ANNEX- I

Definitions adopted by United Nations & India

1. Solid fuels

1. Hard Coal: Coal has a high degree of coalification with a gross calorific value over 24 MJ/Kg.(5700 Kcal/kg) on an ash-free but moist basis. Included are fines, middlings, slurry produced in the installations at pitheads.

2. Lignite: Brown coal is a coal with a low degree of coalification. It's gross calorific value is 5,700 K.cal./kg. or less on an ash-free but moist basis.

3. Coke: The solid product obtained from carbonization of coal or lignite at high temperature.

2. Liquid fuels

1. Crude petroleum comprises of the liquid product obtained from oil wells consisting predominantly of non-aromatic hydrocarbons (paraffinic, cyclanic, etc.) provided that they have not been subjected to any further processes other than those of decantation, dehydration or stabilization (removal of certain dissolved hydrocarbon gases for convenience of transport or to which have been added only hydrocarbons previously recovered by physical methods during the course of the above processes. Data for crude petroleum include shale oil and field condensate but exclude natural gas liquids from plants and oils obtained from the distillation of solid fuels.

2. Liquified petroleum gases include (i) hydrocarbons extracted by stripping of natural gas at crude petroleum and natural gas sources; (ii) hydrocarbons extracted by stripping of imported natural gas in installations of the importing country; and (iii) hydrocarbons produced both in refineries and outside refineries in the course of processing of crude petroleum or its derivatives. Included are mainly propane, butane, isobutane and ethane.

3. Motor gasoline comprises of a mixture of relatively volatile hydrocarbons with or without small quantities of additives, which have been blended to form a fuel suitable for use in spark-ignition internal combustion engines. Natural gasoline, aviation gasoline and naphtha's are excluded.

4. Naphtha's are refined or partly refined light distillates derived roughly between 27 and 221 degrees centigrade, which are to be further blended or mixed with other materials to make high grade motor gasoline or jet fuel, or to be used as raw materials for town gas or feed stocks to make various kinds of chemical products, or to be used as various solvents, depending on the character of naphtha's derived and the demands of various industries.

5. Kerosene comprises mixtures of hydrocarbons with a flash point above 38 degrees centigrade, distilling less than 90 per cent in volume at 210 degrees centigrade, including losses. It is a refined crude petroleum fuel in volatility between motor gasoline and gas oil, free of gasoline's and heavy hydrocarbons such as gas oil and lubricating oil. It is used as a illuminant and as a fuel in certain types of spark-ignition engines such as those used for agricultural tractors and stationary engines. The data include those products, commonly named as burning oil, vaporizing oil, power kerosene and illuminating oil. Jet fuel, white spirit and naphtha's are excluded.

6. **Jet fuels** comprise of fuel meeting of the required properties for use in jet engines and aircraft-turbine engines, mainly refined from kerosene. Gasoline-type jet fuel (light hydrocarbons, also naphtha's type, intended for use in aviation gas-turbine units as opposed to piston power units) is included.

7. **Gas-diesel** oils comprise of gas oils (with a flash point in a closed vessel of at least 55 degrees centigrade and distilling 90 per cent or more in volume at 360 degrees centigrade), fuel oils (with a flash point in a closed vessel of between 55 and 190 degrees centigrade and needle penetration at 25 degrees centigrade of 400 or more), domestic fuel oil (with a viscosity of less than 12 centistokes at 20 degrees centigrade and an asphalt content of not less than 0.5 per cent). It is used as a fuel for internal combustion in diesel engines, as burner fuel in heating installations such as furnaces and for enriching water gas to increase its luminosity. The data refer to those products commonly called diesel fuel, diesel oil, gas oil, solar oil, etc.

8. **Residual fuel oil** comprises of mixtures of hydrocarbons with a viscosity of at least 49 centistokes at 20 degrees centigrade and an asphalt content of at least 1 per cent. It is crude petroleum residues, such as viscous residuum obtained by the refinery operations of crude petroleum after gasoline, kerosene and sometimes heavier distillates (such as gas oil or diesel oil) have been removed. It is commonly used by ships and industrial large scale heating installations as a fuel in furnaces of boilers. It is also known as mazout.

9. **Lubricants** are mixtures of hydrocarbons distilling less than 30 per cent in volume at 300 degrees centigrade with a flow point lower than 30 degrees centigrade. They are heavy liquid distillates obtained by refining crude petroleum and are used for lubricating purposes. They may be produced either from petroleum distillates or residues at refineries. Solid lubricants (e.g. grease) are excluded.

10. **Petroleum coke** is a solid residue consisting mainly of carbon, obtained by the distillation of heavier petroleum oils; used mainly in metallurgical process (excluding those solid residues obtained from carbonization of coal).

11. **Bitumen (Asphalt)** is a brown to black solid or semi-solid material obtained as a residue in the distillation of crude petroleum. It is used mainly in road construction. Natural asphalt is excluded.

12. **Petroleum waxes** include paraffin wax (a translucent white or yellow crystalline hydrocarbon material of low oil content normally obtained as a residue by the distillation of wax-bearing crude petroleum), paraffin scale slack wax and wax emulsions. These waxes are used for candle manufacture, polishes and waterproofing of containers, wrappings, etc.

13. **Refinery gas** is a non-condensable gas collected in petroleum refineries (it is also known as still gas).

3. Gaseous fuels

1. **Natural Gas** is a mixture of hydrocarbon compounds and small quantities of non-hydrocarbons existing in the gaseous phase, or in solution with oil in natural underground reservoirs. It may be sub-classified as associated gas (that originating from fields producing both liquid and gaseous hydrocarbons), dissolved gas, or non-associated gas (that originating from fields producing only hydrocarbons in gaseous form). Included are methane (CH4) recovered from coal mines, sewage gas and natural gas liquefied for transportation. Excluded, however, are gases used for re-pressuring and re-injection, as well as gas flared, vented or otherwise wasted, and shrinkage accruing to processing for the extraction of natural gas liquids.

2. **Coke-oven gas** is a by-product of the carbonization process in the production of coke in coke ovens.

3. **Bio-gas** is a by-product of the fermentation of biomass, principally animal wastes by bacteria. It consists mainly of methane gas and carbon dioxide.

4. Electricity

1. **Installed capacity**: The net capacity measured at the terminals of the stations, i.e., after deduction of the power absorbed by the auxiliary installations and the losses in the station transformers.

3. **Utilities**: undertakings of which the essential purpose is the production, transmission and distribution of electric energy. These may be private companies, cooperative organisations, local or regional authorities, nationalised undertakings or governmental organisations.

4. **Hydro Electricity**: as energy value of electricity is obtained by dividing the electricity generation by the average efficiency of all hydro-power stations.

5. **Thermal Electricity** comprises conventional thermal plants of all types, whether or not equipped for the combined generation of heat and electric energy. Accordingly, they include steam-operated generating plants, with condensation (with or without extraction) or with back-pressure turbines, and plants using internal combustion engines or gas turbines whether or not these are equipped for heat recovery.

6. **Nuclear Electricity** is defined as the heat released by the reactors during the accounting period and is obtained by dividing the generation of nuclear electricity by average efficiency of all nuclear power stations.

7. **Production** comprises gross production, i.e. the amount of electric energy produced, including that consumed by station auxiliaries and any losses in the transformers that are considered integral parts of the station. Included is the total production of electric energy produced by pump storage installations.

8. **Imports, exports** refer to the amounts of electric energy transferred to and from the countries concerned, which are measured at the metering points on the lines crossing the frontiers. Included are imports and exports of electric energy made by means of high voltage lines crossing frontiers as well as imports and exports of electric energy made by means of low-voltage lines for use in the immediate vicinity of the frontier, if the quantities so transferred are known.

9. **Station use & loss**: included are consumption by station auxiliaries and losses in transformers which are considered as integral parts of the electric energy generating plants.

10. **Losses in transport & distribution** comprise of the losses in transmission and distribution of electric energy and losses in transformers which are not considered as integral parts of the electric energy generating plants. Included also is the electric energy consumed in pumping for pump storage installations.

5. Non-commercial Energy Sources

1. **Fuelwood** comprises of the volume of all wood (coniferous and non-coniferous) in the rough use for fuel purposes.

2. **Charcoal** comprises of the solid residue consisting mainly of carbon obtained by the destructive distillation of wood in the absence of air.

3. **Bagasse** is a cellulosic residue of the sugar-cane industry, which is often used as a fuel within the sugar milling industry.

Source: Energy Statistics: Definitions, Units of Measure and Conversion Factors-Studies in Methods Series 'F' No.44-UNITED NATIONS, NEW YORK – 1987