CHAPTER 10
ELECTRICITY, GAS AND WATER SUPPLY

Coverage

10.1 The economic activities relating to generation, trans-mission and distribution of electric energy are covered under the electricity sub-sector, the manufacture of gas in gas works including gobar gas and distribution through mains to household, industrial, commercial and other users and production of liquefied petroleum gas (LPG) from crude oil and natural gas are covered under the gas sub-sector and the activities associated with collection, purification and distribution of water excluding the operation of irrigation system are covered under water supply sub-sector.

Methodology and Source material

10.2 GVA is estimated as the sum of gross factor incomes in the case of electricity and water supply sub-sectors and as gross output less inputs in the case of gas sub-sector.

10.3 **Electricity:** The main agencies involved in the activities falling within the purview of this sub-sector are public sector undertakings comprising DCUs and NDCUs of the central government and state governments and local bodies and private companies including co-operative societies. The major sources of data utilised in respect of each of the above agencies are (i) budget documents of the central, state and union territories in the case of DCUs, (ii) annual reports which inter-alia give profit and loss accounts and balance sheets in the case of NDCUs of central and state governments and (iii) annual reports of a sample of companies and data on electricity sold/generated available in the annual publication of CEA, namely General Review of the Public Electricity Supply - All India Statistics in the case of private companies.

10.4 **Gas:** The major sources of data utilised are (i) production data on LPG from crude oil and natural gas obtained from the Ministry of Petroleum and Natural Gas in the case of LPG, (ii) annual accounts of two gas companies in the case of coal gas and (iii) annual reports of the KVIC in the case of gobar gas.

10.5 **Water supply:** The main sources of data utilised are (i) budget documents of the central and state governments, (ii) municipal data on compensation of employees, (iii) population census and (iv) Directorate General of Employment and Training (DGET) data on public sector employment engaged in water supply activities.

Estimates at Current Prices

10.6 **Electricity:** Estimates of GVA in respect of DCUs are prepared from the data on total receipts and expenditure available in the central and state government budget documents. Gross factor incomes i.e., GVA in the case of NDCUs comprising state and central electricity boards, state and central power corporations are estimated on the basis of the data on annual expenditure and income available in the profit and loss accounts. In the case of undertakings of local bodies, co-operative societies and private companies, the GVA per unit of sale/ generation of electricity derived on the basis of a sample of units/companies is blown up with the total quantity of sales/ generation of electricity by all the private companies. The figures relating to the quantity of electricity sold/generated each year is taken from the CEA publication referred to above. However, for the base year 1980-81, the data in respect of all the undertakings of local bodies, co-operative societies and private companies available with CEA were analysed for obtaining the estimates of GVA. The estimates of GVA worked out in respect of public sector undertakings and private sector companies are added to arrive at the estimated GVA for the given year. The estimates of GVA so arrived at are netted for the imputed bank charges which form a part of the output of the banking sector. The estimate of the factor incomes in the total of GVA in respect of public and private sectors including co-operative societies for the base year 1980-81 is given in Table 10.1.

10.7 **Gas:** The estimates of GVA are worked out separately for LPG, gobar gas and coal gas. In the case of LPG, the estimates of GVA is arrived at by deducting the value of inputs from the corresponding value of gross output. The gross value of output at ex-factory prices is derived from the annual data on production of LPG from crude oil and natural gas obtained from the Ministry of Petroleum and Natural Gas through correspondence. The value of inputs at purchasers' prices, as suggested by BICP is derived from the input-output co-efficients supplied by Bharat Petroleum Corporation Ltd. In the case of gobar gas, the estimates of GVA are worked out on the basis of the state-wise production data available in the annual reports of KVIC. In the absence of details of input structure, the value of gobar gas is treated as equivalent to GVA. This is on the assumption that the value of gobar used in the generation of gobar gas also results in equivalent value of by-products of indigenous fertilizers and the estimates of these fertilizers are not separately taken account of in the agriculture sector. In the case of coal gas, the estimates of GVA are taken directly from the annual accounts of the Bombay Gas Company and Durgapur Projects Limited. The details of estimates for 1980-81 are given in Table 10.2.

10.8 **Water supply:** The estimates of GVA are obtained as the total compensation of employees (salaries and wages), operating surplus and consumption of fixed capital. The estimates of compensation of employees are worked out separately for the public sector and the rural and urban segments of the private sector. In the case of public sector comprising central and state departments dealing with water supply activities, the estimates are worked out from the details available in the respective budget documents. In the case of private sector, the estimates of compensation of employees are arrived at as a product of the average compensation of employees per worker and the corresponding working force. The number of workers engaged in the water supply in the rural areas available from the 1981 population census (as on 1.10.1980) has been treated as workers in rural areas in the private sector for the bench-mark year 1980-81. The number of workers in urban areas in the private sector has been obtained by deducting the number of workers in the public sector (as available from DGE&T) from the total number of workers in the urban areas. For estimating the per worker compensation of employees, all the municipalities/ municipal corporations are grouped into five categories in terms of the population size of the population census. The per worker compensation of employees for urban areas has been worked out as the average compensation of employees of all the five categories of municipalities/municipal corporations and for rural areas as average of the lowest category of municipalities. The estimates of working force for subsequent years in respect of urban areas are worked out with the help of overall growth rate over the previous year revealed by all municipalities which report data for two consecutive years. Compensation of employees is computed on the basis of the overall average salaries and wages per worker for all groups together and the total working force as determined above. The rural working force is moved forward with the lowest growth rate observed among the five categories of municipalities. This is multiplied by the average wages and salaries per worker for rural areas as obtained above to get the compensation of employees for rural areas. To the estimates of the compensation of employees worked out as above are added the estimates of operating surplus available in the reports of ASI and CFC derived on the basis of the capital stock to arrive at the estimates of GVA for the sub-sector for the respective years. The details of the estimates are given in Table 10.3.

Estimates at Constant Prices

10.9 **Electricity:** The estimates of GVA for 1980-81 of electricity are moved forward to other years with the help of quantum indices prepared from the data on quantity of energy sold to obtain the estimates of GVA at constant prices. These data are obtained from the annual publication of CEA referred to in para 10.3.

10.10 **Gas:** The estimates of GVA of gas at constant prices are prepared by evaluating the current year production at 1980-81 prices. The input-output relationship for the base year has been assumed to remain the same for other years also.

10.11 **Water Supply:** The estimates at constant prices are obtained separately from public and private sectors. In the case of public sector, the estimates at constant prices are obtained by deflating the current price estimates with the help of CPI numbers for industrial workers. For the private sector, the estimates at constant prices are obtained by moving forward the per worker net value added comprising of compensation of employees and operating surplus for the base year 1980-81 by the working force in subsequent years estimated on the basis of growth in employment of the responding municipalities. To this is added the CFC at constant prices to obtain the GVA.

Quality and limitations of Data base

10.12 **Electricity:** Generally current data on annual basis are available in respect of departmental undertakings, central/state power corporations, state electricity boards. Annual data are also available from the CEA in respect of undertakings of local bodies, cooperative societies and private companies. However there are cases of time lag in receipt of the annual reports from some of the power corporations/electricity boards. The estimates in respect of such non-responding units are prepared by using the past trends.

10.13 **Gas:** In the absence of details of input structure of gobar gas, the value of output of gobar gas is treated as equivalent to GVA.

10.14 **Water Supply:** A prerequisite for deriving reliable estimates of GVA is the availability of firm data on working force. The rate of growth adopted for estimating private sector working force in urban and rural areas is based on the data of responding municipalities. The information on rent, interest and profits suffer from partial coverage as the data relating to units registered under IFA, 1948 only are being taken into account in preparing these estimates.

TABLE 10.1 : Gross Value Added from Electricity sub-sector, 1980-81

(Rs. crore)

Institution	Salaries & wages	Interest	Rent	Profit	Net value added	Consumption of fixed capital	Gross value added
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1. Public sector	676	834	30	-952	588	1036	1624
2. Private sector	41	30	28	99	38	137	
Total	717	864	30	-924	687	1074	1761

TABLE 10.2: Gross Value Added from Gas sub-sector, 1980-81

(Rs. crore)

Item	Gross value added
(1)	(2)
1. LPG	16.2
2. Gobar gas	13.3
3. Coal gas	2.2
(i) Bombay Gas Company	1.3
(ii) Durgapur Projects Ltd	.9
Total	31.7 or 32

TABLE 10.3: Gross Value Added from Water Supply sub-sector, 1980-81

(Rs. crore)

Item	Gross value added
(1)	(2)
1. Compensation of employees - Private sector (rural + urban)	41
2. Compensation of employees - Public sector	60
3. Operating surplus	11
4. Total net value added (1.+2.+3.)	112
5. Consumption of fixed capital	84
6. Gross value added	196