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Report No. P-6650-CO

MEMORANDUM AND RECOMMENDATION
OF THE
PRESIDENT OF THE
INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT
TO THE
EXECUTIVE DIRECTORS
ON A
PROPOSED LOAN PACKAGE
COMPRISING A LOAN EQUIVALENT TO US\$104.3 MILLION
AND A LOAN EQUAL TO US\$145 MILLION
TO
INTERCONEXION ELECTRICA S.A. "ESP"
WITH THE GUARANTEE OF
THE REPUBLIC OF COLOMBIA
FOR A
POWER MARKET DEVELOPMENT PROJECT

OCTOBER 23, 1995

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CURRENCY EQUIVALENTS

(as of November 1994)

Currency Unit = Colombian Peso

US\$ 1 = 840 Pesos

1 Col\$ = US\$ 0.00119

Fiscal Year

January 1 to December 31

ACRONYMS

IDB	Interamerican Development Bank
Interconexión Eléctrica	Former Generation and Transmission Company
ISA	Interconexión Eléctrica S.A. -ISA- (New Transmission and Dispatch Company)
ISAGEN	ISAGEN S.A. (New Generation Utility)
OED	Operations Evaluation Department, World Bank

ABBREVIATIONS

GDP	Gross Domestic Product
kV	Kilovolt (10^3 V)
kW	Kilowatt (10^3 W)
Mbbl	Million barrels
MW	Megawatt (10^6 W)
Mt	Megatons (10^6 metric tons)
Tcf	Tera cubic feet (10^{12})
TWh	Terawatt-hour (10^{12} Wh)

COLOMBIA

POWER MARKET DEVELOPMENT PROJECT

Loan and Project Summary

Borrower: Interconexión Eléctrica S.A. "E.S.P." (ISA)

Guarantor: Republic of Colombia

Beneficiary: N/A

Poverty: Not applicable

Amount: A package of two loans comprising: (i) a US\$145 million US dollar single currency loan; and (ii) a US\$104.3 million equivalent currency pool loan.

Terms: (i) repayable in 17 years, including four years' grace, at the standard LIBOR-based interest rate for US dollar single currency loans; and (ii) repayable in 17 years, including four year's grace, at the standard variable rate for currency pool loans.

Commitment Fee: 0.75% on undisbursed loan balances, beginning 60 days after signing, less any waivers.

Financing Plan:

IBRD:	249.3
ISA:	<u>160.7</u>
TOTAL:	410.0

Environmental Classification: B

Estimated Economic Rate of Return: ISA's 1994-99 investment program, which includes a number of small investments not included in the project, has an estimated net present value of US\$64 million and a benefit/cost ratio of 1.34 at a discount rate of 12%. The estimated economic rate of return is 27%.

Staff Appraisal

Report No: 13621-CO

Map: IBRD 26929

Project Identification

Number: CO-PA-6887

**MEMORANDUM AND RECOMMENDATION OF THE PRESIDENT OF THE
IBRD TO THE EXECUTIVE DIRECTORS ON A PROPOSED LOAN PACKAGE
TO INTERCONEXION ELECTRICA S.A. "ESP"
WITH THE GUARANTEE OF THE REPUBLIC OF COLOMBIA
FOR A POWER MARKET DEVELOPMENT PROJECT**

1. I submit for your approval the following memorandum and recommendation on two proposed loans to the Interconexión Eléctrica, S. A. "E.S.P." - (ISA), with the guarantee of the Republic of Colombia for financing of a Power Market Development Project. A first loan for US\$145 million (58% of total) would be a LIBOR-based US\$ Single Currency Loan, with 17 years repayment including a grace period of 4 years. A second loan equivalent to US\$104.3 million (42% of total) would be a Currency Pool Loan involving 17 years repayment, including a grace period of 4 years. ISA as Borrower and the Republic of Colombia as Guarantor are eligible for single currency loan terms, since they have authorized conversion of all VLR82 loans. Including the proposed loans, single currency loans to Colombia are expected to amount to US\$290 million under the expanded single currency loan program, or 57 percent of the Bank's planned FY96 lending to Colombia of US\$504 million equivalent.

2. **Country Background.** Although Colombia's prudent macroeconomic management enabled it to achieve one of the highest and most stable growth rates in Latin America during the 1980s (3.7%), the Government sought to improve the economy's performance during the 1990s through appropriate institutional reforms. In order to spur economic growth, the Barco administration (1986-90) launched a reform program during the last year of its tenure which was vigorously pursued during the Gaviria government years (1990-94); it involved opening trade, exposing economic agents to competition and fostering private sector participation in areas where the public sector traditionally prevailed (e.g. ports, railways, state-owned banking, state-controlled industrial enterprises, the energy sector in general, and the power subsector in particular). The Samper Government's (1994-98) policies have so far emphasized socially-oriented priorities, with a renewed focus on expanding and improving of the provision of basic infrastructure and services, but it has continued to support the Gaviria-era structural reforms. Its major economic challenge will consist of taking advantage (and avoiding the pitfalls) of the large foreign currency revenues associated with massive increases in oil production which have the potential for putting the economy (GDP per capita of US\$1620) on a faster development path with sustained GDP growth of more than 5 percent per year.

3. Colombia's energy sector exhibits a large and diversified resource base: reserves of primary energy are estimated to be on the order of 3200Mbbbl of oil, 12.5Tcf of natural gas (including recent discoveries of 5Tcf in August, 1994), 2200Mt of coal and a potential hydroelectric generation in excess of 350 TWh per year. At current rates, the Reserves to Production ratio (R/P) amounts to 20 years for oil, 70 years for natural gas, and over 100 years for coal.

4. **The Power Subsector.** The electricity industry provides service to around 5.2 million customers; energy consumption in 1994 amounted to 39 TWh which were generated with an

installed capacity of 10100MW of predominantly hydro plants (78%). Until recently, the sector was characterized by powerful vertically-integrated monopolies together with a large number of government-controlled distribution companies. It experienced major difficulties during the 1980s: it underwent a lengthy period of financial crisis due to overbuilding of generating facilities and low tariff levels, followed in the early 90s by an unprecedented drought which caused country-wide rationing. These crises provided the impetus for embarking on radical institutional reforms.

5. The sector was gradually reorganized, with Bank support, during the 1991-94 period. The process incorporated efficiency, accountability and financial incentives into sector corporations and was complemented with a financial restructuring whereby the Government injected massive resources into the sector to set it on a sound financial footing.

6. The major elements of the restructuring process culminated in 1994 with the approval by Congress of two major statutes: a Public Services Law which provides a general framework for the supply and pricing of electricity, water, natural gas and local telephone services, and an Electricity Law which spells out sector-specific provisions regarding organization, responsibilities and functions of different entities. Both of these laws emphasize the introduction of competition in non-monopolistic activities and provide for the regulation of natural monopolies. The Government anticipated the approval of these laws by creating the required regulatory institutions, by fostering the incorporation of private capital into generation and by reorganizing some of the major companies in the sector in order to operate according to the proposed structure.

7. Tangible proof of success in the implementation of the restructuring proposals can be seen in the areas of private generation, institutional reorganization, regulatory authority setup, tariff reforms and competition. Perhaps the most compelling evidence of change within the power sector has been the response of private sector independent power producers, who are building over 1000 MW of additional generation capacity, which will be put into service between 1995 and 1997. At the institutional level, Interconexión Eléctrica S.A., formerly the sector's principal generation and transmission company, has been broken up into a generation enterprise (ISAGEN) and a transmission and dispatch company (ISA, the borrower). They have been operating independently since May 1, 1995. Price adjustments have been steadily taking place and economic cost levels will be reached in 1998. Subsidies to consumers were estimated to have been cut from half a billion dollars in 1992 to US\$ 120 million in 1994. Finally, competition is taking place through the deregulation of supplies to large consumers (i.e. loads in excess of 2,000kW) who are now shopping around for supply contracts.

8. **Power Sector Issues.** The major hurdles regarding the power sector's reorganization and financial rehabilitation were cleared during 1991-1994. This involved designing and putting in place a new legal and regulatory framework, and implementing a financial rescue operation for many power utilities that were virtually bankrupt. The system has now entered a period of institutional consolidation; it will require technical assistance while experience is gained under the new commercial and system operation rules, as well as infrastructure investments. Some of the issues to be addressed in this new phase are:

- (a) **Power market and system expansion.** In 1995 a market for bulk energy and capacity will be operating. It will create an environment whereby private producers will engage in generation investments based on the income they can derive either from the spot market or from long term contracts with large users (such as major consumers or distribution companies). This has enabled the Government to limit its commitments and exposure to the transmission and distribution components of the industry. Although no major investments in new generating capacity are required in addition to those already planned or in execution until 2000, beyond that date the system will have to prove that it can survive as a mature, competitive industry. There are encouraging signs in this respect, as evidenced by 21 consortia of public and private organizations, both local and foreign, who have expressed interest in developing new power plants amounting to 1,700-2,600MW and ranging from 10-20MW in small hydro to 500MW gas-fueled plants.
- (b) **Transmission and Dispatch.** A major responsibility for enabling the market concept to be successful has been vested in ISA, the transmission and dispatch enterprise. ISA is in the process of upgrading its system in order to fulfill the required dispatching and clearing house functions for the market to operate smoothly. The interconnection network will also require reinforcements in order to allow an unimpeded flow of energy between generators and demand centers. These investments are to be paid for through adequate, regulated, network charges which have been designed and promulgated by the Energy Regulatory Commission.
- (c) **Distribution.** At the distribution level, private sector participation has been less successful. Since the initiation of the reform process only one small distribution company has been privatized. This can be explained by the generally poor financial condition of many utilities which have been unable to exhibit an acceptable performance due to chronic tariff shortfalls compounded by poor management and the reluctance of local politicians to relinquish the power they exert over these companies. However, the possibilities for the ultimate privatization of distribution companies have improved with the approval of the Public Services Law and will continue to do so with planned tariff increases. A new Bank loan is being identified to support this effort.

9. **Government Strategy.** The government's overall policy regarding the power sector consists of implementing the mandates contained in the Public Service Law and the Electricity Law. The general orientation consists of: (a) limiting the state's intervention in the sector to the formulation of general policy guidelines and to regulation, thereby allowing the private sector to undertake investment and operational tasks; (b) stimulating competition; (c) encouraging private sector participation; and (d) establishing cost-reflective tariffs with transparent subsidies targeted towards low income users (see Annex 2 of the Staff Appraisal Report for the Government policy letter provided to the Bank in November, 1994; COMPES Document No. 2763 (2/15/1995))

“Strategies for the Expansion of the Power Sector”, 1995-2007; and Law No. 188 (6/2/1995) “National Development Plan”.)

10. **Bank Strategy.** The Bank’s role regarding the electric power sector in Colombia is based on, and is consistent with, its 1993 Policy Paper⁷ which provides guiding principles for Bank support of power sector restructuring programs. Since 1991 the Bank has had an active role in promoting institutional reform in the Power Sector in Colombia. Two complementary approaches have been adopted for continuing this support: (a) technical assistance in preparing and implementing the sector reform program, including the legal and regulatory framework, and institutional strengthening; and (b) support for specific projects and investments which will consolidate the reform process and promote the effective operation of key sector institutions.

11. Technical assistance will continue to be provided through the on-going Energy Sector Technical Assistance Project (Loan No. 3827-CO) which was approved by the Board in December, 1994. This TA will support institutional reform within the energy sector as a whole. It includes: (a) assistance in setting up regulatory agencies and developing pricing policies for power and gas; (b) assistance to the energy sector in the process of incorporating private capital and introducing competitive incentives; (c) assistance in developing environmental regulations and guidelines for the energy sector; and (d) development of a demand side management strategy.

12. The proposed investment project would help to implement the next phase of the power sector reform by supporting institutional building and associated investments in power dispatch and energy control, and facilitating the effective operation of a bulk supply market by removing transmission bottlenecks. It will also complement the Technical Assistance project with an additional specialized component oriented towards ISA’s dispatch and clearing house functions.

1. THE PROJECT

13. **Project Objective:** to support power sector reform by facilitating the operation of a competitive bulk supply market for electricity. Successful implementation of the project will remove barriers to competition among generators pushing bulk electricity prices towards their economic costs. Specifically, the project would lift transmission constraints that hinder an open access to the grid and support ISA in its role as transmission network operator, system generation dispatcher and commercial transactions coordinator. Achievement of project objectives will be monitored through indicators of transmission capacity availability and reliability (see Table 5 of Schedule B).

14. **Project Description.** The project consists of three components:

- Enhancing the facilities of the Energy Dispatch Center and creating a Financial Settlement Center in ISA in order to achieve a smooth operation of system dispatch under market conditions at the bulk supply level. This component would adapt ISA’s existing facilities to the requirements of the new regulatory and commercial environment and would consist of: (a) expanding the Energy Dispatch Center’s

⁷ The World Bank’s Role in the Electric Power Sector , The World Bank, 1993

supervisory system, including new metering and telecommunications; (b) technological updating of the Dispatch Center's data processing equipment and software; and (c) putting in place a Financial Settlement Center for keeping track of energy transactions, payments to generators, invoicing of large consumers, and billing of transmission costs through network charges.

- Strengthening and expanding the interconnected transmission system through: (a) the reinforcement of transmission facilities between the main generation center of San Carlos and the southwest region with a 384 km, 500 kV line and a 30km, 230kV line; (b) reinforcements in the Atlantic Coast and Northeastern regions which consist of two 230kV lines (240km total), together with substation equipment; and (c) other transmission projects comprising line extensions and substation expansion. This component would eliminate transmission bottlenecks and would facilitate entry to the electricity market. Additionally, it would improve the economic performance of the system by reducing system losses, increasing system reliability, and lowering generation costs.
- Provision of consulting services and training programs to assist ISA in the strengthening of its capabilities to assume its roles of: (i) transmission network operator, (ii) power dispatch coordinator and (iii) bulk electricity transaction clearing house. These activities will be agreed upon between ISA and the Bank subject to an annual plan to be approved by the Bank.

15. **Project Financing.** The cost estimate for the project is summarized in Table 1 of Schedule A. The project's total cost including taxes, duties, physical contingencies, price contingencies and interest during construction is estimated at US\$ 410.0 million, of which US\$ 249.3 million (60%) corresponds to direct plus indirect foreign costs and US\$ 160.7 million (40%) corresponds to local costs. Taxes and import duties are estimated at US\$43.9 million. Cost estimates are in December 1994 prices.

16. Costs are based on ISA's estimates, which have been reviewed by the Bank and found acceptable. Physical contingencies, which amount on average to 12%, were estimated based upon the type of project and the status of its design. Price contingencies assume: (a) a project execution period of six years based on the 1994 Bank standard disbursement schedule for power projects in LAC, and (b) escalation rates over and above base cost plus physical contingencies of 2.6% for 1995-2001.

17. **Project Implementation.** The project will be implemented by ISA, one of the two companies which originated from Interconexión Eléctrica. The latter was established in 1967 under Bank sponsorship to interconnect the regional electricity companies, to develop future generation projects and to coordinate system dispatch. As noted in para. 7, because of the split arrangements, there are now two autonomous corporations: a generation company (ISAGEN, S.A. "E.S.P"), which inherited 2542 MW of installed capacity, and a company excluded from generation activities and dedicated to transmission and dispatch which maintains the name of the

original company and uses the acronym ISA. The Bank supported Interconexión Eléctrica S.A. in the past through three loans (see para. 1.10 of SAR) totaling US\$300 million equivalent which financed the expansion of the national interconnection grid and three power stations. Interconexión Eléctrica S.A. also executed a 500kV interconnection with the Atlantic Coast region which was financed by the Bank. The execution of all these projects was successful. As part of the split arrangements, ISAGEN is expected to assume (in due time and with your prior approval) the outstanding balance of the two of these loans not yet fully repaid, and release ISA of its joint and several liabilities.

18. The Project Execution Directorate of ISA, which has successfully carried out projects financed by the Bank and IDB and has proven implementation capabilities, will be directly responsible for project implementation. ISA will procure required consulting assistance for engineering and supervision of the construction of transmission lines, substations, and the installation of data acquisition and data processing equipment.

19. **Project Sustainability.** The recently created Energy Regulatory Commission has determined the rules for economic power dispatching, the functioning of the bulk power market, and tariff setting. The Commission is receiving support from the Bank's Energy Sector Technical Assistance Project. Under the new sector organization, generation companies will recover their costs from the revenues of electricity sold directly to distribution companies and large consumers through the transmission grid operated by ISA. ISA will recover its costs through regulated network charges paid by users of the grid. Final users will be charged generation costs, plus a tariff based on a productivity benchmark, sufficient to recover the costs of an efficient handling of transmission and distribution services. ISA has direct financial incentives to implement the project in a timely manner. On one hand it would incur heavy penalties levied by the Regulatory Commission in case of delays, on the other, it would lower its operating costs increasing, therefore, its profit margin once the project is fully implemented. The Government will use transparent and regulated cross subsidies (limited to 20% of service cost by the Public Services Law) and budgeted subsidies to support a lifeline tariff for low-income residential users. By facilitating private sector participation and transparent pricing, the project would help the Government to reduce power costs and subsidies, attract new investments and establish conditions for sustainable operation and development of the power sector.

20. **Lessons from Previous Bank Involvement.** The Bank has lent more than US\$2 billion in 32 operations to support the Colombian energy sector, mainly by financing investments in power generation and transmission. In 1990 an OED study⁸ found that the projects generally met their physical objectives, and helped develop technical capabilities in the beneficiary agencies, but failed to establish a sustainable institutional and financial framework for the sector. It identified weaknesses in the power subsector and recommended its restructuring through the introduction of adequate regulation and private sector participation.

21. Following the OED report, the Bank supported the Government in the recent process of power sector institutional reform since its inception in 1991 (see paras. 5 to 7 for major elements

⁸ OED, Colombia-The Power Sector and the World Bank, 1970-1987, Report No. 8893 (June 28, 1990).

of the reform and implementation status). The Bank has helped to define a new vision for the energy sector by: (a) financing analyses of the sector's problems and identifying the issues; (b) exploring the options for addressing them; (c) fostering constructive debate concerning past conceptual and systemic deficiencies attributable to inadequate institutions; (d) designing a reform program for the power subsector; and (e) by supporting the implementation of this program.

22. The key lesson which has been learned from other Bank loans in Colombia and other countries is the need to position infrastructure investment projects within a sector-wide institutional context to ensure that projects do not fail due to an inadequate institutional framework. The project will internalize this lesson by: (a) coordinating the proposed actions with the on-going umbrella Energy Sector Technical Assistance Project which will continue to provide Bank support to the power sector reform program; and (b) by designing the project to support the overall institutional framework of the sector.

23. **Rationale for Bank Involvement.** The country's prospects and the Bank's assistance strategy were discussed by the Board on December 16, 1993. The country assistance program seeks to help the Government consolidate and increase its structural reforms, to support private-sector-led growth, to improve the delivery of basic services, to address the degradation of the natural resource base, and to strengthen institutional capacities. It proposes to maintain a sound lending program with emphasis on technical assistance and it explicitly endorses support for a comprehensive reform of the power sector which would create an environment which attracts private capital into the sector. The proposed project responds to this strategy by supporting the implementation of the ongoing power sector reform program. The project will be the first major lending operation for the power subsector since 1987.

24. **Actions Agreed.** During negotiations, financial covenants (cash operating ratio, debt service coverage ratio, and self-financing ratio) were agreed. The project has been rated in the "B" environmental category, i.e., no major environmental impacts are expected as a result of either construction or operation of the new transmission facilities. Nevertheless, during negotiations, it was agreed that: Prior to inviting bids for construction of each transmission line, ISA will submit a project specific environmental report and a resettlement plan (see para. 25), and before authorizing any contractor to initiate the line construction and assembly phase, all corresponding rights on land shall have been acquired and each of the persons affected by the works shall have been provided, according to the corresponding resettlement plan, with enforceable rights to have a new home or adequate compensation, or both.

25. **Environmental Aspects.** The investments to be financed include power transmission lines, substations, telecommunications and computing equipment, which present small potential environmental risks. During project preparation and following World Bank guidelines, ISA carried out a Sectoral Environmental Assessment (SEA) of the Colombian power sector, which included a general evaluation of the environmental impact derived from the existing transmission system as well as the impact expected from the new transmission lines foreseen in the expansion plan. ISA identified⁹ the main environmental and social constraints which are being taken into account in the design of the project's transmission lines, as well as the Environmental

⁹ "Restricciones Ambientales-Tercer Plan de Transmisión", ISA.

Management Plan (EMP) to mitigate undesirable effects on human groups and natural resources during construction and operation.

26. The three transmission lines financed by the loans do not affect dense communities. The project will displace around 60 households currently located along the transmission corridor. The required relocation will consist in most cases of rebuilding houses, and the families concerned will be able to remain on their land. By encouraging more efficient power generation and by helping to reduce transmission losses, the project would promote energy efficiency and thus have a positive indirect environmental impact. The project has a "B" environmental rating.

27. **Participatory Approach.** ISA has undertaken successful experiences in applying a participative approach to resettlement of scattered populations living along the right-of-way of the lines of the existing interconnected system. Individual solutions for housing, land and economic activities restoration have been designed and were implemented in conjunction with each affected family.

28. **Program Objective Categories.** The project belongs to the category of Public Sector Management and Private Sector Development.

29. **Poverty Category.** Not applicable to this project.

30. **Project Benefits.** Benefits from the Energy Dispatch Center expansion and the Financial Settlement Center creation are associated with the effective functioning of the generation-level market and are not directly quantifiable. However, this project component will allow the introduction of competition in the electricity market, which will exert pressure on generators to reduce their prices in line with their economic costs and will ultimately benefit consumers. The benefits from the transmission component consist of allowing the Southwestern region to be supplied with low cost energy, reliability enhancement through a new link between the Atlantic Coast and the Central Region, and lower operation costs. The economic rate of return for the transmission component of the project is on the order of 27%, which derives mainly from the fuel savings which will be made possible by facilitating the substitution of high cost thermal generation by lower cost sources.

31. **Risks.** This is a low risk project. Implementation risks will be minimized by the use of experienced consultants in the preparation and evaluation of bids, and contracting the execution of critical components of the project through "erect and build" schemes.

32. Regarding the institutional risk, the execution of the proposed project is essential for the success of the overall power sector reform process, which hinges on the satisfactory implementation of the new Public Services and Electricity Laws approved by Congress in July, 1994. The new Electricity Law establishes sound principles, but opposition from regional and other interest groups, such as unions, management of a number of existing utilities, and some local governments could slow down its enforcement. However, since its approval, no major problems of this nature have appeared and the Government intends to continue with its implementation.

33. Other risks which could impact negatively on the project include: (a) insufficient institutional capabilities in government to develop and enforce the regulations needed for the successful implementation of the competitive power market; (b) sluggish private sector response; and (c) political reluctance to implement the mechanisms for tariff and transmission charge adjustments. The Energy Sector Technical Assistance Project is addressing the issue of institutional weakness. Regarding (b), the private sector has responded positively by investing in over 1000 MW of power generation and by expressing interest in developing another 1700-2600MW. Regarding the price adjustment risk, although the Government has lost its discretionary power and can no longer set prices by fiat, it is conceivable that it could pressure the Regulatory Commission in order to reduce the rate of adjustment of electricity prices for the sake of achieving short term macroeconomic goals or fulfilling political commitments. Three safeguards exist for avoiding this contingency: (i) the terms of the Public Services Law itself; (ii) the attitude of the regulators who may be amenable to marginal revisions but would oppose major changes to the price adjustment plan due *inter alia* to the personal legal risks involved, including penal, in disregarding the mandates of the Law; and (iii) pressures from private sector interests in the generation business who form a constituency in favor of a sound tariff policy to protect their revenues from the consequences of uneconomic pricing. The environmental risks posed by the project are small and hedged (see paras. 25 and 26).

34. ISA selected US dollar single currency loan terms to the maximum extent possible to reduce its currency risk. ISA has substantial yen liabilities and has chosen US dollar to achieve a better overall balance in its foreign currency exposure. ISA's choice of a LIBOR interest rate basis marginally increases interest rate risk since ISA's tariff level is subject to a cap imposed by the Regulatory Commission. ISA has capacity to bear this risk, however, as most of its liabilities carry stable interest rates.

35. A series of sensitivity analyses against less favorable cases are considered in order to determine the robustness of the conclusion that the transmission components of the project (92% of the total project cost) are economically justified. The Internal Rate of Return for ISA's transmission investment program continues to be justified (IRR of 19%) when investment costs are increased by 10% or when operating benefits are decreased by 10%. The IRR shows negligible sensitivity to changes in the value of incremental energy benefits. If demand fails to develop at the expected 6.1% per year average annual rate (e.g. a 4.3% average growth rate), the investment program yields a lower IRR of 18% which still exceeds the 12% benchmark. Finally, the project risks becoming uneconomic in the unlikely event that operating savings decrease by around 27% over the program's lifetime with respect to their estimated values, or that investment costs increase by 30% with respect to their budgeted amounts. The sensitivity analyses show project risks to be acceptable.

36. **Recommendation.** I am satisfied that the proposed loans would comply with the Articles of Agreement of the Bank, and recommend that the Executive Directors approve them.

James D. Wolfensohn
President

Attachments
Washington, D.C.
October 23, 1995

Table 1
COLOMBIA - POWER MARKET DEVELOPMENT PROJECT
COST ESTIMATE
(US\$ thousand)

	SUBTOTAL		TOTAL	
	FC	LC		
PART A: Energy Control Center and Financial Settlement Center				
1.	Engineering and Administration	6,323	2,380	8,703
1.1	Engineering	6,323	2,061	8,384
1.2	Administration	0	319	319
2.	Direct Construction Cost	10,096	1,686	11,782
	Subtotal	16,419	4,066	20,485
3.	Physical Contingencies	2,463	610	3,073
	SUBTOTAL PART A	18,882	4,676	23,558
PART B: Expansion of the Interconnected Transmission System				
1.	Engineering and Administration	530	21,204	21,734
1.1	Engineering	530	14,887	15,417
1.2	Administration	0	6,317	6,317
2.	Direct Construction Cost	153,370	94,502	247,872
2.1	Land Purchase	0	6,507	6,507
2.2	Lines and Substations Construction	153,370	87,995	241,365
	Subtotal	153,900	115,706	269,606
3.	Physical Contingencies	23,085	17,356	40,441
	SUBTOTAL PART B	176,985	133,062	310,047
PART C: Technical Assistance to ISA				
1.	Technical Assistance	1,927	1,021	2,948
1.1	Studies	964	443	1,407
1.2	Training	964	578	1,542
	Subtotal	1,927	1,021	2,948
3.	Physical Contingencies	289	153	442
	SUBTOTAL PART C	2,216	1,175	3,391
Total A+B+C				
1.	Engineering, Administration and Technical Assistance	8,780	24,606	33,386
2.	Direct Construction Cost	163,466	96,188	259,654
	Subtotal	172,246	120,794	293,040
3.	Physical Contingencies	25,837	18,119	43,956
	SUBTOTAL A+B+C	198,083	138,913	336,996
	Escalation	14,460	6,807	21,267
	Subtotal (Including Escalation)	212,544	145,719	358,263
	Interests During Construction	36,770	15,009	51,779
	TOTAL PROJECT INCLUDING TAXES AND DUTIES	249,314	160,729	410,042
	Taxes and Duties	0	43,908	43,908
	TOTAL PROJECT WITHOUT TAXES AND DUTIES	249,314	116,821	366,134

Table 2
Financing Plan
(US\$ million)

	LC	FC	TOTAL
IBRD	0	249.3	249.3
ISA	160.7	0	160.7
TOTAL	160.7	249.3	410.0

TABLE 1
PROJECT BENEFITS AND COSTS
 (US\$ million)

Present Value of Flows
Economic Analysis

Benefits	250
Costs	<u>186</u>
Net Benefits	64
 IRR	 27%

Main Assumptions:

Discount rate: 12%
 Average power tariff: US\$70/MhW
 Growth in GDP: 5.2%
 Growth in power demand: 6.1%

Switching Values of Critical Variables:

Project Costs: 35% above budgeted values.
 Cost of natural gas: 27% lower than current values (reducing benefits of fuel savings).

Nature of Benefits: The project will: (i) allow the introduction of competition in the electricity market, which will exert pressure on generators to reduce their prices and will ultimately benefit consumers; (ii) bring low cost energy to the Colombian's Southwest Region; and (iii) lower the power system operation costs.

Main Beneficiaries: Power consumers.

Table 2 ISA's Financial Projections
Actual and Forecast Income Statements
 (Col\$ billion)

	1995 ⁽¹⁾	1996	1997	1998	1999	2000	2001	2002	2003	2004
Gross Operating Revenues	129.8	166.7	201.0	239.6	288.3	354.2	418.2	493.9	583.5	689.5
Operating Expenses	88.1	105.4	124.1	149.1	186.0	233.6	255.2	278.4	299.6	328.4
O & M Expenses	17.7	21.8	26.0	35.1	40.4	51.3	58.5	66.6	76.0	86.6
Venezuelan Transm. Line Charges	3.2	3.5	3.8	4.0	4.2	4.4	4.5	4.6	0.0	0.0
Administration and General Expenses	5.9	7.3	8.7	11.7	13.5	17.1	19.5	22.2	25.3	28.9
Depreciation (general assets)	0.4	0.5	0.7	0.9	1.2	1.5	1.8	2.2	2.6	3.2
Depreciation (assets in operation)	60.9	72.3	84.9	97.4	126.7	159.3	170.9	182.8	195.7	209.7
Operating Income	41.7	61.3	76.9	90.5	102.3	120.6	163.0	215.5	283.9	361.1
Non-operating Income (net)	-1.8	1.7	4.2	-2.0	-2.8	-3.5	9.2	-4.5	-5.1	-5.7
Income before Interest	39.9	63.0	81.1	88.5	99.5	117.1	172.2	211.0	278.8	355.4
Interest charged to Operation	20.3	25.7	30.2	32.2	43.6	58.5	56.9	54.5	51.2	48.4
Monetary Correction	5.8	6.4	14.5	21.6	24.7	29.2	26.4	37.2	44.8	51.1
Income Tax	9.0	16.0	24.5	29.2	30.2	32.9	53.2	72.6	102.2	134.3
NET INCOME	16.4	27.7	40.9	48.7	50.4	54.8	88.5	121.1	170.2	223.8
Financial Indicators										
Rate of Return										
With accelerated depreciation	4.9%	6.1%	6.6%	6.2%	5.9%	5.9%	6.9%	8.6%	10.6%	12.5%
With linear depreciation	8.3%	8.9%	9.2%	8.2%	8.0%	8.0%	8.4%	9.3%	10.5%	11.7%
Cash Operation Ratio	20.7%	19.6%	19.2%	21.2%	20.2%	20.6%	19.7%	18.9%	17.4%	16.8%

⁽¹⁾ It includes the estimate for the whole year, although the ISA was legally split in May 1, 1995.

Table 3 ISA's Financial Projections
Source and Application of Funds Statement
 (Col\$ billion)

	1995 ⁽¹⁾	1996	1997	1998	1999	2000	2001	2002	2003	2004
Gross Internal Cash Generation	104.8	140.0	171.5	192.3	233.6	284.9	352.9	405.0	487.3	579.7
Income before Interest	39.9	63.0	81.1	88.4	99.5	117.1	172.3	211.0	278.8	355.5
Depreciation	61.3	72.8	85.6	98.4	127.9	160.8	172.7	185.0	198.4	212.8
Other non-Cash Expenses	3.6	4.2	4.8	5.5	6.2	7.0	7.9	9.0	10.1	11.4
Less: Net debt service	56.7	70.5	82.7	75.6	91.6	144.8	151.9	158.7	172.8	182.9
Amortization	36.4	44.8	52.5	43.4	48.0	86.3	95.0	104.2	121.6	134.6
Interest Charges	26.3	33.5	39.1	48.6	57.0	58.5	66.6	74.1	87.6	102.8
Total Debt Service	62.7	78.3	91.6	92.0	105.0	144.8	161.6	178.3	209.2	237.4
Less: Interest during Construction	6.0	7.8	8.9	16.4	13.4	0.0	9.7	19.6	36.4	54.5
Net Internal Cash Generation	48.1	69.5	88.8	116.7	142.0	140.1	201.0	246.3	314.5	396.8
Borrowings	93.9	59.3	107.7	165.1	15.9	0.0	116.8	109.1	316.5	69.5
IBRD	16.1	42.4	80.7	115.7	15.9	0.0	0.0	0.0	0.0	0.0
Existing Loans in FC	74.3	15.4	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Existing Local Loans in LC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Future Loans in FC	0.0	1.1	24.9	49.4	0.0	0.0	116.8	109.1	316.5	69.5
Future Local loans in LC	3.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Sources	142.0	128.8	196.5	281.8	157.9	140.1	317.8	355.4	631.0	466.3
Applications										
Investment Program	84.9	107.9	182.2	272.8	78.6	52.4	321.2	318.9	502.4	320.1
Construction Program ²	78.9	100.1	173.3	256.4	65.2	52.4	311.5	299.3	466.0	265.6
Foreign Component	41.6	52.9	93.8	154.9	21.4	35.0	153.0	128.2	218.9	96.1
Local Component	35.7	45.3	77.4	99.1	41.0	14.3	155.0	167.1	242.6	164.4
Other Investment	1.6	1.9	2.1	2.4	2.8	3.1	3.5	4.0	4.5	5.1
Interest during Construction	6.0	7.8	8.9	16.4	13.4	0.0	9.7	19.6	36.4	54.5
Variation in Working Capital	57.1	21.0	14.1	8.9	79.4	87.7	(3.4)	36.5	128.6	146.3
Other Applications	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total applications	142.0	128.9	196.3	281.7	158.0	140.1	317.8	355.4	631.0	466.4
Financial Indicators										
Debt service Coverage (times)	1.7	1.8	1.9	2.1	2.2	2.0	2.2	2.3	2.3	2.4
Self-financing Ratio %	34	75	30	30	110	224	54	48	37	79

^{1/} Includes the whole year, although ISA was split in May 1, 1995.

^{2/} It does not include VAT

ISA'S FINANCIAL PROJECTIONS

Table 4 Balance Sheet

(Col\$ billion)

ASSETS	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Net Fixed Assets	1,025.1	1,232.8	1,528.0	1,935.6	2,152.9	2,336.1	2,809.1	3,328.8	4,098.2	4,759.0
Fixed Assets in Operation	1,179.5	1,453.6	1,735.7	2,341.9	2,695.1	3,418.7	3,897.2	4,442.4	5,063.5	5,770.9
Less: Accumulated Depreciation	249.3	361.5	500.6	668.1	885.0	1,151.1	1,471.6	1,845.8	2,281.4	2,787.7
Net Fixed Assets in Operation	930.1	1,092.1	1,235.0	1,673.8	1,810.1	2,267.6	2,425.6	2,596.6	2,782.0	2,983.2
Work in Progress	88.1	131.2	280.5	245.9	323.0	44.3	354.2	697.1	1,274.4	1,726.2
Fixed General Assets	7.4	10.6	14.5	19.2	24.7	31.2	39.1	48.4	59.5	72.7
Less: Accumulated Depreciation	0.5	1.2	2.1	3.3	4.9	7.1	9.8	13.3	17.7	23.1
Net Fixed General Assets	6.9	9.5	12.5	15.9	19.8	24.2	29.3	35.1	41.8	49.6
Current Assets	94.8	117.6	123.9	145.5	163.6	225.0	222.7	210.2	264.5	325.7
Cash and Banks	6.4	8.0	8.4	6.6	4.5	5.7	9.9	10.0	11.9	14.1
Temporary surplus	14.8	45.6	25.2	2.2	28.2	92.0	57.4	0.0	0.0	0.0
Accounts Receivable	21.6	27.8	33.5	39.9	48.1	59.0	69.7	82.3	97.3	114.9
Advance income tax payment	12.0	20.8	38.8	75.5	58.4	38.9	52.3	80.0	112.3	147.8
Inventories	5.9	7.3	8.7	11.7	13.5	17.1	19.5	22.2	25.3	28.9
Other	34.1	8.1	9.3	9.6	10.9	12.3	13.9	15.7	17.7	20.0
Other Assets	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
TOTAL ASSETS	1,127.9	1,358.4	1,659.9	2,089.1	2,324.5	2,569.1	3,039.8	3,547.0	4,370.7	5,092.7

... continued

ISA'S FINANCIAL PROJECTIONS
Table 4 Balance Sheet
 (Col\$ billion)

LIABILITIES AND EQUITY		1995	1996	1997	1998	1999	2000	2001	2002	2003	2204
Equity		727.4	871.5	1,043.0	1,237.8	1,455.2	1,699.3	2,008.8	2,391.0	2,872.1	3,469.4
	Capital	99.1	99.1	99.1	99.1	99.1	99.1	99.1	99.1	99.1	99.1
	Legal Reserve	10.4	12.0	14.8	18.9	23.7	28.8	34.3	43.1	55.2	72.3
	Contributions	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4
	Retained Earnings	40.1	66.2	104.2	148.8	194.3	244.2	327.3	439.5	597.7	804.5
	Capital Revaluation	560.4	676.8	807.5	953.6	1,120.7	1,309.8	1,530.7	1,791.9	2,102.7	2,476.1
Long Term Debt		312.5	369.2	486.2	668.8	675.0	653.6	744.1	820.1	1,112.4	1,175.8
Current Liabilities		70.0	95.3	103.8	150.1	155.4	170.4	233.3	273.3	313.7	363.4
	Short term Debt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Current portion of Long Term Debt	41.9	49.5	41.1	45.6	82.1	90.4	99.0	115.4	127.8	128.4
	Accounts Payable	1.1	8.4	13.5	42.4	10.1	10.7	39.9	39.0	30.7	40.2
	Income Tax	9.0	16.0	24.5	29.2	30.2	32.9	53.2	72.6	102.2	134.3
	Other	18.0	21.4	24.7	32.9	33.0	36.4	41.2	46.3	53.0	60.5
Other Liabilities		18.0	22.1	26.9	32.4	38.6	45.6	53.5	62.5	72.6	84.0
TOTAL LIABILITIES AND EQUITY		1,127.9	1,358.1	1,659.9	2,089.1	2,324.2	2,568.9	3,039.7	3,546.9	4,370.8	5,092.6
FINANCIAL INDICATORS		1,995	1,996	1,997	1,998	1,999	2,000	2,001	2,002	2,003	2,004
	Debt/Equity Ratio	33	32	34	37	34	30	30	28	30	27
	Liability/Assets	36	36	37	41	37	34	34	33	34	32

TABLE 5
KEY PERFORMANCE INDICATORS
COLOMBIA
POWER MARKET DEVELOPMENT PROJECT
MONITORING INDICATORS - EXPECTED VALUES

Indicator	1995	1996	1997	1998	1999	2000	2001	2002	2003
Weighted Average frequency of Interruption	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Weighted Average Length of Interruptions (hrs.)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Average Interruption time (hrs.)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Reliability Index (%)	98.6	98.6	98.7	98.8	98.8	98.8	98.8	98.8	98.8
Total Transmission Losses (%)	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Debt Service Coverage ⁽¹⁾	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Cash operating ratio ⁽¹⁾ (%)	20	20	20	20	20	20	20	20	20
Self-financing Ratio ⁽¹⁾ (%)	30	30	30	30	30	30	30	30	30
Accounts Receivable (days)	60	60	60	60	60	60	60	60	60

⁽¹⁾ Indicator covered by legal covenant. (The cash operating ratio agreed in the covenant is 23%).

... continued

TABLE 5
COLOMBIA
ISA
POWER MARKET DEVELOPMENT PROJECT
ENVIRONMENTAL MONITORING INDICATORS

Indicators	1995	1996	1997	1998	1999	2000	2001	2003
1. Completion of Environmental Assessment (EA) for each transmission line before inviting bids for construction.	Yes							
2. Preparation of an Environmental Project Implementation Manual for Transmission Lines ¹		100%						
3. Execution of all actions determined in the Environmental Management Plan (EMP)		Yes						
4. Ratio families relocated/displaced		100%	100%	100%	100%	100%	100%	100%

¹ The Project Implementation Manual should be prepared prior to starting construction of the San Carlos-San Marcos transmission lines.

SCHEDULE C

Table 1: Procurement Arrangements
(US\$ million)

A. Procurement Method⁽¹⁾	ICB⁽²⁾	NCB	OTHER	NBF⁽⁶⁾	TOTAL
Equipment	129.0		12.3 ⁽³⁾	50.0	191.3
	(113.6)		(10.0)		(123.6)
Works	31.6			12.5	43.4
	(25.0)				(25.0)
Equipment and installation	50.0			34.6	84.5
	(43.0)				(43.0)
Consultant services			28.6 ⁽⁴⁾	8.4	37.0
			(5.0)		(5.0)
Training courses			1.9 ⁽⁵⁾		1.9
			(1.0)		(1.0)
Total	210.0		42.8	105.4	358.3
	(181.6)		(16.0)		(197.5)

⁽¹⁾ Figures in parentheses are amounts financed by the proposed Bank Loan, including contingencies. Table does not include US\$ 51.8 million of interest during construction.

⁽²⁾ Goods and services to be procured by International Competitive Bidding in accordance with Bank guidelines

⁽³⁾ Limited International Bidding

⁽⁴⁾ Contracting of Consultants in accordance to Bank guidelines.

⁽⁵⁾ Training: reimbursement of foreign currency expenses.

⁽⁶⁾ Not Bank financed. To be procured locally under ISA's established procurement practices.

B. DISBURSEMENT

Category	Amount of the Loans Allocated (US\$ million)	Percentage of Expenditures to be Financed with Proceeds of the Loans
Works	25.0	90%
Equipment (Part A) ⁽⁸⁾	10.0	100% of foreign expend. and 90% of local ex-factory
Equipment (except Part A)	103.6	100% of foreign expend. and 90% of local ex-factory
Equipment and installation	43.0	95%
Consultant services Part A)	0.5	100% of foreign expenditures
Consultant services (except Part A)	4.5	100% of foreign expenditures
Training (foreign currency expend.)	1.0	100% of foreign expenditures
Interest under the Bank Loan	36.8	100% of foreign expenditures
Unallocated	24.9	
TOTAL	249.3	

⁽⁸⁾ Part A: Energy Control Center and Financial Settlement Center

Estimated Disbursements (Bank FY)

(US \$ million)

Calendar Year	1996	1997	1998	1999	2000	2001
Annual	14.9	39.9	69.8	69.9	49.8	5.0
Cumulative	14.9	54.8	124.6	194.5	244.3	249.3

COLOMBIA

POWER MARKET DEVELOPMENT PROJECT

Timetable of Key Processing Events

- | | | |
|-----|---------------------------------|--|
| (a) | Time taken to prepare: | 7 months |
| (b) | Prepared by: | Ministry of Mines and Energy,
Department of National Planning, and
ISA, with Bank assistance |
| (c) | First preparation mission: | October 1994 |
| (d) | Appraisal mission departure: | January 1995 |
| (e) | Negotiations: | July 1995 |
| (f) | Planned date of effectiveness: | December 1995 |
| (g) | List of relevant PCRs and PARs: | Colombia - the Power Sector and the World Bank
- OED Report No. 8893 of June 28, 1990.

Implementation Completion Report No. 14627, Bogota
Power Distribution II, June 19, 1995. |

SCHEDULE E

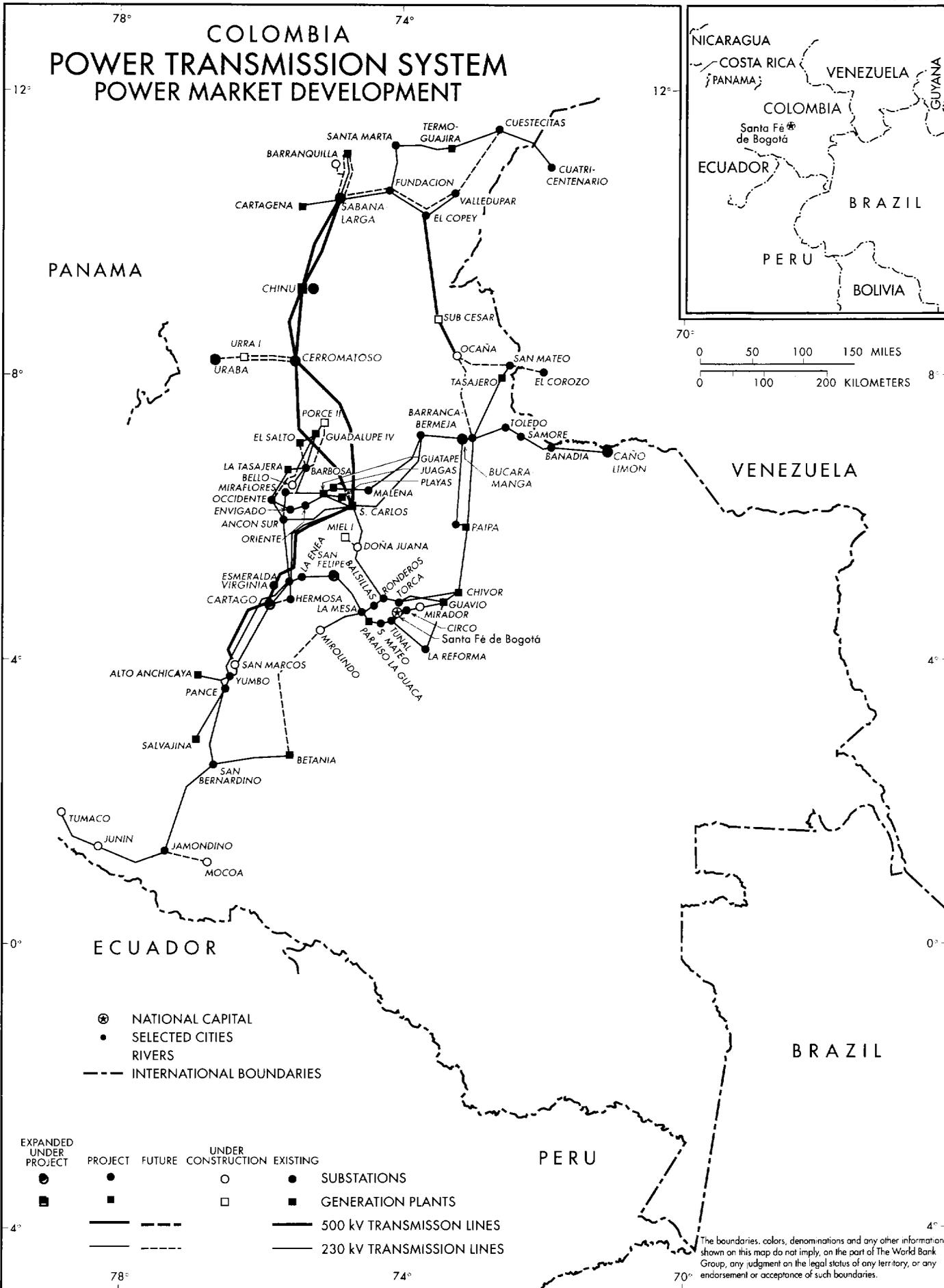
A. STATEMENT OF BANK LOANS & IDA CREDITS IN COLOMBIA (as of March 31, 1995)

Ln/Cr Number	Fiscal Year	Borrower	Purpose	Amount in US\$ million (less cancellations)		Undis- bursed
				Bank	IDA	
123 Loan (s) closed				5,842.11	23.48	
2470	1985	EMC	Cucuta Water/Sew	18.50		4.09
2667	1986	HIMAT	Irrigation II	114.00		41.28
2961	1988	Caja Agraria	WS & Waste Sector	150.00		31.93
3010	1988	BCH	Ed Sector	100.00		44.91
3113	1990	B. de la Rep.	Sm-Scale Irrig	50.00		34.02
3157	1990	Colombia	Rural Rds Sector II	55.00		6.82
3201	1990	Fondo Vial	Comm Child Care & Nu	24.00		7.72
3250	1991	Colombia	Rural Dev Invest	75.00		30.56
3321 (S)	1991	Colombia	Indust Restruct	200.00		111.45
3278	1991	Colombia	Public Sector Reform	304.00		0.26
3336	1991	Colombia	Munic Devt	60.00		14.86
3449	1992	Colombia	IFI-Restrc.&Divst.	100.00		60.25
3453	1992	Colombia	Third National Roads	266.00		138.99
3575	1993	Colombia	Agricultural Credit	250.00		250.00
3615	1993	Colombia	Municipal Health Serv.	50.00		47.55
3669	1994	Colombia	Public Fin. Mgmt.	30.00		28.95
3683	1994	Colombia	Secondary Educ.	90.00		90.00
3692	1994	Colombia	Natural Resource Mgmt.	39.00		38.45
3827	1995	Colombia	Energy TA	11.00		11.00
				1,986.50		993.09
TOTAL				7,828.61	23.48	
Of which repaid				<u>4,434.79</u>	<u>11.83</u>	
Total held by Bank & IDA				3,393.82	11.65	
Amount sold				50.99		
Of which repaid				<u>50.99</u>		
Total undisbursed						993.09

B. STATEMENT OF IFC INVESTMENTS (as of March 31, 1995)

	Loan	Equity	Total
	(in Millions of US\$)		
Total Gross Commitments	539.43	62.33	601.76
Less cancellations, terminations, exchange adjustments, repayments, writeoffs, and sales	396.47	39.87	436.34
Total Commitments now held by IFC	142.96	22.45	165.41
Total Undisbursed IFC	7.82	0.00	7.82

COLOMBIA POWER TRANSMISSION SYSTEM POWER MARKET DEVELOPMENT



- ⊗ NATIONAL CAPITAL
- SELECTED CITIES
- RIVERS
- - - INTERNATIONAL BOUNDARIES

- | | | | | | |
|------------------------|---------|--------|--------------------|----------|---------------------------|
| EXPANDED UNDER PROJECT | PROJECT | FUTURE | UNDER CONSTRUCTION | EXISTING | SUBSTATIONS |
| ● | ● | ○ | ○ | ● | ■ |
| ■ | ■ | □ | □ | ■ | ■ |
| — | — | — | — | — | — |
| — | — | — | — | — | — |
| | | | | | 500 kV TRANSMISSION LINES |
| | | | | | 230 kV TRANSMISSION LINES |

The boundaries, colors, denominations and any other information shown on this map do not imply, on the part of The World Bank Group, any judgment on the legal status of any territory, or any endorsement or acceptance of such boundaries.

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