Country paper on Energy Statistics in India

Introduction

Energy is critical, directly or indirectly, in the entire process of evolution, growth and survival of all living beings and it plays a vital role in the socio-economic development and human welfare of a country. Achieving energy security is, therefore, of fundamental importance to India's economic growth imperatives that aim at alleviation of poverty, eradication of unemployment and meeting the other Millennium Development Goals (MDGs). Holistic planning is essential for achieving these objectives, which, in turn, requires quality energy statistics for effective planning for energy security.

The purpose of constitution of the Oslo City Group, as it is well known, is to come out with guidelines for the preparation of a manual on energy statistics, which will serve as a reference guide for different countries. This workshop, in particular, is to deliberate on the various conceptual issues divided into nine agenda items. Out of these 9 items, I have been asked to deal on three items, namely agenda items 2, 5, and 8.This paper is , accordingly, divided into three Sections. Section A deals with scope of energy statistics in India. Section B delineates the institutional mechanism for energy statistics and Section C is devoted to the discussion of quality dimensions and dissemination of energy statistics.

A. Scope of Energy Statistics in India

The discussion on the scope of energy statistics should comprise the various energy sources/materials (energy mix), different types of energy flows (Physical and monetary), different variables to be measured and indicators compiled, the users of energy statistics and the existing data gaps & steps taken to improve the data.

(i) Energy Mix in India

The energy mix in India comprises both primary, which occur in nature (coal, crude oil, natural gas, fuel wood) and secondary sources, which are derived from primary sources (coal gas, coke, petroleum products and charcoal, electricity (thermal, hydro, nuclear)); renewable sources such as, mini-hydro, wind energy, solar energy, biogas, biodiesel, etc. and non-renewable resources (fossil fuels); commercial (coal, oil, petroleum products, natural gas and electricity) and non-commercial sources (fuel wood, dung cake).

(ii) Types of Energy measures:

To meet the requirements of all kinds of users, energy statistics should be expressed in physical units, in monetary units and also in a common energy unit. The energy statistics in India are compiled in appropriate physical units of measurement of the energy resources/materials. For example, coal and lignite are measured in tonnes (million tonnes); natural gas in cubic meters; electricity in kilowatt-hour (megawatt-hour, gigawatt-hour), etc. These physical measures include both stock and flow variables. The stock variables are: reserves of primary energy resources, installed generation capacity, the length of oil pipe lines and electricity distribution lines, etc. It is relatively easy to measure the stock and flow variables and to compile statistics in physical units, Therefore, most of the energy statistics are compiled in

physical units. Monetary measures of various stock and flow variables are very important for national accounts. But in India the production and consumption flows of energy are not compiled in monetary terms, which is a great limitation of the system. However, the energy producers and suppliers maintain their financial accounts that are used for assessing their financial viability and also to compute their contribution to national income. Since the energy content per unit of energy resources varies from resource to resource and within the same resource according to quality of the resource obtained from various places and over different points of time, it is desirable to express all the energy resources in one common unit viz. Joule (Terra Joule, Peta joule, etc.). The use of such a standard common unit facilitates aggregation of energy statistics from various sources, international comparison and energy balance. Due to large variations in the quality of the same energy resource obtained from different places and over different periods of time, the energy producers, in general, do not convert their energy production in one common unit of energy. However, in the compilation of Energy Statistics by CSO, the production of energy from various resources are converted into peta joules by applying standard conversion factors as recommended for Indian resources.

(iii) Types of Data Generated

The physical flow of Energy Statistics in India relate to several parameters including reserve, potential, install capacity, capacity utilization, production, import &export, availability, consumption, man days worked, labour productivity (output per man shift), transmission & distribution, etc. Further, the physical and financial accounts viz. physical capital formation, infrastructure development, etc. are also maintained by the respective energy companies/organizations. However, at present the statistics on infrastructure for the extraction, production, transformation and distribution are compiled by the respective line organizations, but these do not form part of Energy Statistics in India brought out by the CSO. Efforts are underway to compile Annual Infrastructure Statistics by the CSO, which will include one chapter on energy infrastructure comprising indicators on availability, affordability, accessibility, acceptability, economic & financial regulation and environmental regulation.

(iv) Conformity to International Standards

Energy generation, transmission, distribution and measurement are very scientific and technical in nature. Like all other scientific and technological aspects, energy units and measurable indicators are to be based on internationally accepted standards, concepts, definitions and the statistics are to be compiled according to different standard international classifications. The line ministries are following the international concepts, definitions and measures as feasible in the Indian context. The data on energy resources are compiled according to National Industrial Classification, which is based on International Standard Industrial Classification of all Economic Activities (ISIC) and the 8-digit codes of Indian Trade Classification (based on Harmonized Coding System(HS)).

(v) Users of Energy Statistics

The Energy Statistics generated through various Ministries/Departments find extensive use for development planning, policy formulation, research & development, trade & commerce, etc. pertaining to energy. Various Ministries and Departments of Govt. of India and State governments, research and educational institutions, private researchers, international organizations such as, International Energy Agency, UNSD, etc. make use of these data. Business and industrial houses use the energy data for analyzing the market dynamics of various energy resources, particularly those which are imported.

(vi) Existing data gaps

Official energy statistics, like those pertaining to other areas, have several limitations that need to be addressed on a priority basis to make quality energy statistics available to the planners. Some of these gaps are:-

(a) Inadequacy of renewable energy data

Data on renewable energy sources are comprehensive and adequate. All types of stock and flow data are not compiled. Only the generation capacity created in various states is available from the respective Ministry. The CSO is trying to impress upon the ministry to compile an annual renewable energy report providing details of actual performance of different renewable technologies at the state and national levels. This will include actual energy supplied from different renewable options, availability, actual costs, operating and maintenance problems, etc. It will also report on social benefits, employment created, and women's participation and empowerment for assessing the socio-economic viability of these resources. It is also persuading the Ministry to strengthen the statistical unit/cell by deploying qualified and skilled statistical personnel to compile the requisite data.

b) Incompleteness of Energy consumption data

Energy consumption data generated by the line Ministries are based on the information available only from the production and distribution agencies, which may capture the consumption by various utilities, but fails to take account of life-line energy consumption for domestic purposes. Household energy consumption for majority of the poor people, particularly in rural areas in India, comprises non-conventional sources such as, dung, agricultural waste and firewood for cooking food. The household energy consumption data are collected and compiled by the National Sample Survey Organization (NSSO). The NSSO generates data on the estimated consumption of various sources of energy, both quantity and value, through the regular consumption expenditure surveys.The 1999-2000, 55th Round of the NSSO revealed that for 86% of the rural household, the primary source of cooking energy was firewood and woodchips or dung cakes. In urban areas as well, more than 20% of all household relied mainly on firewood and woodchips. Only 5% of the household in rural areas and 44% in the urban areas used LPG. Kerosene was used by 22% of urban households and only 2.7% of rural households. Other primary sources of cooking energy used by urban and rural households include charcoal, gobar gas, electricity and other fuels. The following table provides the relevant empirical evidence in this regard:-

Household Energy Consumption in India (July 1999- June 2000)

Fuel Type	Physical Units			Mtoe		
	Rural	Urban	Total	Rural	Urban	Total
Fire Wood& Chips (Mt)	158.87	18.08	176.95	71.49	8.13	79.62
Electricity (B kWh)	40.76	57.26	98.02	3.51	4.92	8.43
Dung Cake (Mt)	132.95	8.03	140.98	27.92	1.69	29.61
Kerosene (ML)	7.38	4.51	11.89	6.25	3.82	10.07
Coal (Mt)	1.20	1.54	2.74	0.49	0.63	1.12
LPT (Mt)	1.25	4.43	5.68	1.41	5.00	6.41

Source: Derived from NSS 55th Round (July 1999-June 2000) data, National Sample Survey Organisation, Ministry of Statistics and Programme Implementation, Govt. of India.

These household energy consumption data should be dovetailed with the consumption data generated on the basis of information from production and distribution agencies as mentioned earlier to get the holistic picture on energy consumption in the entire economy.

(c) Unorganised coal production not fully captured

In case of coal, which is the main source of energy in India, the main data sources are the coal companies, mostly under the public sector, except a few captive coal mines owned by private companies. The line ministry of coal, Office of Coal Controller collects the data from these coal companies under various legal provisions viz. Collection of Statistics Act 1953 and rules framed there-under from time to time; Coal Mines (Conservation and Development) Act 1974 and the Colliery Control Order 2000. However, in the case of Meghalay (a North-Eastern state of India) ungraded quality of coal is mined from the large number of small scale coal mines, which are in unorganized sector (Private non-captive) and are mostly operated by the local tribes in their private lands. Meghalay coal is dispatched by road as there is no rail link in the state. These coal are primarily dispatched to the other North-Eastern states and different northern non-coal-producing states like Haryana, Himachal Pradesh, Punjab, Rajasthan, etc. Besides, it is also exported to the neighboring countries, particularly Bangladesh. The Directorate of Mineral Resources, Government of Meghalay, collects production and dispatch data on coal. The figures relating to dispatch of coal are compiled by the directorate from the monthly returns furnished by the different check gates. Since there is no other source of production data and small miners are expected to sell off their mined produce early, production is assumed to be same as dispatch. Consequently, there is no proper account of this unorganised coal production and the production figures reported are far from realty. A specialized survey need to be conducted for capturing the same.

(d) Energy consumption data of utilities obtained from ASI and producer/suppliers need reconciliation:

The industrial energy consumption data are available from two sources. For the public utilities the consumption data are compiled from the dispatch figures furnished from suppliers side by adjusting for the change in industrial stock. In the case of registered manufacturing industries some oh which also include the public utilities, the energy consumption data are also generated through the Annual Survey of Industries. Consistency between the data obtained from these two sources need to be checked in respect of the common units and discrepancy in the consumption figures need to be corrected to the maximum extent possible. It requires a detailed study, which can be taken up subject to availability of resources .

(e) Inadequate energy balance

A proper balance, both commodity balance and energy balance, need to be developed for identifying the utilization of various energy resources vis-à-vis the availability in the country. Considering the variation in quality of energy resources over time and space and also the fact that energy is measured in different natural units in different countries, all these energy resources should be converted to energy units for obtaining energy balance. Energy balance will also facilitate fixation of prices and international comparison. Development of such balance must be effected by applying statistical audit. In India a very simple commodity balance is carried out in respect of coal, which balances the availability (production+ import – export + change in stock) and Off-take (industrial consumption + other consumption + colliery consumption). This type of commodity balance is not maintained in respect of other energy resources.

B. Institutional arrangement for energy statistics in India

Institutional arrangement in the compilation of energy statistics need to be considered from two aspects viz. the institutions/organizations and the manpower that are responsible for supply and compilation of energy statistics and the legal provision for this purpose. The following paragraphs delineate these aspects in brief.

(i) The nature of the energy mix in India clearly indicates towards the multidisciplinary nature of the energy team required for effective measurement and compilation of energy statistics. It involves geologists, engineers, technicians, accountants, statisticians, etc. Also the functional jurisdictions spread over different line organizations. In view of the federal political structure of India, different line Ministries are entrusted with the responsibilities for planning, policy making and development pertaining to their respective functions (production, transmission and distribution) including generation of Official Statistics. Consequently, Ministry of Coal (Office of Coal Controller), Ministry of Power (Central Electricity Authority), Ministry of Petroleum and Natural Gas and Ministry of New and Renewable Energy Sources are responsible for generating Official Energy Statistics pertaining to their respective areas. These line ministries get the data from the producers and suppliers of various energy resources under their jurisdiction. Besides, household energy consumption data are collected through the consumer expenditure survey of the NSSO and the industrial energy consumption data in respect of utilities and registered

manufacturing units are collected through the Annual Survey of Industries conducted by the CSO.

(ii) Data agencies

Each of the line Ministries/organizations collects, compiles and disseminates Energy Statistics pertaining to its domain. They collect the data from the production companies / organizations/licensees under their control. For example, Office of Coal Controller in the Ministry of Coal obtains the data from the Public Sector coal companies, namely, Coal India Limited and its subsidiaries; the Singareni Colliery Company Limited (a joint venture of Govt. of Andhra Pradesh and Govt. of India), Neyvelli Lignite Corporation, Govt. of Tamil Nadu and Gujarat Mineral Development Corporation, besides private companies like TISCO, IISCO, etc., which have captive coal mines. The Central Electricity Authority (CEA) in the Ministry of Power is entrusted with the responsibility of generating Electricity Statistics, hydro, thermal and nuclear. The CEA obtains the information on generation, transmission, distribution, trading and utilization of electricity from licensees, generating companies, individual persons generating electricity. Ministry of Petroleum and Natural Gas obtains the relevant information from oil companies, Petroleum, Planning and Analysis Cell (PPAC) of the Director General of Hydro Carbons (DGHC). Ministry of New and Renewable Energy Sources obtains the data from the reports of the respective line Ministries of States/UTs.

The Energy Sector in India is dominated by large state monopolies at both central and state levels. Over 88% of utility-based generation is in the public sector, which also, almost entirely, controls transmission and distribution. Though Privatization is being encouraged the success achieved so far is limited. This state monopoly is very helpful in compilation of statistics, because these are duty bound for compiling and supplying the data to the controlling line ministries. The details of the present publications on energy statistics in India is given in Annexure.

(iii) Legal/Statutory Backing on Energy Statistics

Generation of Official Statistics gets facilitated through legal/statutory backing. Legal backing makes it binding on the producers and consumers of energy for supply of relevant information to the data collecting agencies. In the Indian context, Energy Statistics are generated with legal backing in respect of coal and electricity. No such legal backing is available for generation of statistics pertaining to new and renewable energy sources. In case of coal, the Coal Controller is the Statistics Authority of Coal Statistics under the Collection of Statistics Act, 1953 and Rules framed there under. Besides, it enjoys the legal authority under Coal Mines (Conservation and Development) Act 1974 and the Colliery Control Order 2000. The Central Electricity Authority generates the Electricity Statistics under Section 73 of the Electricity Act, 2003. The Act empowers the Authority (i) to collect and record the data concerning the generation, transmission, trading, distribution and utilization of electricity and carry out studies relating to cost, efficiency, competitiveness and such like matters (ii) to make public from time to time information secured under this Act, and provide for the publication of reports and investigations and (iii) to promote research on matters affecting the generation, transmission, distribution and trading of electricity.

(iv) Data Coordination and standardization

The Central Statistical Organization (CSO) is nodal statistical organization of the Govt. of India, which is responsible for standardization and coordination of official statistics including Energy Statistics. Trained and qualified statisticians are working in the various line Ministries for collection, compilation and dissemination of official Energy Statistics. CSO provides the necessary guidance in respect of developing concepts, definitions, methodologies etc. to these line Ministries. It also organizes training programmes for the energy statistics personnel of central and state governments and the public sector units. Besides, CSO brings out an annual publication 'Energy Statistics,' which is compiled on the basis of the information provided by the various line Ministries.

C. Data quality assurance and dissemination

This section is divided into two parts viz. (a) definition of data quality and discussion of dimensions of quality, and (b) data dissemination. The Indian situation and practices are indicated in the respective heads.

(i) Quality and dimensions of quality

The quality of energy statistics, like any other official statistics, is to be evaluated from various dimensions. Quality means "The totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs (ISO). In general terms 'quality' is defined as "fitness for use" in terms of user needs. This definition is broader than has been generally used in the past when quality was equated with accuracy. It is now generally recognized that there are other important dimensions of quality. Even if data are accurate, these can not be said to be of good quality, if these are produced too late to be useful or cannot be easily accessed or appear in conflict with other data. Thus, quality is viewed as a multi-faceted or multidimensional concept.

In the literature on official statistics the quality of a statistical product is assessed via several dimensions The important ones include: Relevance, Accuracy, Credibility, Reliability, Timeliness, Accessibility, Interpretability, Coherence, Consistency, Adequacy/Completeness, Independence/Neutrality/Integrity, Comparability, Serviceability, Sustainability and cost-efficiency. The exact meanings of these dimensions are discussed in detail in the following paragraphs. Further, one additional dimension, Adequacy, which is frequently referred to by statisticians is also discussed.

(ii) **Descriptions of quality dimensions:**

- **Relevance**: Energy statistics have to carter to the diverse demands and uses of analysts, planners, policy makers, etc. It will be relevant, if it serves all their requirements and if it is based on appropriate concepts. It should be relevant to the context (problem or scope), time (reference period) and space (coverage) of the study. According to the OECD quality framework, relevance is proportional to the scope and coverage and it is also positively correlated to the number of "best" methods adopted and indicators generated. Judged from these angles, the energy statistics in India are quite relevant to the problems simply because these produced as official byproducts of energy administration and are extensively used for planning,

monitoring and evaluation of the energy sector. The vast scope and coverage , the large number of indicators generated and the diversity of uses of energy statistics in India add to the relevance dimension.

- **Accuracy**: Energy statistics is a combination of the statistics of various energy resources and their derivatives. Hence the accuracy of energy statistics strongly depends on the accuracy of the constituents. The OECD explains that "Accuracy refers to the closeness between the values provided and the (unknown) true values" and that "Accuracy has many attributes, and in practical terms there is no single aggregate or overall measure of it." According to this, accuracy of energy statistics has to be assessed via the closeness between the initially released value(s) (provisional data) and the subsequent value(s) of estimates (final data) in practice and the absence of revisions does not necessarily mean that the data are accurate". According to the Eurostat's *Methodology of Short-term Business Statistics: Interpretation and Guidelines*, "Accuracy can be measured using several indicators: random sampling errors, non-random sampling errors, statistical frame errors, measuring errors, process errors, non-response errors, model errors". Taking into account these considerations, not much claim can be made about the accuracy of energy statistics in India. The data compiled from official records are subject to regular revisions and often large differences are noticed between the provisional and final estimates. Further, except for the household energy consumption data collected through the consumer expenditure survey of NSSO and the industrial energy consumption data collected through Annual Survey of Industries , most of the energy statistics are official records based and, therefore, not amenable to the computation of various types of sampling and non-sampling errors.

- **Credibility**: According to the OECD "the credibility of data products refers to the confidence that users place in those products based simply on their image of the data producer, i.e., the brand image." It is indispensable a National Statistical Office (NSO) should have this brand image in the field of energy statistics. This requires that in case of multiplicity of agencies engaged in the generation of energy statistics, the NSO should play the guidance, advice and coordinating roles. The CSO in India is discharging this role and has a good brand image for official statistics.
- **Timeliness:** Timeliness refers to the punctuality and regularity in the dissemination of statistics. It requires that the data should be released with the least possible time lag and with perfect regularity. Though not very satisfactory, it is not bad altogether in view of the vast coverage and multiplicity of agencies involved in the collection, compilation and dissemination of energy statistics in India. (Refer to the table on publications)
- **Accessibility**: the accessibility of data products refers to their ready location and accessibility by users". It also refers to the suitability of the form in which the data are available, the media of dissemination, and the availability of metadata and user support services. It also includes the affordability of the data to users in relation to their value to them and whether the user has reasonable opportunity to know that the data are available and how to access them. In addition, the Eurostat's *Methodology of Short-term Business Statistics: Interpretation and Guidelines* states that there is a "need for a catalogue system to allow users to find what information is available, and where to find it" and that "the SDDS therefore requires advance dissemination of release calendars and simultaneous release to all interested parties". Accessibility is discussed further in the section covering dissemination, which imply that energy statistics possess the accessibility dimension.

- **Interpretability***:* The interpretability of data is closely related to the users' understanding of the data for their use. Thus the degree of interpretability depends on all aspects of information on the data such as adequacy of the definitions or concepts, target populations, variables and terminology, limitations of the data, etc. Thus the quality of metadata provided along with the energy statistics is indeed crucial to improve interpretability. Such metadata should contain all the aspects of planning, designing, collection methodology, data processing procedures, tabulation methods, dissemination details, limitations of the data, etc. The line ministries responsible foe the compilation and dissemination of official energy statistics in India provide the requisite explanatory notes about the concepts, methods, etc. to help the users in the analysis and interpretation of the data. Besides, the CSO has under taken a project to publish a series of 'Manuals on Statistical Indicators'. Publication of a Manual on Energy Statistics is proposed to be undertaken under this project, which is expected to improve the interpretability of the official energy statistics in India.

- **Coherence***:* The coherence of data products reflects the degree to which they are logically connected and mutually consistent. The OECD distinguishes four important sub-dimensions for coherence:
  - ❖ coherence within a dataset;
  - ❖ coherence across datasets;
  - ❖ coherence over time; and
  - ❖ coherence across countries.

The energy statistics can be *coherent within a dataset* if all individual energy resource statistics are compiled based on the same standard methodologies. *Coherence across datasets* of energy statistics cannot be ensured until its coherence within corresponding datasets is properly checked. This can be examined by ensuring consistency in classifications, concepts and definitions used in the compilation of energy statistics by different agencies. *Coherence over time* and *coherence across states* can be theoretically achieved using a standardized methodology. However, in practice, there are many reasons for these properties not to be respected by various energy statistics producers. When this is the case, it is advisable to clearly note the differences from the recommendations. Energy statistics in India, which are compiled by various line ministries on the basis of information provided by the energy producers and suppliers under their control are prone to lack coherence due to adoption of different concepts and definitions suitable for their activities. Efforts are made by the CSO for standardization of concepts, definitions and methodology to improve the coherence of energy statistics , but the success so far has been very limited.

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- **Cost-efficiency:** It means there should be match between value accrued from the use of the data and the costs involved in the generation of these data. There is always a trade-off between cost and the value of output/outcome. Appropriate optimization techniques should be used in designing the data collection strategy. However, according to OECD cost-efficiency need to be factored in while assessing the quality of energy statistics as it can affect quality in all dimensions.

As most of the energy statistics in India are compiled from official records, hardly any separate account is available in the line ministries about the cost of

generation of the statistics. Further, statistics are knowledge-products, which are intangible and defy accurate measurement. Therefore, it is very difficult to assess their cost-efficiency. This could be possible in case the energy statistics are generated through specially designed surveys, which is hardly the case in India.

- **Adequacy/completeness:** this dimension of quality is often advocated by some statisticians. In simple terms it refers to the ability of the statistics to contain all or almost all the information required by all types of users of these statistics. This quality dimension can be compared to the sufficiency property of an estimator, which means the estimator contains all the available information in the sample. This quality dimension is in general, very difficult to achieve and this is particularly so in case of energy statistics in India, which are compiled by multiplicity of agencies for their own use and applying their own concepts and definitions. There is an urgent need for harmonization of data compilation methodology and inclusion and consolidation of all available and likely to be available energy statistics to cater to the needs of all the users.

- **Independence/Neutrality/Integrity:** It refers to the property of data being free from external influence of any kind. It requires that the data collecting agencies are fully autonomous politically/bureaucratically neutral entities. In the case of energy statistics in India, which are the results of administrative activities, might not command this quality dimension. To ensure this the energy statistics need to be collected and compiled by an independent professional body like the NSSO, which is not the case at present.

The assessment of the quality of energy statistics based on the criteria outlined above is a challenging task. It is not also a simple task to generate energy statistics, which satisfies all these quality dimensions. The main problems arise from difficulties in quantifying the level of individual dimensions and in aggregating the levels of all dimensions. Any resulting score can be arbitrary as it depends, to a large extent, on the data compilers choice of quality measurement variables and weights used for their aggregation. No single and fit-all criteria exists in practice. In view of this it is sufficient that qualitative statements be made with respect to each quality dimension adopted by the statistical agency compiling the energy statistics. This would enable subsequent determination of priorities on the basis of an understanding of user needs.

(b) Data presentation and dissemination

The important issues relating to presentation and dissemination of energy statistics in India include: the form of presentation of energy statistics, their dissemination to users and the related desirable benchmarks/principles that need to be adhered to by the statistical offices, particularly the CSO. The first few paragraphs of this section delineate the benchmarks for dissemination followed by a discussion on format for data presentation and dissemination.

(I) Key presentation and dissemination principles

Data dissemination is the last stage of any survey, census or data compilation, including that of energy statistics. It consists of distribution or transmission of statistical data to policy makers, business community and other users. It is one of the important activities of the national statistical office. Statistical authorities collect data using the legal authority derived from the national statistical acts and regulations. These regulations require that the data provided by the respondents should be kept confidential. The dissemination strategy of the national statistical office should obviously meet the requirements of the legal/administrative regulations and also confirm to the international data dissemination standards to the maximum extent possible. The Eurostat 1998 states that the dissemination of statistics by the statistical offices should fulfill three benchmarks; confidentiality, equality and objectivity, and elaborates these principles in very clear and unambiguous terms. In the following paragraphs, these principles are examined with respect to energy statistics in India.

1. Statistical Confidentiality

This requires that the energy statistics collected under various legal provisions from the producers, suppliers and the consumers should be kept confidential.

The issue of confidentiality has both national dimension and international dimensions, chiefly due to (i) increase of data dissemination over the internet; (ii) internationalization of users of statistical data (including international organizations); and (iii) high interest in cross-country comparisons. As a result, there is a growing demand for countries' data at very detailed level, even in some cases – demand of countries' micro-data.

The collection, compilation and dissemination of energy statistics in India takes care of these concerns. As already mentioned earlier, the data pertaining to coal and lignite are collected under the Collection of Statistics Act, 1953, which provides for maintaining sufficient confidentiality of data. Similar provisions are available also under the Electricity Act. Besides these, the data tabulation procedures also provide mechanism for maintaining data confidentiality.

2. Equality

Statistics compiled by national statistical offices are collective goods, which imply that no users are privileged and every citizen can take note of statistical data under equal terms. It is important to ensure that no new data are supplied to anyone before these are officially released. In most cases press release is the first publication. The press release serves dual purpose in that apart from making the data officially public it also sends a signal to the data users that additional data on the subject can be obtained from the national statistical office.

To ensure the dissemination of energy statistics to all users at the same time, the national statistical offices and other publishers of energy statistics should develop and announce an advance release calendar. The advance release calendar should be given sufficient publicity and should also be posted at the websites of respective publishing organizations in the beginning of each year. All these methods are adopted in the release and dissemination of energy statistics in India, particularly the CSO.

3. Objectivity

Released data should not be accompanied by judgments or recommendations. The independent and objective position of the national statistical office does not permit subjective interpretations. To conform to this principle, energy statistics in India are released to the press and put in the website without any analytical notes to influence the users in the interpretation of the data. However, the press and other analysts are free to give their own interpretations and draw their own conclusions.

(II) Presentation and dissemination of Energy Statistics in India

The main issues touching on the presentation and reporting of energy statistics relate to their type and form of presentation, while the issues regarding dissemination relate to the appropriateness of the media. Various publications provide guidelines and recommendations about dissemination of statistics to users via various media. Much emphasis has been given to the publication of appropriate methodological information (or metadata) describing key concepts and terminology and practices used in the collection of basic data, etc.

The question of the most appropriate form of presentation of data is however less clear-cut, with a range of possible options. It needs to be noted that a variety of forms of energy statistics are required by various users depending on their need for economic analyses, the most requested forms being raw and seasonally adjusted series monthly data. There is a continuing debate among statisticians on which is the most appropriate form for the presentation of a time series to users and the outcome of the discussion is that there is generally no absolute ideal, and the final choice depends on the media for the dissemination of data and the main focus or intent of the series. Dissemination of detailed data via an on-line database could imply the availability of original series which affords maximum flexibility to users, whereas dissemination of more aggregated and headline series in a press release would involve the presentation of seasonally adjusted, perhaps in addition to original series.

In the case of energy statistics in India the original data, without any seasonal or periodic adjustments, are released to the press and also put in the website to provide the flexibility to the users to apply their own analysis. These are disseminated both in printed and electronic forms. Some of these data are made available to various users free of cost and some at nominal cost in accordance with the National Data Dissemination Policy of the Govt. of India. A list of publications brought out by various line Ministries along with their periodicity, time lag, major items of data, etc. are given in the Annexure.

ANNEXURE

Source-wise Publications on Energy Statistics in India

Sl. No.	Source	Title of publication (Periodcity)	Time lag	Main types of data contained	Major users	Free /priced	Use of UN Manual
1.	M/o Coal, Deptt. of Coal, (O/O Coal Controller)	(i)Monthly Coal Statistics	2-3 months	Production, dispatches, stock, value and price	M/o Coal, CSO, IBM, SSBs, TERY, CMIE, Planning Commission	Free	UN guidelines partially followed. Coal balance in common energy unit (NCB/joule) is not prepared as coal is not converted into it.
		(ii)Provisional Coal Statistics (Annual)	1-2 months	Production, dispatches, stock, value and price, Input-Output data, Import-Export & Reserve	M/o Coal, CSO, IBM, SSBs, TERY, CMIE, Planning Commission, IEA and UNSD (through CSO)	Free	
		(iii)Coal Directory of India (Annual)	8-9 months	Colliery-wise details on production, dispatch etc. besides the data contained in the Annual Report are also included	M/o Coal, CSO, IBM, SSBs, TERY, CMIE, Planning Commission, IEA and UNSD (through CSO)	Free	
2.	M/o Petroleum & Natural Gas	(i)Monthly progress Report	1 month	Production, consumption, import & export of crude petroleum & petroleum products, natural gas, LNG. Refinery intake also included.	Various line Ministries of Govt. of India, Planning Commission, oil industries, research institutions, UNSD, IEA, etc.	Free	The Manual and Questionnaire developed by Joint Oil Data Initiative (JODI) for supply of oil data to UNSD are being followed.
		(ii)Quarterly Progress Report	1 month	- do -	- do -	Free	
		(iii)Basic Statistics on Indian Petroleum & Natural Gas(Annual)	6-8 months	- do -	- do -	Free	
		(iv)Indian Petroleum & Natural Gas(Annual)	6-8 months	- do -	- do -	Priced	
3.	M/o Power (Central Electricity Authority)	Vidyut Bharati, (i)All India Electricity Statistics (General Review) (Annual) (ii)Review of Performance of Hydro-Power Stations (Annual)		Generation, transmission, distribution, trading and utilization of electricity (thermal, hydro & nuclear)	Line Ministries, power utilities, generation companies, distributor companies, CSO, RBI, Planning Commission, research agencies & media, equipment manufacturers for power plant, association/federation of industries, IEA, World Bank, ESCAP, UNSD	Free supply to stake holders. Priced publication for other users.	UN methodology is used for calculating annual per capita electricity consumption.

Sl. No.	Source	Title of publication (Periodcity)	Tim e lag	Main types of data contained	Major users	Free /priced	Use of UN Manual
		(iii)Growth of Electricity Sector in India (Annual) (iv)Annual Report of CEA (v)Tariff & Average rates of Electricity Supply & Electricity Duty in India(Annual)					
4.	M/of Statistics & Programme Implementation (CSO)	Energy Statistics (Annual)	8-9 months	Production, availability, consumption, import & export, Wholesale Price Index of various energy sources like coal, petroleum & natural gas, electricity (hydro, thermal, nuclear). The installed capacity of renewable energy according to sources are also included.	Different Ministries of Govt. of India, Planning Commission, UN organizations like UNSD, IEA, World Bank etc.	Priced	The data are compiled from the publications of various line Ministries. As such, the use of UN Manual and guidelines is the same as in their case.