

PUBLIC

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

COLOMBIA

**LOAN TO EMPRESA DE ENERGÍA ELÉCTRICA DE BOGOTÁ
POWER TRANSMISSION AND DISTRIBUTION PROJECT**

(CO0013; 249/OC-CO)

LOAN PROPOSAL

1973

COLOMBIA. POWER TRANSMISSION AND DISTRIBUTION PROJECT

LOAN TO EMPRESA DE ENERGIA ELECTRICA DE BOGOTA

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BASIC COUNTRY DATA FOR COLOMBIA
(Preliminary data for 1971 and partially estimated for 1972)

AREA: 1,138,400 Km²
439,513 ms²

POPULATION: 22.5 million (mid-1972)
Rate of Growth: 3.2%

Mortality (1971): 8.1 per 1,000 inhabitants
Infant Mortality (1970): 67.9 per 1,000 live births
Years of Live Expectancy at Birth (1970): 53.3
Percentage of Literacy (1971): 78.5

Gross Domestic Product (GDP) (1971)

Total: 7,886.3 (millions of 1970 dollars)
Per capita: 361.9 (1970 dollars)
Average rate of growth (1969-71): 6.1%

Gross Domestic Product (GDP) (1972)

Average rate of growth: 7.4% (estimated)

Gross Investment (1971)

Total: 1,774.4 (millions of 1970 dollars)

Public Finances

Effective Central Government Operations (1971)

	<u>(Col.\$ Million)</u>	<u>% of GDP</u>
Current receipts	14,416	9.5
Current expenditures	10,175	6.7
Current surplus	4,241	2.8
Capital expenditures	5,903	3.9
Total credit (net)	1,662	1.1

Money, Prices and Rate of Exchange

	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>
Money (million Col\$)	18,448	21,627	23,995	29,842
Consumer Prices (Index 1954/55 = 100)	421.9	450.2	503.4	573.1
Rate of Exchange (Col\$ per US\$ 1)	17.90	19.13	20.94	22.83

(annual variations in %)

Money	19.5	17.2	11.0	24.3
Consumer Prices	6.9	6.7	11.8	13.8
Rate of Exchange	-5.8	-6.9	-9.5	-9.0

CURRENCY EQUIVALENTS

US\$1.00	=	Colombian Pesos (Col.\$) 22.79 <u>1/</u>
Col.\$ 1 million	=	US\$43,879

UNITS AND EQUIVALENTS

1 kilovolt (kv)	=	1,000 volts (v)
1 megavolt amperes (MVA)	=	1,000 kilovolt amperes (Kva)
1 megawatt (MW)	=	1,000 kilowatts (Kw)
1 gigawatt hour (Gwh)	=	1 million kilowatt hours (Kwh)

ABBREVIATIONS

CAR	-	Corporación Autónoma Regional de la Sabana de Bogotá y Valles de Ubaté y Chiquinquirá
CHIDRAL	-	Central Hidroeléctrica del Río Anchicaya Ltda.
CORELCA	-	Corporación Eléctrica de la Costa Atlántica
CVC	-	Corporación Autónoma Regional del Cauca
EEEB	-	Empresa de Energía Eléctrica de Bogotá
EMCALI	-	Empresas Municipales de Cali
EPM	-	Empresas Públicas de Medellín
ICEL	-	Instituto Colombiano de Energía Eléctrica
IBRD	-	International Bank for Reconstruction and Development
ISA	-	Interconexión Eléctrica S.A.
JNTSP	-	Junta Nacional de Tarifas de Servicio Público
PIDUZOB	-	Programa Integrado de Desarrollo Urbano de la Zona Oriental de Bogotá

1/ Unless otherwise specified, this is the exchange rate used in this document for cost determination.

Foreign Trade and Net International Reserves of The Central Bank

	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>
	(millions of US\$)			
Exports	667	782	754	820 (*)
Imports	645	802	784	911 (*)
Net International Reserves	96.6	152.0	170.4	353.4
	(annual variations)			
Exports (%)	10.6	17.2	-5.6	29.2 (*)
Imports (%)	4.9	24.3	-2.3	14.8 (*)
Net International Reserves (in millions US\$)	61.4	55.4	18.4	183.0

External Debt (in millions of US\$)

Total (1971): 2,018

Ratio of 1972 Foreign Debt Service to 1971 Exports of Goods and Services: 17.1%

(*) Registered imports and exports.

COLOMBIA. POWER TRANSMISSION AND DISTRIBUTION PROJECT

LOAN TO EMPRESA DE ENERGIA ELECTRICA DE BOGOTA

SUMMARY AND CONCLUSIONS

1. Borrower and Executing Agency: The Empresa de Energia Eléctrica de Bogotá, an autonomous municipally-owned public corporation.
2. Guarantor: The Republic of Colombia.
3. Amount of Loan: US\$21,200,000.
4. Source of Funds: The Ordinary Capital resources of the Bank.
5. Terms: Amortization in 20- years, with the first installment payable 5 years from the date of the loan contract, with an interest rate of 8% per annum (including the Bank 1% special commission), and a commitment fee of 1-1/4% per annum. The loan would be disbursed in a 4-1/2 year period.
6. Project Objective: The expansion and improvement of the transmission and distribution facilities of the EEEB to meet the projected growth in customer demand in its service area (which has been exceeding 10% per year), not covered by the PIDUZOB energy subprogram partially financed under loan 238/OC-CO.
7. Project Description: The project would consist of: (a) the construction of 8 lengths of 115 Kv aerial subtransmission lines totalling 124.5 kilometers; 4 short lengths of 57.5 Kv aerial and underground subtransmission lines totalling 11.7 kilometers, and the construction of some 120 kilometers of 34.5 Kv aerial line to serve industrial loads, all within the EEEB service area; (b) the construction and expansion and/or uprating of five 230 Kv, 115 Kv and 57.5 Kv receiving substations within the EEEB service area, involving the installation of 435 MVA in power transformer capacity; (c) the construction within the EEEB service area of some 212 kilometers of 13.2 Kv primary distribution lines, 81 kilometers of 13.2 Kv primary distribution lines, 81 kilometers of secondaries, the installation of some 556 MVA in distribution transformer capacity, the installation of approximately 65,000 customer watt-hour meters as well as the installation of corrective capacitors and voltage regulators and the installation of public lighting in main streets to be constructed during the period; (d) the extension of electric services in 15 suburban communities in the area normally served by the EEEB and to 24 smaller localities formerly served by the CAR involving the construction of a total of 70 kilometers of 34.5 Kv rural feeders, 95 kilometers of secondary line, and the installation of 35 MVA in distribution transformer capacity; and (e) the acquisition of load-dispatching and miscellaneous equipment related to the project, including maintenance, transportation, communications and laboratory equipment, as well as hot-line and other and tools.
8. Cost and Financing of the Project: The total cost of the proposed project is estimated at US\$42,175,000 and would be financed as follows:

(In thousands of US\$ or its equivalent)

Investment Category	IDB	Suppliers'	E E E B				Sub- Total	Total	%
	Foreign Exchange	Credits Foreign Exchange	Foreign Exchange	Local Currency					
1. <u>ENGINEERING AND ADMINISTRATION</u>	<u>150</u>	<u>160</u>	<u>-</u>	<u>2,381</u>	<u>2,381</u>		<u>2,691</u>	<u>6.4</u>	
2. <u>DIRECT COST OF CONSTRUCTION</u>									
2.2 Transmission	2,459	-	-	1,191	1,191		3,650	8.6	
2.3 Distribution	11,118	-	-	10,583	10,583		21,701	51.5	
2.4 General Installations	<u>328</u>	<u>2,933</u>	<u>326</u>	<u>110</u>	<u>436</u>		<u>3,697</u>	<u>8.8</u>	
Total Category 2	13,905	2,933	326	11,884	12,210		29,048	68.9	
3. <u>FINANCIAL CHARGES DURING CONSTRUCTION</u>	<u>3,811</u>	<u>-</u>	<u>1,183</u>	<u>-</u>	<u>1,183</u>		<u>4,994</u>	<u>11.8</u>	
5. <u>UNALLOCATED</u> ^{1/}	<u>3,334</u>	<u>827</u>	<u>92</u>	<u>1,189</u>	<u>1,281</u>		<u>5,442</u>	<u>12.9</u>	
TOTAL COST	21,200 ^{2/}	3,920	1,601	15,454	17,055		42,175	100.0	
	(50.3%)	(9.3%)	(3.8%)	(36.6%)	(40.4)		(100.0%)		

9. Procurement: International competitive bidding procedures would be followed for equipment purchases under the Bank loan, on the basis of a program for contracting goods and services that is satisfactory to the Bank. Colombian manufacturers would be allowed a 15% margin of preference. The EEEB is exempt from import duties.

10. Consultants: EEEB would retain the services of Ingetec (a Colombian firm) and J. G. White Engineering Company (a U. S. firm) in the development and execution of the project.

11. Conclusions: The EEEB, which has legal capacity to contract the loan and execute the project, is operating efficiently as demonstrated by the reasonable 1972 median tariff level of US cents 1.12 per kilowatthour and the highly satisfactory rate of

^{1/} General contingency and provision for cost escalation

^{2/} Includes indirect foreign exchange costs equivalent to US\$ 2,922,000.

return on net utility investment realized thereon, which was 10.3% in 1972. The projected annual rate of return on net utility investment indicated that the total operation of the EEEB will exceed the 9% per year return considered reasonable by the Bank. EEEB's existing facilities are in good to excellent condition, and its administrative and financial organization are satisfactory. Its engineering organization is adequately supported by the Ingetec engineering consulting firm in the areas of transmission line and substation design and construction supervision. On the other hand, the EEEB is deficient in the areas of distribution system management and planning. The contract under negotiation with J. G. White Engineering Company of New York, pursuant to the EEEB subprogram of the PIDUZOB Loan 238/OC-CO, will be expanded to provide EEEB with needed distribution management services. That part of the project dealing with the subtransmission lines and substation construction is technically feasible and sound, having been found to be in keeping with the latest engineering practices. The distribution classification of the project is also considered satisfactory from the point of view of providing an adequate supply of materials and equipment to connect 65,000 new consumers to the EEEB system and to improve service to all existing consumers in the 1973-77 period. The construction cost of the project is considered reasonable, containing sufficient allowance for contingencies. It is felt that the project can be completed in the 4-1/2 year construction period envisaged using EEEB's usual policy of contracting the major erection and mounting services to local experienced firms but providing all materials and equipment from its own stock. The project is found to be feasible from the economic point of view, showing an internal rate of return of 21.6%. The financial situation of EEEB, as of December 31, 1972, has been thoroughly investigated and found to be generally satisfactory. The local counterpart would be provided by internal cash generation and local borrowing. Financial projections show that the EEEB would be able to make its contributions to the proposed project on schedule, taking into account existing arrangements with a local bank to cover any cash shortfalls for local counterpart financing during the first two years of project execution, and other arrangements which would be made prior to project initiation.

I. INTRODUCTION

A. The Application

1.01 On November 14, 1972, the Empresa de Energía Eléctrica de Bogotá (EEEB) submitted to the Administration of the Bank a loan application for the equivalent of US\$25,000,000, to assist in the partial financing of the foreign exchange cost of a project for the expansion and improvement of the transmission and distribution system of the EEEB for the period 1973-77. On November 29, 1972, the Bank granted a US\$20.0 million loan (238/OC-CO) to the Government of Colombia for the partial financing of the PIDUZOB program, in which was included an electric energy transmission and distribution subprogram (US\$7.0 million) to be executed by the EEEB in the "Eastern Zone" of Bogotá. The proposed project plus the "Eastern Zone" subprogram of PIDUZOB comprise the total EEEB expansion program for the period 1973-1977.

B. Priority

1.02 On January 18, 1973, the Departamento Nacional de Planeación stated that it considered the EEEB transmission and distribution project of the greatest importance and, consequently, assigned to it high priority within the group of projects that the "Departamento" will approve for external financing in 1973. The proposed project has been included by the Colombian authorities in the list of projects for external financing in 1973-74 that will be presented to the next meeting of the Consultative Group for Colombia, to be held in June, 1973.

C. Bank Mission

1.03 Following the establishment of the Project Committee on January 12, 1973, an Analysis and Negotiation Mission of the Bank remained in Colombia between February 12 and 23, 1973, for the purpose of evaluating the technical, financial, economic and institutional aspects of the project and to discuss with EEEB officials the conditions under which the Bank might consider participating in its financing. On the basis of the studies carried out in the field and, subsequently, on further analysis done by the Project Committee in Headquarters, it was concluded that the financing required from the IDB should be reduced to US\$21,200,000, since the load dispatching equipment (which is of a specialized nature) does not lend itself to unrestricted bidding as is required by the Bank (see paragraph 3.14). Therefore, it was considered more appropriate to finance this equipment through suppliers' credits. This alternative was agreed to by the EEEB in April, being established that the last mentioned figure would be the amount of the loan to be considered.

II. FRAME OF REFERENCE OF THE PROJECT

A. The Electric Power Sector in Colombia

(1) Organization of the Sector

2.01 Electricity in Colombia is basically supplied by public corporations owned by the central, departamental or municipal governments. Captive industrial plants account for about 10% of installed capacity. Four public utilities supply 95% of public electricity in Colombia, which are: the Instituto Colombiano de Energía Eléctrica (ICEL), the Empresa de Energía Eléctrica de Bogotá (EEEB), Empresas Públicas de Medellín (EPM), and the Corporación Autónoma Regional del Valle del Cauca (CVC). ICEL is a Government owned enterprise with national responsibility for power supply. It controls 15 subsidiaries ("electrificadoras") which provide service to 20 of the country's 29 Departments, outside the areas of service of EEEB, EPM and CVC. EEEB and EPM are municipally-owned public corporations, generating and distributing power in Bogotá and Medellín, and their outskirts, respectively. CVC is a multiple-purpose, autonomous regional entity responsible for developing mainly agriculture and power in the Cauca Valley. For power supply it operates Central Hidroeléctrica del Río Anchicaya Ltda. (CHIDRAL), partially financed with the Bank's loans 175/OC-CO and 134/CD-CO. (Alto Anchicaya). CHIDRAL principally sells energy in bulk for distribution to Empresas Municipales de Cali (EMCALI) and to several other smaller distributing entities.

2.02 There are two other principal entities in the electric power sector in Colombia, created in 1967, Corporación Eléctrica de la Costa Atlántica (CORELCA) and Interconexión Eléctrica S.A. (ISA). CORELCA is a public corporation, responsible for interconnecting the major markets of the northern region. ISA was founded as a stock corporation by the above-mentioned four major power utilities (ICEL, EEEB, EPM and CVC) for the interconnection of its sponsors' transmission systems and for the planning, construction and operation of new power generating plants ^{1/}. Since ISA's inception in 1967, significant progress toward national integration of supply has taken place. The main areas of service are the Central region, which became interconnected in 1972; the Northeast, which will become part of the interconnected system in 1974; and the Atlantic Coast region, planned for interconnection to the rest of the country in the late 1970's.

(2) Generating Capacity and Investments in the Sector

2.03 The electric power sector of Colombia has developed rapidly during the last eight years. Total installed generating capacity, including captive industrial plants, increased from 1,245 MW in 1965 to 2,545 MW in 1972, or an

^{1/} IBRD partially financed ISA's first project, a 535 Km, 230 Kv transmission network to interconnect the systems of its sponsors. The IDB and IBRD are both helping to finance ISA's first generation project, a 500 MW hydroelectric plant to start operation in mid-1975 (loan 214/OC-CO).

average annual growth rate of about 13 percent. At present, 71% of installed generating capacity is hydroelectric and the remaining 29% thermal. However, installed capacity per capita for the country as a whole is only 101 watts, less than in most Latin American countries (the Latin America average was 130 watts in 1968). The levels of electric consumption are substantially different between regions, and even more so between urban and rural areas. The average per capita annual consumption for the country in 1971 was 400 kwh, which is below the average for Latin America (485 kwh annual per capita consumption in 1968). In the most important market areas, annual per capita consumption was in the order of 500 kwh, while in the urban centers with more than 30,000 inhabitants the average per capita consumption was about 600 kwh. About 30% of the country's population did not have any electricity service at all. Investments in power increased from US\$ 14.7 million in 1965 to US\$134.0 million in 1971. Present plans call for expanding the installed generating capacity to some 5,000 MW by the end of the present decade, which is expected to involve an estimated US\$1.6 billion in additional investment. This would imply an average annual rate of growth of generating capacity of approximately 10% during that period.

(3) Sector Financing

2.04 In 1971, sector investments were financed as follows: 50% through foreign credit, 20% from internal resources of utilities, and 30% from the national budget and internal credit. IBRD has been Colombia's main source of foreign financing for the power sector; it has extended 19 loans to eight Colombian utilities, totalling US\$350.1 million, of which US\$ 234.5 million has been disbursed as of March 31, 1973. The World Bank has granted three loans to EEEB, for generation, transmission and distribution projects, totalling US\$85.6 million, of which US\$ 83.5 has been disbursed. EEEB's performance in executing these projects was satisfactory. Over the last five years the IDB has also assumed an important role in the financing of the Colombia power sector. The IDB has loaned US\$148.8 million (US\$97.3 million has been disbursed as of February 28, 1973) for the following projects in the energy sector: Central Hidroeléctrica del Río Prado (loan 106/OC-CO for US\$8.0 million); Planta Termoeléctrica de Zulia (loan 107/OC-CO for US\$3.4 million); a transmission and distribution project executed by EMCALI (loan 65/SF-CO for US\$3.3 million); Central Hidroeléctrica de Caldas (loan 125/OC-CO for US\$8.2 million); Central Hidroeléctrica del Río Anchicaya (loans 175/OC-CO and 13/CD-CO for US\$70.0 million); Central Hidroeléctrica de CHIVOR (loan 214/OC-CO for US\$33.9 million); and a transmission and distribution project executed through ICEL (loans 211/OC-CO and 290/SF-CO for US\$25.0 million). In addition, the Bank, through loan 238/OC-CO for the Bogotá Urban Development Program (PIDUZOB), is financing an EEEB energy subprogram for subtransmission and distribution improvements and expansion in the City's "Eastern Zone" (US\$7.0 million).

(4) Sector Planning

2.05 The principal objectives of the Colombian Government in the electric power sector are to expand and improve the efficiency of generating and transmission facilities, and to integrate the country's electric power facilities into a single national system. In this respect, IDB and IBRD support of the energy sector and of ISA has helped to provide considerable rationalization in the planning process for a major part of the sector. Nevertheless, in addition to the urgent need to install additional generating capacity and to interconnect the Northeast and Atlantic Coast regions (see paragraph 2.02), there are other problems remaining in the sector to be resolved, which are: (a) further consolidation

of ICEL's subsidiaries along regional lines; (b) improved distribution in the urban low-income areas (EEEB and EPM are now giving high priority to this problem); (c) improved quality of service in many of the smaller towns served by ICEL's subsidiaries (a program for 117 small towns has been started with the help of Bank loans 290/SF-CO and 211/OC-CO to ICEL); and (d) rural electrification to serve about six million people living in areas without electric service (basic studies sponsored by ICEL to ascertain priorities are now under way). The Colombian Government has begun to prepare a power development plan that will address these problems and will include institutional changes necessary to increase planning and operational efficiency of the sector on a national scale. This plan will be coordinated with the country's overall development plan and its is expected to be concluded early in 1974; also, Colombian authorities have expressed their interest to consult with the IBRD and the IDB during the preparation of the plan and during its implementation.

B. The Project Service Area

(1) General Characteristics

2.06 The EEEB provides electric service to the city of Bogotá (the capital of Colombia) and to a number of adjacent towns in nearby Cundinamarca and Boyacá. While the capital and some of the outlying communities are served directly by the EEEB, there are three distributing and/or transmitting enterprises, CAR ^{1/}, ICEL and ISA, buying bulk power from EEEB.

2.07 The EEEB system is one of the most important in the country since it serves the large concentration of population and industry in and around Bogotá, as well as the rich agricultural areas of the Bogotá and Ubaté River Valleys. According to the 1964 census, the population of the Distrito Especial de Bogotá was 1.7 million. It is estimated that in 1972 the city's population totalled 2.5 million; if outlying communities are included this figure would increase to 3.0 million. The population growth rate of the city in the last two decades has been 6.8%. With respect to Colombia's industrial manufacturing sector, the city of Bogotá accounts for 23% of national production, 24% of value added, 23% of the number of establishments and 26% of the sector's employment. The construction industry in Bogotá represents 40% of total construction in the 23 most important cities in the country. A map showing the location of the EEEB service areas is attached as Appendix C.

(2) Present and Future Market for Electric Power

2.08 In 1972, EEEB served over 322,000 consumers directly, having a total consumption of 2,163 Gwh for that year. In addition EEEB sold 344 Gwh wholesale to ICEL's distributing agencies serving Tolima, Huila, Boyacá and Valle

^{1/} CAR was established in 1961 to develop the natural resources in the high-land plains of Cundinamarca and Boyacá. EEEB acquired the electric distribution facilities of CAR in February of 1973 and has taken over electric operations of CAR since April of 1973.

del Cauca and to ISA. A tabulation of the EEEB sales for the years 1969-1972 is shown below, as well as other market highlights for this period:

	1969	1970	1971	1972
No. of Consumers Directly Served (000's)	262	281	301	322
<u>Sales (Gwh)</u>				
- Directly served	1,570	1,765	2,002	2,163
- Bulk Sales to Other Systems	120	260	191	344
Total	1,690	2,025	2,193	2,507
<u>Levels of Consumption (000's kwh) per Consumer</u>				
- Residential	2.3	2.4	2.6	2.7
- Commercial	6.7	7.1	7.5	7.8
- Industrial	61.7	70.2	68.0	69.5
Combined ^{1/}	6.5	7.2	7.3	7.8
System Losses (% of Sales)	12.0	10.8	11.3	10.3
System Maximum Demand (MW)	424.7	479.4	535.1	579.2
System Load Factor (%)	51.8	54.0	52.7	55.1

2.09 As is indicated in the above tabulation, sales have increased at an average of 14% per year over the 1969-1972 period as a result of an average increase of 7% per year in the number of consumers, and an average increase of over 6% per year in the average annual use per consumer (from 6,500 Kwh per year in 1969 to 7,800 Kwh per year in 1972). Maximum demand on the system has increased at an average of 11% per year of the period, which is representative of the growth being experienced in the country as a whole.

2.10 The estimates of energy consumption (kilowatthours of electric energy to be purchased by the consumers) were prepared by EEEB with the assistance of its Consultant, Ingetec, and took into account the following factors:

- (a) the growth in population and area of the city of Bogotá through 1982 from the estimates of the City Planning Division;
- (b) the average annual consumption level per consumer (by classification of user) and its growth based on comparisons with other large cities in Colombia;
- (c) the average annual increase in consumers (by classification of user) and its projection based on the Bogotá population studies;
- (d) the past trends of consumption for the EEEB system since 1951; and,
- (e) the elimination of bulk sales to ICEL's "Electrificadoras" as their generating capacity is increased.

^{1/} Including bulk sales to other systems.

2.11 Using these factors, the projections of sales for the EEEB System are shown in Appendix G. The average annual increase in sales indicated during the 1973-1982 period is around 10%, which compares favorably with the annual average increase for all of Colombia of 11% obtained during the 1960 to 1971 period. The average annual percent increases in maximum demand and consumers are indicated as 9% and 7% respectively, which are considered prudent.

(3) Existing Electric Power Facilities in Operation and Under Construction

2.12 The EEEB is the only distributor of electric energy in the project area. In order to attend the demand of its consumers, EEEB owns, operates and maintains a system having 547.6 MW of generating capacity installed in five consecutive hydro plants on the Río Bogotá and 14.9 MW installed in two thermal plants, all located within 40 kilometers of Bogotá.

2.13 The EEEB transmission system has some 370 kilometers of 115 Kv single-circuit and double-circuit aerial lines and 160 kilometers of 57.5 Kv underground and aerial lines, as well as 21 receiving substations in operation.

2.14 The EEEB distribution system provides electric service to over 322,000 metered connections via some 1,850 kilometers of primary circuits; 1,800 kilometers of aerial and 300 kilometers of secondary lines, with approximately 950 MVA of installed distribution transformer capacity.

2.15 In addition to a central office building in Bogotá, EEEB maintains in its general plant the following: a fleet of vehicles, office equipment, maintenance equipment, laboratory and communications equipment. The present condition of the EEEB operating plant is good to excellent.

2.16 EEEB completed the construction of the 50 MW Canoas Hydroelectric Plant some 25 kilometers southeast of Bogotá with the related 115 Kv transmission system interconnection at the end of 1972. Construction of the third unit (66.6 MW) at the Zipaquirá Thermal is underway and its completion is scheduled for 1974. Also under construction at the end of 1972, were short lengths of 115 Kv transmission line, as well as the expansion of two receiving substations. Normal distribution system expansion and new public lighting were being executed, including distribution voltage change-over to 208/120 v. throughout Bogotá.

III. THE PROJECT

A. Objectives of the Project

3.01 Among the works which the Empresa de Energía Eléctrica de Bogotá has been carrying out since 1960, there are two major programs of development to be continued in the 1973 to 1982 period, which are: (a) the expansion and modernization of its subtransmission and distribution systems, including maintenance equipment, control and communications equipment; and, (b) required additions to existing generation facilities and to improve regulation of the Río Bogotá for electric power and flood control.

3.02 The proposed project relates to the first of the programs listed in the preceding paragraph and has as its objectives:

- (a) the expansion and improvement of the transmission and distribution facilities of the EEEB to meet the projected growth in customer demand in its service area through 1977;
- (b) to raise the efficiency and reliability levels of electric service through more adequate distribution of loads among substations, reduction of system losses and improvement of regulation, modernization of control and protection and improvement of maintenance and operation; and
- (c) to extend service to the suburban areas near the city.

B. Project Description

3.03 The 1973-1977 transmission and distribution project proposed by the EEEB would be executed in all of the service area except the "Eastern Zone" for which the corresponding subtransmission and distribution improvements and expansion are being financed as a subprogram of the Bogotá Urban Development Program (PIDUZOB) under loan 238/OC-CO.

3.04 The project would consist of 1/ :

- (a) the construction of 8 lengths of 115 Kv aerial subtransmission lines totalling 124.5 kilometers; 4 short lengths of 57.5 Kv aerial and underground subtransmission lines totalling 11.7 kilometers, and the construction of some 120.0 kilometers of 34.5 Kv aerial line to serve industrial loads, all within the EEEB service area;
- (b) the construction and expansion and/or uprating of five 230 Kv, 115 Kv and 57.5 Kv receiving substations within the EEEB service area involving the installation of 435 MVA in power transformer capacity;
- (c) the construction within the EEEB service area of some 212 kilometers of 13.2 Kv primary distribution lines, 81 kilometers of secondaries, the installation of some 556 MVA in distribution transformer capacity, the installation of approximately 65,000 customer watthour meters as well as the installation of corrective capacitors and voltage

1/ Descriptions of each item included in the project are given in Appendix C.

regulators and the installation of public lighting in main streets to be constructed during the period;

- (d) the extension of electric services in 15 suburban communities in the area normally served by the EEEB and in 24 smaller localities formerly served by the CAR involving the construction of a total of 70 kilometers of 34.5 Kv rural feeders, 95 kilometers of distribution primary line, 400 kilometers of secondary line, and the installation of 35 MVA in distribution transformer capacity; and
- (e) the acquisition of load-dispatching and miscellaneous equipment related to the project including maintenance, transportation, communications and laboratory equipment, as well as hot-line and other hand tools.

C. Cost and Financing of the Project

3.05 The total cost estimate of the project is the equivalent of US\$42,175,000 and is detailed in Appendix D. A summary of Appendix D is shown below, grouping the items into categories of investment and principal subdivisions:

(In thousands of US\$ or its equivalent)

Categories and Principal Subdivisions	Foreign Exchange			Local		%
	Direct	Indirect	Total	Currency	Total	
1. <u>ENGINEERING AND ADMINISTRATION</u>	<u>310</u>	<u>-</u>	<u>310</u>	<u>2,381</u>	<u>2,691</u>	<u>6.4</u>
2. <u>DIRECT COST OF CONSTRUCTION</u>						
2.2 Transmission	2,278	181	2,459	1,191	3,650	8.6
2.3 Distribution	8,953	2,165	11,118	10,583	21,701	51.5
2.4 General Installations	<u>3,587</u>	<u>-</u>	<u>3,587</u>	<u>110</u>	<u>3,697</u>	<u>8.8</u>
Total Category 2	<u>14,818</u>	<u>2,346</u>	<u>17,164</u>	<u>11,884</u>	<u>29,048</u>	<u>68.9</u>
3. <u>FINANCIAL CHARGES DURING CONSTRUCTION</u>						
3.1 IDB Loan						
3.11 IDB Interest	3,599	-	3,599	-	3,599	8.5
3.12 Commitment Fee	589	-	589	-	589	1.4
3.13 IDB Supervision and Inspection Fund	<u>212</u>	<u>-</u>	<u>212</u>	<u>-</u>	<u>212</u>	<u>0.5</u>
Sub-total	4,400	-	4,400	-	4,400	10.4
3.2 Suppliers' Credits	<u>594</u>	<u>-</u>	<u>594</u>	<u>-</u>	<u>594</u>	<u>1.4</u>
Total Category 3	<u>4,994</u>	<u>-</u>	<u>4,994</u>	<u>-</u>	<u>4,994</u>	<u>11.8</u>
5. <u>UNALLOCATED</u>						
5.1 General Contingency	1,482	235	1,717	1,189	2,906	6.9
5.2 Provision for Escalation	<u>2,195</u>	<u>341</u>	<u>2,536</u>	<u>-</u>	<u>2,536</u>	<u>6.0</u>
Total Category 5	<u>3,677</u>	<u>576</u>	<u>4,253</u>	<u>1,189</u>	<u>5,442</u>	<u>12.9</u>
TOTAL PROJECT COST	<u>23,799</u>	<u>2,922</u>	<u>26,721</u>	<u>15,454</u>	<u>42,175</u>	<u>100.0</u>
	<u>(56.4%)</u>	<u>(6.9%)</u>	<u>(63.3%)</u>	<u>(36.6%)</u>	<u>(100.0%)</u>	

3.06 The Direct Cost of Construction Category was calculated taking into account the capability of Colombian industry to furnish a portion of the supplies required. All materials and equipment were classified into probable imported or Colombian supply and assigned a use currency as follows:

<u>Category</u>	<u>Imported</u>		<u>Colombian</u>
	<u>Direct Foreign Exchange</u>	<u>Indirect Foreign Exchange</u>	<u>Local Currency</u>
2.2 Transmission	Approximately 50% of the conductor supply; all insulated and underground cables; steel towers; suspension and post insulators; hardware receiving substation; transformers; protection control and grounding equipment.	Raw material for the balance of the conductor supply.	Processing of the raw materials into finished conductor; poles and crossarms; pin and disc insulators.
2.3 Distribution	Approximately 50% of the conductor supply; approximately 50% of the distribution transformer supply; voltage regulating and corrective equipment; street lighting controls; grounding equipment, meters and special hardware.	Raw materials and components for the balances of the conductor and distribution transformer supply.	Processing of the raw materials and components into finished conductor and distribution transformers; poles and crossarms, pin and disc insulators; common hardware and street lighting fixtures.

All load dispatching, maintenance, transportation, communications and laboratory equipment, as well as hot-line and other tools would be imported. It should be noted that the project's indirect foreign exchange costs, totalling some US\$2.9 million (or 7% of total project cost), reflects the incidence of raw materials and components for conductors and transformers that would be imported into the country requiring further transformation before being applied in the project.

3.07 1972 Colombian prices of materials were used for the local supply. Prices from latest 1972 bidding results related to IBRD-financed transmission and distribution construction being executed by the EEEB were used in estimating the cost of the imported supply, in addition to the experience on other projects being supervised by the EEEB's engineering consultants, Ingetec.

3.08 Having assumed the origin of all goods and the corresponding 1972 prices, the appropriate imported item prices were adjusted upwards to reflect the 10% depreciation of the US dollar that was announced on February 11, 1973. Using these materials and equipment costs as a base, each item of work included in the Direct Cost of Construction was estimated by adding to the materials and equipment costs the amounts necessary for transport, insurance, transformation of raw materials and construction labor.

These item costs, making up the Direct Cost of Construction category and totalling some US\$29.0 million, are shown in the Appendix D and summarized in the table shown in paragraph 3.05.

3.09 General Construction Costs were computed as percentages of the Direct Cost of Construction category using the previous experience of EEEB for this type of construction, as follows: (a) engineering and direction of construction - approximately 6%; (b) construction administration and general expenses - approximately 3%; and (c) contingencies (to cover omissions and unforeseen items) - approximately 10%.

3.10 The sum of the Direct Cost of Construction and the General Construction Costs (Engineering and Administration and General Contingency items of investment) amount to approximately US\$34.6 million, which is the Total Construction Cost of the project before a provision for escalation and before financial charges during construction. Included in the estimate for the Engineering and Administration category are the foreign exchange costs of consulting firms to be contracted by the EEEB for distribution system planning and management services and for the engineering purchasing assistance and erection services related to the load-dispatching center.

3.11 A provision for escalation of approximately US\$2.5 million distributed over the 1973-1977 period was added to the foreign exchange component of the total construction cost based on trends of construction and price indices within Colombia and the depreciation in purchasing power of the US dollar, the currency in which the cost estimate is represented. In determining the provision for escalation, it was found that the annual local currency investments in the construction cost, converted into US dollars at the average official 1972 rate of exchange, will adequately reflect the colombian peso expenditures to be made in the Project over the 1973-1977 period, assuming there will be no substantial change of work scope. This is due to the fact that in the past few years the price increases in the local construction costs attributable to inflation have been equivalent to the increases in the exchange rate. For the foreign exchange component a cumulative rate of 5% per year was used to adjust the construction cost. This rate was determined from the experience in price trends over the last seven years and it reflects the recent realignment in foreign currencies. The construction cost of US\$34.6 million (see paragraph 3.10), plus the provision for escalation of US\$2.5 million, or US\$37.1 million, represents the project cost before financial charges during construction and is considered reasonable, with sufficient allowance for contingencies.

3.12 For the computation of financial charges for the IDB Loan (US\$21.2 million OC resources), the following terms and conditions were assumed: amortization in 20 years at interest of 8% per annum on outstanding indebtedness payable semi-annually in foreign exchange. A commitment fee of 1-1/4% per annum payable semi-annually, on undisbursed balances, and a 4-1/2 year disbursement period beginning from the date of the loan contract. Also included as a financial charge during construction is the fee for IDB inspection and supervision (1% of the loan amount).

3.13 In the consideration of suppliers' credits as part of the financing scheme of the project, it was agreed with the EEEB to have 90% of the foreign exchange cost of the load dispatching equipment and 100% of the foreign exchange cost of the engineering services related thereto financed outside the Bank loan, since such highly specialized equipment and services do not lend themselves to unrestricted bidding as required by the Bank. Consequently, the equivalent of US\$3.9 million is expected to be covered under suppliers' credits on terms and conditions similar to those currently in effect at EXIMBANK (USA) for product financing, which are: 7 year amortization period; 8% per annum interest on outstanding indebtedness payable semi-annually in foreign exchange; a 2-year disbursement period; and a 2-1/2 year grace period from credit agreements. With respect to the possibility of financing other imported items in the project through suppliers credit, it was concluded that to increase the amount of suppliers' participation in project financing would adversely affect the EEEB's projected cash situation during project execution and in the early years of project operation. This results as a consequence of the more rigid terms of suppliers' credits and the normally higher prices that would be paid for the equipment and materials purchased under restricted bidding conditions.

3.14 The financial plan of the project would be as follows:

(In thousands of US\$ or its equivalent)

Categories and Principal Subdivisions	IDB	Suppliers'	E E E B			Total
	Foreign Exchange	Foreign Exchange	Foreign Exchange	Local Currency	Sub- Total	
1. ENGINEERING AND ADMINISTRATION						
1.1 Engineering and Supervision of Construction	150	160	-	1,500	1,500	1,810
1.2 Administration	-	-	-	881	881	881
Total Category 1	<u>150</u>	<u>160</u>	<u>-</u>	<u>2,381</u>	<u>2,381</u>	<u>2,691</u>
2. DIRECT COST OF CONSTRUCTION						
2.2 Transmission	2,459	-	-	1,191	1,191	3,650
2.3 Distribution	11,118	-	-	10,583	10,583	21,701
2.4 General Installations	<u>328</u>	<u>2,933</u>	<u>326</u>	<u>110</u>	<u>436</u>	<u>3,697</u>
Total Category 2	<u>13,905</u>	<u>2,933</u>	<u>326</u>	<u>11,884</u>	<u>12,210</u>	<u>29,048</u>
3. FINANCIAL CHARGES DURING CONSTRUCTION						
3.1 IDB Loan						
3.11 IDB Interest and Service Charge	3,599	-	-	-	-	3,599
3.12 IDB Commitment Fee	-	-	589	-	589	589
3.13 IDB IDB Inspection and Supervision Fund	<u>212</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>212</u>
Sub-total 3.1	3,811	-	589	-	589	4,400
3.2 Suppliers' Credits	<u>-</u>	<u>-</u>	<u>594</u>	<u>-</u>	<u>594</u>	<u>594</u>
Total Category 3	<u>3,811</u>	<u>-</u>	<u>1,183</u>	<u>-</u>	<u>1,183</u>	<u>4,994</u>
5. UNALLOCATED						
5.1 General Contingency	1,390	327	-	1,189	1,189	2,906
5.2 Provision for "Escalation"	<u>1,944</u>	<u>500</u>	<u>92</u>	<u>-</u>	<u>92</u>	<u>2,536</u>
Total Category 5	<u>3,334</u>	<u>827</u>	<u>92</u>	<u>1,189</u>	<u>1,281</u>	<u>5,442</u>
TOTALS	<u>21,200</u> ^{1/}	<u>3,920</u>	<u>1,601</u>	<u>15,454</u>	<u>17,055</u>	<u>42,175</u>
	(50.3%)	(9.3%)	(3.8%)	(36.6%)	(40.4%)	(100.0%)

^{1/} This sum includes indirect foreign exchange costs equivalent to US\$2,922,000 (see paragraphs 3.05 and 3.06).

3.15 The proposed IDB loan (US\$21.2 million) covering 50.3% of the project cost would finance all the foreign exchange costs, excluding only the cost of the load dispatching equipment and related services and charges and the IDB commitment fee. The Bank loan would represent 79% of total foreign exchange costs. Included in the Bank loan are indirect foreign exchange costs (US\$2,922,000) representing 11% of total foreign exchange costs of the project and 14% of the IDB loan. Suppliers' credit financing (some US\$3.9 million) would absorb 9.3% of total project cost and would represent 15% of total foreign exchange costs.

3.16 The 10% down payment for the load dispatching equipment, interest charges on the suppliers's credits, the IDB commitment fee and all local currency costs would be financed by the EEEB through internal cash generation and local borrowing (see paragraph 4.21). The EEEB contribution (US\$17,055,000) would finance 40.4% of the project cost. The equivalent of US\$15,454,000 would cover total local currency costs and the balance, US\$1,601,000, would cover 6% of total foreign exchange currency requirements.

3.17 The origin and use of currencies for the financing of the project would be as follows:

(In thousands of US\$ or its equivalent)

	<u>Currencies of Origin</u>		<u>Currencies of Use</u>		<u>Total</u>	<u>%</u>
	<u>Foreign Exchange</u>	<u>Local Currency</u>	<u>Foreign Exchange</u>	<u>Local Currency</u>		
IDB	21,200	-	21,200 ^{1/}	-	21,200	50.3
Suppliers' Credits	3,920	-	3,920	-	3,920	9.3
EEEB	-	17,055	1,601	15,454	17,055	40.4
	25,120	17,055	26,721 ^{1/}	15,454	42,175	100.0
	<u>(59.6%)</u>	<u>(40.4%)</u>	<u>(63.4%)</u>	<u>(36.6%)</u>	<u>(100.0%)</u>	

The financing schemes outlined above are considered adequate and satisfactory for the financing of the project under consideration.

D. Justification of the Project

(1) Technical and Economic Judgement on the Soundness and Feasibility of the Project

3.18 As is indicated in paragraph 2.11 and Appendix G, the EEEB kilowatthour sales are being projected during the 1973-1982 period at an average increase of 10% per year. Projected coincident maximum demands assuming 10% of the kilowatthour sales as System Losses and utilizing a System Load Factor approaching an optimum 57% in 1975, are expected to increase from the 579.2 MW recorded in 1972 to 1,375 MW in 1982, reflecting an average annual increase of around 9%.

^{1/} Includes indirect foreign exchange costs equivalent to US\$2,922,000, corresponding to the incidence of raw materials and components for conductors and transformers that would be imported into the country requiring further transformation before being applied to the project.

3.19 The capability of the EEEB to provide the system energy and demand requirements either through its own installed generating capacity or through purchases from ISA (this latter company to produce energy from the CHIVOR 500 MW Stage No. 1, now under construction, and from the CHIVOR 500 MW Stage No. 2, expected to be in service in 1978) and assuming hydroelectric plant operation under average water conditions of the Rio Bogotá is shown in the following balance:^{1/}

Year	System Demand (MW)	System Energy Requirements (Gwh)	Available Capacity EEEB+ISA (MW)	Net Energy to System EEEB+ISA (Gwh)	Capacity Balance (MW)	Net Energy Balance (Gwh)
1973	650	3,135	633	3,135	- 17	0
1974	619	3,038	699	3,038	+ 80	0
1975	648	3,234	999	3,234	+ 351	0
1976	721	3,598	999	3,598	+ 278	0
1977	802	4,004	999	4,004	+ 197	0
1978	893	4,457	1,299	4,457	+ 406	0
1979	994	4,963	1,299	4,963	+ 305	0
1980	1,107	5,529	1,299	5,529	+ 192	0
1981	1,234	6,161	1,299	6,161	+ 65	0
1982	1,375	6,864	1,299	6,864	- 76	0

3.20 The above tabulation clearly indicates the critical situation in which the EEEB will find itself at the time of the 1973 peak load (December) when it will have to operate all available generating capacity and over-load some of the units to meet the 650 MW demand anticipated. This "tight" situation will be relieved in 1974 with the operation of the third unit (66 MW) at Zipaquirá. In 1975 the benefits of EEEB's investment in ISA will begin to accrue with the operation of the 500 MW CHIVOR First Stage; 300 MW of this First Stage will be available to EEEB at all times. In 1978, it is expected that an additional 300 MW will become available to EEEB from the 500 MW CHIVOR Second Stage operation, which, when added to the other capacity available to EEEB, will provide generating capability to serve the system demand adequately through the 1980/81 period. In 1981, the EEEB will be obliged to make arrangements with ISA to provide additional generating capacity to adequately serve the projected 1982 demand.

3.21 For the subtransmission planning, the forecast of system energy requirements and maximum demand were used to determine the probable locations and sizing of receiving substations over the next ten-year period from a study of load densities by areas, experience in use of land as gained by the City Planning Division, and judgement in studies of alternative locations on the part of EEEB and its consultant. Subtransmission circuits were routed and sized to connect the substations to the appropriate 115 Kv and/or 57.5 Kv transmission systems.

3.22 For the distribution planning, the anticipated substation demands and the land areas to be served by the substations were used in determining the "demand-densities" of specific load areas from which the number and sizes of primary circuits, distribution transformers and secondary circuits were determined.

^{1/} Derived from Appendix G.

In these computations indices and ratios to convert "demand-densities" into quantities of physical distribution system items were used, based on EEEB's historic trends and standardized sizing. Customer forecasts were based on the historic trends of the EEEB taking into account the land use as set forth by the City Planning Division. The number of customer watt-hour meters, and the types, included in the project are directly related thereto.

3.23 The EEEB plans to install capacitors in all existing substations to provide power factor correction (for the first time in its history). EEEB also plans to install voltage regulators on the secondary side of all existing 57.5/11.4 Kv substations and to continue its intensive program of street lighting expansion, as well as that of the modernization of its existing secondary system to change the original Bogotá voltage of 260/150 volts to 208/120 volts.

3.24 As a result of the technical analysis carried out, it is concluded that the subtransmission classification of the project has been adequately planned and sized to meet the expected requirements for the transportation and transformation of the 115 Kv and 57.5 Kv energy to distribution levels. This part of the project is technically feasible and sound, having been examined and found to be in keeping with latest engineering practices.

3.25 The distribution classification of the project is also considered satisfactory from the point of view of providing an adequate supply of materials and equipment to connect 65,000 new consumers to the EEEB system and to improve service to all existing consumers in the 1973-1977 period. Alternative methods of computing the physical components required were not studied, since it was felt that any difference in the cost of the distribution system expansion proposed from a least cost alternative is likely to be within the margin of error of the estimates. Notwithstanding, it is felt that the EEEB systems has reached a physical size that warrants a more sophisticated approach to distribution planning rather than the simplistic approach of projecting trends to determine only quantities of materials to purchase for stock to be installed whenever necessary without the benefit of a master plan for distribution. In this respect, the EEEB will require assistance in distribution system planning, particularly in regard to: (i) setting forth its distribution system model; (ii) preparing a conceptual master plan for distribution expansion and, (iii) preparing and putting into effect a scheme to coordinate protection for the distribution system concept adopted. This latter situation is discussed more thoroughly in paragraphs 4.04 and 4.28.

(2) Analysis of Project Benefits

3.26 In the internal rate of return calculations for the incremental investments, the stream of costs includes: (a) capital investments, net of financial costs, of the transmission and distribution plant necessary to convey energy to consumers; and (b) the operating and maintenance costs, exclusive of depreciation, for the generation, transmission, distribution plants, plus administration expenses, associated with the energy sales included in the project benefits. The stream of benefits consists of the marginal increase in revenues from energy sales attributable to the project (valued at actual average tariff levels of the EEEB system), estimated to have a life of 25 years. With these assumptions, the cost and benefit streams are:

(In millions of US\$ or its equivalent)

	<u>Investments</u>	<u>Operating and Maintenance costs</u>	<u>Revenues due to Project Installation</u>
1973	4.8	-	-
1974	6.6	0.8	2.1
1975	7.4	1.8	4.8
1976	9.6	2.8	7.7
1977	6.1	4.0	10.9
1978-98	-	4.0	10.9

3.27 On the above basis, the internal rate of return on project investment would be 21.6%. Sensitivity analysis carried out shows that an increase in investment of 25% would reduce the internal rate of return to 16%; an increase in operating costs of 25% would reduce it to 18%, and a decrease in investment costs of 25% would result in a rate of 29%. It should be noted that for the above calculations, costs and revenues corresponding to the "Eastern Zone" subprogram of PIDUZOB (238/OC-CO) which EEEB will execute, have not been included. Taking into account that project benefits for the PIDUZOB Subprogram were very satisfactory (see Document PR- 546), the inclusion of the costs and benefits of this subprogram together with the proposed project, would not affect substantially the results obtained above (it is estimated that a slightly higher internal rate of return would be obtained).

3.28 In addition, it should be pointed out that it is expected that the combined population of Bogotá and the outlying communities, estimated to be a total of 3 million at the end of 1972, would benefit from the project for the following reasons, in addition to the normal benefits of receiving adequate electric service:

- (a) as it is estimated that some 70% of the population benefitting from this project are in the lower income categories, the adequate and relatively inexpensive electric service contemplated should result in the reduction of the use of wood, coal and charcoal for domestic cooking. This would reduce air pollution, deforestation and consequent erosion in the Bogotá river basin and nearby watersheds;
- (b) better electric service and the resulting expansion of street lighting to all urban sectors which would provide greater street safety; and
- (c) the improvement of living conditions and increasing of job opportunities in rural areas should help to reduce migration to the already overcrowded low-income "barrios" of Bogotá.

IV. THE BORROWER AND PROJECT EXECUTION:

The Borrower and Executing Agency

(1) Nature, Purpose and Legal Capacity

4.01 The borrower and executing agency would be EEEB, founded in 1892 as a private enterprise. In 1959, through Agreement No.18 of the Distrito Especial de Bogotá, it became an autonomous, municipality-owned public corporation. As established in said Agreement, the EEEB has been formed for a period of 99 years. In accordance with the provisions of its charter in force, which was approved in March of 1969, EEEB's principal purpose is to provide electricity services to the city of Bogotá and vicinity. In said charter it is established that the EEEB is an entity with juridical personality, independent assets, administrative autonomy and with the legal capacity to contract internal and external credits. EEEB is specifically empowered by its charter to execute works of the nature included in the project. The EEEB has authority to operate its plants, as well as to install a transmission and distribution system on public roads and streets of the municipalities in which it renders its service. This authorization has been granted for a period of 50 years and is to expire in the year 1984. Since the IDB loan is scheduled for a period of 20 years and such authorization elapses in 1984, it is recommended that in the guarantee contract the guarantor commit itself to extend the necessary authorization for a term not less than the life of the IDB loan (See Chapter V - Recommendations). Furthermore, by virtue of Decree No.2675 of 1952, it has been given the right to acquire private real property rights and the right of way for its transmission and distribution lines, including the power to institute the corresponding condemnation proceedings. These proceedings are based on factual data presented to the competent courts by the EEEB and are brief in nature.

(2) Organization and Management

4.02 The management and administration of EEEB is entrusted to its Board of Directors of seven members consisting of: the Mayor of Bogotá or his representative; one member appointed by the President of the Republic, two elected by the Bogotá Municipal Council; and three selected by said Council from lists of names submitted by the Bankers' Association, the Merchants' Association and the Manufacturers' Association. The Mayor serves permanently as Chairman of the Board, and the remaining members are elected for terms of two years and may be re-elected indefinitely.

4.03 The Legal Representative and chief executive officer of the EEEB is the General Manager who is elected for two-year terms by the Board of Directors and may be re-elected indefinitely. The present General Manager of EEEB has served since 1968. In accordance with the provisions of its statutes, EEEB has an Auditor ("Revisor Fiscal") elected also by the Board for two-year terms and may be re-elected indefinitely. The General Manager directs the business of EEEB with the cooperation of four Deputy-Managers (Administrative, Financial, Technical and Operations) and the following dependencies: the Department of Organization and Methods, Secretary General and Legal Counsel. The Organizational Chart of EEEB is shown in Appendix E.

4.04 In general, EEEB has clearly defined its technical and administrative areas, as well as its operational and service functions. The overall administrative, financial, technical and operational structures were examined and found to be satisfactory. However, in the Technical and Operations "Subgerencias"

there continues to be a deficiency in distribution system planning and administration. This deficiency was identified and recognized by the EEEB at the time the "Eastern Zone" Subprogram of the PIDUZOB was analyzed and a condition precedent to the first disbursement of the subsequent loan 238/OC-CO required the EEEB to engage an engineering consulting firm to provide distribution system management services. At present, negotiations to engage J.G. White Engineering Company of New York to carry out these services are underway. The terms of reference describing the work to be done by the firm are discussed more fully in paragraph 4.27.

4.05 With respect to other future requirements, four units are pending final establishment within EEEB's permanent organizational structure (see Appendix E), which are:

- (a) The Secretary General's Office and the Department of Organization and Methods, whose functions today are being carried out by the Administrative "Subgerencia";
- (b) The Department of Material Control. At present, the industrial and management consulting firm of F. del Río and Company is providing to the EEEB satisfactory consulting services in relation to the organization and administration of supplies and materials, to purchasing regulations and to the corresponding procedures manual. EEEB has programmed to implement the last recommendations of said consulting firm no later than June 30, 1973; and
- (c) The Budget Control Section. The systems and documentation corresponding to this section have been designed and prepared by the EEEB staff for Board Approval (see paragraph 4.07).

In view of the importance that EEEB complete consolidating its organization, it is recommended that within 12 months from the date of the loan contract, the EEEB should submit to the Bank a report which indicates the measures it has adopted or will adopt in the areas of organization and administration of supplies and materials, and of budget control (see Chapter V - Recommendations).

4.06 As of December 31, 1972, EEEB employed a total staff of 1,617, out of which 109 were classified in the executive and professional category, 345 in the assistant and administrative category, 92 in the technical category and 1,071 in the workers' category. The quality of EEEB's top management, as well as of its technical, administrative and service personnel, is satisfactory. Personnel turn-over is low, not greater than 5%. In 1972, EEEB had one employee for every 199 customers, which is very satisfactory when compared to other Latin American power utilities. Further, because of the high population density in Bogotá and other market characteristics, the proportion of consumers to employees should become even higher in the future for EEEB. EEEB's labor regulations have improved during recent years and are considered to be acceptable.

(3) Financial Administration

4.07 The functions relating to the accounting-financial administration of EEEB are carried out in a satisfactory manner. Its accounting system is considered to be acceptable. For the purpose of illustration, it is noted that the EEEB follows the guidelines established by the Federal Power Commission for power utility companies in the United States. Accounting transactions, including billing and other records, are maintained up-to-date with the help of an IBM 1401 computer. Procedures for collection and payment of accounts are also considered satisfactory. EEEB does not have, however, a formal budget system. Its budget is actually represented by a forecast of Income and Expenses, which is prepared annually, showing only main account elements. No doubt the present system is desirable from the point of view of the General Manager, since a formal transfer of items within main accounts would have to be submitted to the Board

for approval, a situation which would reduce quick decision-making by the General Manager. Although no problem has arisen to date from using the above system, the EEEB has prepared for the approval of the Board of Directors all the necessary documentation to implement a formal, complete and efficient budget system. In fact, EEEB has already prepared the Budget Control Manual and it has included in its detailed organization chart the Budget Control Section. See paragraph 4.05 for the appropriate recommendation concerning the budget control system.

4.08 Internal audit arrangements are satisfactory within EEEB. These functions are carried out by the "Revisor Fiscal" (Auditor), who reports directly to the Board of Directors. The financial statements of EEEB are audited annually by a firm of independent public accountants. The financial statements for the period ended December 31, 1972 were audited by Arthur Anderson & Company. In their opinion these statements presented fairly the financial position of EEEB as of that date. To ensure that adequate audit continues, it is recommended that financial statements of EEEB and the project should be audited by an independent public accounting firm acceptable to the Bank, and that these statements should be submitted to the Bank each year, within 120 days from the close of each fiscal year, starting with the balance sheets closed December 31, 1973 (see Chapter V. - Recommendations).

(4) Tariffs

4.09 The electric power rates charged by the EEEB for the electric services are regulated by the Junta Nacional de Tarifas de Servicios Públicos (JNTSP), established by Decree 3069 of December 16, 1968. The criteria for establishment of rates, defined in the decree, are those usually applicable to the regulation of power utilities, that is, that the tariffs charged by the electric power entities must generate sufficient revenue to cover real costs of the service and must yield a reasonable return on assets to permit the financing of expansion of the electric power systems. The Junta authorized an increase in EEEB tariffs through its Resolution No.4 of February 8, 1973, raising the average revenue per kilowatt hour by 12%, from the 1972 average of US cents 1.11 to US cents 1.24. At this new tariff level, EEEB expects to attain a highly satisfactory rate of return of 12.2% on net utility investment for 1973. Also, EEEB is authorized, under Resolution No.4, to apply the approved tariffs to the municipalities and communities included in the service areas of CAR.

4.10 The new schedule of EEEB tariffs which went into effect in March of 1973, includes the following rates per kilowatt hour of consumption for the principal users:

	Colombian Centavos/Kwh	Equivalent US Cents/Kwh	1/
- Residential	25.32	1.11	
- Commercial	42.14	1.85	
- Industrial	31.02	1.37	
- Official and Street Lighting	23.00	1.01	

1/ Converted on the basis of US\$1.00 = Col.\$ 22.79

In addition to the new rates, the February, 1973, tariff authorization permits the EEEB to charge up to 500 Colombian peses (US\$21.94) for each new customer connection to the system. The rates charged by the EEEB are reasonable, and are within the range of rates charged by other utilities in Colombia 1/.

4.11 During negotiations it was agreed that the previous accord reached for the electricity subprogram with the EEEB in the PIDUZOB program (loan 238/OC-CO) requiring that tariffs be established to yield a 9% rate of return on net utility investment would be applicable and remain in force for this project if the corresponding loan is approved. (See Appendix A and Project Resolution). On the basis of past performance it is expected that EEEB will encounter no difficulties in fulfilling this requirement.

(5) Financial Situation 1969-1972

4.12 The financial situation of EEEB, as of December 31, 1972, has been thoroughly investigated and found to be generally satisfactory. Detailed financial statements (comparative balance sheet, income statement and the statement of utility income and rate of return determination) for the period 1969-1972 are shown in Appendix F. It should be mentioned that EEEB has not been affected by internal inflation because of the annual increase it has obtained in tariffs. Annual increases in outstanding foreign debt due to variation of the exchange rates in the currencies in which the foreign debt is assumed, which are reflected in EEEB's books in local currency, are charged to fixed assets. As of December 31, 1972, the EEEB made total adjustments of US\$9.3 million as follows: US\$3.2 million for revaluation of European and Asian currencies, and US\$6.1 million for differences in the exchange rate between the US dollar and the Colombian peso. Notwithstanding the above, EEEB was still affected by the recent revaluation of European and Asian currencies in relation to the US dollar. It is expected that EEEB will make in the future the corresponding adjustments.

4.13 Selected data from the financial statements for the period 1969-72 are shown below:

1/ From an examination made by the JNTSP in February of 1973 of the rate schedules of forty Colombian electric utility entities, it was shown that the rate applied to residential consumers using more than 100 Kwh per month (estimated average for each entity) ranged from US\$0.80 per Kwh to US\$1.91 per Kwh.

Year Ending December 31
(in millions of US\$)

	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>
<u>Net Fixed Assets</u>	<u>105.0</u>	<u>107.2</u>	<u>110.3</u>	<u>114.2</u>
Index (1969= 100)	100	102	105	108
As % of Total Assets	89%	85%	82%	80%
<u>Provision for Depreciation</u>	<u>3.2</u>	<u>3.6</u>	<u>3.8</u>	<u>4.3</u>
As % of Fixed Assets	2.9 %	2.8%	2.7%	2.7%
<u>Capitalization^{1/}</u>	<u>107.9</u>	<u>113.7</u>	<u>119.4</u>	<u>127.5</u>
As % Net Fixed Assets	103%	106%	108%	112%
<u>Long-Term Debt</u>	<u>70.4</u>	<u>71.3</u>	<u>72.8</u>	<u>75.6</u>
As % of Capitalization	65%	63%	61%	59%
<u>Equity</u>	<u>37.5</u>	<u>42.5</u>	<u>46.6</u>	<u>51.9</u>
As % of Capitalization	35%	37%	39%	41%
<u>Net Utility Investment^{2/}</u>	<u>100.8</u>	<u>100.9</u>	<u>121.5</u>	<u>134.1</u>
<u>Operating Revenues</u>	<u>19.0</u>	<u>21.9</u>	<u>24.4</u>	<u>28.0</u>
<u>Operating Expenses</u>	<u>8.5</u>	<u>9.6</u>	<u>10.8</u>	<u>12.7</u>
As % of Operating Revenues	45%	44%	44%	45%
<u>Operating Income^{3/}</u>	<u>10.5</u>	<u>12.4</u>	<u>13.7</u>	<u>15.3</u>
As % of Net Utility Investment	9.6%	10.2%	10.2%	10.3%
<u>Financial Ratios</u>				
Current Assets/Current Liabilities	1.87	1.57	1.83	1.94
Liquid Assets/Current Liabilities	1.05	0.67	0.94	0.96
Net Fixed Assets/Long-term Debt	1.49	1.50	1.51	1.51
Long-term Debt/Equity	1.9	1.7	1.6	1.5
Debt Service Coverage ^{3/}	2.3	1.9	2.0	2.1
Operating Ratio: ^{4/}	26%	32%	33%	29%

^{1/} Long-term debt plus total equity (including surplus)

^{2/} The "net utility investment" is defined by the Bank as the average of the annual net fixed assets plus working capital (adjusted) for the corresponding year.

^{3/} Operating income plus depreciation divided by debt service.

^{4/} "Operating Ratio" is the relationship of operating expenses before depreciation to operating revenues.

4.14 The current financial condition of EEEB is considered satisfactory, as of December 31, 1972. The current ratio of 1.94 and the "acid test" (liquid assets to current liabilities) of 0.96 for 1972 is acceptable. The downward turn in these ratios in 1970 was caused by the expansion programs of the EEEB. Net working capital has increased from US\$4.8 million in 1969 to US\$8.1 million in 1972. Collectibility of receivables for private consumers is excellent. Billing is done every two-months and customers have 15 days to pay without penalty; afterwards he is given 15 more days to pay with an annual late fee of 12.5%. Once the 30 day period has expired, if payment is not made, EEEB discontinues electricity services to the customer. Past due accounts over the 30 day period are rare and correspond to isolated cases for insignificant amounts. On the other hand, EEEB has a large number of past due accounts from official entities to which it supplies electric services. As of 1972, official entities owed EEEB the equivalent of US\$2.1 million. Fifty per cent of total official accounts were overdue more than 180 days; of these accounts, 90% correspond to the "Electrificadora de Cundinamarca"^{1/}. It is felt that the above situation has not impaired EEEB's performance, since official past due accounts for more than 60 days represented, in 1972, only 5% of energy sales. It should be mentioned also that EEEB considers that the above overdue official accounts are still collectible. However, in order that the Bank may be informed as to the efforts that EEEB is making to collect official accounts which are overdue by more than 60 days, it is proposed that it submit to the Bank within 12 months from the date of the loan contract a report on the measures it has adopted jointly with the guarantor for payment of said overdue accounts from public entities (see Chapter V - Recommendations).

4.15 Net fixed assets, which constitute the principal asset item, were mainly financed through foreign credit. Although net fixed assets only increased an average of about 3% during the period 1969-72, efforts made by the EEEB to finance the balance of its fixed investments have been considerable, especially taking into account that EEEB: (a) does not receive government subsidies; (b) must absorb the energy costs of the public lighting system and that of the city's offices; and (c) must appropriate 10% of its income for the expansion and maintenance of the city's street lighting. The ratio of capitalization to net fixed assets was: 102% in 1969, 106% in 1970, 108% in 1971 and 111% in 1972. These latter figures indicated that EEEB financed part of its net fixed assets from internal cash generation. In addition to its fixed assets, it should be pointed out that EEEB has made important investments in ISA to finance the construction of the CHIVOR hydroelectric plant and its interconnecting transmission system. Accumulated investments in ISA as of December 31, 1972 totalled US\$24.9 million.

4.16 The financial data summarized in paragraph 4.13 show excellent operating results. Annual operating expenses were adequately covered by revenues in each of the years 1969 to 1972; operating expenses (including depreciation) as a percentage of operating revenues have maintained constant levels of about 45% for these years. EEEB achieved the following rates of return on net utility investment: 9.6% in 1969, 10.2% in 1970, 10.2% in 1971 and 10.3 in 1972, which were above the 9% level considered reasonable for utilities in Colombia. Operating efficiency plus the tariff increases obtained by the EEEB helped to make possible the attainment of these rates of return. EEEB also showed a comfortable servicing of long-term debt obligations; debt service coverage ranged from 2.3 to 2.9 times between 1969 and 1972. The excellent operating ratios of around 30% attained by the EEEB during the 1969-1972 period are even better than those averaging 45% obtained by electric companies in the US during the same period.

^{1/} In February of 1973, the "Electrificadora de Cundinamarca" issued to EEEB notes guaranteed by ICEL to cover payment of all of its accounts overdue more than 180 days (US\$0.9 million).

4.17 The long-term financial position of the EEEB is also satisfactory. The long-term debt/equity ratio improved from 1.9 in 1969 to 1.5 in 1972. EEEB's debt consists mainly of three IBRD loans, which accounted for 95% of the total long-term debt outstanding in 1972. The remaining 5% of foreign borrowing consisted of five loans, totalling US\$6.1 million, made by the following institutions: KFW of Germany, the Istituto Mobiliare Italiano of Italy, the Eximbank from the United States and the Eximbank from Japan. Local long-term borrowing has been insignificant. Total equity increased from US\$37.5 million in 1969 to US\$51.9 million in 1972 (a 38% increase) and consisted of: capital stock, represented by the net value of contributions made by the Municipality; retained earnings for the Expansion Fund; donations from the Municipality and consumers for physical facilities; and a reserve to cover revaluation of real estate. Retained earnings (Expansion Fund) accounted for 82% of the total equity in 1972.

(6) Financial Projections 1973-1982

4.18 Projected Income Statements for 1973-1982 are shown in Appendix F-2. Revenues were computed assuming an 11% annual increase in kilowatt hour sales and average annual tariff increases of 2% over the present tariff level for the period 1973-1982, which is considered reasonable. The operating expenses were projected taking into account average annual increases for the period 1969-72, present and anticipated Kwh rates for energy purchased and EEEB's participation in ISA's operating expenses. The depreciation allowance for each year was computed as 2.8% of the end-of-year gross fixed assets. This percentage reflected the average annual depreciation factor in the 1969-72 period and is considered reasonable in view of the large portion of the EEEB fixed assets in hydro-electric facilities. The projections of operating income, reflecting the difference between the operating revenues at the tariff levels anticipated and the estimated operating expenses, indicate highly satisfactory results in each year. Operating income will increase from US\$17.9 million in 1973 to US\$57.6 million in 1982, representing 52% and 57%, respectively, of total operating revenues, which compares satisfactorily with past trends. The debt service coverage ratio is expected to vary on an annual basis between 2.21 and 5.39 during the period 1972-82, which is satisfactory.

4.19 The projections of annual rates of return on net utility investment are shown in Appendix F-3 and indicate that the total operation of the EEEB would exceed the 9% per year return considered reasonable by the Bank (see paragraph 4.11). The rate of return on investment increases in the latter years of the projections: starting with 1979 the rate exceeds 17% until it reaches 25% in 1982. The reason these rates are high is that they do not reflect the investments to be made by EEEB in the two CHIVOR hydroelectric plant stages and the Chingaza aqueduct project that appear as other assets in the balance sheet. If the EEEB participation in these installations are shown as part of its own fixed assets, these rates would be reduced to 13% in 1979 and would reach 20% in 1982.

4.20 As can be seen from the Sources and Applications of Fund Statement for the period 1973-1982 shown in Appendix F-4, EEEB has planned total construction expenditures of US\$69.8 million for the years 1973-77, the

project construction period. These expenditures are represented by US\$42.2 million corresponding to the proposed transmission and distribution project; US\$11.9 million to the PIDUZOB project (238/OC-CO); US\$11.5 million to the Zipaquirá III project; and US\$4.2 million for other miscellaneous investments. EEEB would finance these construction projects as follows: US\$40.6 million from foreign credit (including IDB contributions from loan 238/OC-CO and the proposed loan) and US\$29.2 million from internal cash generation (US\$21.9 million) and local borrowing (US\$7.3 million) to cover the local component. It should be noted that EEEB's cash situation for the years 1973-82 is positive, showing an accumulation of excess funds of US\$174.5 million for 1982. However, it should be mentioned that if the EEEB makes additional investments (through ISA) to cover needed generating capacity for 1982, these large available resources will have to be committed to finance required future investments in expansion projects, in addition to foreign financing.

4.21 The financial plan for the proposed project, as shown in paragraph 3.15 contemplates the following structure: the Bank loan (US\$21.2 million), suppliers' credits (US\$3.9 million) and internal cash generation and local borrowing to cover the local component (US\$17.1 million). Since EEEB would have cash shortfalls in the first two years of project execution equivalent to US\$7.3 million, it will have to contract short or medium-term loans to cover these cash requirements. The First National City Bank in Bogotá has offered in writing to EEEB a medium term credit equivalent to US\$6.7 million (5 years amortization, 2 year grace period and interest to be fixed at two points over London's Interbank rate). It is expected that no difficulty would arise in obtaining short-term borrowing for the remaining US\$0.6 million. The EEEB has a good credit rating and name, both nationally and internationally, within the banking community. In order that the Bank may confirm the amount, nature and source of the local borrowing to be obtained, it is recommended that: (a) prior to the first disbursement the EEEB should submit evidence that it has obtained the equivalent of US\$3.1 million in local credit to cover cash shortfalls during the first year of project execution, and (b) Within 12 months from the date of the loan contract, the EEEB should submit evidence that it has obtained the equivalent of US\$4.2 million in local credit to cover any cash shortfalls during the second year of project execution. In both cases, the EEEB should give preference in using these local credits for local counterpart financing of the proposed project, when it is not possible to obtain resources for these purposes from internal cash generation (see the Project Resolution). Taking into account the above situation and arrangements, it can be concluded that EEEB would be able to make its contribution to the proposed project on schedule.

B. Project Execution

(1) Construction, Investment and Procurement Schedules

4.22 The construction and the disbursement period of the proposed project is scheduled from July 1, 1973 through December 31, 1977; a 4-1/2 year period. The annual schedule of investments and disbursements has been estimated to meet the anticipated construction progress of the project during the construction period and is shown in detail, by category of investment and source of financing, in Appendix H. A summary of this schedule is presented below:

(In thousands of US\$ or its equivalent)

	^{1/} <u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>Total</u>
IDB	2,786	4,296	4,502	5,138	4,478	21,200
Suppliers' Credit	-	46	513	3,350	11	3,920
EEEB	<u>2,318</u>	<u>3,245</u>	<u>3,928</u>	<u>3,638</u>	<u>3,926</u>	<u>17,055</u>
Total	<u>5,104</u>	<u>7,587</u>	<u>8,943</u>	<u>12,126</u>	<u>8,415</u>	<u>42,175</u>
	(12%)	(18%)	(23%)	(29%)	(20%)	(100%)

The proposed Bank loan would be disbursed entirely against the foreign exchange cost of goods and services procured. In order to ensure fulfillment of the construction and investment schedules, it is proposed that up to the equivalent of US\$100,000 for engineering services be recognized as part of the local contribution to project financing before the loan contract date but after November 14, 1972. (see Chapter V - Recommendations). No disbursements of the Bank loan would be made for expenditures incurred prior to the signing of the contract.

4.23 The urban and rural distribution system expansion and improvements are expected to be carried out simultaneously over the complete 4-1/2 year period. Work on the subtransmission lines would start in the fourth quarter of 1973 with the last of the lines in operation at the end of December 1975. Construction of the receiving substations would start in the third quarter of 1974 and would continue through the end of 1977. The installation of capacitors and voltage regulators would be carried out simultaneously with the construction of the receiving substations. The load dispatching equipment would be purchased in 1975 and 1976 and installed throughout 1976 and early 1977.

4.24 EEEB would engage local contractors to provide the principal erection services for all substations and transmission line construction. Minor related work may be carried out by EEEB personnel. The EEEB plans to use contractors to erect the major distribution lines, and will use its own personnel to carry out some of the smaller distribution and street-lighting extensions. In all cases, EEEB will furnish materials and equipment and the contractors will provide the mounting and erection services. This same practice was used successfully by EEEB in previous transmission and distribution programs financed by the IBRD.

4.25 Procurement for the project would be carried out using public bidding procedures, which have already been reviewed by the Bank staff and conform to IDB requirements. A program of contracting goods and services to be financed with the proceeds of the proposed IDB loan is being followed to insure the fulfillment of the construction schedule and is shown in detail in Appendix H. The EEEB bidding documents for which public announcements were scheduled in April have also been reviewed by the Bank staff and found to be acceptable in their final form. Bank procurement procedures are being followed by EEEB.

(2) Status of Designs and Specifications

4.26 The subtransmission line and substation designs, being similar in detail to various already in operation in the EEEB system are being elaborated by Ingetec and are at a level now from which specifications and bidding documents may be prepared. In this classification, steel towers, conductor insulators and hardware, power transformer and lightning arrester specifications have already been completed. In the distribution classification, although no construction drawings or distribution model has been made for the project, the materials required fall into EEEB's standardized types for which specifications are readily available. It should be noted that approximately 50% of the material requirements of the project is expected to be on order by October, 1973. At the time of the Bank's Analysis and Negotiation mission the status of the project designs were estimated to be 20% complete (February, 1973). It is expected that by the end of May, 30% of designs will have been completed.

(3) Project Engineering and Technical Supervision

4.27 Project engineering and technical supervision by EEEB would be executed through its general consultant, Ingetec. In addition, EEEB is in negotiations with the J.G. White Engineering Company of the United States, to provide the distribution planning and management services required as a condition precedent of the PIDUZOB Subprogram for the "Eastern Zone" and included in the financing provided under Loan 238/OC-CO (see paragraph 4.04). As a result of the analysis of this project, it has been concluded that the terms of reference of the contract being negotiated with J.G. White Engineering Company for the PIDUZOB Subprogram should be expanded to include the following: (a) the compiling of basic input for a load forecast computer model to consist of load areas, land use, customer density, energy requirements and existing load; (b) the preparation and annual updating of the computerized load-forecast model from which probable locations, electrical requirements and service classes of consumers in 1974-1978 can be determined; and (c) the preparation of a conceptual "master development plan" for the Bogotá distribution system, indicating the type of protection required and affecting the coordination with the existing protection. To add these services over a 3-year period of the contract already under negotiation with the J.G. White Engineering Company would mean to increase its cost by US\$150,000. To facilitate the execution of both the PIDUZOB Subprogram and this project,

this amount has been included as part of the cost of this project and has been shown for IDB financing in the "Engineering and Administration" category of investment (see Appendix B - Project Resolution and Chapter V - Recommendations).

4.28 For project inspection and supervision by the Bank, it is proposed that the IDB utilizes part time the services of the Energy Project Specialist currently performing similar duties in Colombia. This Specialist would assist EEEB and Ingetec personnel in the project supervision duties.

4.29 The above outlined scheme for project engineering and technical supervision is considered to be satisfactory. EEEB and Ingetec have technically competent personnel experienced in similar works and each has sufficient executive capacity for proper supervision and direction of the works. The consultant has been working with the EEEB for many years and has thorough knowledge of EEEB's structure and programs.

V. RECOMMENDATIONS

5.01 As a result of the Bank's appraisal of the EEEB power transmission and distribution project for the city of Bogotá and outlying communities, summarized in this document, and the conclusions stated therein, it is recommended that a loan be granted to the Empresa de Energía Eléctrica de Bogotá (EEEB) with the guarantee of the Republic of Colombia for the equivalent of US\$21,200,000, from the ordinary capital resources of the Bank, to partially finance the foreign exchange costs of said project. The loan would have a term of 20 years, with the first installment payable 5 years from the date of the loan contract, interest of 8% per annum (including the Bank's 1% special commission) and a commitment fee of 1-1/4% per annum. The loan would be disbursed in a 4-1/2 year period.

5.02 It is also recommended that in addition to the standard contractual clauses, there be included in the loan and guarantee contracts, as appropriate, and in the proposed resolution, the following special conditions which shall be fulfilled to the satisfaction of the Bank:

- (a) Prior to the first disbursement of the loan, the borrower shall present to the Bank evidence that: (i) the terms of reference of the consulting firm contracted pursuant to the EEEB sub-program of the PIDUZOB loan (238/OC-CO) have been expanded as provided in paragraph 4.27 of this document; and (ii) it has obtained medium term loan commitments in a total amount equivalent to US\$3,100,000 to cover cash shortfalls during the first year of project execution (see Resolution, paragraph 8, c).
- (b) Within 12 months from the date of the loan contract, the borrower shall present evidence to the Bank that it has obtained commitments for medium term financing of cash shortfalls which are estimated to arise during the second year of the project execution and which are calculated in the equivalent of US\$4,200,000. (see Resolution, paragraph 8, d).
- (c) Within 18 months from the date of the loan contract, the borrower shall present to the Bank evidence that it has obtained loans or suppliers credit under conditions appropriate to the project, in an amount estimated and related engineering services (see Resolution, paragraph 8, e).
- (d) The borrower agrees to take appropriate measures acceptable to the Bank to assure that the rates for the sale of electric energy are maintained at levels which will yield a reasonable rate of return on fixed assets and sufficient funds to amortize the borrower's debt (see Resolution, paragraph 8, f).

- (e) Unless the Bank authorizes in writing otherwise, the borrower shall not execute by force account works which in total exceed the amount of US\$2,500,000 from the local contribution and in conformity with annual work programs previously approved by the Bank (see Resolution, paragraph 8,g).

5.03 It is also recommended that there be included in the loan and guarantee contracts, as appropriate, the following conditions, in addition to those mentioned under paragraph 5.02 above, which shall be fulfilled to the satisfaction of the Bank:

- (a) Prior to the first disbursement of the loan, the borrower shall present to the Bank: (i) a communication in which the competent authorities of Colombia express their intention to grant such import permits as may be necessary for the acquisition abroad of the goods and services payable in foreign exchange required for the execution of the project, and (ii) evidence that the loan contract has been recorded in the appropriate foreign exchange registry office of the Colombian Government.
- (b) Within 12 months from the date of the loan contract, the borrower and the guarantor shall present to the Bank a report on the measures that they have adopted jointly for payment of accounts owed to the borrower by public entities, which are overdue by more than 60 days.
- (c) Within 12 months from the date of the loan contract, the borrower shall submit to the Bank a report which indicates the measures it has adopted or will adopt in the areas of organization and administration of supplies and materials, and of budget control.

- (d) Within 6 months from the date of completion of the work to be performed by the consulting firm to be engaged for the purpose of carrying out the services set forth in paragraph 5.02 (a)(i) above, the borrower shall submit to the Bank a report showing that appropriate measures have been taken to put into effect the recommendations of such firm, or that it has adopted alternative measures which are satisfactory to the Bank.
- (e) The Bank may recognize as part of the local contribution to the financing of the project up to the equivalent of US\$100,000 invested by the borrower for payment of local costs of engineering services, prior to the date of the loan contract, but after November 14, 1972, provided that requirements substantially similar to those in the resolution and the loan contract have been fulfilled.
- (f) The borrower shall commit itself to request and the guarantor to grant the extensions of the franchises of the borrower relating to the project, for a period not less than the life of the loan contract.

5.04 In the loan contract there shall be established the manner in which the financial statements related to the borrower and the project are to be audited, taking into account the provisions of paragraph 4.08 of this document.

5.05 In the loan contract there shall be included an annex substantially similar in content to Appendix A (Description of the Project) of this document, including a specification of 9% as the rate of return considered reasonable under paragraph 5.02 (d) above.

5.06 Of the resources of the loan there shall be utilized US\$212,000 to cover the cost of inspection and supervision of the Bank.

DESCRIPTION OF THE PROJECT
(Annex B of the Loan Contract)

I. Objective

The Project has as its principal objective the expansion and improvement of the transmission and distribution facilities of the EEEB to meet the projected 1973-1977 growth in demand in its service area, as well as to improve the quality of the electric service to its consumers. This latter objective will be effected by raising the efficiency and reliability levels of the energy distribution by reducing losses, improving voltage regulation, and by modernizing system controls, protection, maintenance and operation.

II. Summary Description of the Project

The Transmission and Distribution Project will consist of:

- (a) the construction of 8 lengths of 115 Kv aerial subtransmission lines totalling 124.5 kilometers; 4 short lengths of 57.5 Kv aerial and underground subtransmission lines totalling 11.7 kilometers, and the construction of some 120 kilometers of 34.5 Kv aerial line to serve industrial loads, all within the EEEB service area;
- (b) the construction and expansion and/or uprating of five 230 Kv, 115 Kv and 57.5 Kv receiving substations within the EEEB service area involving the installation of 435 MVA in power transformer capacity;
- (c) the construction within the EEEB service area of some 212 kilometers of 13.2 Kv primary distribution lines, 81 kilometers of secondaries, the installation of some 556 MVA in distribution transformer capacity, the installation of approximately 65,000 customer watthour meters as well as the installation of corrective capacitors and voltage regulators and the installation of public lighting in main streets to be constructed during the period;
- (d) the extension of electric services in 15 suburban communities in the area normally served by the EEEB and to 24 smaller localities formerly served by the CAR involving the construction of a total of 70 kilometers of 34.5 Kv rural feeders, 95 kilometers of distribution primary line, 400 kilometers of secondary line, and the installation of 35 MVA in distribution transformer capacity; and
- (e) the acquisition of load-dispatching and miscellaneous equipment related to the project including maintenance, transportation, communications and laboratory equipment, as well as hot-line and other hand tools.

III. Total Cost of the Project and Financing:

The total cost of the Project has been estimated as the equivalent of US\$42,175,000 ^{1/}, which is to be financed as shown in the following table:

^{1/} Exchange rate utilized for cost determination US\$1.00 = Col\$. 22.79

(In thousands of US\$ or its equivalent)

Names and Principal Subdivisions	IDB Foreign Exchange			Suppliers' Foreign Exchange	E E I B		
	Direct	Indirect	Subtotal		Foreign Exchange	Local Currency	Sub- Total
<u>ENGINEERING AND ADMINISTRATION</u>							
Engineering and Supervision of Construction	150	-	150	160	-	1,500	1,500
Administration	-	-	-	-	-	881	881
Category 1	150	-	150	160	-	2,381	2,381
<u>DIRECT COST OF CONSTRUCTION</u>							
Transmission	2,278	181	2,459	-	-	1,191	1,191
Distribution	8,953	2,165	11,118	-	-	10,583	10,583
General Installations	328	-	328	2,933	326	110	43
Category 2	11,559	2,346	13,905	2,933	326	11,884	12,211
<u>FINANCIAL CHARGES DURING CONSTRUCTION</u>							
3 Loan							
3 Interest and Service Charge	3,599	-	3,599	-	-	-	-
3 Commitment Fee	-	-	-	-	589	-	589
3 Inspection and Supervision	212	-	212	-	-	-	-
Sub-total 3.1	3,811	-	3,811	-	589	-	589
Suppliers' Credits	-	-	-	-	594	-	594
Category 3	3,811	-	3,811	-	1,183	-	1,183
<u>ALLOCATED</u>							
	2,758	576	3,334	827	92	1,189	1,281
Category 5	2,758	576	3,334	827	92	1,189	1,281
TOTALS	18,278	2,922	21,200	3,920	1,601	15,454	17,055
	(43.4%)	(6.9%)	(50.3%)	(9.3%)	(3.8%)	(36.6%)	(40.4%)

IV. Origin and Use of Currencies

The origin and use of currencies for financing the project is as follows:

(In thousands of US\$ or its equivalent)

	<u>Currencies of Origin</u>		<u>Currencies of Use</u>		<u>Total</u>	<u>%</u>
	<u>Foreign Exchange</u>	<u>Local Currency</u>	<u>Foreign Exchange</u>	<u>Local Currency</u>		
IDB	21,200	-	21,200 ^{1/}	-	21,200	50.3
Suppliers' Credits	3,920	-	3,920	-	3,920	9.3
EEEB	-	17,055	1,601	15,454	17,055	40.4
	25,120	17,055	26,721 ^{1/}	15,454	42,175	100.0
	(59.6%)	(40.4%)	(63.4%)	(36.6%)	(100.0%)	

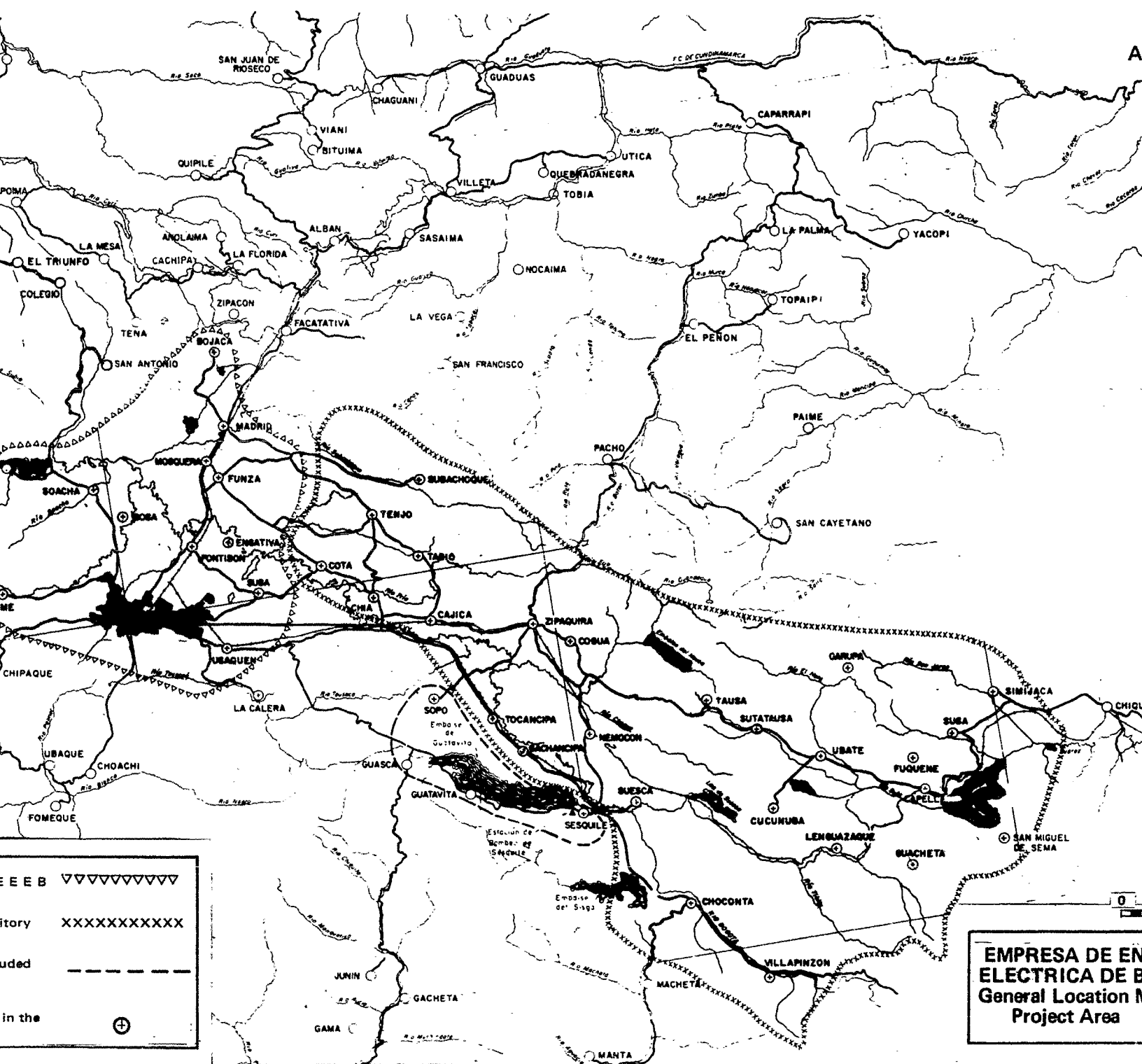
V. Bidding Requirements

When goods and services to be required through competitive bidding are to be financed in whole or in part with the resources of the loan, the applicable bidding procedures and specific bidding requirements shall be such as to permit free participation of bidders of or from countries which are eligible under the eligibility rules governing the use of the resources from which the loan was made. Consequently, no conditions preventing or restricting the participation of such bidders shall be established in those procedures and/or specific bidding requirements.

VI. Tariffs and Minimum Rate of Return

For the objectives stipulated in Section of the Loan Contract, the tariff for the sale of electricity of the specific system covered by the loan to Empresa de Energía Eléctrica de Bogotá must be established to yield a rate of return on net utility investment of at least 9% per annum commencing in the year 1973, except as the Bank shall agree on different rate or rates.

^{1/} Includes indirect foreign exchange costs equivalent to US\$2,922,000.



EMPRESA DE ENERGIA ELECTRICA DE BOGOTA (EEEB)
1973-1977 Transmission and Distribution Project
Summary of Project Investment and Financing Plan
(in thousands of US dollar equivalent)

Categories and Principal Subdivisions	Total Investments			Financing Sources			
	F. Ex.	Loc. Curr.	Total	IDB F. Ex.	Suppl. Credit F. Ex.	EEEF F. Ex.	Loc. Curr.
1. ENGINEERING AND ADMINISTRATION							
1.1 Engineering and Supervision of Construction	310.3	1 500.0	1 810.3	150.0	160.3	-	1 500.0
1.2 Administration	-	881.1	881.1	-	-	-	881.1
Total Category 1	310.3	2 381.1	2 691.4	150.0	160.3	-	2 381.1
2. DIRECT COST OF CONSTRUCTION							
2.2 Transmission							
2.21 Lines	1 216.5	923.8	2 140.3	1 216.5	-	-	923.8
2.22 Substations	1 242.1	267.6	1 509.7	1 242.1	-	-	267.6
Subtotal 2.2 Transmission	2 458.6	1 191.4	3 650.0	2 458.6	-	-	1 191.4
2.3 Distribution							
2.31 Urban Distribution	10 145.9	8 219.7	18 365.6	10 145.9	-	-	8 219.7
2.32 Rural Distribution	971.9	2 363.5	3 335.4	971.9	-	-	2 363.5
Subtotal 2.3 Distribution	11 117.8	10 583.2	21 701.0	11 117.8	-	-	10 583.2
2.4 General Installations							
2.41 Load Dispatching Equipment	3 259.3	93.4	3 352.7	-	2 933.4	325.9	-
2.42 Maintenance, Construction and Labor Eqpt.etc.	327.7	16.8	344.5	327.7	-	-	16.8
Subtotal 2.4 General Installations	3 587.0	110.2	3 697.2	327.7	2 933.4	325.9	110.2
Total Category 2	17 163.4	11 884.8	29 048.2	13 904.1	2 933.4	325.9	11 884.8
3. FINANCIAL CHARGES DURING CONSTRUCTION							
3.1 IDB Loan							
3.11 IDB Interest and Service Charge at 8%	3 599.0	-	3 599.0	3 599.0	-	-	-
3.12 IDB Commitment Fee at 1.25%	588.6	-	588.6	-	-	588.6	-
3.13 IDB Project Supervision at 1% of Loan Amt.	212.0	-	212.0	212.0	-	-	-
Subtotal 3.1 IDB Loan	4 399.6	-	4 399.6	3 811.0	-	588.6	-
3.2 Suppliers' and Other Credits at 8% Interest	594.8	-	594.8	-	-	594.8	-
Total Category 3	4 994.4	-	4 994.4	3 811.0	-	1 183.4	-
5. UNALLOCATED							
5.1 General Contingency	1 716.3	1 188.5	2 904.8	1 390.4	325.9	-	1 188.5
5.2 Provision for "Escalation"	2 536.1	-	2 536.1	1 944.5	500.0	91.6	-
Total Category 5	4 252.4	1 188.5	5 440.9	3 334.9	825.9	91.6	1 188.5
TOTAL INVESTMENTS AND FINANCING	26 720.5^{1/}	15 454.4	42 174.9	21 200.0	3 919.6	1 600.9	15 454.4
Percentages	63.4	36.6	100.0	50.3	9.3	3.8	36.6
							40.4

1/ Includes approximately US\$2,922.000 in "Indirect Foreign Exchange Costs"

EMPRESA DE ENERGIA ELECTRICA DE BOGOTA (EEEB)
1973-1977 Transmission and Distribution Project
Project Construction Cost Estimate
(in thousands of US dollar equivalent)

Categories and Subdivisions	Foreign Exchange Cost			Local Currency	Total
	Direct F. Ex.	Indirect F. Ex.	Total F. Ex.		
1. ENGINEERING AND ADMINISTRATION					
1.1 Engineering and Supervision of Construction					
1.11 Services of Consulting Firm for Load Dispatching	160.3	-	160.3	-	160.3
1.12 Services of Consulting Firm for Distribution Management	150.0	-	150.0	-	150.0
1.13 Local Engineering Services	-	-	-	1 500.0	1 500.0
Subtotal 1.1 Engineering and Supervision of Construction	310.3	-	310.3	1 500.0	1 810.3
1.2 Administration	-	-	-	811.0	811.0
Total Category 1	310.3	-	310.3	2 381.1	2 691.4
2. DIRECT COST OF CONSTRUCTION					
2.2 Transmission					
2.21 Subtransmission Lines					
2.21.1 Torca-Usaquén 16.0 kms (115 KV, one)	92.7	16.6	109.3	65.6	174.9
2.21.2 Torca-Autopista 17.5 kms (conductor)	101.4	17.3	118.7	68.4	187.1
2.21.3 Torca-Martín del Corral 22.5 kms (per phase)	130.4	22.1	152.5	88.0	240.5
2.21.4 Torca-Norte 7.0 kms (single)	40.6	6.8	47.4	27.4	74.8
2.21.5 Norte-Autopista 8.0 kms (circuit)	46.3	7.8	54.1	31.3	85.4
2.21.6 Facatativá-Balsillas 22.5 kms (605 MCM)	130.4	22.1	152.5	88.0	240.5
2.21.7 Balsillas-Mosquera 6.0 kms (ACSR, Metal)	34.8	5.9	40.7	23.5	64.2
2.21.8 Mosquera-Suta 25.0 kms (Towers)	144.8	24.7	169.5	97.8	267.3
2.21.9 Charquito-Techo 6.0 kms (57.5 KV, 1/c, 4/o, Metal Poles)	47.4	3.3	50.7	23.9	74.6
2.21.10 San Facon-San José 1.0 km (57.5 KV, 1/c)	30.6	-	30.6	21.6	52.2
2.21.11 San Facon-Gorgonzola 2.0 kms (UG Cable 3 p)	60.8	-	60.8	43.4	104.2
2.21.12 San Facon-Calle 67 2.7 kms (Copper 2/o)	82.2	-	82.2	58.6	140.8
2.21.13 Industrial Areas 120.0 kms (34.5 KV, 1/c, ACSR 4/o, Conc. poles)	93.4	54.1	147.5	286.3	433.8
Subtotal 2.21 Subtransmission Lines	1 035.8	180.7	1 216.5	923.8	2 140.3
2.22 Substations					
2.22.1 Balsillas, 230/115 KV, 300 MVA (Transformer and Control)	322.1	-	322.1	53.8	375.9
2.22.2 Facatativá, 115/34.5/11.4-13.2 KV, 15 MVA (New)	167.4	-	167.4	56.3	223.7
2.22.3 Concordia, 115/11.4-13.2 KV, 2 x 20 MVA (Expansion)	184.2	-	184.2	46.3	230.5
2.22.4 Calle 51, 115/11.4-13.2 KV, 2 x 20 MVA (Upgrading from)	284.2	-	284.2	55.6	339.8
2.22.5 Meratú, 115/11.4-13.2 KV, 2 x 20 MVA (57.5 KV SS)	284.2	-	284.2	55.6	339.8
Subtotal 2.2 Substations	1 242.1	-	1 242.1	267.6	1 509.7

EMPRESA DE ENERGIA ELECTRICA DE BOGOTA (EEEB)
1973-1977 Transmission and Distribution Project
Project Construction Cost Estimate^{1/}
(in thousands of US dollar equivalent)

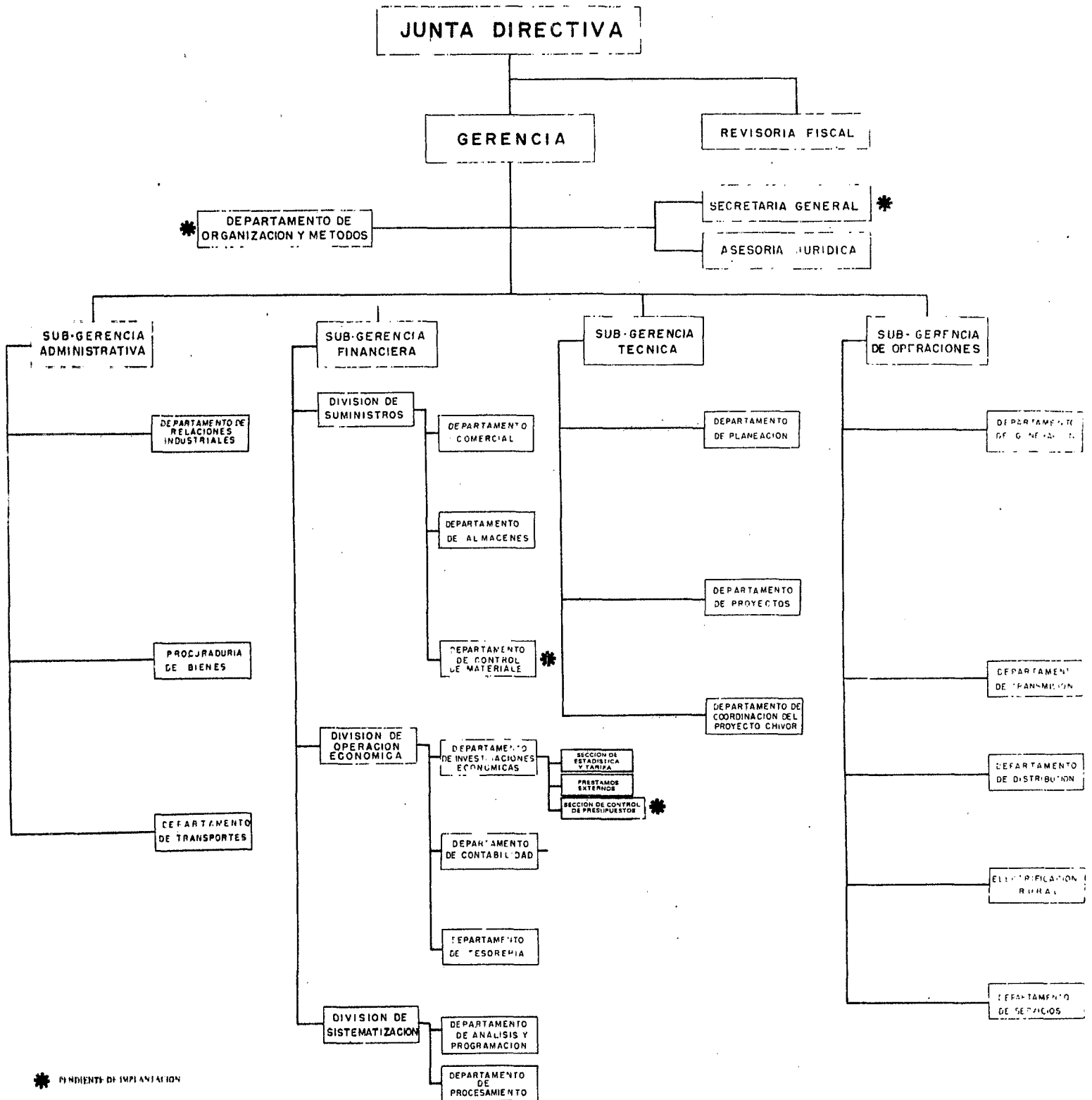
Categories and Subdivisions (Continued)	Foreign Exchange Cost			Local Currency	Total
	Direct F. Ex.	Indirect F. Ex.	Total F. Ex.		
2.3 Distribution					
2.31 Urban Distribution					
2.31.1 Primary Circuits: 173.8 kms OH and 38.1 UG	486.6	264.7	733.3	656.7	1 390.0
2.31.2 Distribution Transformers, 556.1 MVA	4 439.8	1 519.7	5 959.5	5 783.4	11 742.9
2.31.3 Secondary Circuits, 68.1 kms OH, 12.9 UG	113.9	88.0	201.9	866.9	1 068.8
2.31.4 Capacitors and Voltage Regulators	1 375.6	-	1 375.6	121.9	1 497.5
2.31.5 Customer Watthourmeters, 65017 Units	858.2	-	858.2	38.0	896.2
2.31.6 Street Ltg. (Main and Intermediate Avenues)	1 008.2	9.2	1 017.4	752.8	1 770.2
Subtotal 2.31 Urban Distribution	8 264.3	1 881.6	10 145.9	8 219.7	18 365.6
2.32 Rural Distribution					
2.32.1 Rural Electrification Services in the CAR Territory	351.0	138.4	489.4	1 171.4	1 660.8
2.32.2 Rural Electrification of Communities near Bogotá	337.7	144.8	482.5	1 192.1	1 674.6
Subtotal 2.32 Rural Distribution	688.7	283.2	971.9	2 363.5	3 335.4
2.4 General Installations					
2.41 Load Dispatching Equipment	3 259.3	-	3 259.3	93.4	3 352.7
2.42 Maintenance, Construction, Laboratory Eqpt., Tools, etc.	327.7	-	327.7	16.8	344.5
Subtotal 2.4 General Installations	3 587.0	-	3 587.0	110.2	3 697.2
Total Category 2	14 817.9	2 345.5	17 163.4	11 884.8	29 048.2
5. UNALLOCATED					
5.1 General Contingency	1 481.8	234.5	1 716.3	1 188.5	2 904.8
TOTAL CONSTRUCTION COST OF PROJECT ^{2/}	16 610.0	2 580.0	19 190.0	15 454.4	34 644.4

^{1/} Date of Estimate: February 14, 1973.

^{2/} Before Provision for "Escalation" and Financial Charges During Construction.

EMPRESA DE ENERGIA ELECTRICA DE BOGOTA ORGANIGRAMA

APENDICE E



EMPRESA DE ENERGIA ELECTRICA DE BOGOTA

Financial Statements: Comparative Balance Sheets 1969-1972 Actual (Closing Date December 31)
(in millions of US Dollars)

	1969	1970	1971	1972	Percentage of Total 1972 Assets		1969	1970	1971	1972
Exchange rate used US\$1.00=	Col. \$17.85	19.10	21.00	22.79		Exchange rate used US\$1.00=	Col. \$17.85	15.10	21.70	25.70
						<u>NET WORTH AND LIABILITIES</u>				
						<u>Long-Term Liabilities</u>				
Plant in Service at Cost.	97.23	108.32	109.58	123.22	85.8	External Long-Term Loans	69.37	73.30	76.75	79.57
Accumulated Depreciation	(15.02)	(17.58)	(19.61)	(22.27)	(15.5)	Local Long-term Loans	3.35	2.41	0.71	0.23
Assets - Plant in Service	82.21	90.74	89.97	100.95	70.3	Less: Current Maturities	(2.33)	(4.43)	(4.65)	(4.30)
Work in progress	3.33	3.30	3.12	2.92	2.0	Total Long-Term Liabilities	70.39	71.28	72.81	75.60
Real Estate	19.34	13.02	17.06	10.26	7.1	<u>Net Worth</u>				
	0.13	0.12	0.12	0.10	0.1	Contributions of DE de Bogotá	5.60	5.24	4.77	4.39
Total Assets	105.01	107.18	110.27	114.23	79.5	Retained Earnings (For System Expansion)	28.57	33.79	37.80	42.56
ISA (incl. advances)	0.74	5.35	7.05	9.07	6.3	Participation of DE 'Street Lighting'	2.96	3.17	3.69	4.67
Loans	0.23	0.25	0.35	0.38	0.3	Balance for revaluation and from sales of				
	0.18	0.18	0.16	0.14	0.1	Real Estate	0.22	0.26	0.29	0.28
Total Assets	2.84	7.44	9.15	11.19	7.8	Total Net Worth	37.46	42.46	46.55	51.90
Accounts	2.58	1.67	3.55	2.93	2.0	Total Capitalization	107.85	113.74	119.36	127.50
Supplies (Net of Protection)	3.27	3.48	4.08	5.25	3.7	<u>Reserves</u>				
Cost of Expenses	4.45	6.87	7.21	8.35	5.8	Consolidated Severance	0.92	0.81	1.26	1.20
Total Assets	0.07	0.08	0.05	1.73	1.2	Pensions	2.77	3.20	3.69	4.24
	10.37	12.10	14.89	18.26	12.7	Other Social Benefits	1.08	1.26	1.59	1.92
	118.22	126.72	134.31	143.68	100.0	Special	0.04	-	0.26	0.29
						Total Reserves	4.81	5.27	6.80	7.65
						<u>Current Liabilities</u>				
						Accounts Payable	2.59	2.60	1.81	2.33
						Various Creditors	0.64	0.68	1.69	1.90
						Current Maturities on Long-Term Loans	2.33	4.43	4.65	4.30
						Total Current Liabilities	5.56	7.71	8.15	8.53
						TOTAL NET WORTH AND LIABILITIES	118.22	126.72	134.31	143.68

EMPRESA DE ENERGIA ELECTRICA DE BOGOTA

APPEN

Financial Statements: Comparative Income Statements 1969-1972 Actual; 1973-1982 Projected
(in millions of US dollars unless otherwise noted)

	ACTUAL				PROJECTED							
	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Revenue	Col. \$17.50	18.66	20.20	22.13	24.00	26.40	29.00	31.90	35.10	38.60	42.50	46.70
Costs (KWH)	1.690	2.025	2.193	2.507	2.850	2.762	2.940	3.271	3.640	4.052	4.512	5.027
Cost Sold (US cents/KWH)	1.12	1.09	1.11	1.12	1.24	1.27	1.29	1.32	1.34	1.37	1.40	1.43
Operating Expenses	17.91	20.33	22.69	25.42	31.44	33.97	37.98	43.10	48.93	55.55	63.10	71.70
Operating Expenses	1.07	1.58	1.75	2.58	2.96	3.41	3.92	4.43	5.00	5.65	6.22	6.84
Operating Revenue	18.98	21.91	24.44	28.00	34.40	37.38	41.90	47.53	53.93	61.20	69.32	78.54
Operating Expenses	1.79	2.03	2.66	3.26	4.44	4.28	5.03	3.62	3.21	3.21	3.21	3.21
Operating Expenses	0.60	0.66	0.87	0.71	0.73	0.77	0.82	0.87	0.92	0.98	1.04	1.10
Operating Expenses	0.73	0.82	0.90	0.99	1.02	1.08	1.14	1.21	1.28	1.36	1.44	1.53
Operating Expenses	0.61	0.66	0.73	0.79	0.85	0.93	1.02	1.13	1.24	1.36	1.50	1.65
Operating Expenses	1.47	1.50	1.61	1.97	2.22	2.57	2.98	3.45	4.00	4.63	5.26	6.21
Operating Expenses	0.10	0.23	0.18	0.61	0.86	0.99	2.08	2.39	4.31	3.93	3.48	3.48
Operating Expenses	3.20	3.63	3.83	4.34	4.78	5.61	5.99	6.27	6.53	6.88	7.30	7.72
Operating Expenses	-	-	-	-	-	-	0.14	3.50	4.76	5.89	7.16	6.57
Operating Expenses	8.50	9.56	10.78	12.67	14.90	16.23	19.20	22.44	26.25	28.24	30.39	31.47
Operating Expenses	10.48	12.35	13.66	15.33	19.50	21.15	22.70	25.09	27.68	32.06	38.93	47.07
Operating Expenses	(0.83)	(1.06)	(1.28)	(1.43)	(1.60)	(1.84)	(2.03)	(2.45)	(2.67)	(2.99)	(3.35)	(3.76)
Operating Expenses	9.65	11.29	12.38	13.90	17.90	19.31	20.67	22.64	25.01	29.97	35.58	43.31
Operating Expenses	(0.22)	0.16	(0.49)	(0.53)	0.75	0.98	1.18	1.17	1.28	1.33	1.26	1.21
Operating Expenses	9.43	11.45	11.89	13.37	18.65	20.29	21.85	23.81	26.29	31.30	36.84	44.52
Operating Expenses	(4.51)	(4.95)	(4.45)	(4.87)	(5.62)	(5.65)	(5.08)	(4.72)	(4.91)	(6.45)	(5.93)	(5.43)
Operating Expenses	4.92	6.50	7.44	8.50	13.03	14.64	16.77	19.09	21.38	24.85	30.91	39.09
Operating Expenses	(0.49)	(0.65)	(0.74)	(0.85)	(1.30)	(1.46)	(1.68)	1.91	(2.14)	(2.49)	(3.09)	(3.91)
Operating Expenses	0.95	1.30	0.65	0.31	-	-	-	-	-	-	-	-
Operating Expenses	5.38	7.15	7.35	7.96	11.73	13.18	15.09	17.18	19.24	22.36	27.82	35.18
Operating Expenses	2.13	2.28	2.78	2.85	3.18	3.41	4.06	4.79	5.09	4.64	6.00	7.97

Operating Income covers Interest Charges

EMPRESA DE ENERGIA ELÉCTRICA DE BOGOTÁ

APPENDIX

Financial Statements: Net Utility Investment and Rate of Return Determination
(in thousands of US dollars unless otherwise noted)

	ACTUAL				PROJECTED							
	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Col. \$17.85	19.10	21.00	22.79	24.00	26.40	29.00	31.90	35.10	38.60	42.50	46.70	57.40
Plant in Service ^{1/}	102 470.9	110 145.2	127 803.3	138 580.5	160 121.4	170 846.3	200 344.1	213 755.1	224 063.1	233 131.4	245 639.6	260 591.6
Depreciation ^{2/}	7 674.3	17 658.1	10 777.2	21 540.9	10 724.9	29 497.8	13 411.1	10 308.1	9 062.3	12 508.2	14 952.0	14 965.0
Net Investment	110 145.2	127 803.3	138 580.5	160 121.4	170 846.3	200 344.1	213 755.1	224 063.1	233 131.4	245 639.6	260 591.6	275 556.6
Accumulated Depreciation	7 056.8	10 255.8	13 890.2	17 720.3	22 060.7	26 844.4	32 454.0	38 439.1	44 712.9	51 240.6	58 118.5	65 415.1
Plant in Service - Year-end Balance	99 889.4	113 913.1	120 860.2	138 060.7	144 001.9	167 890.1	175 316.0	179 350.2	181 890.8	187 521.1	195 175.5	202 425.9
Plant in Service (Average for Year)	97 651.8	106 901.3	117 386.7	129 460.5	141 031.3	155 946.0	171 603.1	177 333.1	180 620.1	184 706.0	191 348.2	198 801.2
Average for Year ^{2/}	3 163.9	3 984.0	4 072.0	4 666.0	5 733.3	6 229.6	6 983.3	7 921.0	8 987.9	10 200.3	11 552.3	13 090.0
Investment (Average for Year)	100 815.7	110 885.3	121 458.7 ^{3/}	134 126.5	146 764.6	162 175.6	178 566.4	185 254.1	189 608.0	194 906.3	202 901.1	211 891.2
From Appendix E-2)	9 650.4	11 290.0	12 478.4	13 814.9	17 899.8	19 301.2	20 667.6	22 644.8	25 007.9	29 968.6	35 577.4	43 320.4
Net Utility Investment (%)	9.57	10.18	10.19	10.29	12.19	11.90	11.57	12.22 ^{4/}	13.18 ^{4/}	15.37 ^{4/}	17.53 ^{4/}	20.44 ^{4/}
Covered by Internal Cash	25.66	31.80	33.25	28.60	34.05	33.35	36.38	39.15	41.52	39.79	34.14	35.01
Covered by External Cash	2.31	1.93	2.00	2.12	2.21	2.40	2.69	2.99	3.00	2.76	3.26	3.92

accumulated depreciation indicated in this table reflect conversion into US dollars of the December 31, 1966 figures at the average rate of exchange for 1966 and of the corresponding net additions and depreciation for 1967-1972 at the average rate of exchange for the corresponding years. Annual depreciation allowance in the table is based at 2.8% of year-end Fixed Assets - Plant in Service. Projected annual net additions to Fixed Assets, other than the 1973-1977 Transmission and Distribution into account an escalation factor of 10% per year.

Capital requirements computed as 1/6 corresponding annual billings

Investment established at US\$121 458 700.00 based on December 31, 1971 Fixed Assets - Plant in Service of US\$138 580 500.00 and December 31, 1971 Accumulated Depreciation of US\$16 821 800.00.

Investments in CHIVOR I and II and the Chingaza Aqueduct were reflected in the EEB Net Utility Investment, the rates of return would be the following:

1976	1977	1978	1979	1980	1981
10.65	10.40	11.77	13.44	15.01	17.60

EMPRESA DE ENERGIA ELÉCTRICA DE BOGOTÁ

Financial Statements: Projections of Sources and Applications of Funds 1973-1982
(in millions of US dollars)

SOURCES		1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Internal Sources		Exchange Rate US\$1.00 =									
Operating Income		24.00	26.40	29.00	31.90	35.10	38.60	42.50	46.70	51.40	56.50
Depreciation		17.90	19.31	20.67	22.64	25.01	29.97	35.58	43.31	49.64	57.59
Other Income		4.78	5.61	5.99	6.27	6.53	6.88	7.30	7.72	8.14	8.56
		0.75	0.98	1.18	1.17	1.28	1.33	1.26	1.21	1.16	1.09
Total Internal Sources		23.43	25.90	27.84	30.08	32.82	38.18	44.14	52.24	58.94	67.24
External Sources											
Borrowings:											
IBRD 3d. Program		2.50	-	-	-	-	-	-	-	-	-
IDB "PIDUZOB" Subprogram		2.16	2.51	2.12	0.24	-	-	-	-	-	-
IDB 1973-1977 Project		2.79	4.29	4.50	5.14	4.48	-	-	-	-	-
Suppliers and Other Credits		-	0.05	0.43	2.93	0.01	-	-	-	-	-
Eximbank-MIT (Zipa III)		2.34	0.42	-	-	-	-	-	-	-	-
C. Itoh and Co. (Zipa III)		3.71	-	-	-	-	-	-	-	-	-
1978-1982 TED Project		-	-	-	-	-	9.00	9.00	9.00	9.00	9.00
Total External Sources		13.50	7.27	7.05	8.31	4.49	9.00	9.00	9.00	9.00	9.00
Other Sources											
Provision for Reserves (Net Annual Accumulation)		0.69	0.62	0.68	0.72	0.74	0.86	0.87	0.96	1.01	1.10
TOTAL SOURCES		37.62	33.79	35.57	39.11	38.05	48.04	54.01	62.20	68.95	77.34
APPLICATIONS											
Construction Costs (Including Interest)											
1973-1977 Transmission and Distribution Project		5.10	7.59	8.94	12.13	8.41	-	-	-	-	-
3d. Program		2.50	-	-	-	-	-	-	-	-	-
"PIDUZOB" Subprogram		4.40	4.36	2.93	0.24	-	-	-	-	-	-
Zipaquirá III		8.80	2.74	-	-	-	-	-	-	-	-
Contracted Engineering and Other Projects		0.30	0.31	0.32	0.34	0.35	0.37	0.38	0.40	0.41	0.42
Total Construction Costs		21.10	15.00	12.19	12.71	8.76	14.97	14.98	15.00	15.01	15.02
Investments in Affiliates and Other											
Investments in Interconexión Eléctrica S.A. (Chivor)		7.56	8.92	8.43	7.23	3.04	1.45	0.42	-	-	-
Contribution to Chingaza (EAB)		1.56	2.65	2.76	2.51	-	-	-	-	-	-
Acquisition of CAR Electric System		0.63	0.19	-	-	-	-	-	-	-	-
Acquisition of New Building Site		0.29	-	-	-	-	-	-	-	-	-
Total Investments in Affiliates, etc.		10.04	11.76	11.19	9.74	3.04	1.45	0.42	-	-	-
Debt Service											
Amortization:											
IBRD Loans (and other)		4.12	4.31	4.45	4.49	4.72	4.96	5.17	5.36	5.25	5.46
IDB "PIDUZOB" Subprogram		-	-	-	-	0.44	0.44	0.44	0.44	0.44	0.44
IDB 1973-1977 Project		-	-	-	-	-	0.69	0.74	0.80	0.87	0.94
Suppliers and Other Credits		-	-	-	-	0.07	0.49	0.49	0.49	0.49	0.49
Eximbank Loans		0.42	0.43	0.42	0.43	0.42	0.43	0.42	0.43	0.42	0.43
C. Itoh and Co.		0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
Colombian Banks		0.05	0.05	0.04	0.04	-	-	-	-	-	-
Subtotal Amortization		4.96	5.16	5.28	5.33	6.02	7.38	7.63	7.89	7.84	8.13
Interest:											
IBRD Loans (and other)		5.18	4.91	4.63	4.34	4.04	3.73	3.41	3.07	2.72	2.38
IDB "PIDUZOB" Subprogram		-	-	-	-	0.55	0.52	0.48	0.45	0.41	0.38
IDB 1973-1977 Project		-	-	-	-	-	1.68	1.63	1.57	1.50	1.43
Suppliers and Other Credits		-	-	-	-	-	0.25	0.20	0.17	0.14	0.10
Eximbank Loans		0.17	0.28	0.25	0.21	0.18	0.15	0.12	0.10	0.07	0.04
C. Itoh and Co.		0.24	0.44	0.19	0.17	0.14	0.12	0.09	0.07	0.04	0.02
Colombian Banks		0.03	0.02	0.01	-	-	-	-	-	-	-
Subtotal Interest		5.62	5.65	5.08	4.72	4.91	6.45	5.93	5.43	4.88	4.35
Total Debt Service		10.58	10.81	10.36	10.05	10.93	13.83	13.56	13.32	12.72	12.48
Increase in Working Capital Requirements		1.00	0.42	0.67	0.86	0.97	1.10	1.26	1.43	1.63	1.85
TOTAL APPLICATIONS		42.72	37.99	34.41	33.36	23.70	31.35	30.22	29.75	29.36	29.35
Increase (Decrease) in Cash											
Accumulated Cash Balance (Taking into account part of Dec. 31, 1972 Carry-over of US\$2.93 million) ^{1/}		(5.10)	(4.20)	1.16	5.75	14.35	16.69	23.79	32.45	39.59	47.99
		(3.10)	(7.30)	(6.14)	(0.39)	13.96	30.65	54.44	86.89	126.48	174.47
Possible Investments EEBB may make in additional generating capacity (through ISA) ^{2/}											
- Mesitas		-	-	5.57	13.77	31.16	71.41	45.40	19.81	-	-
- Samaná		-	-	0.09	0.28	0.77	0.89	0.95	1.09	0.50	-
		-	-	5.66	14.05	31.93	72.30	49.35	20.90	0.50	-
Accumulated Cash Balance (taking into account possible investments in Mesitas and Samaná) which would be financed through foreign borrowing		(3.10)	(7.30)	(11.80)	(20.10)	(37.68)	(93.29)	(118.85)	(107.30)	(68.21)	(20.22)

^{1/} Only \$12.0 million of this amount would be carried over to meet 1973 requirements, since US\$0.9 million would be retained as the cash on-hand minimum balance.
^{2/} EEBB will have to make investments in new generating capacity to meet its 1981/82 requirements.
 The EEBB participation in the total investments for these plants has not yet been established. It is estimated that it will be around 40%.

EMPRESA DE ENERGIA ELECTRICA DE BOGOTA (EEEB)

Projection of System Electric Power and Energy Requirements 1973-1982

	1973	1974	1975	1976	1977	1978	1979	1980	1981
<u>Consumers (thousands)</u>									
Initial	288.0	309.3	332.6	357.6	384.4	413.2	444.2	477.5	522.2
Special	42.6	43.3	44.0	44.8	45.5	46.2	46.9	47.7	48.7
Industrial	10.6	11.5	12.5	13.5	14.6	15.8	17.1	18.5	20.0
Street and Street Lighting	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Number of Consumers ^{1/}	343.4	366.4	391.4	418.2	446.8	477.5	510.5	546.0	593.2
<u>Electricity Sales (millions of kilowatt-hours)</u>									
Initial	822.2	932.6	1 057.8	1 199.9	1 360.9	1 543.5	1 750.6	1 985.5	(Increase
Special	346.8	368.5	391.5	415.9	441.8	469.2	498.3	529.2	(11.4% p
Industrial	752.4	833.9	924.1	1 024.0	1 139.4	1 257.8	1 394.0	1 545.0	(year in
Street and Street Lighting	345.6	384.3	426.9	475.2	528.8	588.6	655.1	729.1	(tions es
Power	583.02/	245.42/	139.9	155.8	173.3	192.8	214.4	238.5	(these t
Energy Sales	2 350.0	2 762.0	2 940.2	3 270.8	3 639.7	4 051.9	4 512.4	5 027.3	5 601.0
Energy Requirement (millions Kwh) based on 10% losses	3 135.0	3 038.0	3 234.0	3 598.0	4 004.0	4 457.0	4 963.0	5 529.0	6 161.0
Load Factor (%)	55.1	56.0	57.0	57.0	57.0	57.0	57.0	57.0	57.0
Maximum Demand (MW)	649.5	619.3	647.7	720.6	801.9	892.6	993.9	1 107.3	1 233.9
<u>Installed Capacity (MW)</u>									
Initial	547.6	547.6	547.6	547.6	547.6	547.6	547.6	547.6	547.6
EEEB-owned Installed Capacity	84.9	150.93/	150.9	150.9	150.9	150.9	150.9	150.9	150.9
Generation (millions Kwh)	632.5	698.5	698.54/	698.5	698.5	698.55/	698.5	698.5	698.5
Net System Generation	2 600.0	2 600.0	2 600.0	2 000.07/	2 000.0	2 000.0	2 000.08/	2 800.0	2 800.0
Purchases	535.0	438.0	600.0	200.0	100.0	100.0	100.0	100.0	100.0
Net System Input (Including Purchases)	3 135.0	3 038.0	3 200.0	2 200.0	2 100.0	2 100.0	2 100.0	2 900.0	2 900.0
	-	-	34.02/	1 398.010/	1 904.0	2 357.0	2 863.0	2 629.0	3 261.0
	3 135.0	3 038.0	3 234.0	3 598.0	4 004.0	4 457.0	4 963.0	5 529.0	6 161.0

consumers number less than 100.
 des bulk sales to other electric power systems in 1973 and 1974.
 sales to other electric power systems will be discontinued in
 leaving only EEEB's own wholesale consumers.
 tion of Zipaquirá No. 3 Thermal Unit; 66.6 MW.
 dition to its own generating capacity, EEEB will have available
 CHIVOR I 300 MW for a total available capacity of 998.5 MW

- 5/ An additional 300 MW of generating capacity at CHIVOR II will be the disposition of EEEB for a total available capacity of 1 298.5 MW.
- 6/ Hydro generation based on average flow of Río Bogotá.
- 7/ Although average water conditions can support around 2 600 million m³ per year, EEEB will store water through 1979.
- 8/ Additional 12 m³/sec in Río Bogotá due to Chingaza operation.
- 9/ Purchase from EPM.
- 10/ Purchases starting in 1976 from ISA

EMPRESA DE ENERGIA ELECTRICA DE BOGOTA (EEEB)
1973-1977 Transmission and Distribution Project
Project Investment and Disbursement Schedule
(in thousands of US dollar equivalent)

APPENDIX H
Page 1 of 2

Divisions	Total Investments			Annual Investments									
				2nd Semester 1973		1974		1975		1976		1977	
	F. Ex.	Loc.	Total	F. Ex.	Loc.	F. Ex.	Loc.	F. Ex.	Loc.	F. Ex.	Loc.	F. Ex.	Loc.
ADMINISTRATION													
and Supervision of Construction	160.3	-	160.3	-	-	45.9	-	42.3	-	60.9	-	-	11.2
Center Engineering Services	150.0	-	150.0	63.5	-	45.0	-	41.5	-	-	-	-	-
to Distribution Mgt. Contract	-	1 500.0	1 500.0	-	222.2	-	307.8	-	344.3	-	330.1	-	-
EEEB Services	310.3	1 500.0	1 810.3	63.5	222.2	90.9	307.8	83.8	344.3	60.9	330.1	-	11.2
1.1 Engineering and Sup. of Constr.	-	881.1	881.1	-	140.7	-	240.4	-	172.6	-	173.3	-	-
ory 1	310.3	2 381.1	2 691.4	63.5	362.9	90.9	548.2	83.8	516.9	60.9	503.4	-	11.2
CONSTRUCTION													
Transmission Lines	1 216.5	923.8	2 140.3	243.3	120.1	547.4	314.1	425.8	489.6	-	-	-	-
s	1 242.1	267.6	1 509.7	74.5	-	298.1	74.9	223.6	26.8	546.5	139.1	-	99.4
2 Transmission	2 458.6	1 191.4	3 650.0	317.8	120.1	845.5	389.0	649.4	516.4	546.5	139.1	-	99.4
Distribution	10 145.9	8 219.7	18 365.6	1 623.3	1 214.6	2 029.2	1 488.3	2 130.6	1 653.7	2 333.6	1 810.8	2 029.2	2 217.7
tribution	971.9	2 363.5	3 335.4	185.2	378.9	156.6	376.4	186.6	437.2	225.8	512.7	-	217.7
3 Distribution	11 117.8	10 583.2	21 701.0	1 808.5	1 593.5	2 185.8	1 864.7	2 317.2	2 090.9	2 559.4	2 323.5	2 246.9	2 435.4
Installations	3 259.3	93.4	3 352.7	-	-	-	-	652.0	-	2 607.3	10.4	-	-
atching Equipment	327.7	16.8	344.5	152.5	7.8	175.2	9.0	-	-	-	-	-	-
e, Constr., Lab Eqpt., tools, etc.	3 587.0	110.2	3 697.2	152.5	7.8	175.2	9.0	652.0	-	2 607.3	10.4	-	-
4 General Installations	17 163.4	11 884.8	29 048.2	2 278.8	1 721.4	3 206.5	2 252.7	3 618.6	2 607.3	5 713.2	2 420.0	2 346.9	2 435.4
ory 2													
FINANCIAL CHARGES DURING CONSTRUCTION													
st and Service Charge at 8%	3 599.0	-	3 599.0	60.5	-	399.2	-	726.1	-	1 060.8	-	1 352.1	-
ment Fee at 1.25%	586.6	-	586.6	61.9	-	216.7	-	169.1	-	116.6	-	24.1	-
t Supervision at 1% Loan Amount	212.0	-	212.0	27.0	-	53.0	-	53.0	-	53.0	-	26.1	-
1 IDB Loan Financial Charges	4 399.6	-	4 399.6	149.4	-	668.9	-	948.2	-	1 230.4	-	1 402.3	-
Credits Interest at 8%	594.8	-	594.8	-	-	1.8	-	37.7	-	208.8	-	346.1	-
ory 3	4 994.4	-	4 994.4	149.4	-	670.7	-	985.9	-	1 439.2	-	1 749.0	-
Contingency	1 716.3	1 188.5	2 904.8	227.9	172.2	320.6	225.3	361.9	260.7	571.3	248.0	234.1	234.1
or "Escalation"	2 536.1	-	2 536.1	128.5	-	271.4	-	508.0	-	1 109.8	-	518.0	-
ory 5	4 252.4	1 188.5	5 440.9	356.4	172.2	592.0	225.3	869.9	260.7	1 681.1	248.0	753.1	753.1
	20 720.5	15 454.1	36 174.6	2 848.1	2 256.5	4 560.1	3 026.2	5 458.2	3 384.0	8 604.1	3 231.4	4 859.0	4 859.0

EMPRESA DE ENERGIA ELCTRICA DE BOGOTA (EEEB)
1973-1977 Transmission and Distribution Project
Project Investment and Disbursement Schedule
(in thousands of US dollar equivalent)

APPENDIX H
Page 2 of 2

ITEMS (from Page 1)

SOURCES

ns to Distribution Mgt. Contract
ls and Equipment (CIF)
ency
on for "Escalation"
ject Supervision
erest and Service Charge
DB Loan and Disbursements
Credits or Other Loans
ning Center Engineering Services Contract
spatching Equipment (90% CIF)
ency
on for Escalation
suppliers' Credits and Other Loans and
rsements
spatching Equipment (10% CIF)
on for "Escalation" on Load Disp. Equipment
nitment Fee
t on Suppliers' Credits and Other Loans
osts
EEB Participation
ING AND DISBURSEMENTS

Investments			2nd. Semester							
			1973		1974		1975		1976	
F. Ex.	Loc.	Total	F. Ex.	Loc.	F. Ex.	Loc.	F. Ex.	Loc.	F. Ex.	Loc.
26 720.5	15 454.4	42 174.9	2 848.1	2 256.5	4 560.1	3 026.2	5 558.2	3 384.9	8 894.4	3 231.4
Annual Disbursements										
150.0	-	150.0	63.5	-	45.0	-	41.5	-	-	-
13 904.1	-	13 904.1	2 278.8	-	3 206.5	-	2 966.6	-	3 105.9	-
1 390.4	-	1 390.4	227.9	-	320.6	-	236.7	-	310.6	-
1 944.5	-	1 944.5	128.5	-	271.4	-	418.4	-	607.8	-
212.0	-	212.0	27.0	-	53.0	-	53.0	-	53.0	-
3 599.0	-	3 599.0	20.5	-	399.2	-	725.1	-	1 060.8	-
21 200.0	-	21 200.0	2 786.2	-	4 295.7	-	4 502.3	-	5 138.1	-
160.3	-	160.3	-	-	45.9	-	42.3	-	60.9	-
2 933.4	-	2 933.4	-	-	-	-	326.1	-	2 607.3	-
325.9	-	325.9	-	-	-	-	65.2	-	260.7	-
500.0	-	500.0	-	-	-	-	79.0	-	421.0	-
3 919.6	-	3 919.6	-	-	45.9	-	512.6	-	3 349.9	-
325.9	-	325.9	-	-	-	-	325.9	-	-	-
91.6	-	91.6	-	-	-	-	10.6	-	81.0	-
588.6	-	588.6	61.9	-	216.7	-	169.1	-	116.6	-
594.8	-	594.8	-	-	1.8	-	37.7	-	208.8	-
-	15 454.4	15 454.4	-	2 256.5	-	3 026.2	-	3 384.9	-	3 231.4
1 600.4	15 454.4	17 055.3	61.9	2 256.5	218.5	3 026.2	743.3	3 384.9	405.4	3 231.4
26 720.5	15 454.4	42 174.9	2 848.1	2 256.5	4 560.1	3 026.2	5 558.2	3 384.9	8 894.4	3 231.4

APPENDIX I
Page 1 of 2

Page 1 of 2

DESCRIPTION	Estimated Date for Call of Bids	Estimated Date for Receipt of Bids	Estimated Date of Contract
(Already in progress)			
Engineering Services and Part of Distribution Mgt. Services	May 1973	July 1973	July 1973
Steel Towers, 115 KV, 1 circuit	June 1973	July 1973	Oct. 1973
" " " "	April 1974	July 1974	Oct. 1974
Steel Poles, 57.5 KV, 1 circuit	Jan. 1974	April 1974	July 1974
Conductors, ACSR $\frac{1}{2}$	June 1973	July 1973	Oct. 1973
" " " $\frac{2}{2}$	April 1974	July 1974	Oct. 1974
Insulators and Hardware (O H Lines)	June 1973	July 1973	Oct. 1973
" " "	April 1974	July 1974	Oct. 1974
Underground 57.5 KV Cables and Accessories	July 1974	Oct. 1974	Jan. 1975
Sub-Total 2.21 Lines			
Balsillas 230/115 KV 300 MVA Transformer Bank	Nov. 1973	Feb. 1974	May 1974
Facatativá and Concordia: Transformers	June 1973	July 1973	Oct. 1973
Other equipment	June 1973	July 1973	Oct. 1973
Calle 51 and Morato: Transformers	March 1975	June 1975	Sept. 1975
Other equipment	March 1975	June 1975	Sept. 1975
Sub-Total 2.22 Substations			

Location	DESCRIPTION	Estimated Date for Call of Bids		Estimated Date for Receipt of Bids		Estimated Date of Contract	
13.2	KV Primaries: Conductors ^{1/} Insulators and Hardware	June	1973	July	1973	Oct.	1973
	Conductors ^{1/} Insulators and Hardware	April/June	1973	July	1973	Oct.	1973
		April	1974	July	1974	Oct.	1974
		April	1974	July	1974	Oct.	1974
	Distribution Transformers ^{2/} (including street lighting transformers and controls)	July	1973	August	1973	Oct.	1973
	and Accessories:	April	1974	July	1974	Oct.	1974
	Secondaries: Conductors ^{1/}	June	1973	July	1973	Oct.	1973
	Capacitors and Voltage Regulators	July	1974	Oct.	1974	Jan.	1975
	Customer Watthour Meters:	July	1973	Oct.	1973	Jan.	1974
		July	1974	Oct.	1974	Jan.	1975
	Street lighting: Luminaries and Lamps	July	1973	Oct.	1973	Jan.	1974
		July	1974	Oct.	1974	Jan.	1975
Sub-Total 2.31 Urban Distribution							
	Rural Lines and Primaries ^{1/}	June	1973	July	1973	Oct.	1973
	Insulators and Hardware ^{2/}	June	1973	July	1973	Oct.	1973
	Distribution transformers, ^{2/} substations and street lighting controls	April	1974	July	1974	Oct.	1974
	Secondaries: Conductors ^{1/}	April	1974	July	1974	Oct.	1974
Sub-Total 2.32 Rural Distribution							
	Maintenance Equipment, Tools, etc.	July	1973	Oct.	1973	Jan.	1974
Sub-Total 2.4 General Installation							
TOTAL CATEGORY 2							
IDB Loan Interest and other financial charges during construction							
Unallocated (General Contingency and Provision for "Escalation")							
TOTAL							

CSR requirements to be purchased as finished conductor and balance as imported raw material
ately 50% of distribution transformer requirements to be purchased as finished units and balance as co

COLOMBIA: ACONTECIMIENTOS ECONOMICOS RECIENTES

A. Crecimiento económico general

De acuerdo con estimaciones preliminares, el PIB de Colombia a precios constantes aumentó en un 7,4 por ciento en 1972, lo cual representó una significativa aceleración del ritmo de crecimiento con respecto al año anterior (5,5 por ciento) y al promedio del trienio 1969-71 (6,1 por ciento). Los principales factores que han coadyuvado en este comportamiento fueron la recuperación de los precios del café y de la producción agropecuaria, el fuerte incremento de las exportaciones menores y el crecimiento sostenido de la inversión pública. Dentro de este cuadro de la evolución de la economía colombiana, satisfactorio en términos generales, cabe señalar la tendencia creciente del aumento de los precios internos, iniciada en 1971 y acentuada en 1972, lo que se ha constituido en un elemento preocupante para las autoridades del país, sobre todo si se tiene en cuenta que en el período 1967-70 se había logrado una reducción en el crecimiento de los precios. Además, en 1972 se observó una notoria disminución del ritmo de aumento de las recaudaciones fiscales.

B. Sectores principales

El sector agropecuario es el de mayor importancia relativa dentro de la estructura económica colombiana, representando en 1971 el 27,6 por ciento del PIB, generando el 73 por ciento de los ingresos de exportación y dando ocupación al 40 por ciento de la población económicamente activa. En 1972 creció en un 5,4 por ciento, o sea a un ritmo inferior que el resto de la economía; sin embargo, esta tasa de aumento representó una importante recuperación en comparación con el año anterior, que fue del 2,2 por ciento, y con respecto al promedio del trienio 1969-71 (3,9 por ciento). El bajo nivel observado en 1971 se debió, principalmente, a las condiciones adversas de tipo climático que afectaron las cosechas de buena parte de los productos agrícolas. El crecimiento de 1972 se reflejó particularmente en los incrementos de la producción del trigo, algodón, sorgo, soya, papa y arroz.

El café ha sido el producto dominante en la economía colombiana, sin embargo en los últimos años ha disminuido su importancia relativa debido a los esfuerzos de diversificación de la producción agrícola y de las exportaciones. Dentro de estas últimas el café representaba el 72 por ciento en 1962 y en 1972 había descendido al 52 por ciento. Los precios del café en el mercado internacional se recuperaron, de un precio promedio de US\$ 0,49 la libra en 1971 subieron a US\$ 0,57 de promedio en 1972.

El sector manufacturero, uno de los más dinámicos de la estructura económica colombiana, creció en un 10,8 por ciento en 1972 de acuerdo con cifras preliminares, lo que significa que en este año se habría logrado la tasa de aumento más alta del período 1968-72. En base a datos parciales

para 1972, la producción de cemento aumentó en un 7 por ciento (enero-agosto 1972), la soda cáustica en un 49,1 por ciento (enero-agosto 1972), la producción de lingotes de acero en un 16,6 por ciento (enero-octubre 1972) y la producción de electricidad para usos industriales en un 12,7 por ciento.

El sector de la construcción creció un 6,0 por ciento en 1972 (cifra preliminar), o sea que disminuyó su tasa de crecimiento en comparación con el año anterior, que fue de 7,3 por ciento. La construcción urbana ha sido declarada actividad prioritaria en el último Plan de Desarrollo, y se está incentivando además la canalización del ahorro hacia este sector mediante la creación de un sistema de ahorro y préstamo con ajuste monetario, es de esperar, entonces, que esta actividad experimentará un notable impulso en el período 1973-74.

C. Situación fiscal

Los ingresos ordinarios del Gobierno Central a precios corrientes crecieron en un 12,9 por ciento, lo que representó una importante disminución de la tasa de aumento en comparación con los años 1970 y 1971, que registraron 26,2 y 20,6 por ciento, respectivamente. Asimismo, el crecimiento de 1972 se habría deteriorado en términos reales ante el aumento de las presiones inflacionarias experimentadas en ese año. El impuesto a la renta y complementarios aumentó en un 14,1 por ciento y los tributos sobre el comercio exterior lo hicieron en un 7,5 por ciento, incrementos notoriamente por debajo de los observados en los años anteriores. El Gobierno está adoptando un conjunto de medidas tendientes a mejorar los instrumentos tributarios y presupuestarios, con el objeto de obtener mayores ingresos que le permitan intensificar la inversión pública y lograr un control fiscal más eficiente.

Los gastos corrientes crecieron en un 12,1 por ciento en 1972, mientras que la inversión pública aumentó en un 21,3 por ciento. Los gastos e inversiones del Gobierno Central en este año muestran una saludable reorientación de los recursos hacia estas últimas, ya que el año anterior los gastos corrientes aumentaron en un 23,7 por ciento y la inversión pública en un 15,4 por ciento.

El déficit fiscal en 1972 alcanzó a 2.625 millones de pesos colombianos, lo que representó el 16,1 por ciento de los ingresos ordinarios netos 1/, mientras que el año anterior esta proporción fue del 11,5 por ciento. El financiamiento del déficit se realizó prácticamente a través del crédito externo, que aumentó en términos netos en un 167 por ciento respecto del año anterior, mientras que el crédito interno neto fue negativo, o sea que la política de endeudamiento permitió disminuir la deuda pública interna.

1/ Netos de los Certificados de Abono Tributario (CAT).

D. Oferta monetaria y desarrollo de los precios

Los medios de pago crecieron en 1972 en un 24,3 por ciento, o sea un incremento relativo de más del doble del observado en 1971, que fue de un 11,1 por ciento. Este fuerte aumento del medio circulante se debió, principalmente, a la expansión primaria derivada del importante aumento de las reservas netas internacionales del Banco de la República, el incremento del crédito neto al Fondo de Promoción de las Exportaciones y la reducción de los depósitos del Gobierno Nacional. El índice promedio de los precios al consumidor obrero creció en un 13,8 por ciento en 1972, ritmo superior al del año anterior que fue de un 11,8 por ciento, y por encima del promedio del período 1967-70 (7,0 por ciento). El rubro alimentos dentro del índice de precios es el que acusó el mayor aumento (15,4 por ciento), debido en parte a deficiencias de abastecimiento interno como consecuencia de las malas cosechas de 1971, fallas en el sistema de mercadeo y orientación de la producción hacia la exportación.

E. Balanza de pagos y reservas internacionales

Las exportaciones registradas aumentaron en un 29,2 por ciento en 1972, lo que representa una significativa recuperación con respecto al año anterior, en el que habían disminuido en un 4,4 por ciento. Las importaciones registradas también crecieron en un 14,8 por ciento, mientras que en 1971 habían declinado en un 14,7 por ciento. El importante incremento de las exportaciones se debió principalmente, al fuerte aumento de las exportaciones no tradicionales, que lo hicieron en un 66,6 por ciento, superando holgadamente las metas propuestas en el Plan Cuatrienal de Exportaciones. Las exportaciones de café crecieron en un 7,1 por ciento, como consecuencia del mejoramiento de sus precios en el mercado internacional, lo que se compara favorablemente con la declinación del 1,3 por ciento observada en el año anterior.

El saldo de la balanza de pagos en cuenta corriente continuó siendo negativo y fue compensado en parte con los ingresos netos de capital. Como resultado del movimiento de las cuentas del sector externo las reservas netas internacionales del Banco de la República aumentaron en US\$ 183 millones, alcanzando el nivel sin precedentes de US\$ 353 millones a fines de 1972. Este importante crecimiento de las reservas del Banco de la República se debió fundamentalmente al incremento de las exportaciones y de los flujos del crédito externo neto. Las reservas del sistema bancario comercial también aumentaron en US\$ 6 millones, aunque continúan siendo negativas por US\$ 316 millones.

F. Deuda externa y capacidad de pago

El endeudamiento externo a largo plazo y pagadero en divisas alcanzaba a US\$ 2.017 millones al 31 de diciembre de 1971, de los cuales un 32,9 por ciento quedaba por utilizar. La amortización de las obligaciones

contraídas se distribuyeron de la siguiente manera: más de 10 años, 53,9 por ciento; de seis a diez años, 21,6 por ciento; hasta cinco años, 24,5 por ciento.

Deuda Pública Externa a Largo Plazo Pagadera en Divisas
al 31 de Diciembre de 1971 a/
(en millones de US\$)

	<u>Total</u>	<u>Desembolsada</u>	<u>Por Desembolsar</u>
<u>Préstamos de Organismos Internacio- nales</u>	<u>890,9</u>	<u>488,4</u>	<u>402,5</u>
BID	159,1	78,2	80,9
BIRF	712,4	390,8	321,6
IDA	19,4	19,4	-
<u>Préstamos de Gobiernos Extranjeros</u>	<u>854,8</u>	<u>699,1</u>	<u>155,7</u>
EE.UU.	783,1	660,2	122,9
Canadá	18,2	7,8	10,4
Alemania	29,8	14,6	15,2
Italia	13,5	10,8	2,7
Otros	10,2	5,7	4,5
<u>Otros</u>	<u>271,8</u>	<u>166,9</u>	<u>104,9</u>
Bonos	15,1	15,1	-
Crédito de proveedores y bancos privados	256,7	151,8	104,9
TOTAL	<u><u>2.017,5</u></u>	<u><u>1.354,4</u></u>	<u><u>663,1</u></u>

a/ Con vencimiento original de un año o más.
Fuente: BIRF

De acuerdo con el cuadro siguiente, en 1972 el servicio de la deuda pendiente a fines de 1971 representa una relación de un 17,1 por ciento de los ingresos en divisas por concepto de las exportaciones de bienes y servicios en 1971 y disminuye en los años posteriores.

Servicio de la Deuda Externa al 31 de Dic. de 1971

	<u>1972</u>	<u>1973</u>	<u>1975</u>	<u>1978</u>	<u>1980</u>	<u>1985</u>
Servicio (US\$ millones)	170,1	178,0	159,5	157,8	133,4	98,7
Porcentaje de las exportaciones de 1971 <u>a/</u>	17,1	17,9	16,0	15,8	13,4	9,9

a/ Ingresos por bienes y servicios de US\$ 997 millones.

Teniendo en cuenta que la estructura de la deuda pública externa de Colombia es relativamente satisfactoria, y suponiendo la continuación de la política cambiaria y de la balanza de pagos en términos adecuados, este país parece tener una razonable capacidad para absorber el servicio adicional derivado de un aumento de la deuda pública externa, en términos y condiciones que no deterioren la situación actual.