica, Grenada, Guyana, Jamaica, Suriname and Trinidad and Tobago.

**Data Sources**

Please refer to **Appendix 1.5.4** for the sources of the data on mineral production by type in Member States/Associate Members.

**Evaluation**

It can be seen from the data provided in **Table 5.4** below that mineral production is concentrated in Guyana, Jamaica, Belize and Suriname. Guyana reported the largest quantities of *gold* produced in the Region which ranged from 1.2 million tonnes in 1990 to 14.5 million tonnes in 1997 and was the only country to report on the production of *silver*. Guyana also reported production of *clay*, *crushed stone* and *diamonds*. Suriname produced an average of 4,064 x 1,000Mt of *bauxite* for the period 1990 to 2004, while Jamaica reportedly produced an average of 12.3Mt of *bauxite* for the same period. Suriname also reported average production of 1,977 x 1,000Mt of Aluminium for the years 2000 to 2004. Other production of minerals for Jamaica includes *gypsum and anhydrite*, *marble*, *silica sand* and *limestone*. Four Member States reported production of *sand* and *gravel* with the highest being reported by Jamaica averaging over 1.9 million tonnes from 1990 to 2004. The Bahamas was the only Member States which reported the production of *salt* which fluctuated since 1990 along with the production of *aragonite*. Mineral production in Belize included increasing production of *clays*, *sand* and *gravel*, *stone* and *bridgesand* and fluctuations in the production of *limestone*, *dolomite* and *limestone marble*. In 2004, crude oil production stood at 44,982 thousand barrels a 3 per cent increase from 2000, while natural gas production averaged 2,938 million standard cubic feet per day (mmscfd) representing an increase of 96.1 per cent from 2000.

Table 5.4- Mineral Production by Type: 1990 - 2004

| Country | Year | Salt      | Alagomite |
|---------|------|-----------|-----------|
| BS      |      | tonnes    | tonnes    |
|         | 1990 | 754,499   | ...       |
|         | 1995 | 1,579,323 | ...       |
|         | 1998 | 1,226,981 | 13,611    |
|         | 1999 | 879,163   | 6,587     |
|         | 2000 | 1,021,921 | 17,596    |
|         | 2001 | 1,267,496 | 5,311     |
|         | 2002 | 1,074,355 | 73        |
|         | 2003 | 1,245,447 | 8,933     |

| Country | Year | Sand and Gravel  | Limestone        | Stone            | Clay/ Fill       | Limesand & Silt  | Pridgesand       | Dolomite | Limestone Marble Grade |
|---------|------|------------------|------------------|------------------|------------------|------------------|------------------|----------|------------------------|
| BZ      |      | yds <sup>3</sup> | yds <sup>3</sup> | yds <sup>3</sup> | yds <sup>3</sup> | yds <sup>3</sup> | yds <sup>3</sup> | tonnes   | ft <sup>2</sup>        |
|         | 1995 | 66,857           | 182,462          | 291              | ...              | ...              | ...              | ...      | ...                    |
|         | 1998 | 254,266          | 189,258          | 894              | 122,312          | 113,656          | ...              | 3,198    | ...                    |
|         | 1999 | 100,821          | 213,154          | 2,613            | 74,645           | 282,512          | 25,489           | 5,740    | ...                    |
|         | 2000 | 190,160          | 350,114          | 6,877            | 339,015          | 104,273          | 15,612           | 5,272    | ...                    |
|         | 2001 | 215,477          | 549,716          | ...              | 303,451          | 334,888          | 30,185           | 4,525    | 38,000                 |
|         | 2002 | 142,451          | 170,716          | 24,027           | 265,181          | 124,092          | 50,000           | 5,500    | 45,000                 |
|         | 2003 | 369,362          | 423,464          | 18,116           | 224,948          | 106,962          | 40,064           | 6,319    | 25,000                 |
|         | 2004 | 211,922          | 274,790          | 21,077           | 311,449          | 327,031          | 36,312           | 3,288    | ...                    |

| Country | Year     | Sand and Gravel |
|---------|----------|-----------------|
| DM      |          | tonnes          |
|         | 1995     | *101,479        |
|         | 1998     | 201,571         |
|         | 1999     | 444,634         |
|         | 2000     | 608,750         |
|         | 2001     | 672,993         |
|         | 2002     | 597,529         |
|         | 2003     | 598,643         |
| 2004    | *399,143 |                 |

| Country | Year | Sand and Gravel  |
|---------|------|------------------|
| GD      |      | yds <sup>3</sup> |
|         | 1998 | 17,862           |
|         | 1999 | 186              |
|         | 2000 | 13,237           |
|         | 2001 | 14,101           |
|         | 2002 | 39,393           |
| 2003    | 116  |                  |

Table 5.4 Cont'd. Mineral Production by Type: 1990 - 2004

| Country | Year   | Gold   | Silver    | Aluminium | Clay  | Crushed Stone | Diamonds                       |
|---------|--------|--------|-----------|-----------|-------|---------------|--------------------------------|
| GY      |        | kg     | tonnes    | tonnes    | tons  | tons          | x10 <sup>3</sup> metric carats |
|         | 1990   | 1,204  | 0.1       | 1,423,058 | 2,000 | 49,000        | 15.3                           |
|         | 1991   | 1,844  | 0.1       | 1,345,727 | 2,000 | 55,000        | 29.3                           |
|         | 1992   | 2,475  | 0.1       | 895,196   | 6,000 | 73,000        | 46.0                           |
|         | 1993   | 9,635  | 0.5       | 2,093,899 | 406   | 110,000       | 50.9                           |
|         | 1994   | 11,678 | 0.6       | 1,991,132 | ...   | 150,000       | 36.8                           |
|         | 1995   | 9,005  | 0.5       | 2,028,080 | ...   | ...           | 52.4                           |
|         | 1996   | 12,007 | 0.6       | 2,475,459 | ...   | ...           | 46.7                           |
|         | 1997   | 14,571 | 0.7       | 2,470,895 | 360   | 90,000        | 36.5                           |
|         | 1998   | 14,146 | 0.7       | 2,267,368 | ...   | 214,000       | 35.3                           |
|         | 1999   | 12,905 | 0.7       | 2,359,272 | ...   | ...           | 52.6                           |
| 2000    | 13,527 | 0.7    | 2,689,451 | ...       | ...   | 83.9          |                                |

| Country | Year | Gold | Bauxite | Sand and Gravel | Limestone | Gypsum and Anhydrite | Marble      | Silica Sand |
|---------|------|------|---------|-----------------|-----------|----------------------|-------------|-------------|
| JM      |      | kg   | tonnes  | tonnes          | tonnes    | '000 tonnes          | '000 tonnes | '000 tonnes |
|         | 1990 | ...  | 11.0    | 0.9             | 5.5       | 82.2                 | 4.0         | 16.6        |
|         | 1995 | ...  | 11.0    | 1.8             | 7.3       | 208.0                | 2.8         | 16.3        |
|         | 1998 | ...  | 13.0    | 1.8             | 7.1       | 154.5                | 0.8         | 6.1         |
|         | 1999 | ...  | 12.0    | 2.1             | 7.8       | 236.0                | 0.4         | 9.4         |
|         | 2000 | ...  | 11.1    | 2.1             | 8.1       | 330.0                | 0.1         | 6.7         |
|         | 2001 | 227  | 12.4    | 2.2             | 8.9       | 320.3                | 0.1         | 8.2         |
|         | 2002 | ...  | 13.1    | 2.2             | 9.2       | 164.9                | 0.2         | 9.4         |
|         | 2003 | ...  | 13.4    | 2.3             | 9.9       | 249.0                | 0.2         | 12.8        |
|         | 2004 | ...  | 13.3    | 2.4             | 8.4       | 283.0                | 0.1         | 11.2        |

| Country | Year  | Aluminium | Bauxite |
|---------|-------|-----------|---------|
| SR      |       |           | tonne*  |
|         | 2000  | ...       | 3,659.0 |
|         | 2001  | ...       | 4,334.0 |
|         | 2002  | 1,902     | 3,999.0 |
|         | 2003  | 2,004     | 4,111.0 |
| 2004    | 2,025 | 4,217.0   |         |

| Country | Year   | Crude Oil      | Natural gas              |
|---------|--------|----------------|--------------------------|
| TT      |        | ('000 barrels) | (million cubic feet/day) |
|         | 2000   | 43,680         | 1,498                    |
|         | 2001   | 41,469         | 1,596                    |
|         | 2002   | 47,824         | 1,826                    |
|         | 2003   | 49,117         | 2,594                    |
| 2004    | 44,982 | 2,938          |                          |

**EM5: MINERAL RESERVES BY TYPE****H****Concepts and Definitions**

A *mineral* is defined as any of a class of substances occurring in nature, usually comprising inorganic substances, as quartz or feldspar, of definite chemical composition and usually of definite crystal structure. They, however, sometimes also include rocks formed by these substances, as well as certain natural products of organic origin, such as asphalt or coal.

A '*Mineral Reserve*' is the economically mineable part of a measured or indicated mineral resource. It is inclusive of diluting materials and allows for losses that may occur when the material is mined.

A '*Mineral Resource*' is a concentration or occurrence of material of intrinsic economic interest in or on the Earth's crust (a deposit) in such form and quantity that there are reasonable prospects for eventual economic extraction.

**Minerals**

*Gold* is a soft, yellow, corrosion-resistant element. It is the most malleable and ductile metal, occurring in veins and alluvial deposits and recovered by mining or by panning or sluicing. A good thermal and electrical conductor, gold is generally alloyed to increase its strength, and it is used as an international monetary standard, in jewellery, for decoration, and as a plated coating on a wide variety of electrical and mechanical components.

*Silver* is a lustrous, white, ductile, malleable, metallic element, occurring both uncombined and in ores, such as argentite. It has the highest thermal and electrical conductivity of the metals.

*Iron* is a silvery-white, lustrous, malleable, ductile, magnetic, metallic element occurring abundantly in combined forms, notably in hematite, limonite, magnetite, and taconite

*Bauxite* is the principal ore of aluminium, composed mainly of hydrous aluminium oxides and aluminium hydroxides.

*Nickel* is a silvery, hard, ductile and ferromagnetic metallic element used in alloys, in corrosion-resistant surfaces, batteries and for electroplating.

*Sand/Gravel* is small loose grains of worn or disintegrated rock or an unconsolidated mixture of rock fragments and pebbles.

*Limestone* is a common sedimentary rock that consists mostly of calcium carbonate, CaCO<sub>3</sub>. It is used as a building stone and in the manufacture of lime, carbon dioxide, and cement.

*Salt* is a crystalline compound, sodium chloride, NaCl, which occurs as a mineral.

*Crude Oil* is unrefined petroleum, which is a thick, flammable, yellow-to-black mixture of gaseous, liquid, and solid hydrocarbons that occurs naturally beneath the earth's surface.

*Gypsum*, hydrated calcium sulphate ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ), is a very common mineral occurring in crystals and in masses. It is soft enough to be scratched by the fingernail and is used to make plaster of Paris, as an ornamental material and as a fertilizer.

*Anhydrite* is a colourless, white, grey, blue, or lilac mineral of anhydrous calcium sulphate ( $\text{CaSO}_4$ ), occurring as layers in gypsum deposits.

*Marble* is a metamorphic rock formed by alteration of limestone or dolomite, often irregularly coloured by impurities, and used especially in architecture and sculpture.

*Silica Sand* is the dioxide form of silicon,  $\text{SiO}_2$ , occurring especially as quartz sand, flint, and agate. It is usually used in the form of its prepared white powder chiefly in the manufacture of glass, water glass, ceramics, and abrasives.

*Not Stated* refers to minerals that have not been so far mentioned and that were not specified in the questionnaires.

#### Method of Computation

Data for this indicator was obtained from Member States/Associate Members according to the categories: Gold, Silver, Iron, Bauxite, Nickel, Sand & Gravel, Limestone, Salt, Crude Oil, Gypsum & Anhydrite, Marble, Silica Sand and Not Stated.

#### Indicator Relevance

The purpose of the indicator is to measure the availability of mineral resources. Mineral reserves estimates, particularly in terms of years remaining at current rates of extraction, are crucial for the assessment of sustainable development. The factors for estimating the availability of non-renewable resources are exhaustibility, uncertainty and economic supply as a function of price and technology. The conservation of energy and the increased use of recycling materials can result in reducing mineral exploitation.

#### Data Assessment

The internationally recommended definition of a mineral reserve was followed and so, this indicator is regionally and internationally conceptually harmonized.

**Data Sources**

Three Member States provided data for this indicator. Those three countries are Grenada, Guyana and Jamaica. None of the Associate Members provided data. The data for this indicator is, therefore, sparse and with little detail. Please refer to **Appendix 1.5.5** for the sources of the data on mineral reserves by type in Member States/Associate Members.

**Evaluation**

Data on mineral reserves for three Member States is presented in **Table 5.5** below. In Guyana mineral reserves of *bauxite* was 1,200 x 106 million tonnes in 1996 whereas Grenada reported its reserves of *sand and gravel* experiencing major fluctuations from 17,862 cubic yards in 1998 to 186 cubic yards in 1999 then increasing to 13,237 cubic yards in 2000 with further increases in 2001 (14,101 cubic yards) and 2002 (39,393 cubic yards) with a high decline in 2003 to 116 cubic yards. The table below also shows data for Jamaica whose reserves of *gold* were 986 in 2002. The data for Jamaica also shows reserves of *bauxite* at 2,500 tonnes in 1990 and 2002, *limestone*, *sand and gravel*, *gypsum* and *anhydrite*, *marble* and *silica sand*.

**Table 5.5 - Mineral Reserves by Type: 1998 - 2003**

| Country | Year | Gold | Bauxite                 | Sand & Gravel    | Limestone | Gypsum & Anhydrite | Marble | Silica Sand |
|---------|------|------|-------------------------|------------------|-----------|--------------------|--------|-------------|
| GD      |      |      |                         | yds <sup>3</sup> |           |                    |        |             |
|         | 1998 | ...  | ...                     | 17,862           | ...       | ...                | ...    | ...         |
|         | 1999 | ...  | ...                     | 186              | ...       | ...                | ...    | ...         |
|         | 2000 | ...  | ...                     | 13,237           | ...       | ...                | ...    | ...         |
|         | 2001 | ...  | ...                     | 14,101           | ...       | ...                | ...    | ...         |
|         | 2002 | ...  | ...                     | 39,393           | ...       | ...                | ...    | ...         |
|         | 2003 | ...  | ...                     | 116              | ...       | ...                | ...    | ...         |
| GY      | 1996 | ...  | tonnes<br>1,200,000,000 | ...              | ...       | ...                | ...    | ...         |
| JM      |      | kg   | tonnes                  | tonnes           | tonnes    | tonnes             | tonnes | tonnes      |
|         | 1990 | ...  | 2,500                   | ...              | ...       | ...                | ...    | ...         |
|         | 2002 | 986  | 2,500                   | 2.4              | 3,100,450 | 85                 | 355    | 2.1         |

### Appendix 1.5

#### 1.5.1 (a): Sources of Data for Table 5.1 - Energy Consumption by Type and Year: 1990, 1995, 1998 - 2004

| Country                        | Data Source  |
|--------------------------------|--|
| THE BAHAMAS                    | Bahamas Electricity Company  |
| BELIZE                         | Land Information Centre/ Ministry of Natural Resources                     |
| DOMINICA                       | Central Statistical Office and Dominica Electricity Services               |
| GRENADA                        | National Statistical Office  |
| JAMAICA                        | Jamaica Public Service Company, Ministry of Commerce, Science & Technology |
| SAINT LUCIA                    | Saint Lucia Electricity Services Limited                                   |
| ST. VINCENT AND THE GRENADINES | St. Vincent Electricity Services   |
| BERMUDA                        | Department of Statistics: Facts and Figures                                |

#### 1.5.1 (b): Notes for Table 5.1 - Energy Consumption by Type and Year: 1990, 1995, 1998 - 2004

| Country     | Notes   |
|-------------|---|
| THE BAHAMAS | The increase in kWh sold and the corresponding fuel consumption is a direct reflection of Bahamas Electricity Company's use of higher efficiency machinery, which uses lower grade and less fuel.<br>n/a refer to not applicable or not in use at any measurable scale. |
| DOMINICA    | Liquids are Kerosene, Diesel and Gasoline.<br>Gases are Butane and Propane.   |
| JAMAICA     | a/: Import of liquid fuels<br>p: provisional data<br>boe: barrel oil equivalent   |

**1.5.2 (a): Sources of Data for Table 5.2 - Number of Households by Type of Fuel Used for Cooking: 2000 Round of Census**

| Country                       | Data Source   |
|-------------------------------|---|
| ANTIGUA AND BARBUDA           | Basic Table Volume  |
| THE BAHAMAS                   | Population and Housing Census, 2000 Round                     |
| BARBADOS                      | Basic Table Volume  |
| BELIZE                        | Population and Housing Census, 2000 Round                     |
| DOMINICA                      | Population and Housing Census, Central Statistics Office      |
| GRENADA                       | Population and Housing Census 2001                            |
| GUYANA                        | Basic Table Volume  |
| JAMAICA                       | Population Census 2001  |
| MONTSERRAT                    | Basic Table Volume  |
| ST. KITTS AND NEVIS           | Basic Table Volume  |
| SAINT LUCIA                   | Population and Housing Census, 2000 Round                     |
| ST VINCENT AND THE GRENADINES | Basic Table Volume  |
| SURINAME                      | Population and Housing Census, 2000 Round                     |
| TRINIDAD AND TOBAGO           | Central Statistical Office/2000 Population and Housing Census |
| ANGUILLA                      | Basic Table Volume  |
| BRITISH VIRGIN ISLANDS        | Basic Table Volume  |
| THE TURKS AND CAICOS ISLANDS  | TCI 2001 Population & Housing Census, Statistical Office      |

**1.5.2 (b): Notes for Table 5.3 - Number of Households by Type of Fuel Used for Cooking: 2000 Round of Census**

| Country                       | Notes  |
|-------------------------------|--|
| THE BAHAMAS                   | Other includes not stated  |
| BARBADOS                      | Charcoal = wood/charcoal. Other includes natural gas, solar and other. |
| DOMINICA                      | Other includes not stated. Charcoal = coal/wood                        |
| GRENADA                       | Other includes not stated  |
| GUYANA                        | Charcoal = coal  |
| JAMAICA                       | Other includes not stated  |
| SAINT LUCIA                   | Other includes not stated. Charcoal = coal/wood                        |
| ST VINCENT AND THE GRENADINES | Other includes not stated  |
| TRINIDAD AND TOBAGO           | Charcoal = coal/wood   |
| ANGUILLA                      | Charcoal = charcoal/wood   |
| THE TURKS AND CAICOS ISLANDS  | Charcoal = coal/wood   |

**1.5.3 (a): Sources of Data for Table 5.3 - Number of Households by Type of Fuel Used For Lighting: 2000 Round of Census**

| Country                       | Data Source   |
|-------------------------------|---|
| ANTIGUA AND BARBUDA           | Basic Table Volume  |
| THE BAHAMAS                   | Population and Housing Census, 2000 Round                     |
| BARBADOS                      | Basic Table Volume  |
| BELIZE                        | Basic Table Volume  |
| DOMINICA                      | Population and Housing Census, Central Statistical Offices    |
| GRENADA                       | Population and Housing Census 2001                            |
| GUYANA                        | Basic Table Volume  |
| JAMAICA                       | Population and Housing Census 2001                            |
| MONTserrat                    | Basic Table Volume  |
| ST. KITTS AND NEVIS           | Basic Table Volume  |
| ST VINCENT AND THE GRENADINES | Basic Table Volume  |
| TRINIDAD AND TOBAGO           | Central Statistical Office/2000 Population and Housing Census |
| ANGUILLA                      | Basic Table Volume  |
| BRITISH VIRGIN ISLANDS        | Basic Table Volume  |
| THE TURKS AND CAICOS ISLANDS  | TCI 2001 Population and Housing Census, Statistical Office    |

**1.5.3 (b): Notes for Table 5.3 - Number of Households by Type of Fuel Used for Lighting: 2000 Round of Census**

| Country                       | Notes  |
|-------------------------------|--|
| ANTIGUA AND BARBUDA           | Not stated includes none.  |
| THE BAHAMAS                   | Other includes not stated  |
| BARBADOS                      | Other includes batteries and other.  |
| DOMINICA                      | 1981 data for kerosene lighting was mainly due to Hurricane David's devastating effects on electrical power. |
| GUYANA                        | Other includes generator/inverter and other.   |
| GRENADA                       | Other includes not stated  |
| JAMAICA                       | Other includes not stated  |
| MONTserrat                    | Not stated = none.   |
| ST VINCENT AND THE GRENADINES | Other includes not stated. Not stated = none.  |
| ANGUILLA                      | Other = other + none   |
| BRITISH VIRGIN ISLANDS        | Not stated = none.   |

**1.5.4 (a): Sources of Data for Table 5.4 - Mineral Production by Type: 1990 - 2004**

| Country             | Data Source   |
|---------------------|---|
| THE BAHAMAS         | Department of Statistics  |
| BELIZE              | Land Information Centre/ Ministry of Natural Resources  |
| DOMINICA            | Central Statistical Office  |
| GRENADA             | Central Statistical Office  |
| GUYANA              | Guyana Geology and Mines Commission   |
| JAMAICA             | Mines & Geology Division, Jamaica Bauxite Institute   |
| TRINIDAD AND TOBAGO | Ministry of Planning and Development, First Compendium of Environmental Statistics of Trinidad and Tobago |
| SURINAME            | General Bureau of Statistics  |

**1.5.4 (b): Notes for Table 5.4 - Mineral Production by Type: 1990 – 2004**

| Country     | Notes   |
|-------------|---|
| THE BAHAMAS | Other refers to Aragonite.  |
| DOMINICA    | *: only export data available. There are no reserves or production of gold, silver, iron, aluminium, nickel, limestone, salt and crude oil. |

**1.5.5 (a): Sources of Data for Table 5.5 - Mineral Reserves by Type: 1998 - 2003**

| Country | Data Source   |
|---------|---|
| GRENADA | National Statistical Office.                        |
| GUYANA  | Guyana Geology and Mines Commission                 |
| JAMAICA | Mines & Geology Division, Jamaica Bauxite Institute |

**1.5.5 (b): Notes for Table 5.5 - Mineral Reserves by Type: 1998 - 2003**

| Country | Notes  |
|---------|--|
| JAMAICA | It is difficult to arrive at a value for reserves of sand and gravel as there is replenishment in river beds and plains after heavy rainfall. There are no reserves or production of gold, silver, iron, aluminium, nickel, limestone, salt and crude oil. |

**REFERENCES**

1. The United Nations Statistics Division, Energy Statistics: Definitions, Units of Measure and Conversion Factors
2. A joint publication by the World Resources Institute, the United Nation's Environment Programme, the United Nations Development Programme, and The World Bank, World Resources 1998-99: Environmental change and human health