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REGIONAL

**SUPPLEMENTARY FINANCING FOR THE YACYRETA
HYDROELECTRIC PROJECT**

(RG0045)

LOAN PROPOSAL

NOVEMBER 1988

R E G I O N A L

SUPPLEMENTARY FINANCING FOR THE YACYRETA HYDROELECTRIC PROJECT

(RG-0045)

LOAN PROPOSAL

C O N T E N T S

Basic Socioeconomic Data

Loan Proposal

Annex 1

Appendices:

- 1 - Proposed Resolution**
- 2 - Recommendations**
- 3 - The Project (Annex A of the Loan Contract)**
- 4 - Annual Meetings for Evaluating the Electric Subsector**
- 5 - Proposed Resolution (Amendment of Resolution DE-41/84)**
- 6 - Proposed Resolution (Amendment of Resolution DE-42/84)**
- 7 - Proposed Resolution (Amendment of Resolution DE-209/82)**
- 8 - Proposed Resolution (Amendment of Resolution DE-208/82)**
- 9 - Proposed Resolution (Amendment of Resolution DE-210/82)**
- 10 - Proposed Resolution (Amendment of Resolution DE-159/86)**

Basic Socioeconomic Data of Argentina

1. General

Total population (millions of inhabitants. 1987)	31.5
Rural population (%) (1987)	14.7
Land area (thousands of Km2)	2,776.7
Population per Km2	11.3
Birth rate per thousand (%) (1980-85)	24.6
Population growth rate (average 1980-85) (%)	1.6
Death rate per thousand (%) (1980-85)	8.7
Infant mortality rate per thousand (1980-85)	36.2
GDP per capita US\$ 1987 ^{a/}	2,745.0
Life expectancy at birth (1980-85)	69.7
Literacy (1982) (%)	94.2
Official exchange rate (December 1985); (australes/US\$)	0.80
December 1986 (australes/US\$)	1.26
December 1987 (australes/US\$)	3.75
April 1988 (australes/US\$)	6.21
Energy consumption per inhabitant. 1985 (Kwh)	1,245.0
Low income level per inhabitant	
December 1985 (in australes)	765
December 1986 (in australes)	1,423
December 1987 (in australes)	2,415
March 1988 (in australes)	3,385

Economically Active Population (1986):

	<u>Thousands</u>	<u>%</u>
<u>T o t a l</u>	<u>9,989</u>	<u>100.0</u>
Agriculture and fishing	1,289	12.9
Mining	50	0.5
Manufacture	2,138	21.4
Construction	1,079	10.8
Commerce	1,828	18.3
Transportation	499	5.0
Electricity, water and gas	109	1.1
Financial services and others	2,997	30.0

Unemployment and Underemployment Rate

	<u>Unemployment</u>	<u>Underemployment</u>
October 1983	3.9	5.9
October 1984	4.5	5.9
October 1985	5.9	7.4
October 1986	5.2	7.3
October 1987	5.7	8.1

^{a/} US\$ at 1986 prices.

2. Gross Domestic Product a/ (at market prices)	Composition (%)					Real Annual Growth Rate (%)				
	1983	1984	1985	1986	1987	1983	1984	1985	1986	1987 b/
<u>Expenditure of GDP</u>										
GDP	100.0	100.0	100.0	100.0	100.0	2.8	2.6	-4.4	5.4	1.6
Gross domestic investment	14.9	12.0	10.3	11.6	13.3	-10.7	-10.6	-20.0	18.2	16.1
Consumption	79.4	82.9	82.1	83.9	84.2	3.6	6.0	-6.2	7.7	2.0
Exports	14.5	14.0	16.8	14.8	13.6	7.8	-0.7	12.5	-7.0	-6.4
Imports	8.8	8.9	9.2	10.3	11.1	-4.7	6.1	-14.4	17.4	9.3
<u>By Origin c/</u>										
Agriculture	15.3	15.4	15.9	14.6	14.7	1.9	3.6	-1.3	-2.8	1.8
Mining	2.8	2.7	2.7	2.5	2.5	0.2	-0.6	-2.6	-0.5	-1.9
Manufacturing	24.2	24.8	22.6	24.2	23.6	10.8	4.0	-10.3	12.9	-0.6
Construction	4.7	3.6	3.2	3.3	3.7	-13.1	-20.0	-6.7	9.0	14.8
Transportation	11.4	11.6	11.7	11.5	11.5	4.2	4.4	-2.9	3.4	2.2
Commerce	12.8	13.1	14.1	14.5	14.5	2.1	4.6	-8.3	8.7	1.5
Government	10.7	10.7	10.7	10.5	n.a.	0.1	1.9	0.9	0.4	n.a.
Electricity, gas and water	4.3	4.4	4.7	4.8	4.9	8.0	6.5	1.3	7.4	5.4
Financial services	7.7	7.7	7.8	7.9	8.0	-7.0	1.3	-1.2	6.9	2.9
Other services	6.1	6.0	6.7	6.0	16.6 d/	1.2	2.5	1.4	1.5	n.a.

a/ At 1970 constant prices.

b/ Preliminary.

c/ At factor cost.

d/ Includes Government.

n.a. Not available.

Source: Central Bank and Ministry of Economy.

Millions of dollars					
3. <u>External Trade</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987 a/</u>
<u>Exports of Goods (FOB)</u>	<u>7,836</u>	<u>8,107</u>	<u>8,396</u>	<u>6,852</u>	<u>6,356</u>
Beef	338	182	160	226	227
Other meat	92	75	64	60	59
Corn	803	744	766	651	291
Wheat	1,474	923	1,133	329	348
Sorghum	554	451	296	152	66
Oil seeds	364	948	731	647	316
Vegetable oil	517	945	970	645	532
Leather goods	300	331	317	381	410
Wool	145	112	130	122	137
Industrial foods products	1,147	1,141	855	1,168	1,369
Mineral products	372	365	657	184	129
Metalmechanic, machinery and transportation equipment	591	695	1,013	966	959
<u>Imports of Goods (CIF)</u>	<u>4,505</u>	<u>4,584</u>	<u>3,814</u>	<u>4,724</u>	<u>5,800</u>
Consumption goods	208	249	198	286	276
Intermediate goods	3,074	3,224	2,514	3,409	3,916
Capital goods	769	643	648	614	975
Fuel	454	468	454	415	633

a/ Preliminary.

Source: Central Bank.

Millions of Dollars					
4. <u>Balance of Payments</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987 a/</u>
Current account balance	-2,440.5	-2,543.0	-963.6	-2,861.4	-4,702.0
Merchandise balance	3,710.5	3,940.1	4,895.0	2,456.6	558.0
Exports of goods (FOB)	7,833.6	8,072.0	8,419.2	6,847.8	6,196.0
Imports of goods (FOB)	4,123.1	4,131.8	3,524.2	4,391.2	5,638.0
Net services	-6,167.1	-6,484.2	-5,858.5	-5,319.2	-5,252.0
Transfers	16.0	1.0	0.0	1.2	-8.0
Capital account (net)	410.5	2,738.8	2,254.1	1,681.2	1,850.0
Change in net reserves (- = increase)	2,472.6	-143.5	-977.8	874.0	2,209.0

a/ Preliminary.

Source: International Monetary Fund and Central Bank.

Percentage of GDP					
5. <u>Non Financial Public Sector</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987 a/</u>
Current revenues	23.6	22.9	27.5	25.9	24.4
Current expenditures	26.8	25.2	25.4	23.2	-24.4
Current Savings	-3.2	-2.3	2.1	2.7	0.0
Capital expenditures	7.9	6.1	5.6	5.4	6.3
Deficit (-) Surplus (+)	-11.1	-8.4	-3.5	-2.7	-6.3
Domestic financing	n.a.	n.a.	n.a.	n.a.	n.a.

a/ Preliminary.

n.a. Not available

Source: Ministry of Economy.

6. <u>Monetary Survey</u>	<u>Annual Growth Rate</u>				
	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987*</u>
Domestic credit	400.8	565.7	356.1	86.8	151.7 <u>a/</u>
Public (net)	669.8	549.4	389.7	68.1	233.7 <u>a/</u>
Private (net)	345.5	567.2	345.4	93.2	119.5 <u>a/</u>
Money supply (M1)	362.0	546.7	697.9	70.7	106.6 <u>a/</u>

a/ Preliminary. 12 month increase as of June.

Source: International Monetary Fund.

7. <u>Prices (Annual growth rate)</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
GDP deflator	158.2	150.2	100.7	105.6	248.2	349.4	654.9	684.1	78.1	129.4
Consumer prices										
annual average	175.5	159.5	100.8	104.5	164.8	343.8	626.7	672.2	90.1	131.3
(Dec. to Dec.)	169.8	139.7	87.6	131.3	109.7	433.7	688.0	385.4	81.9	174.8
Wholesale prices										
(annual average)	146.0	149.3	75.5	109.6	256.2	360.9	575.1	662.9	63.9	122.9

Source: Central Bank.

8. <u>External Debt</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
<u>Total</u> (billions of US\$)	<u>45.07</u>	<u>46.17</u>	<u>49.33</u>	<u>51.42</u>	<u>54.20</u> a/
Public sector	31.71	35.53	40.87	44.72	n.a.
Private sector	13.36	10.64	8.46	6.70	n.a.
Bilateral institutions	1.34	2.02	0.90	0.59	n.a.
Paris Club, 1982-85	-	-	2.06	2.29	n.a.
Paris Club, 1986	-	-	-	2.24	n.a.
Multilateral institutions	1.72	1.68	2.28	2.89	n.a.
IMF	1.17	1.14	2.29	2.72	n.a.
Bonds holders	4.21	4.31	3.92	3.64	n.a.
Banks	31.87	32.74	33.78	33.70	n.a.
Other creditors	4.76	4.29	4.10	3.35	n.a.
<u>Debt Services</u>					
Total services					
(billions of US\$)	8.56	6.26	8.26	6.18	6.45
Services/exports of					
goods and non					
factor services (%)	91.9	86.0	81.8	72.8	81.3

a/ Non dollar denominated obligations valued at exchange rates as of December 31, 1986.

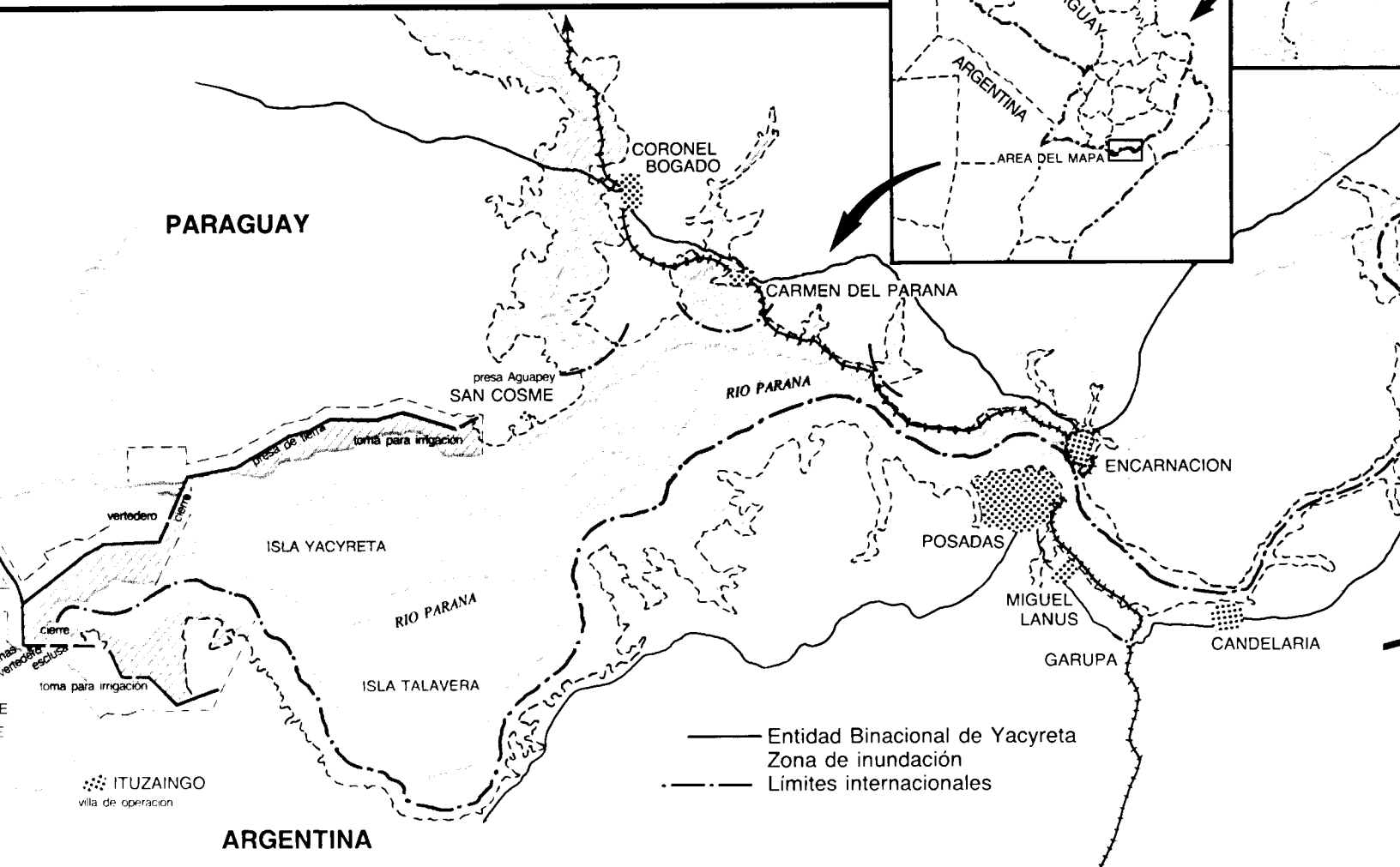
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Source: Central Bank.

9. <u>IDB Loans</u> (Approved through Dec. 31, 1987)	<u>Millions of US\$</u>	<u>% of Total</u>
<u>Total</u>	<u>4,264.5</u>	<u>100.0</u>
Ordinary capital	1,904.1	44.7
Interregional capital	1,791.9	42.0
Fund for Special Operations	519.4	12.2
SPTB	45.9	1.1
Other funds	3.1	0.1
<u>By Sector</u>	<u>4,264.5</u>	<u>100.0</u>
Agriculture and fishing	437.8	10.3
Industry and mining	741.9	17.4
Transportation and communications	418.9	9.8
Energy	1,814.3	42.5
Education, science and technology	283.4	6.6
Housing and urban welfare	163.8	3.8
Health	304.5	7.1
Preinvestment	3.3	0.1
Export financing	96.7	2.3

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BANCO INTERAMERICANO DE DESARROLLO
FINANCIAMIENTO SUPLEMENTARIO AL PROYECTO HIDROELECTRICO YACYRETA
RG-0045



REGIONAL
PROYECTO HIDROELECTRICO YACYRETA
VISTA DE LA CASA DE MAQUINAS Y VERTEDERO
(JULIO 1988)



REGIONAL

Supplementary Financing for the Yacyretá
Hydroelectric Project

(RG-0045)

LOAN PROPOSAL

I. THE PROJECT

A. Purpose and description

- 1.01 The object of the supplementary financing proposed herein is to assist in carrying on with the construction of the Yacyretá Hydroelectric Generating Station that began in 1979 with partial financing from the IDB (loan 346/OC-RG). The power plant will have an installed generating capacity of 2,700 MW and 20,200 GWh of annual average energy generation that will provide for meeting part of the demand for energy in Argentina and Paraguay (although in the foreseeable future, all energy will be purchased by Argentina). Completion of the project constitutes the most economical alternative for supplying electric energy in Argentina.

B. Cost, borrower and executing agency

- 1.02 The estimated cost of the project is US\$5,846.6 million of which about US\$2,640 million had been invested by December 31, 1987, including US\$210 million from the earlier IDB loan and a like amount from the IBRD loan. Proposed financing amounts to US\$250 million, along with a loan in the same amount from the IBRD for the project and US\$2.0 million more for institutional strengthening of the Secretaría de Energía (the total amount of the IBRD loan is US\$252.0 million). The two IDB loans will account for 7.9% of the project cost. The IDB loan will be made to the Yacyretá Binational Agency (50% of the capital stock is Argentine and 50% is Paraguayan) charged with executing the project and will be guaranteed by the Argentine Republic.

C. Terms and conditions of the loan

- 1.03 The loan will be drawn on the ordinary capital of the Bank and disbursed over a period of two years, with a five-year grace period and a 20-year term of amortization. The commitment fee will be 1.25% of the undisbursed amount. There will be a charge of 1% of the loan amount for the IDB Inspection and Supervision Fund; the interest rate will be set annually and revised semiannually for each disbursement (at the time of loan approval, the rate is 7%).

- 1.04 Additional financing for the project is available from export financing agencies and international banks in the total amount of US\$693.4 million and local funds (Argentina) in the amount of US\$3,833.1 million, part of which has been already invested. The financing plan shows a US\$400 million deficit to provide for which officials of the Yacyretá Binational Agency have said they planned to request of the IDB and the IBRD, in the form of additional loans and/or supplementary financing, in the year 1990.
- 1.05 As in the past, the supplementary financing is being processed at the same time as the IBRD loan and actions have been so coordinated as to make the contractual provisions of both loans compatible. The IBRD financing, though it allocates all resources to EBY investment, is part of a strategy for financing investments in the electric energy subsector, of which this would be the first stage. Even though the IDB considers this a specific loan to EBY it too includes sectoral aspects as did the earlier one, as described ahead.

II. CONDITION OF THE ARGENTINE ELECTRIC ENERGY SUBSECTOR

A. Background information

1. Introduction

- 2.01 As mentioned earlier, the Yacyreta Hydroelectric Project is a binational effort of Argentina and Paraguay; nevertheless, the main supplier of financial assets is Argentina and it will be Argentina that, in the foreseeable future will purchase all project-generated energy from the Yacyretá Binational Agency. Even though the proceeds of the lending operation proposed herein will go directly to provide for the facilities of the Yacyretá Hydroelectric Plant, this plant draws on a pool of financial assets (Energy Funds) in common with the other companies in the subsector and will provide a major part of the electric energy supply when it becomes operational. Furthermore, the IDB is now processing disbursements for four lending operations to the following companies: Agua y Energía Eléctrica (AyEE) and Hidroeléctrica Norpatagónica S.A. (HIDRONOR), which together with the Greater Buenos Aires Electric Services (SEGBA), a five-time borrower of the IBRD, are the national companies engaged in the subsector that are dependents of the Department of Energy. These national companies, along with the National Atomic Energy Commission (CNEA) and the Salto Grande Binational Commission (Comisión Técnica Mixta Salto Grande, CTMSG, with Uruguay) control 80% of the installed generating capacity and 64% of the energy distribution. The rest is held by provincial utility companies. Because the national companies are dependent on Energy Funds and Argentina is experiencing financial hardships, it is imperative that there be effective management of the subsector along with improvement of the financial condition of the companies, in addition to ensuring the availability of the funds necessary for completion of projects now in progress.

- 2.02 Hence it was deemed advisable to perform a review of the condition of the subsector in the context of this operation. Even though the conclusion is that the subsector is effectively supplying electric energy, its financial position is quite precarious and its institutional condition is fairly complex. In light of those circumstances it was deemed necessary to improve and enhance the subsector by drawing up a short- and medium-term program of reorganization and recovery. The following sections contain an assessment of the condition of the subsector, the measures which the IBRD as well as the IDB have been requiring, and the actions that must be taken to remedy the situation.

2. Recent developments

- 2.03 Argentina has an ample supply of energy resources, as well as a production structure that has been changing over the last few years to reflect the relative cost and abundance of energy sources. In general terms, the share of hydroelectric energy and natural gas fuel has increased at the expense of a percentage reduction in the use of petroleum, of which there are smaller reserves in relative terms. This trend will continue, and it is estimated that by the middle of the next decade the share of natural gas will increase to 40% and use of liquid hydrocarbons will consequently decline.
- 2.04 Development of the electric energy industry has come up against difficulties in the form of severe financial restrictions brought about by unfavorable economic circumstances in the last decade and, together with a shortage of funds for new investments, the industry has had to cope with low internal cash generation, further restricted by an anti-inflation policy which has precluded much-needed rate increases. Furthermore, the uncertainty of that state of affairs has hindered systematic planning at aggregate level as well as at company level. Emphasis on actions conducive to meeting needs and dealing with specific short-term problems, in a setting of severe financial restrictions, has introduced operating inefficiencies that have further complicated the condition of the companies.

B. Present state of the electric energy subsector

1. Organization

- 2.05 The organization of the electric energy industry is complex and fragmented. Policy guidance for the industry is issued by the Department of Energy of the Ministry of Public Works and Services, which is also in charge of investment planning in the industry and for allocating the revenues of the Energy Funds (described ahead). Some of the companies, like AyEE, HIDRONOR and SEGBA, report to the Department of Energy; among the binational agencies, only the EBY does so, whereas the CTMSG reports to the Ministry of Foreign Affairs. The National Atomic Energy Commission reports directly to the President of the Republic.

- 2.06 There are 20 provincial electric utility companies, some of which have energy generating capacity. They report to the provincial ministries (most of these utility companies were created in 1979 through decentralization of the energy distribution activities of the AyEE, which conveyed the assets but not the associated liabilities). These provincial utility companies are fairly independent of the Department of Energy, which exercises only limited supervision; its chief instrument of control is the allocation of resources from the Energy Funds for new investment. Coordination between the various provincial utility companies and the Department of Energy has improved recently as a result of the reactivation of the Federal Electricity Council, the umbrella organization of these companies.
- 2.07 In addition, there is the Directorate of Public Enterprises (DEP), an organization unit, recently created (1986), of the Ministry of Public Works and Services. It is charged with supervising the management of public utility companies among which are the AyEE, SEGBA, HIDRONOR and EBY. The DEP has set improvement of productivity in all companies as its chief goal and for that purpose it encourages programs of cost control and improvements in administrative efficiency.

2. Energy Funds

- 2.08 The Energy Funds are made up of revenues from taxes on energy use (a 15% surcharge on the selling price), on natural gas (10%), on petroleum products (from 1% to 18%), and on processed crude oil (10%). In 1987 the Energy Funds were managing assets in the amount of US\$752 million. About 30% of all revenues are from electricity use, and about 75% of the assets in the Energy Funds are returned to the subsector, that is, the subsector has its own revenues and receives part of the revenues from taxes on other sources of energy as well. These assets are used to finance mostly investments and some operating expenses of companies in the subsector, particularly the AyEE, HIDRONOR, SEGBA, EBY and Electricidad de Misiones, EMSA (this last-named company is also a borrower from the IDB).
- 2.09 These assets are channeled through the Department of Energy but they are collected by the various companies that render service, such as the AyEE, Yacimientos Petrolíferos Fiscales, YPF (hydrocarbons); SEGBA and the provincial companies, among others. In light of the relatively exposed financial position of some of these withholding agents and because of high inflation, these utility companies tend to delay transfer of assets, with consequent loss of purchasing power and damages to the companies that require the funds for their own funding. This scheme causes inefficiency in the allocation of resources.

3. Rates

- 2.10 As regards setting of rates for the electric service, the system employed is also fragmented, with various national and provincial institutions and organizations empowered to approve changes in rates and levy taxes on consumption. For example, rates are now approved by the DEP, although in actual practice, because of efforts to control inflation, rate increases are set by the Ministry of Economy, which in part uses the need of each company as a criterion and in part the effect the increase will have on the price level. Therefore, there is no coherent policy for setting long-term electric rates and any changes depend for the most part on needs and cyclical short-term prospects. However, the national government's aim has been to keep their real values at constant level, making some recoveries where possible, spaced out over time and among the various classes of consumers.
- 2.11 As regards rate levels, built into the rates charged the consumers are value-added taxes which they must pay into the national treasury (15%) as well as taxes in the provinces (on average 15%, although there is much variation between provinces), as well as a surcharge for the Energy Funds (15%). Including all taxes and surcharges the end user pays on average US\$0.065 per Kwh, near the average marginal cost which is estimated at US\$0.065 to US\$0.075 per Kwh. Even though this state of affairs is arguably valid in the aggregate, it does cause severe distortions for individual companies and consumers, deforming the allocation of resources. As a remedy for this situation, a study of rate structures and levels at marginal cost is in progress (see section D).
- 2.12 From the financial point of view, these rate levels, as will be shown ahead, are not enough for the utility companies, partly because of the low share they receive of what consumers actually pay (about 69% in direct fashion, although on the other hand they receive assets from the Energy Funds). The consumer, however, pays a price which does not include any subsidies, since he also pays taxes. It is not a matter of the rates paid being insufficient, but rather the problem is fiscal in nature.

4. Investment planning

- 2.13 Investment planning in the electric industry subsector is the responsibility of the Department of Energy, which draws up and updates plans every two years, according to an acceptable methodology based on its own demand projections, in contrast with the individual demand of the utility companies. Expansion of generating capacity is determined by means optimization and simulation through mathematical models. The latest plan drawn up by the Department was for 1985-1986; it calls for the completion of generating facilities on which work has already started (the Bahía Blanca thermal-electric generating station, 620 MW; the Piedra del Aguila Hydroelectric Power Station, 1,400 MW; and the Yacyretá Hydroelectric Power Station,

2,700 MW, which would become operational in 1991, 1992 and 1993, respectively) and the addition of hydroelectric and nuclear electric generating capacity. Also included is the completion of the third CNEA nuclear electric generating station named Atucha II (845 MW), scheduled for 1992. However, it is faced with serious financial difficulties which cast some doubt on prospects for its timely entry in service.

- 2.14 However, this expansion program does not constitute the least-cost option, for the parameters are not based on suitable estimates of the economic cost of money nor do they allow for the uncertainty inherent in key parameters; moreover, other elements, which are the product of considerations other than economic efficiency, are incorporated. So, the parameters employed should be revised, particularly the discount rate and the parameters for operation of the thermal-electric alternatives, before devising a plan that may be regarded as a least-cost plan.
- 2.15 However, preliminary estimates done at the request of the banks by the Department of Energy, with a broad range of these parameters, including values that would be acceptable - though they have not yet been agreed to with the national authorities - suggest that the program for 1988-1993 continue to include completion of the works in progress mentioned earlier. Completion of the Bahía Blanca, Piedra del Aguila and Yacyretá electric generating stations is still the optimal decision from the economic point of view. The Yacyretá project is the best option for system expansion over the medium term, if it is compared with the other options.

5. Financial position of the national companies

(a) Recent financial developments

- 2.16 The troubles that have beset the economy in the last several years - acute inflation, ongoing devaluation, real reductions in the mean average rate-schedule charges of companies, owing to government-imposed anti-inflation policy, higher operating costs of the companies and inefficiency in some of them - have led to substantial deterioration in the financial position of the sector. Thus, in 1987 operating revenues of the three companies were insufficient to cover their operating costs. In 1985 and 1986, HIDRONOR continued to yield positive operating results which, on average, amounted to US\$16.5 million equivalent. The flow of operating profit was stable in 1985 and 1986, at US\$20 million equivalent per annum on average; nevertheless, the operating ratio has declined to a point below the level of 1985. At the AyEE and SEGBA, the situation is reversed, for in those two companies operating revenues have not managed to cover operating costs and therefore, during the three-year period 1985-1987, these two companies posted operating losses on the order of US\$883 million. The SEGBA offers the worst scenario, for it posted a US\$297 million operating loss in 1987, that is, its operating revenues covered about 76% of its operating expenses, net of depreciation, over

against 98% in 1986. It is evident that its rate levels stayed well below operating requirements. At the AyEE, coverage of operating expenses, net of depreciation, was 108% in 1987, down from the previous year when the company had covered 116% of operating expenses.

2.17 As a result, companies in the sector posted growing negative returns, the SEGBA showing the worst losses in earning power, which stood at -13.7% in 1987 (-5.3% in 1986), whereas the AyEE posted -2.2% in 1987 (-1.6% in 1986). HIDRONOR posted -0.9% in 1987 (0.9% in 1986). In those circumstances, internal cash generation has been insufficient to cover the debt service, especially in 1987 when there was a deficit on the order of US\$350 million which had to be covered out of national treasury appropriations. The decline in the amount of cash generation has forced the companies to resort to the national treasury to service their debt; to maintain balances outstanding between generating companies and distribution companies for more than 100 days of sales; and to postpone investment plans. The tight financial position was made even worse by a net reduction in the balance of long-term debt, which declined US\$384 million in the last three years; its effect in the last two years, in which foreign loans diminished, became even more significant as a result of the foreign debt renegotiation. Therefore, implementation of the investment programs of the three companies was essentially supported by transfers of assets from the Energy Funds (an estimated US\$460 million in 1988), 30% of the assets of these funds being generated by surcharges on electric rates.

2.18 In terms of capital structure, it is worth noting that the HIDRONOR as well as the SEGBA have maintained quite small long-term debt ratios, mainly the result of a sound asset position and a policy of moderate borrowing, as well as of the injection of assets from the Energy Funds, which are capitalized. The condition of the accounts receivable of those companies has shown that even though the ratio remains high in the case of the AyEE, it has shown substantial improvement in light of the delays reported in the year 1986. Nevertheless, companies in the sector are still facing difficulties in keeping their debts between themselves and with third parties on a current basis.

C. Actions of the two banks in earlier operations

1. Introduction

2.19 Such problems in the electric energy subsector have been the object of attention of the IDB and the IBRD in earlier operations. At the time of approval of the respective lending operation, some of these problems did not appear to be as serious as they are now, whereas in others the actions of the two banks have not yet been completed. This section contains a short description of such actions and the next section describes the joint program to step up action in the context of this operation.

2. IDB actions

- 2.20 When the loan for transmission lines associated with the Piedra del Aguila Hydroelectric Generating Plant, HIDRONOR, S.A. (loan 528/OC-AR) was under consideration at the end of 1986, the current contractual scheme was jointly reviewed by the IDB and the IBRD, and contractual provisions were added to the guarantee contract for the Yacyretá Hydroelectric Plant (loan 346/OC-RG). The need for these amendments was brought about by the financial problems of companies in the sector, as mentioned earlier; deficiencies in the energy planning system, as well as difficulties in the collection of accounts due the Energy Funds. To assist in improving these conditions, a scheme of annual reviews of the financial position of the companies in the sector was established, and the reviews were made in conjunction with the joint missions (with the IBRD) that studied the operation described herein. The conclusion was drawn from these reviews that the actions taken earlier were insufficient to remedy the troublesome position of the subsector and, therefore, a broader and better coordinated attack on the financial problems was needed, one based on concrete actions in the form of rate increases, cost reductions and acquisition of financial assets. That is proposed in the next section.
- 2.21 It may be said of actions to improve the organization and collection of accounts due the Energy Funds that they were only partly successful, in view of the high inflation experienced since then and the worsening of the financial position of the collecting companies. The contract for loan 528/OC-AR calls for action to improve the planning system of the Department of Energy, but such actions are only partial in nature and are only now being implemented. Nevertheless, the measures must be made part of a broader scheme of institutional support for the Department of Energy. Furthermore, it was necessary to draw up a program for implementing administrative programs and procedures at HIDRONOR; this program was submitted recently to the Bank, was found satisfactory, and work is now in progress on it.

3. IBRD actions

- 2.22 In the review of the Yacyretá contract mentioned above, the IBRD included a requirement to undertake a study of the organization of the subsector to ascertain any legal and institutional impediments in the path of its development. The study has not yet been completed, but its early findings are expected to be ready at the beginning of 1989. In an operation approved in 1987 to rationalize the subsector, a requirement was included to complete an assessment of the status of services rendered and of coordination of electric distribution investments in the provincial companies. It also included enhancement of the Department of Energy to improve its investment planning system, particularly standardization of criteria amongst the companies. In a recent lending operation to SEGBA (1988) accomplishment of a program to improve the company's efficiency and reduce its operating losses was required. The study of the levels and structure

of rates at marginal cost is a current requirement in the review of the Yacyretá operation; this study should be completed at the end of 1989. Just like the IDB, the IBRD has witnessed difficulties in the performance of contractual commitments.

4. Conclusion

- 2.23 Even though both Banks have shown concern over the problems, in some cases the action taken has been insufficient in the presence of the ongoing deterioration of the financial position of the subsector and adverse economic conditions; in other cases, it is necessary to repeat or step up efforts already under way. The proposed actions constitute a consolidation of efforts on the part of both Banks, on the basis of the status of implementation, and a consolidation of the follow-up and control machinery.

D. Proposed actions

1. Legal and institutional framework

- 2.24 As mentioned earlier, the legal and institutional framework in which the companies operate is most complex and brings complications that lower efficiency. Even though the problems have been identified, the solutions are not at all obvious. It is recommended that completion of the study undertaken in the framework of the IBRD loan be required. The purpose of that study is to propose a long-term strategy for reviewing the legal and institutional structure of the subsector, the system for collection and allocation of financial assets, the relations with provincial companies, and the needs for enhancement of the institutions. It will include as well specific measures to improve efficiency and control in the management of the Energy Funds and will put forward a methodology for revaluing the assets of the companies and for its implementation. This study must be ready within six months of the effective date of the guarantee contract, and its recommendations will be discussed with the Banks; within twelve months of the effective date of the loan contract, a time schedule for carrying out such actions as may be relevant must be submitted. After that, once a year, at the time of the annual review of the subsector, the results will be examined and necessary action agreed upon (see Recommendations).

2. Rates

- 2.25 In order to provide for more efficient allocation of resources, it is recommended that completion of the study of marginal cost rate structures and levels be made a requirement. The first stage will be completed six months from the effective date of the loan contract and there will be a second stage within twelve months from that date. This study will provide for drawing up a schedule for instituting the findings in a period of three more months, to which the national authorities would commit themselves. For timely fulfillment of the objectives of the study, this schedule should call for the least time

possible. Over the short run, while the findings are implemented, rates will continue to be determined by financial considerations so as to ensure the financial feasibility of the companies. Implementation of the findings of the study will also be subject to control in the annual reviews (see Recommendations).

- 2.26 Of the findings of the studies of legal/institutional matters and rates, changes may emerge in the method of allocating resources received from end users that are now shared by the national government, the provincial governments, and the companies themselves, either directly or indirectly through the Energy Funds.

3. Expansion plan and investment program

- 2.27 The Argentine authorities have concurred in principle on the need to draw up an optimized expansion plan; the prospective loans of both Banks are based, among other things, on a condition: the definition and periodic updating of a least-cost expansion plan. For that purpose agreement has been reached on a 12% discount rate and it has been proposed that an independent technical study of the operating parameters of thermoelectric plants be conducted (see Recommendations), with terms of reference acceptable to both Banks, and submitted no later than six months after the effective date of the loan contract. This will provide for accomplishment of the expansion plan in time for the first annual evaluation review of the subsector. It is worth noting that the definition of the parameters under discussion has no effect on short-term investments in the sector (1988-1991), for it will affect only projects that become operational after 1995. This provides for a detailed review of the plan by officials in the sector (see Recommendations). The loan from the IBRD includes a component of US\$2.0 million for institutional strengthening of the Secretaría de Energía, which is the entity in charge of preparing and coordinating the expansion plan and the investment program.

- 2.28 Under this scheme, the borrower will also agree that the national enterprises will only agree to the start, during the life of the loan contract, of major generating or transmitting works that are in conformity with the least-cost expansion plan and that have adequate financing. The annual evaluation meetings on the subsector will review these aspects (see paragraph 2.39) (see Recommendations).

4. Program for financial recovery of the subsector

(a) Introduction

- 2.29 In order to achieve financial recovery of electric companies controlled by the Department of Energy, the Sectoral Financial Recovery Program (PRF) has been drawn up in conjunction with the Argentine authorities. The program is designed to achieve the following ends: (i) sustained recovery of electric subsector finances and of the companies in particular; (ii) recomposition of

the net operating revenues so as to yield a growing operating ratio (expressed as the percentage of operating revenues left over after payment of operating expenses, net of depreciation, that is, total expenses less depreciation) that allows companies to cover operating expenses over the short term; (iii) a growing percentage of internal cash generation going to investment programs; (iv) execution of an investment program in the sector (AyEE, SEGBA, HIDRONOR, EBY) consisting of a least-cost expansion plan; and (v) increasing the capacity for self-sustained financing of the electric sector and the companies therein, in order to reduce government transfers to the companies and avoid either excessive surpluses or deficits in cash flow.

(b) Actions

- 2.30 Achievement of the aims pursued rests essentially on specific and timely actions by the Argentine authorities, especially in respect of real term adjustments in rates, financial support from the Energy Funds and, over the medium term, from the national treasury as well as effective control over company operating costs. Such actions include: (i) rate increases in the range of 5% to 12% at the AyEE and HIDRONOR, and of 3% to 9% at SEGBA; (ii) Energy Fund allotments which amount to US\$372 million per annum during the five-year period 1988-1992; (iii) financial support from the national treasury for payment of service on the refinanced foreign debt at US\$285 million average per annum from 1988 to 1992; and (iv) lowering of operating costs per kilowatt-hour sold, not including energy purchases, in the range of 15% to 19% for the AyEE and SEGBA, respectively, and of 30% for HIDRONOR; these goals are to be achieved in the projected period from 1988 to 1995. Such actions would be supervised by the Banks at scheduled annual meetings to evaluate and review achievement of goals mutually agreed upon with the Banks in order to achieve the aims of the PRF. In addition, regular progress reports would be supplied on implementation of these measures, the contractual requirements having been established.

(c) Results

(i) Operating ratio

- 2.31 The financial projections of companies in this sector, which show the aims and measures of the PRF, reveal a positive change in the operating ratios of the three companies. Thus, operating revenues would manage to cover operating expenses, net of depreciation as of 1988, over against negative ratios posted by SEGBA in 1987. In addition, the trend would be for projected rate-schedule revenues of the companies to begin to cover all operating expenses, including depreciation, as of 1988 in the case of HIDRONOR, 1989 in the case of SEGBA, and 1991 in the case of AyEE, respectively, as shown in the following table. Recommended in the lending operation herein is the inclusion, as a contractual condition, of operating ratios based on all operating expenses, net of depreciation, that are specified below

(see also Annex A of the guarantee contract). For purposes of illustration, the result of the operating ratio, based on all operating expenses, is shown:

Year	Operating ratios (%)					
	AyEE		SEGBA		HIDRONOR	
	Targets		Targets		Targets	
	a/	b/	a/	b/	a/	b/
1987 (real)	7.3	-21.9	-30.9	-48.5	23.9	-15.4
1988	7.0	-25.0	7.0	-8.0	22.0	15.0
1989	10.0	-21.0	17.0	3.0	47.0	41.0
1990	18.0	-10.0	19.0	5.0	39.0	31.0
1991	25.0	1.0	20.0	7.0	62.0	60.0
1992(& thereafter)	27.0	5.0	23.0	10.0	65.0	62.0

a/ Of all operating costs, net of depreciation.

b/ Of all operating costs.

- 2.32 The projections of results show that after recomposition of company revenues is included in the percentages specified in the foregoing paragraphs, the results are still conducive to negative earnings rates in the first years of the projection, as a consequence of generalized financial deterioration of the companies in recent years and the absence of timely and sufficient corrective measures, especially in rate increases. To achieve the levels of earnings mutually agreed to with the Bank would require over the short term such major increases in operating revenues of the companies as would not be feasible through rate-schedule charges alone (short-term increases on the order of 40% to 70%, in real terms, and increases of 10% to 30% in the next two years), and would generate very large cash surpluses as well. That is why improvement in operating efficiency of the companies is necessary as is restructuring of the rate level and structure and of taxes and fiscal assets included therein and charged the end users. These ends can be achieved only over the medium and long term. Therefore, although in actual practice, it would neither be feasible nor appropriate to attain earnings targets at times agreed to with the Bank. However, the PRF, based on scheduled action, shows that even though it would not be feasible to attain the current earnings levels sustained growth of the financial position of the sector would be achieved and it would be brought into financial equilibrium in order that, over the long term, dependency on treasury allotments may be eliminated.

(ii) Cash generation

- 2.33 The cash flow projection for the companies shows that net internal cash generation, with the addition of assets from the Energy Funds, would provide a growing contribution to the investment program.

Internal cash generation, with the addition of assets returning to the sector from the Electric Funds (through the 15% surcharge on electricity use though they originate in the sector), would each year be contributing to a growing share of the investment program, except for AyEE during 1988 at which time the share would be slightly negative. The proposed aims are specified in the following table (see Annex A of the guarantee contract).

Internal cash generation
Percentage of contribution to the construction program a/

<u>Year</u>	<u>AyEE</u>	<u>SEGBA</u>	<u>HIDRONOR</u>
1988	0	10	10
1989	5	40	10
1990	40	40	40
1991 (and after)	40	40	40

a/ Defined as (Internal Cash Generation + Allotments, Electric Funds-Net Debt Service)/Construction Program.

(iii) Energy Funds and treasury allotments

- 2.34 To cover unfunded financial requirements of the three companies, assets from the Energy Funds will be required in the amounts of US\$463 million in 1988, with an ongoing decline to US\$256 million in 1992. At the EBY requirements are fairly constant at US\$130 to US\$180 million. Estimated assets to be drawn on the national treasury to cover the refinanced debt service of the three companies are fairly uniform, averaging out at US\$285 million per annum in the next five years. The EBY's requirements for service on the foreign debt are growing, starting at US\$124 million and reaching US\$235 million in 1992 (in the case of EBY assets are transferred through lending).
- 2.35 The cash flow projection of the Energy Funds indicates that their projected revenues would be sufficient to defray funding needs of the national electric companies as well as the EBY (no allotments from the Energy Funds will be made for CNEA programs). In addition, the projections show that surpluses would be yielded in 1990 and thereafter.
- 2.36 According to the projection, starting in 1989, balances of assets in the Funds would become available in the amount of US\$408 million equivalent in the period 1989-1991 and in the amount of US\$1,893 million equivalent in 1992-1995, after paying out obligated allotments to EBY and to companies in the sector. In these circumstances,

national treasury allotments to the companies, for refinanced debt servicing, might not be necessary after 1990 and the net effect on public finance would diminish substantially starting in 1990. In the annual reviews of developments in the sector, appropriate measures for using surpluses in the Energy Funds to bring about a reduction of treasury allotments would be analyzed and agreed upon.

(d) Feasibility of the financial recovery program

- 2.37 The analysis establishes that the national electric utility companies will have at their disposal in due course assets from the Energy Funds in the amounts specified in the financial projection, as follows from the cashflow projection of the Energy Funds and the allocation thereof to the companies. Financial support from the government to the companies for service on the refinanced foreign debt has been confirmed by the Ministry of Economy and included in the approved budgets of each one of the companies. In addition, the companies would have the necessary assets to accomplish the investment program, which was drawn up as a least-cost expansion program, thus ensuring effective use of resources. Cash costs of operation, controllable directly by the companies, would decline in terms of costs per kilowatt-hour of energy sold and help to improve the operating ratio and achieve greater efficiency of the companies over the medium and long term.
- 2.38 It is worth noting, in connection with rate schedule increases called for in the PRF, that the Argentine authorities in the first semester of 1988 have been making periodic rate adjustments for each company so as to maintain rates at levels in keeping with the rate of inflation, which in the first semester rose at a cumulative rate of 219.3% (nonagricultural wholesale price index). The rate adjustments show a 5% recovery above this index in the case of SEGBA, whereas shortfalls on the order of 8% at AyEE and of 18% at HIDRONOR were posted. These had to be compensated and provided for through rate adjustments and cost reduction measures in the second semester. Accordingly, during the negotiations over the present operation, a review was performed, in conjunction with the Argentine authorities, of measures that have been taken up to that time and those that would be taken through the end of the period in order to attain the goals specified in the PRF. A system of annual reviews has been established for subsequent periods in order to determine whatever measures may be necessary in each period. Those measures will be accompanied by follow-up reports.

5. Annual meetings

- 2.39 Because of the many actions needed to arrive at a short- and long-term solution to problems in the subsector and of the recent experience of the Banks, it is recommended that the scheme of annual meetings be continued to evaluate the financial position of the companies as well as of other issues that are part of the program of action. Not only will financial issues be examined in the course of

these meetings; the investment program, the progress made in drawing up studies of the legal and institutional framework, rates at marginal cost, implementation of the findings of those studies and actions agreed upon in earlier reviews, will be looked into as well. See Appendix 4 of this proposal for a more detailed description of these meetings. A body of preparatory information will be drawn up and submitted to the Banks before April 30 of each year, in time for the meetings scheduled before May 31. In addition, a progress report on agreements reached at those meetings will be required for submission to the Banks before October 31 each year (see Recommendations and Annex A of the guarantee contract, Appendices 2 and 4 of this proposal).

- 2.40 These reviews will provide for maintaining control not only over the agreements reached in the context of this operation, but will provide as well for keeping up-to-date information to determine the advisability and timing of future operations in the subsector as well as the need for contractual enhancements that may be required in these new operations. The IBRD now has plans for a new lending operation in the subsector by 1990, with a large part of the resources allocated to the Yacyretá Hydroelectric Plant, whereas the IDB is maintaining most active interest in the subsector and might continue to provide financial support.

6. Conclusion

- 2.41 The actions described in the foregoing paragraphs establish the right informational framework for appropriate decision-making in the reorganization of the subsector, a most complex affair in institutional and legal terms. From those studies will emerge actions which will make it possible to proceed with the necessary simplification measures for more efficient operation in the medium term. At the same time, the foundations for setting rates based on marginal costs will be established and work will begin on planning investments in accordance with economic efficiency criteria. In the meantime, in order to remedy the delicate position of companies in the sector, a financial recovery program based on rate increases, cost reductions and acquisition of financial assets (unobtainable through traditional borrowings) is to be implemented. The action program will improve the financial condition of the companies over the short term; over the long term it will provide for laying the foundations for more efficient operation of the subsector.

E. Contractual amendments

1. Introduction

- 2.42 Implementation, control and monitoring of such actions requires the amendment and rewording of existing contracts. Annexes VI-5, VI-6, VI-7 and VI-8 of the project report include the relevant changes, some of which require amendatory resolutions. The proposed resolutions are contained in the loan proposal, Appendices 5 through 10.

2. Proposal

- 2.43 The control scheme proposed herein rests on closer supervision of all actions mentioned earlier, and on financial, legal, institutional and economic actions as well. For that purpose, the scope and flexibility of annual reviews now called for in current contracts should be enlarged. It is worth noting that the electric energy industry is faced with a most adverse economic situation, one wherein the three national companies (two of them are borrowers of the IDB) are not in compliance with the IDB rate-schedule clauses and the prospects for short-term recovery are not at all favorable. Furthermore, the economic setting is surrounded by great uncertainty which precludes the development of fixed long-term strategy measures and must operate in the short run through improvements which, though small, are systematic and continuous.
- 2.44 In view of the powerful financial relationships between companies in the sector and between such companies and the national treasury, the present-day contractual scheme, based on the achievement of fixed individual goals for each company, should be converted into a general scheme that will deal with the sector as a whole and allow for the possibility of making sacrifices in some respects if by doing so others are improved and the final outcome is favorable. Furthermore, in view of the adverse and ever-changing situation, a scheme adaptable to current circumstances is required, which does not mean to say that no concrete measures such as may be applied systematically will be required.
- 2.45 The scheme proposed herein has the following features:
- (a) It is based on broad annual measures of control over developments in the subsector and over the national companies (described earlier).
 - (b) In financial affairs it will reduce as much as possible the number of financial indicators subject to supervision and control and enlarge their definition to make them more general, so that their achievement will be the result of all financial improvement actions undertaken by the company, but without imposing specific decisions for their achievement. Two indicators are proposed for this purpose: (i) the operating ratio, which controls the operating efficiency of the company, the achievement whereof results from decisions on rate-schedule charges and other income and controls over operating costs; and (ii) coverage of the investment program, which controls net cash generation to provide for meeting expansion requirements, the achievement whereof is the result of decisions on financing, liquidity, collection and payment of accounts, operating efficiency and expansion requirements. The large majority of actions needed are under the company's control. Indicators are set upon approval of the operation and are not subject to review during the life of the

contract, except in unusual circumstances. Appendix IV of the loan proposal (Annex A of the guarantee contract) contains the values set for these indicators and their definitions.

- (c) Supplementing the basic scheme described above, each year specific supplementary indicators of the financial position of each company will be established and reviewed, that is, such indicators as liquidity, debt, collection of accounts, operating efficiency, and the like, in order to set spans of action in each one of these areas and avoid extremes in the range of action of the scheme mentioned in (a). These goals will be reviewed each year and adapted to each company and to the prevailing economic circumstances. Initial goals have been agreed to and are set forth in Annex I herein.

3. Rate clauses

- 2.46 It is worth noting, moreover, that the proposed scheme requires the amendment of the rate clauses of current contracts with companies in the sector, that is, the clause that requires coverage of all expenses of administration, operation, maintenance and depreciation and attainment of a reasonable return on investment. The proposed clause would require attainment of a pre-set operating ratio (surplus of revenue over costs) and coverage of part of the investment program through cash generation.
- 2.47 The proposed clause is consistent with IDB policy on public utility rates (GP-65-5 of July 29, 1982), even though in the medium term, some of the companies may not attain the indicators that would be required by the policy and, at least temporarily, must accept lower levels than are desired. The policy requires "... that, as a general rule, tariffs cover the operating and maintenance costs of the services provided, including depreciation of plant in service, take the expansion of services into account..." and allow in the particular case of electric energy projects "... an alternative method to establish a minimum contribution to future investments as a financial condition, that is, to establish that internally generated funds (from tariffs) must equal, after deduction of operating expenses and debt service, a stated percentage of future capital investments...". The policy clause further establishes that "... the financial clause recommended for inclusion in loan contracts should be flexible with respect to the speed at which a public utility is expected to attain the required targets".
- 2.48 The proposal is consistent with the aims of this policy in that increasing goals are included which indicate a trend toward financial self-sufficiency of the companies in the sector and use of the option provided for in the foregoing paragraph in that coverage of the investment program is included as an alternative to reaching an earnings target.

- 2.49 It is worth noting in another connection that these rate-schedule clauses will be supplemented by other financial measures that will constitute support for the trend toward self-sufficiency of companies in the sector, which will also be supported by a program of reviews and annual agreements on measures to be instituted to achieve the proposed aims.
- 2.50 In addition, this scheme of rate-setting would be replaced, over the medium term, by one based on marginal costs, as noted earlier. This scheme would also be consistent with the public utility rate policy which, to that effect, states that "It is recognized that marginal economic costs provide guidance in the formulation of rate structures which are conducive to an efficient allocation of resources".

III. THE PROJECT, COST, FINANCING AND EXECUTION

A. Purposes

- 3.01 The purpose of the project is the construction of a hydroelectric generating station, with 2,700 MW of installed capacity and 20,200 GWh annual average of energy generation, that is part of the least-cost plan for expansion of generating capacity of the national interconnected system and will help to meet anticipated electric energy requirements in Argentina and Paraguay.
- 3.02 In addition, the project will help to improve navigation and provide for an overland link between Argentina and Paraguay, as well as for the development of irrigation, fish culture and tourism.

B. Description

- 3.03 The project is located along the Paraná River, 90 km downstream of the cities of Posadas and Encarnación, and consists of the following facilities:
- (a) A generating station comprising 20 units, rated at 135 MW each, and a step-up substation whence the 220 kv lines to Paraguay and the 500 kv lines to Argentina start.
 - (b) Construction work on a reservoir with a volume of 21,000 Hm³ over an area of 1,700 km², consisting of earthfill dams about 70 km in length, a navigation lock, two spillways and irrigation structures.
 - (c) Housing units for resettlement along both sides of the Paraná River of about 35,000 persons who will be displaced by the filling of the reservoir, and infrastructure facilities.

- (d) Facilities for protection of the basins of the streams on the Paraguayan bank.
- (e) Environmental protection measures which provide within the power station facilities for upstream movement of fish, designation of refuges for wildlife displaced in the flood zone, and cleansing of the reservoir.

C. Cost and financing

1. Cost

- 3.04 The cost estimate shown on the following table, updated to December 1987, amounts to US\$5,846,600,000, of which US\$2,627,500,000 represent investments made by December 31, 1987; the balance of US\$3,219,100,000 is the estimated amount to be invested between 1988 and 1997, the year of project completion.

Investment and financial plan
(in US\$ millions)

	<u>IDB</u>		<u>IBRD</u>		<u>Export</u>	<u>Local</u>	
	<u>346/OC-RG</u>	<u>Proposed</u>	<u>1761/AR</u>	<u>Proposed</u>	<u>credit</u>	<u>counterpart</u>	<u>Total</u>
						<u>funding</u>	
1. ENGINEERING AND ADMINISTRATION	<u>51.5</u>	<u>29.0</u>	<u>40.5</u>	<u>29.2</u>	-	<u>825.5</u>	<u>975.7</u>
1.1 Engineering and management	51.5	29.0	40.5	29.2	-	364.4	
1.2 Administration and overhead expenses	-	-	-	-	-	461.1	
2. DIRECT COST OF CONSTRUCTION	<u>141.5</u>	<u>152.3</u>	<u>169.5</u>	<u>177.2</u>	<u>582.3</u>	<u>2,018.6</u>	<u>3,241.4</u>
2.1 Preliminary works	141.5	-	-	-	-	333.7	
2.2 Civil works and insurance	-	152.3	169.5	177.2	179.5	1,004.1	
2.3 Generating equipment	-	-	-	-	325.9	78.0	
2.4 Electromechanical equipment	-	-	-	-	76.9	141.0	
2.5 Environmental protection	-	-	-	-	-	18.1	
2.6 Indemnity	-	-	-	-	-	133.2	
2.7 Resettlement and relocation	-	-	-	-	-	310.5	
3. FINANCE CHARGES	<u>17.0</u>	<u>42.5</u>	-	<u>40.6</u>	-	<u>1,197.7</u>	<u>1,297.8</u>
3.1 Interest on the loan	-	15.0	-	-	-	50.0	
3.2 Interest on loan 346/OC-RG	14.9	25.0	-	-	-	65.5	
3.3 IDB credit fee	-	-	-	-	-	15.7	
3.4 Inspection and supervision	2.1	2.5	-	-	-	-	
3.5 IBRD interest	-	-	-	40.6	-	162.5	
3.6 Interest on other credit	-	-	-	-	-	904.0	
4. UNALLOCABLE	<u>-</u>	<u>26.2</u>	<u>-</u>	<u>3.0</u>	<u>111.2</u>	<u>191.3</u>	<u>331.7</u>
4.1 Contingencies	-	12.8	-	1.6	21.8	47.8	
4.2 Allowance for escalation	-	13.4	-	1.4	89.4	143.5	
GRAND TOTAL	<u>210.0</u>	<u>250.0</u>	<u>210.0</u>	<u>250.0</u>	<u>693.35 a/</u>	<u>4,233.1 b/</u>	<u>5,846.6 c/</u>
PERCENTAGES	3.6	4.3	3.6	4.3	11.8	72.4	100.0

a/ Includes US\$162,200,000 invested as of December 31, 1987.

b/ Includes US\$2,057,200,000 invested as of December 31, 1987.

c/ Does not include US\$2 billion in interest earned on loans from the Funds and the treasury and hence does constitute a financial requirement during project construction.

- 3.05 Interest and fees payable during the construction period on all foreign loans and on local loans, through the entry into service of the power plant, have been evaluated in the cost of the project. From that time until all generating units are set in operation, which will take place in four years, finance charges allocable to investment are in relation to interest on export credits and therefore will decline according to the number of generating units that become operational each year.
- 3.06 It is worth noting that the finance charges included in the cost of the project do not include interest on Argentine Government loans, which consist of borrowings from the Energy Funds in the amount of US\$2 billion, even though they are part of the assets from a strict accounting standpoint; in actual fact, pursuant to government decrees, they are capitalized during the construction period and therefore do not constitute a cash requirement for EBY.
- 3.07 As soon as the power plant attains its annual average generation, the EBY, drawing on internal cash generation, will meet its operating and maintenance expenses and provide for payment of debt service on other loans and it will use the balance to pay part of the interest on loans from the Funds. The difference will continue to be capitalized and only in 1998 will the full amount of debt assumed with the government start to be amortized.

2. Financing

- 3.08 Financing of project-related investments is shown in the following table:

Investments and sources of financing

(in US\$ millions)

<u>Investments</u>	<u>Up to December 1987</u>	<u>1988 1996</u>	<u>Total</u>
Engineering and administration	705.1	270.6	975.7
Direct cost of construction	1,354.5	1,886.9	3,241.4
Finance charges	567.9	729.9	1,297.8
Unallocable expenses	-	331.7	331.7
TOTAL	2,627.5	3,219.1	5,846.6
<u>Sources</u>			
Loan 346/OC-RG	210.0	-	210.0
IBRD loan (1761-AR)	198.1	11.9	210.0
IDB loan (proposed)	-	250.0	250.0
IBRD loan (proposed)	-	250.0	250.0
Credit to be obtained	-	400.0 ^{a/}	400.0
Export credits	162.2	531.3	693.5
Commercial banks	446.0	-	446.0
Central Bank	39.5	145.0	184.5
Internal cash generation	-	135.0	135.0
Energy Funds	1,202.7	788.4	1,991.1
Capital allotments	56.7	40.0	96.7
Treasury loans	312.3	667.5	979.8
TOTAL	2,627.5	3,219.1	5,846.6

a/ Possible additional loans from the IBRD and the IDB and/or cofinancing.

3.09 Investments in direct costs of construction up to December 1987 represent preliminary facilities such as workers' housing, access roads, machine shops and the main civil works, construction advance whereof was 40% at that time. IDB and IBRD financing in that period concentrated on engineering contracts and civil construction work, contracts for which were awarded on the basis of international competitive bidding.

3.10 A consortium of foreign, Argentine and Paraguayan construction companies, jointly led by Impregilo of Italy and Dumez of France, are engaged in the civil engineering construction work. The engineering services that comprise construction drawings and supervision of construction work are being provided by a consortium headed by Harza Engineering of the U.S.A., with participation of Laymeyer Company of Germany, and Argentine and Paraguayan companies.

- 3.11 It may be said about investments pending that because the IDB loans have been drawn down, the project at this time faces a shortage of US\$900 million in funding of future investments, considering assured sources or predictable sources, among which are export credit and a Central Bank credit line for equipment purchases, the Energy Funds, and EBY internal cash generation once the power station has begun to operate.
- 3.12 In these circumstances, funding of the main civil works and engineering contracts, which were being covered entirely by both Banks up to now, would still be incomplete. Investment in these contracts through the year 1991, after which investments in the contracts would decline substantially, amounts to US\$880 million for which no funding has become available so far. This is the amount which the EBY and the Argentine authorities have requested in the form of additional loans or cofinancing from the IBRD and the IDB; in the foregoing table those loans are specified as new proposed sources. The timing for the two loans from IBRD and IDB, in the amount of US\$250 million each, would be the year 1988, the proceeds whereof would be depleted at the end of 1989 at which time the EBY should arrange for other credit, to be disbursed in 1990 and 1991, in the amount of about US\$400 million to close the gap. After 1991, through completion of the project in the year 1996, these contracts would be financed out of the Energy Funds and out of EBY internal cash generation, inasmuch as pending investments are smaller, the Energy Funds would have assets, and the power station starts significant production in 1994.
- 3.13 In addition to this main contract, there are other sources that have not yet been assured: (i) credit from export agencies and suppliers of equipment for which bids have not yet been invited to cover the foreign exchange cost thereof; and (ii) Argentine Central Bank credits in Argentine currency for that equipment. EBY must demonstrate, in the annual reviews considered for monitoring progress in the industry, that it has been obtaining such funding.

3. Use of IDB loan proceeds

- 3.14 The proposed loan amount is US\$250 million, with a five-year grace period and a 20-year term of amortization. Although it is estimated that the loan would be disbursed in a year and a half, a disbursement term of two years and a schedule for the start of repayment after five years are proposed. These terms are consistent with IDB policy. In that period of time, construction work will continue and funding needs will remain, for only in the year 1994 will EBY have adequate internal cash generation to pay amortization on this additional loan.
- 3.15 The loan is scheduled for disbursement in the years 1988, 1989 and 1990; its proceeds will be applied to partial payment of engineering contracts of the main civil works contracts. Funds would also be used to cover the interest on this loan in that period and the interest on the earlier 346/OC-RG, from the time of approval of the

new loan. The latter use is consistent with the Bank's policy which provides for the financing of interest on earlier IDB loans, provided that both loans are for the same project and are chargeable to the same fund. The share to be applied *pari passu* by the IDB and the IBRD to those loan contracts would be 50% for each bank, in principle. However, the share might vary according to the timing for the eligibility of both loans, any larger share of payment by either bank would be compensated later on.

D. Project execution

1. Status of work advance

- 3.16 As of April 30, 1988, construction work under the main civil works contract may be summarized as follows: (i) construction of the principal structure of the lock has been completed and construction of the approach channels is considerably advanced; (ii) at the dam, work on the bentonite cutoff wall under the dam foundation on the island has been completed, construction work advance on the right side of the river is 40%, and earthwork advance is 26%; (iii) the advance of excavation work on the main spillway is 87%, and the steel-reinforced concrete structures show a 78% advance; (iv) at the Aña-Cuá spillway, excavation work shows advance at 90%; and (v) excavation work of the power station shows 70% advance, while steel-reinforced concrete installed in the various structures accounts for 20% of the total. The weighting of individual work advance means that, as a whole, the civil works construction contract is only 40% complete in respect of the volume currently scheduled.
- 3.17 As for equipment, which is not financed by the Bank, the following contracts were entered into in 1987:
- (a) turbines: Voith (USA), DEW (Canada), and METANAC (Argentina), in the amount of US\$267,200,000;
 - (b) generators (10 units): Japan Consortium, in the amount of US\$82 million;
 - (c) gates: ATB (Italy), CIE (Paraguay) and METANAC (Argentina) in the amount of US\$95,400,000; and
 - (d) equipment for the lock: ATB (Italy), COMETARSA (Argentina), Tecno Elect (Paraguay) and CIE (Paraguay), in the amount of US\$18,500,000.
- 3.18 The remainder of other equipment, the budget for which amounts to US\$158 million, consists of 10 generators and minor equipment such as cranes, equipment for the fish ladder, transformers and control and measuring devices for the power station. Invitations for bids are expected to be held in the year 1988 and in the first few months of 1989.

2. Project completion

- 3.19 Completion of the project was rescheduled so as to adapt investments therein to the liquid assets and funding available for the sector, as well as to the reduction in the rate of growth of demand in the period 1988-1996. The following table shows the investment and disbursement schedule for the various sources of financing.

	(in US\$ millions)					
	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>	<u>1992/96</u>	<u>Total</u>
<u>Investment</u>	562.2	639.0	610.8	491.8	915.3	3,219.1
<u>Sources</u>	562.2	639.0	610.8	491.8	915.3	3,219.1
IDB loan	60.0	180.0	10.0	0.0	0.0	250.0
Other international financing	236.4	175.1	280.1	197.2	304.6	1,193.4
Local funds	265.8	283.9	320.7	294.6	610.7	1,775.7

- 3.20 The following key events in actual project construction, for which a schedule is given in the Annexes, are as follows:

- (a) Diversion of the river: Main branch June 1989
Aña-Cuá branch June 1990
- (b) Filling of the reservoir: November 1992
- (c) First unit to enter service: January 1993
- (d) All units to be in service: January 1997

3. Retroactive financing

- 3.21 Between the disbursement of all the proceeds of loan 346/OC-RG and approval by the Board of Executive Directors of the new loan, an estimated period of nine months will have elapsed, during which payments must be made by EBY through a bridge loan. In view of that circumstance, it is proposed that allowance be made for the proceeds of the new loan to be used to reimburse part of these expenses up to an amount no greater than US\$60 million. This amount will cover 50% of expenses incurred for eligible items in the period March-November 1988; the rest would be retroactive financing corresponding to the IBRD (see Proposed Resolution). It is worth noting that the contractor has been certifying expenses at the rate of US\$13 million a month on average.

4. Advance of funds

- 3.22 It is recommended that an advance of funds in an amount equivalent to 15% of the loan amount be allowed in view of the rate of disbursement mentioned above and in order to provide for payments agreed to with contractors. This advance constitutes about four months of use of the IDB resources (US\$9 million to US\$10 million monthly on average during 1989 and 1990 for each Bank). (See Recommendations). The advance of 15% would only be set up after EBY has provided evidence of achievement of the execution pace mentioned. Until such time, the advance will be 10% of the amount of the loan.

E. Ex post evaluation

- 3.23 In order to assess the results of the project, the borrower shall undertake to submit to the Bank, two ex-post evaluation reports, to cover: (a) the technical, economic and financial aspects, in accordance with a methodology agreed upon in advance with the Bank; and (b) environmental and relocation issues, drawn up according to the methodology and guidelines agreed to with the Bank and set forth in Chapter IV, Appendix 3. To those ends, the guarantor shall supply to the borrower any sectoral information that may be necessary (see Recommendations).
- 3.24 The borrower undertakes to submit, prior to April 30 and October 31 of each year, for as long as the ex post evaluation report referred to in the foregoing paragraph has not been submitted to the Bank, according to the guidelines specified in paragraph 7.01 of Appendix 3, a report assessing the performance of the resettlement and relocation program and the program for environmental protection of the project area. The borrower will undertake to take such corrective measures as may be necessary (see Recommendations).

F. Operation and maintenance

- 3.25 The EBY will be responsible for operating the power station; for that purpose, it will create a suitable organization, for the present-day organization has only the necessary staff and structure for managing and supervising project execution. For that purpose, it is recommended that a provision be set forth in the contract to require the borrower to submit, six months before the entry in service of the power station, a description of the organization it will have at its disposal for operation and maintenance of the plant (see Recommendations).

G. External auditing

- 3.26 The financial statements of the project, during its construction, and the financial statements of the borrower, during the life of the loan contract, shall be submitted to the Bank each year after auditing by a firm of independent public accountants, using procedures satisfactory to the Bank (see Recommendations). EBY has been performing this

contractual provision satisfactorily, and the financial statements have been delivered on time after auditing by a consortium of Argentine-Paraguayan firms.

H. Inspection and supervision

- 3.27 The responsibility for inspection and supervision of the project by the IDB has been vested in the IDB Field Office in Argentina.

I. Resettlement and relocation program

- 3.28 Construction of the project will affect the dwellings of 5,549 urban families and 261 rural families in Argentina, as well as 1,714 urban families and 1,418 rural families in Paraguay. In addition, commercial and industrial establishments, the port and railway stations at Encarnación and Posadas, and numerous community and public facilities will be affected.
- 3.29 Pursuant to the Yacyretá treaty, procedures have been drawn up for resettlement, relocation and indemnization of people in urban and suburban areas, people in rural areas, as well as business, industry and community facilities and services on both sides of the river. The estimated cost of resettlement, relocation and indemnity payments is US\$443,700,000 of which about US\$104,700,000 have been invested.
- 3.30 General program advance is satisfactory and the current time schedule is adequate in relation to the work scheduled between 1988 and 1992. As regards housing, 364 urban dwellings have been built and 1,496 additional dwellings are under construction in Argentina, 359 families have already been resettled, 300 have been paid indemnity, and about 600 families will be resettled in 1988. There are about 900 urban dwellings under construction at Encarnación, where a site has been selected for relocation of commercial facilities. In Paraguay, 40 dwellings in rural areas have been built, and 20 land parcels have been occupied; in addition, appropriation of a tract of land for resettlement of the MBA-PU tribe has been approved, with provisions for preservation of tribal lifestyle, a process which is now being supervised by INDI (Instituto Nacional de Indígenas). Now in progress is a study of alternative solutions for the ceramic industry; selection of a site for the location of the port and railway facilities at Encarnación is now undergoing review. In Argentina, a study is in progress, in conjunction with the government of Misiones province, on possible deferral of construction of the port of Posadas, so as to optimize the use of the port of Encarnación and the new bridge between Posadas and Encarnación.
- 3.31 Because of the complexity of the task and in an effort to resettle the population, while minimizing the costs of adaptation for the affected population, social action programs (PAS) have been drawn up and are being implemented on both sides of the river, for the purpose of informing, supporting and training resettled persons in the

process of adaptation to the new environment. The PAS programs include training in labor matters, public health, resettlement and dwelling adaptation, regularization of documents and benefits as well as social promotion, communication for resettlement, and the like.

J. Environmental impact

1. Introduction

- 3.32 Construction of the Yacyretá project will create a lake upstream of the dam, measuring about 1,720 square kilometers, of which 872 square kilometers are to be flooded and the rest will be part of the present-day river bed. Environmental impact (in addition to population resettlement) has been an object of constant concern for the EBY as well as the IDB and IBRD which at the time of the original analysis of the project and during the supervision of its construction, made numerous recommendations on the subject.
- 3.33 Adverse impacts of the project on the environment may be broken down into those that are inevitable, which consist of the cost that must be paid for the use of hydroelectric potential, and the potential effects that may be subject to control or corrective action by the EBY.
- 3.34 Besides generating electricity, the project will also help improve navigation on the Parana River, making use of the sluice currently under construction. In the future it will provide for the execution of irrigation programs on both banks and tourism development programs in the area.

2. Inevitable adverse environmental impacts

- 3.35 Inevitable adverse impacts comprise: (i) flooding of 249 km of natural pasture, 18.8 km of farm land, 401 km of swamp land, 196 km of forest and shrub with consequent loss of plants and animal species; and (ii) conversion from a running-water ecosystem to a stagnant-water ecosystem and the consequent change in plant and animal communities.

3. Potential adverse environmental impacts

- 3.36 Potential adverse impacts, which may be subject to control of the agency, comprise: (i) erosion along the river bed that is conducive to increasing the deposition of sediment in the reservoir; (ii) eutrophication of the reservoir and contamination of its waters; (iii) increase in waterborne disease; and (iv) extinction of rare animals and prevention of fish migration along the Paraná River. It is important to point out that none of these effects is so great as to produce catastrophic consequences and not be subject to control of the type planned by EBY, as described in the next section. Indeed, the size of the reservoir is very small compared with the flow of the Paraná River and the function of the dam is not to regulate the river

but to produce head for the hydroelectric development. Therefore, water does not remain in the reservoir for very long, nor does it flood tropical forest; problems of water quality are several orders of magnitude less than those experienced in other projects in tropical areas. Likewise, the problem of sedimentation is regarded as negligible compared with the average project of this kind considered by the Bank.

4. Measures to prevent and/or reduce adverse environmental impacts

- 3.37 At the very beginning of the project, the EBY organized an environmental protection unit, charged with coordinating and commissioning a number of studies to establish measures conducive to reducing or preventing adverse environmental impact. This research work yielded points of reference for measuring impacts and the relevant parameters were estimated. The environmental protection unit has drawn up an environmental master plan, which was discussed and approved by the IBRD and the IDB. The environmental protection program bears a cost of US\$55.4 million. Additional studies and commitments became necessary which created the need for the project to conform to the guidelines on environmental impact assessment specified therein and to allow for social and cultural considerations in hydroelectric projects.
- 3.38 The studies and corrective measures in the plan are summarized below:
1. A reforestation program along the shore of the lake to prevent erosion.
 2. Complete studies of the aquatic fauna and fishery potential, and construction of a complete fish culture station upstream of the reservoir. Fish migration studies and construction of a fish ladder at a place adjacent to the dam to facilitate fish migration upstream.
 3. Removal of the biomass in the flood zone in order to prevent problems of eutrophication.
 4. Complete studies of water quality, effluent quality control standards, and standards for construction of waste water treatment plants in the new towns.
 5. Study of waterborne diseases (none have been found so far) and public health programs.
 6. Complete studies of the wildlife and establishment of a wildlife refuge on 8,000 hectares of land. Programs for rescue and removal of wildlife.
 7. Programs for the recovery of archeological assets.

K. Associated transmission facilities

- 3.39 The transmission facilities of the Yacyretá hydroelectric plant were not included in the electric generation project examined in the year 1978, for system configuration at that time had not yet been defined by the AyEE company that was supposed to be the executing agency and owner of these lines and substations on Argentine territory. In order to achieve that definition, the Department of Energy organized an inter-company committee which, with advisory assistance from specialized firms abroad, developed the basic design of the Yacyretá transmission system which consists of joining the power station to the national system by means of 500 kv interconnection lines with the NEA and NOA systems at the Resistencia and Bracho power stations, respectively, and with the Litoral Gran Buenos Aires system, at the Salto Grande station.
- 3.40 The study, which comprises several stages and the preparation of final drawings and documents for inviting bids on this transmission system, is being financed through loans 466/OC-AR and 746/SF-AR made to AyEE. The selection of consultants for the first stage is in progress and should be completed in the last quarter of 1992 in order that the first lines and stations will be ready to operate at the same time as the commissioning of the first Yacyretá generating units at the beginning of 1993.
- 3.41 An examination of the schedule drawn up by AyEE for the studies and construction work shows very tight deadlines which do not allow for delay, for otherwise the schedule for making the plant ready to operate would be compromised. As a result, it is recommended that a clause be included in the contract to require that within six months after the signing of the contracts, the guarantor should submit the schedule for construction of the Yacyretá transmission system, the scheme for funding the investments therein, and the organization for the execution of the project (see Recommendations).

L. Execution agreement

- 3.42 On the occasion of signature of loan contracts 346/OC-RG, on November 6, 1979 an Execution Agreement was signed between the governments of Argentina and Paraguay and the Bank stipulating the obligations on the part of the two governments to permit execution of the project on their territories. Although this Executive Agreement continues to be in force, in granting a new loan it has been deemed necessary that its content be ratified and consequently it is recommended that a similar document be signed (see Recommendations).

IV. JUSTIFICATION OF THE PROJECT

A. Introduction

- 4.01 The project described herein is fully under construction and the results being attained are satisfactory. The companies that are doing the engineering and supervision work on the project as well as those in charge of the civil works have been performing on time and with competence. In addition, the Yacyretá Binational Agency has an organization and staff adequate for the performance of its duties. The Argentine Government, in conjunction with the EBY, is also performing adequately with respect to the acquisition of the financial assets needed to complete the project. In addition to satisfactory execution, it is established further on that completion of the project is economically justified, inasmuch as the environmental impact has been duly ascertained, relevant decisions are being taken, and the resettlement and relocation program is being carried out effectively.
- 4.02 As a source of electricity for the sector, the project constitutes an essential source of supply for Argentina in the mid-1990s inasmuch as its 20,200 GWh of generation would then account for 27% of the the generating requirements of the interconnected system. Completion of the plant has become an even more urgent necessity at the present time, because programs for construction of the Bahía Blanca thermal-electric plant and the Atucha II nuclear electric generating station have been substantially delayed, meaning that the approximate 1,500 MW of capacity of these two power stations will go on line at least one or two years behind schedule.
- 4.03 Therefore, the conclusion may be drawn that completion of the project at the required time is a pressing need, for otherwise the financial recovery program, the achievements whereof have been described earlier, would be only partly effective in bringing the electric energy sector into a sound position, for without the project the risk would be run of having to resort to electricity rationing.

B. Technical evaluation

- 4.04 In general terms, the technical conception of the project two years earlier has remained unchanged during the construction period; however, certain design modifications were introduced which, though they are not relevant, have helped to optimize the project facilities and make them more economical.
- 4.05 The costs of completing the project are highly reliable because of the advance in the construction contracts and the fact that pending invitations for bids are smaller in scope and estimates have been regularly brought up to date. Furthermore, it is interesting to note that the current cost of the project, compared with the original

cost, shows no significant differences except for administration expenses in view of the revised construction term which is longer than the term first scheduled.

- 4.06 The terms for project completion are regarded as realistic, are based on construction schedules agreed to with the contractors and on scheduling of pending contracts and especially on effective planning for resettlement of population and relocation of infrastructure facilities affected by the project.

C. Economic evaluation

1. Introduction

- 4.07 The Yacyretá project is primarily an electric energy generation project; its generating capacity is 2,700 MW, and it will generate 20,200 GWh of energy per annum, half of which is allocable to Paraguay and the rest to Argentina. However, inasmuch as the Paraguayan electric system will not require Yacyretá energy until about the year 2025, it is expected that this energy will be sold to the Argentine system in the first 30 years of project operation.
- 4.08 The project may have the capacity to generate other benefits in the future for Argentina and Paraguay. Among those benefits are flood control, navigation, development of irrigation, fish culture and tourism. The quantity of these potential benefits has not been determined because their realization will depend heavily on decisions to be taken in the future about additional investments required. These investments are now simply notions, or in the best of cases, are at the technical prefeasibility stage, in the case of Paraguay as well as of Argentina. For example, irrigation of 102,000 hectares on the Argentine side and 108,000 hectares on the Paraguayan side - both areas are potential producers of rice, soybeans, vegetables, cotton and pasture grass - are at the prefeasibility study stage. An increase in waterborne traffic might result from the increase in farm output in the area, especially in Paraguay, and that increase would be feasible owing to the improvement of conditions for navigation provided by the project. However, at the present stage of studies, the economic feasibility of these agriculture development projects has not yet been tested, and time and additional studies will be required for the projects to mature.
- 4.09 Therefore, the economic evaluation of the Yacyretá project has concentrated on the analysis of those aspects that might affect the decision either to carry on or not to carry on with its construction. For that purpose, on one hand, the role of the project in the program for expansion of electric energy generation in Argentina has been reviewed and the cost saving that completion of the project would bring about, in respect of other generating alternatives, has been estimated. Furthermore, a cost-benefit analysis of the project has been done from the standpoint of the whole region. The analysis shows that completion of the project will yield net benefits to the region and to each country involved.

2. Results

- 4.10 The results show that, compared with the second best generating alternative to meet Argentine electric system requirements over the medium term (between 1993 and 1994), project completion will yield a saving of at least US\$89.7 million (at January 1988 present value) and may amount to as much as US\$146.8 million for Argentina, using a reasonable range of economic cost of natural gas. For the region as a whole, the net saving is at least US\$423 million owing to the fact that US\$362.6 million out of the total cost for Argentina consist of transfers to Paraguay as compensation for land flooded and payment for energy purchases.
- 4.11 Furthermore, the cost-benefit analysis concludes that the value of the additional energy delivered by the project to the system, plus the cost of thermal electric energy replaced, represent benefits that are greater than the avoidable costs of generation, transmission and associated distribution. Hence, completion of the project for both countries represents a net present value (at 12% discount rate) of US\$1,394,700,000 with a 19.5% internal rate of return. Because of transfers to Paraguay, the net present value for Argentina is US\$1,031,900,000, with an internal rate of return of 17.2%. As stated, the net present value for Paraguay is US\$362,800,000. Of the total net benefits of completing the project, 26% will accrue to Paraguay and 74% to Argentina.
- 4.12 If the project costs from its inception are taken into account, including investments made between 1978 and 1987, the net present value for the two countries and for Argentina is negative at US\$2,304,800,000 and US\$1,869,300,000, respectively. The resulting internal rates of return in this case are 7.8% and 8.5%, respectively. However, for Paraguay, because the investment costs have been incurred by Argentina, the discounted net present value is US\$435,500,000.

3. Uncertainty in the economic evaluation of the project

- 4.13 Owing to the status of project execution and the parameters used, the results achieved are conservative in that possible errors in estimating the economic return on the project would more likely be in the direction of undervaluation than of overvaluation.
- 4.14 The project is in an advanced stage of construction, and a large share of the work has already been contracted for. Therefore, the risk of cost overruns is small. On the other hand, the costs of not finishing the project do not include the cost of indemnity in the case of suspended contracts, amounts that might be considerable.
- 4.15 The principal risk on the side of benefits would be: (a) that demand will grow more slowly than predicted; (b) that the rate level, and therefore the marginal value of energy, will be less than assumed in the analysis.

- 4.16 In order to assess the effect of changes in these variables on the economic profitability of the project, a sensitivity analysis was made: (a) at increases of 10% in investment costs; (b) at a 6% to 5% per annum decline in the rate of growth in consumption; (c) at a US\$0.075/Kwh to US\$0.07/Kwh additional decline in the marginal mean rate; and (d) at 20% lower fuel prices. Results show that in all cases rates of return greater than 14.5% are obtained and overall net benefits, as well as those for each country, are still positive.
- 4.17 Finally, a determination was made about whether the project is actually required by the year 1993 or might be deferred at least one more year. Because deferred investments that can be made without incurring cost overruns are only a small part of the total (less than 10% of the total cost), the optimal date is 1993 and no additional delay is warranted. Only if demand in the national interconnected system should grow at a rate equal to or less than 5% per annum between 1988 and 1995, would a delay of one year in the project (rescheduled for 1994) be warranted. However that would depend on the indemnity payable by agreement with contractors for delaying their construction programs, an amount that might be substantial.
- 4.18 It is noteworthy that net benefits to Paraguay are not subject to the same measure of uncertainty as for Argentina. In fact, because these were set forth in the Yacyretá Treaty on the basis of variables which do not depend on the benefit Argentina may obtain from the project, Paraguay faces no risks.

4. Distribution effect

- 4.19 Benefits for the low-income population have been estimated from a regional point of view, including benefits accrued to unskilled labor in Paraguay and Argentina and to such energy users as may be included in the low-income population of Argentina.
- 4.20 The results show that of the US\$524.6 million (in present value) that accrue to the private sector, US\$90.4 million are for overpayment of unskilled labor in both countries, and US\$74.4 million are incremental use by the low-income population. Hence, 31.4% of total benefits accruing to the private sector are received by the low-income population.

D. Financial and institutional evaluation of the project

1. Institutional feasibility

- 4.21 From the administrative and financial standpoints, the organization of the EBY is considered to be adequate, and its systems and procedures for financial planning, auditing, internal control, and records-keeping of its operations are acceptable. The company has been engaged in supervising and exercising control over execution of the project in satisfactory fashion and it has an effective organization to proceed with the work it has been performing. The company

also has an adequate system for short- and long-term financial planning which enables it to constantly bring up to date and exercise control over the total cost of the project as well as the sources of funding.

- 4.22 The company would have to shape its organization and personnel structure to suit the needs that will emerge as soon as the power station becomes operational, which is scheduled for the year 1993. It would also be necessary that it define the scope and type of risks covered by its current insurance policies once the power station is operating. To those ends, in the operation under consideration, contractual requirements have been established in order that before the power station starts to operate, the necessary measures, to the satisfaction of the Bank, will be taken in those respects (see Recommendations).

2. Financial feasibility of the project

- 4.23 The examinations support the conclusion that the assets to be lent to EBY from the Fund for Major Electric Works (FONGOE) and the Chocón Cerros Colorados-Alicopa Fund would be available in the amount and at the time estimated in the project financing scheme. Service on the EBY refinanced foreign debt would be covered by the Argentine national treasury through loans to EBY. The timely supply of these assets is the only significant uncertainty in the project financing plan; however, the importance of the project is such that the Argentine Government is expected to do whatever may be necessary to provide or obtain such funds.
- 4.24 It is further estimated that EBY will be in a position to obtain the additional financial assets called for in the Project Financing Plan, which would include: (i) credit in the amount of US\$400 million which the government intends to request of the IDB and the IBRD and which would be needed between 1990 and 1991; (ii) credit from export finance agencies and suppliers for 85% of goods to be procured, estimated at US\$91 million, for which no loans have yet been finalized; and (iii) unfinalized credit from local banks in the amount of US\$44 million, for which the Central Bank has established the corresponding rediscount lines.

E. Environmental impact

- 4.25 The environmental protection programs drawn up by the EBY are satisfactory and were developed in close cooperation with the IBRD and the IDB. The studies included in the Environmental Master Plan must be completed in accordance with a schedule agreed upon in advance with the Bank and the results must be submitted to the Bank for its consideration. It is therefore recommended that a detailed follow-up of progress in implementing the master plan be carried out through semiannual reports, which the agency would submit to the Bank, on the resettlement and relocation program (see Recommendations). In addition, in order to establish the guidelines and

criteria for other investments in the subsector, it is recommended that the regulations aimed at establishing the environmental protection guidelines now being drawn up, and applicable to the works in thermoelectric plants (that in regard to the hydroelectric plants is already available) be completed no more than eighteen months after the effective date of the loan contract (see Recommendations).

F. General evaluation of the resettlement and relocation program

1. Introduction

- 4.26 In general terms, the Resettlement and Relocation Program is well structured, has skilled personnel, has established and maintained effective communication and coordination with regional authorities and supporting organization on both sides of the river. However, several IDB missions found the need to add to the staff in charge of the program as the pace of construction work on the program steps up in comparison with the pace maintained until 1987. Associated with this there are some aspects as yet undefined on both sides of the river; in Argentina, a decision from EBY and the government of the province is pending on treatment of squatters dwellings (intrusos) in the affected areas; in Paraguay, identification of final solutions for the ceramic industry and for location of the railway and port facilities, which should be part of the Encarnación Master Plan, are required as is the establishment of a formal mechanism for reassessment of the affected population. Finally, on both sides of the river, implementation of an integrated scheme for monitoring the resettlement and relocation process is pending.

2. Recommendations

- 4.27 Therefore, in order to ensure effective and timely operation of the resettlement and relocation process, it is recommended that the Bank exercise semiannual supervision of that program and that the borrower be required to take the following actions (see Recommendations):
- (a) Present an analysis and dimensioning of the problem of the families not included in the original census and the measures being taken to prevent proliferation of problems, prior to April 30, 1989. The solutions considered must be presented before April 30, 1991 and the solution adopted before October 31, 1991.
 - (b) Every six months there will be: (i) an evaluation of the progress achieved in the implementation of the actions aimed at relocation, as well as the presentation of evidence that the necessary steps have been taken to ensure that the opinions of the affected population have been appropriately taken into consideration; (ii) a determination of the professional and support staff needs to strengthen the Social Action Programs on each bank, based on the number of families relocated and in the process of being relocated, for the urban as well as rural area; and (iii) the submission of the program for hiring and training personnel.

- (c) Complete the design of the system for monitoring, evaluation and control on both sides of the river and submit, to the satisfaction of the Bank, annual progress reports describing the partial results of the population resettlement program in its physical and social dimensions. To that end, single coordinated system for compiling information in all areas of the resettlement program will be designed.
- (d) To define, in conjunction with the relevant authorities, the Encarnación Master Plan. For that purpose, it shall: (i) complete the study of alternative solutions for the ceramic industry (pot-makers) on the right side of the river; (ii) complete the feasibility study for protection of the "recovery area" on the right bank of the river; and (iii) submit to the satisfaction of the Bank, the Encarnación Master Plan, with a time schedule of installation and the costs thereof, these steps must be completed before October 31, 1989.
- (e) To bring up to date, data on the population to be affected on the right side of the river, in urban as well in rural areas, before October 31, 1989, and to design as part of the follow-up, evaluation and control system, a method to provide for regular updating of figures for both sides of the river.

V. RECOMMENDATIONS

- 5.01 For the reasons set forth above, the project is considered to be feasible from the technical, environmental, institutional, financial, economic and legal points of view. Therefore, approval of the loan is recommended, for which purpose the following normative documents are submitted to the Board of Executive Directors for consideration:
 - Proposed Resolution (OC)
 - Recommendations
 - Description of the Project (Annex A of the loan contract)
 - Indicators and Definitions (Annex A of the guarantee contract)
- 5.02 In addition, approval is recommended of: (a) the amendment of the chapters containing the Recommendations and Annex A corresponding to loans 466/OC-AR, 746/SF-AR, 114/IC-AR, 430/OC-AR, 704/SF-AR and 528/OC-AR described in Annexes VI-5 to VI-8 of the Project Report; and (b) the relevant proposed amendments of Resolutions DE-41/84, DE-42/84, DE-209/82, DE-208/82, DE-210/82 and DE-159/86 which are shown as Appendixes 5 to 10 herein.

Leading performance indicatorsNational electric sector companies

	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>
<u>AGUA Y ENERGIA ELECTRICA</u>					
1. Debt service coverage - net (times)	0.1	0.2	1.2	1.6	2.1
2. Debt ratio (%)	49.5	46.3	44.3	42.2	40.2
3. Collection period (days)	145.4	85.2	73.9	71.9	70.2
4. Payment period - electricity (days)	210.0	150.0	110.0	60.0	60.0
5. Current ratio (times)	1.0	0.7	0.7	0.8	0.8
6. Earning power (%)	-2.3	-2.0	-1.1	0.1	0.7
7. Energy fund allotments (US\$ millions)	171.1	252.4	211.3	186.6	204.6
8. Contributions to electricity funds (millions US\$)	93.6	168.8	176.1	186.6	69.2
9. Payment of debt service by government (US\$ millions)	214.8	190.8	189.9	197.2	195.9
<u>HIDRONOR</u>					
1. Debt service coverage - net (times)	0.2	0.5	0.3	1.0	1.1
2. Debt ratio (%)	35.9	35.8	35.6	32.7	28.8
3. Collection period (days)	89.8	90.0	90.0	90.0	90.0
4. Payment period - electricity (days)	n/a	n/a	n/a	n/a	n/a
5. Current ratio (times)	0.3	0.3	0.2	0.4	0.4
6. Earning power (%)	0.6	2.1	1.4	5.4	5.8
7. Energy fund allotments (US\$ millions)	206.8	155.7	163.8	115.0	42.8
8. Contributions to electricity funds (millions US\$)	91.0	86.4	102.4	103.4	22.6
9. Payment of debt service by government (US\$ millions)	14.3	45.7	41.4	43.4	38.3
<u>SEGBA</u>					
1. Debt service coverage - net (times)	1.2	5.8	5.7	3.2	3.2
2. Debt ratio (%)	29.5	30.4	33.0	35.8	35.4
3. Collection period (days)	61.6	57.3	56.7	51.1	51.1
4. Payment period - electricity (days)	178.0	91.0	61.0	61.0	61.0
5. Current ratio (times)	0.6	0.8	0.9	0.7	0.7
6. Earning power (%)	-2.6	1.2	2.0	3.0	4.0
7. Energy fund allotments (US\$ millions)	84.5	44.7	13.3	-	9.0
8. Contributions to electricity funds (millions US\$)	-	-	-	-	-
9. Payment of debt service by government (US\$ millions)	52.8	58.2	58.7	26.0	58.1

PROPOSED RESOLUTION 1/

REGIONAL. LOAN /OC-RG TO THE ENTIDAD BINACIONAL YACYRETA (EBY)
(Supplementary Financing for the Yacyretá
Hydroelectric Project)

The Board of Executive Directors

RESOLVES:

That the President of the Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Bank, to enter into such contract or contracts as may be necessary with the Entidad Binacional Yacyretá (EBY), as borrower, and the República Argentina, as guarantor, for the purpose of granting the former a loan to cooperate in the execution of the Yacyretá Hydroelectric Project. This financing shall be subject substantially to the following conditions:

1. Amount and Currencies: Up to US\$250,000,000, or the equivalent in other currencies (except those of Paraguay and of Argentina) which are part of the ordinary capital resources of the Bank, to pay for goods and services acquired through international competition in the member countries of the Bank and for such other purposes as may be specified in the loan contract. Payments of amortization and interest shall be made in the currency or currencies specified by the Bank, in a quantity equivalent to the corresponding amount owed, calculated in units of account in terms of dollars of the United States of America, in accordance with provisions to be included in the loan contract.
2. Source of Funds: The ordinary capital resources of the Bank.
3. Guarantee: Joint and several guarantee of the República Argentina.
4. Credit Fee: 1-1/4% per annum on the undisbursed portion of the financing, commencing to accrue 60 days after the date of the contract and payable in dollars of the United States of America on the same dates as the interest.

1/ The provisions set forth in this Appendix 1 and in Appendices 2 through 10 shall only become final when the Board of Executive Directors has approved the loan proposal.

5. Amortization: The borrower shall amortize the loan in a period of 20 years from the date of the contract by means of semiannual, consecutive and, insofar as possible, equal installments. The first installment shall be paid 42 months after the date scheduled for the last disbursement of the financing. The Bank may credit the amortization installments proportionally to the outstanding balance of each of the portions of the loan which accrues different rates of interest.
6. Interest: The borrower shall pay interest semiannually on the outstanding balance of the loan. The first payment shall be made six months after the date of the loan contract. During the disbursement period, the Bank: (a) shall determine the rate of interest to be applied as of the first day of each January and for the life of the loan to any amount disbursed during the ensuing year; and (b) may modify the interest rate, in accordance with the policy of the Bank, to be applied to disbursements of the loan made during the second half of the year. At the request of the borrower, the resources of the financing may be used to pay interest of this loan, and interest of loan 346/OC-RG incurred after the date of this resolution, during the disbursement period of this financing.
7. Disbursement: The term for disbursement of the financing shall expire two years after the effective date of the contract.
8. Special Conditions:
 - (a) The resources of the loan shall be utilized in their entirety by the borrower. If modifications in the legal provisions or the basic regulations concerning the borrower, or in the Yacyretá Treaty or in any of its side letters, are approved which, in the opinion of the Bank, may substantially affect the Project, the Bank shall have the right to require the borrower to provide explanatory and detailed information in order to determine whether such modification or modifications may have an adverse impact on the execution of the Project. Only after hearing the borrower and assessing its information and clarifications, may the Bank take such measures as it deems appropriate in accordance with provisions to be set forth in the loan and the guarantee contracts.
 - (b) The resources of the loan, together with the resources of Loan 346/OC-RG, shall be used to participate in the execution of a project estimated at the equivalent of US\$5,846,600,000. Consequently, the loan and the guarantee contracts shall contain such provisions as the Bank deems appropriate to ensure that such national resources as may be necessary, in addition to the two Bank loans, for the complete execution of the Project shall be duly provided, in an amount estimated at the equivalent of US\$5,386,600,000, in accordance with a schedule of investments satisfactory to the Bank. The last-named amount may include a further loan of up to the equivalent of US\$250,000,000 to the

República Argentina from the International Bank for Reconstruction and Development (IBRD) as well as credit from other sources.

- (c) Prior to the first disbursement of the financing the borrower shall present, to the satisfaction of the Bank, evidence that the guarantor has entered into the loan agreement with the IBRD referred to in paragraph (b) above.
- (d) Up to the equivalent of US\$60,000,000 of the resources of the financing may be utilized to cover expenses incurred by the borrower in the Project before the date of this resolution but after March 1, 1988, provided that requirements substantially similar to those set forth in this resolution and in the loan contract have been fulfilled.
- (e) Six months before the scheduled date for the placing in service of the Project's power house, the borrower shall submit, to the satisfaction of the Bank, the program for establishing the cost of the service provided for in Annex C, Chapter III, of the Yacyretá Treaty, covering the following aspects:
 - (i) the amount necessary for payment to the parties that make up Yacyretá of a dividend of 12% per annum on their participation in the paid-in capital;
 - (ii) the amount necessary for servicing the debt;
 - (iii) the amount required to pay Agua y Energía Eléctrica ("AyEE"), of Argentina, and the Administración Nacional de Electricidad ("ANDE"), of Paraguay, in equal sums, as restitution for their total expenditures relating to Yacyretá;
 - (iv) the amount necessary for payment of full compensation on account of flooded land;
 - (v) the amount necessary for payment of the compensation called for in the Yacyretá Treaty which shall be charged to the national companies that are receiving energy which otherwise would be destined for the other country;
 - (vi) the amount necessary to cover operating costs; and
 - (vii) the amount of the balance, either positive or negative, of the operating statement for the prior fiscal year.
- (f) In the acquisition of machinery, equipment and other materials for the Project, and in the awarding of construction contracts financed either in whole or in part:

- (i) with resources of the loan, the system of international public bidding shall be followed in each case in which the value of such acquisitions or contracts exceeds the equivalent of US\$200,000. Bidding for such contracts shall be subject to procedures to be set forth as an annex to the loan contract;
 - (ii) with local counterpart funds, procedures acceptable to the Bank shall be followed; and
 - (iii) with funds from suppliers' credit, purchasers' credit and any external resources other than funds from the Bank and the IBRD loans, the borrower shall, at the request of the Bank, demonstrate that the purchase price agreed upon or paid for the goods as well as the financial conditions established for the credits, are reasonable, and that the quality of the goods is consistent with the technical requirements of the Project.
- (g) If during the period of the Project's execution, resources provided from the Fondo Chocón-Cerros Colorados and the Fondo Nacional de Grandes Obras Eléctricas are insufficient, in respect of the amounts set forth in the financing plan, the guarantor shall commit itself to grant or facilitate the granting of the necessary additional credits on such terms and conditions as are compatible with that plan.
- (h) The Bank shall establish such inspection procedures as it deems necessary to assure the satisfactory execution of the Project, and the borrower, the guarantor and the Republic of Paraguay shall extend all cooperation which is required for the most effective accomplishment of this purpose. From the amount of the financing the sum of US\$2,500,000 shall be allocated for credit to the general accounts of the Bank to meet expenses of general inspection and supervision.

RECOMMENDATIONS

- A. It is recommended that the following conditions, to be fulfilled to the satisfaction of the Bank, be included in the loan and/or guarantee contracts, as appropriate, in addition to the conditions set forth in the proposed resolution (Appendix 1):
1. Unless the Bank shall otherwise agree, before each public call for bids the borrower shall submit:
 - (a) the plans, specifications and other documents necessary for such call; and
 - (b) in the case of construction works, evidence that the lands required for the execution of the works are situated in areas demarcated in accordance with Article XVII of the Yacyretá Treaty. Prior to the awarding of the contracts, the borrower shall present evidence that it is in possession of the lands or is able to take such possession immediately.
 2. The guarantor shall take the appropriate measures to ensure that revenues from tariffs of the national electric energy companies (HIDRONOR S.A. Hidroeléctrica Norpatagónica Sociedad Anónima, Agua y Energía Eléctrica, Sociedad de Estado (AyEE) and Servicios Eléctricos del Gran Buenos Aires, S.A. (SEGBA)) shall cover all operating expenses, not including depreciation, and generate a surplus to cover either all or part of the other expenses, which include depreciation and other financial obligations of the respective company. In addition, revenues from tariffs by the respective company, after providing for its operating expenses and the net service on its debt, shall internally generate sufficient cash so as to cover a reasonable proportion of the investment program. If such tariffs should fail to generate sufficient revenue to cover all financial obligations of the respective company, the company and the guarantor shall take such measures as may be necessary, which may include an increase in the rates, to meet such financial obligations.
 3. The guarantor agrees to: (a) complete and submit the "Study of Levels and Structure of Tariffs at Marginal Cost: High Tension", within a period of 6 months after the effective date of the guarantee contract; (b) submit a plan, along with a time schedule, with the appropriate actions that shall be executed to achieve the recommendations agreed upon by the parties, issuing from said study, within 9 months after the effective date of the guarantee contract; (c) complete and submit the "Study of Levels and Structure of Tariffs at Marginal Cost: Low Tension", within a period of 12 months after the effective date of the guarantee contract; and (d) submit a plan, along with a time schedule, to achieve the recommendations agreed

upon by the parties, issuing from said study, within 15 months after the effective date of the guarantee contract.

4. Within 6 months after the effective date of the guarantee contract, the guarantor agrees to submit a "Study of the Legal and Institutional Framework of the Electric Subsector", the object whereof shall be to identify the main legal and institutional constraints on the normal operation of the electric subsector and to define a long-term policy for their solution. The study shall be drawn up in accordance with the terms of reference and a time schedule approved in advance by the Bank. Furthermore, the study shall: (a) examine the factors that by virtue of revenue shortfalls prevent the national companies from achieving their financial objectives; (b) establish a methodology, designed for periodic use, for asset revaluation of the companies; and (c) analyze the status of management and revenues of the Energy Funds.
5. Within 12 months after the effective date of the guarantee contract, the guarantor agrees to submit a plan, along with a time schedule, with the appropriate actions that shall be executed to achieve the recommendations agreed upon by the parties, issuing from the study referred to in paragraph 4 herein.
6. Before May 31 of each year, and during a period of 10 years after the effective date of the guarantee contract, the guarantor and/or each of the national electric energy companies, on the one hand, and the Bank, on the other hand, shall hold annual meetings intended to evaluate the financial and institutional evolution of the electric subsector and of the respective company, pursuant to paragraph I, Appendix 4. The guarantor and/or the respective company shall see to it that actions are carried out and the targets agreed to at the meetings are met. If the evaluation should determine that the agreements are not being carried out or the financial and operating indicators established for each company in paragraph II of Appendix 4 are not being attained, the guarantor and/or the respective company shall take such measures as may be necessary to achieve that purpose.
7. In order to accomplish the evaluation referred to in the foregoing paragraph, the guarantor shall submit annually:
 - (a) before April 30, a report for the preceding year containing the information referred to in paragraph 1.05 of Appendix 4; and
 - (b) before October 31, a report describing the progress made in that year in the implementation of the actions called for in the plans referred to in paragraph 3 and 5 herein.
8. As from the next calendar year after the start of energy sales, the borrower agrees, during the life of the loan contract, to take appropriate actions to ensure that the balance of accounts receivable outstanding at the end of each semester do not exceed the equivalent of 60 days of the average sales over the 12 preceding months.

9. The guarantor agrees to adjust, during the life of the guarantee contract, the investment program of the electric energy subsector based on the least cost expansion plan, updated annually and drawn up on the basis of parameters previously agreed upon with the Bank.
10. The guarantor agrees that during the life of the guarantee contract the national electric energy companies shall only agree to start major generating or transmission works that are in accordance with the least cost expansion plan and have appropriate financing. The parties may agree to modify the least cost expansion plan during the annual evaluation referred to in paragraph 6, or in any other opportunity that the parties agree upon.
11. The guarantor agrees to submit: (a) within six months after the effective date of the guarantee contract, the results of the "Study of the Operating Parameters of Thermo-Electric Plants" to be considered in the least cost expansion plan referred to in paragraph 9; and (b) within twelve months after the effective date of the guarantee contract, the results of the "Economic Study for the Rehabilitation of Thermo-Electric Plants."
12. The guarantor agrees during the life of the guarantee contract:
 - (a) to take such measures as may be necessary to ensure that the rates charged on the sale of electric energy from the National Atomic Energy Commission (CNEA) do not exceed the greater value of the other supply sources of the National Interconnected System (SIN); and
 - (b) that resources of the Energy Funds shall only be allocated to the CNEA to finance its financial requirements, once all financial requirements of the other companies in the sector are being adequately covered.
13. The borrower shall submit to the Bank, six months before the scheduled date for generation start-up of the power-plant, its organization chart, organization manual, schedule for hiring personnel to fill required positions, and the insurance program for the operative stage.
14. The borrower agrees to submit, prior to April 30 and October 31 of each year, and until the ex post evaluation report on environmental and relocation issues referred to in paragraph 18 herein is submitted to the Bank, based on the guidelines specified in paragraph 7.01 of Appendix 3, reports assessing the performance of the relocation and environmental protection programs within the Project's area, agreeing to take such corrective measures as may be appropriate.
15. The guarantor agrees to complete and submit, no more than eighteen months after the effective date of the guarantee contract, the standards for establishing a framework for environmental protection in the execution of new works relating to the thermo-electric energy subsector.

16. The guarantor agrees to submit, no more than six months after the effective date of the guarantee contract, the execution plan (including the organization it shall have for the execution), along with the financing scheme for the first stage of the Transmission System of the Yacyretá Hydroelectric Power Plant, whose operation is scheduled for the beginning of 1993.
 17. The borrower agrees:
 - (a) that the works, equipment and facilities included in the Project shall be managed and maintained according to generally accepted technical standards; and
 - (b) to submit to the Bank, for a period of five years from the start-up in operation of the first unit of the Project, and in the first three months of each calendar year: (i) an annual maintenance plan for each one of the works built under the Project; and (ii) a detailed report on maintenance operations in the previous year and on the reliability, operating efficiency and quality of service as well as on the state of maintenance of the system at the end of the previous year. For such purposes, the borrower shall take such measures as may be necessary to include the necessary funds in its annual budgets.
 18. In order to assess the results obtained from the execution of the Project, the borrower shall agree to submit to the Bank two ex-post evaluation reports which shall cover: (a) the technical, economic and financial issues, based on a methodology previously agreed upon with the Bank; and (b) the environmental and relocation issues, based on the methodology and guidelines agreed upon with the Bank and specified in Chapter VI of Appendix 3. For such purposes, the guarantor shall supply to the borrower any sectoral information that may be necessary.
 19. Once the pertinent conditions set forth in the loan and guarantee contracts are complied with, the Bank may establish an advance of funds of up to 15% of the amount of the financing.
 20. Financial statements of the Project, during its execution, and those of the borrower, during the life of the loan contract, shall be submitted each year to the Bank certified by a firm of independent public accountants, following procedures satisfactory to the Bank.
 21. In the same act as the loan and guarantee contracts are entered into, the República Argentina, the República del Paraguay and the Bank shall sign a document similar to the Execution Agreement signed on November 6, 1979, in connection with Loan 346/OC-RG.
- B. Annexes substantially similar in content to Appendix 3 (The Project) and Appendix 4 (Annual Evaluation Meetings) of the loan proposal shall be included in the loan and guarantee contracts, as appropriate.

THE PROJECT
(Annex A of the Loan Contract)

I. Purposes

- 1.01 The purpose of the Project is the construction of a hydroelectric power plant with 2,700 MW of installed generating capacity and 20,300 GWh of annual average energy generation, that shall help in meeting electric energy requirements scheduled for the middle of the 1990's in Argentina and Paraguay.
- 1.02 In addition, the Project shall contribute to improve navigation, road traveling between Argentina and Paraguay, and the development of irrigation, fish culture and tourism.

II. Description

- 2.01 The Project is located along the Paraná River, 90 kilometers downstream from the cities of Posadas and Encarnación, and consists of the following works:
- (a) a power house of 20 units rated at 135 MW each and a step-up substation whence the 220 kv lines to Paraguay and 500 kv lines to Argentina start;
 - (b) a reservoir with a volume of 21,000 cubic hectometers over an area of 1,700 square kilometers, consisting of earth-fill dams about 70 kilometers in length, a navigation lock, two spillways and irrigation structures;
 - (c) housing units for the resettlement of about 35,000 persons and relocation of infrastructure facilities affected by the filling of the reservoir along both sides of the Paraná River;
 - (d) facilities for protection of the basins along the side of Paraguay; and
 - (e) environmental protection measures which provide, within the power plant, facilities for upstream movement of fish, refuges for the existing fauna in the zone to be flooded, and cleansing of the reservoir.

III. Cost and Financing

3.01 The cost estimate, updated to December 1987, and shown in the following table, amounts to US\$5,846,600,000, allocated to the following categories:

(In US\$ millions)

	COUNTERPART FUNDING						TOTAL
	346/OC-RG	IDB PROP.	1761/RG	IBRD PROP.	Export Credit	Government/ Other	
1. <u>ENGINEERING AND ADMINISTRATION</u>	<u>51.5</u>	<u>29.0</u>	<u>40.5</u>	<u>29.2</u>	<u>-</u>	<u>825.5</u>	<u>975.7</u>
1.1 Engineering and Management	51.5	29.0	40.5	29.2	-	364.4	
1.2 Admin. and Overhead Expenses	-	-	-	-	-	461.1	
2. <u>DIRECT COSTS OF CONSTRUCTION</u>	<u>141.5</u>	<u>152.3</u>	<u>169.5</u>	<u>177.2</u>	<u>582.3</u>	<u>2,018.6</u>	<u>3,241.4</u>
2.1 Preliminary Works	-	-	-	-	-	333.7	
2.2 Civil Works and Insurance	141.5	152.3	169.5	177.2	179.5	1,004.1	
2.3 Generating Equipment	-	-	-	-	325.9	78.0	
2.4 Electro Mechanical Equipment	-	-	-	-	76.9	141.0	
2.5 Environmental Facilities	-	-	-	-	-	18.1	
2.6 Indemnity	-	-	-	-	-	133.2	
2.7 Resettlement and Relocation	-	-	-	-	-	310.5	
3. <u>FINANCE CHARGES</u>	<u>17.0</u>	<u>42.5</u>	<u>-</u>	<u>40.6</u>	<u>-</u>	<u>1,197.7</u>	<u>1,297.8</u>
3.1 Interests Loan	-	15.0	-	-	-	50.0	
3.2 Interests Loan 346/OC-RG	14.9	25.0	-	-	-	65.5	
3.3 IDB Credit Fee	-	-	-	-	-	15.7	
3.4 Inspection and Supervision	2.1	2.5	-	-	-	-	
3.5 IBRD Interests	-	-	-	40.6	-	162.5	
3.6 Interest on Other Credit	-	-	-	-	-	904.0	
4. <u>UNALLOCATED</u>	<u>-</u>	<u>26.2</u>	<u>-</u>	<u>3.0</u>	<u>111.2</u>	<u>191.3</u>	<u>331.7</u>
4.1 Contingencies	-	12.8	-	1.6	21.8	47.8	
4.2 Allowance for Escalation	-	13.4	-	1.4	89.4	143.5	
<u>Grand TOTAL</u>	<u>210.0</u>	<u>250.0</u>	<u>210.0</u>	<u>250.0</u>	<u>693.35</u>	<u>4,233.1</u>	<u>5,846.6</u>
<u>PERCENTAGES</u>	3.6	4.3	3.6	4.3	11.8	72.4	100%

4.01 When goods and services to be procured or contracted for are to be paid, either in whole or in part, with foreign exchange of the financing, the bidding procedures and specific bidding requirements or any other form of purchase or contracting shall allow unrestricted participation of

goods and services, including those relating to any mode of transport, from member countries of the Bank. Consequently, no conditions such as would limit or restrict the offering of goods or the participation of such contractors may be set forth in those procedures and/or specific bidding requirements.

V. Consulting Services

- 5.01 In selecting and contracting for consulting services to be financed either in whole or in part out of the loan proceeds, no conditions or stipulations such as would limit or preclude the participation of consultants from the member countries of the Bank may be established.
- 5.02 In selecting and contracting for consulting services to be financed either in whole or in part out of local counterpart funding, the borrower shall submit to the Bank for approval, before proceeding with the contracting, the names of the firms or individual consultants selected, the terms of reference thereof, as well as the fees agreed to.

VI. Ex Post Evaluations

A. Project Ex Post Evaluation

- 6.01 Before 2 years have elapsed after the entry into service of the last unit, the borrower shall present to the Bank a Project's ex post evaluation report, for which it shall compile the annual data specified below, until one year before the preparation of said report.
- 6.02 Annual data shall be compiled, as from the effective date of the loan contract, on the categories specified below, and they may be consolidated with the periodic reports of the borrower for as long as such reports are submitted:

1. Project Execution: Annual Data

- (a) Annual investment.
- (b) Modifications to the Project, according to cause.
- (c) Changes to the budget, according to cause.
- (d) Changes in the bidding and contracting schedule, and in the terms for construction and supply.
- (e) Changes to the financial scheme.

2. System Operation: Annual Data

- (a) The energy and demand balance of the interconnected system.

- (b) Data by type of generation: hydroelectric, nuclear and thermal. The types and quantities of fuel used, the economic cost of fuel, and the costs of maintenance.
- (c) Information on outages or rationing due to deficits in the interconnected system.
- (d) Costs of operation and maintenance of the Project.

B. Relocation Program: Annual Data and Ex Post Evaluation

6.03 Two years after the reservoir has been filled, the borrower shall submit to the Bank an ex post evaluation report on the relocation program. For this purpose, and as from the effective date of the loan contract, the borrower shall compile each year the following information which shall be submitted annually to the Bank before April 30 of each year:

- (a) The number of dwellings constructed in the period, and aggregate numbers.
- (b) The number of families resettled in the period, and aggregate numbers.
- (c) A qualitative description of the resettled population, before and after, based on a representative sample of families, including:
 - (i) occupation of the head of the household and its members;
 - (ii) family income level;
 - (iii) employment or underemployment rate in the group;
 - (iv) participation in training programs and occupational adaptation;
 - (v) public health status indicators;
 - (vi) attendance of children of school age at schools built for each community;
 - (vii) farm output of resettled farmers; and
 - (viii) permanence of families resettled in new dwellings.
- (d) The number of families that have been paid indemnity in the period, and aggregate numbers, plus a qualitative description thereof.
- (e) The number and description of industrial, commercial, public and community establishment either relocated or paid indemnity. The amount invested in indemnization.

- (f) A description of the progress achieved (in works and amount), aggregate and in the period, in relocation of public infrastructure facilities.
- (g) Personnel employed in social programs on each side of the river, by professional category.
- (h) Participation of government and non-government organizations in agreements relating to execution of the relocation program.

VII. Relocations and Environmental Programs

7.01 The semi-annual report referred to in paragraph 14, Appendix 2, shall cover the following items:

- (a) All semi-annual reports shall describe: (i) the progress attained in implementing relocation actions, as well as evidence that necessary measures have been taken to assure that the opinions of the population affected have been appropriately considered; (ii) an assessment of the professional and supporting staff requirements to enhance the Social Action Programs on both sides of the river, including a time schedule for hiring and training said staff; and (iii) the progress attained in implementing the approved Environmental Master Plan, showing the degree of compliance with the schedule for executing said plan.
- (b) The first report shall include: (i) a diagnosis and the measurement of the problem relating to the families not included in the original census, and the measures taken to avoid the proliferation of said problem; and (ii) the design of the Monitoring and Evaluation System on both sides of the river: (1) a computer-operated data base; and (2) a single coordinated system for compiling information in all areas of operation of the relocation program.
- (c) The second report shall include:
 - (i) the Encarnación Master Plan, the time schedule and the cost of its implementation, including a study of alternative solutions for the ceramic industry on the right side of the river, and a study of the technical and economical feasibility of protecting the "recovery area" at Encarnación, Paraguay;
 - (ii) updated figures on the rural and urban population affected on the right side of the river; and
 - (iii) evidence of the implementation of the Monitoring and Evaluation System.
- (d) The fifth report shall include the preliminary options considered for the solution of the problem relating to the families not

included in the original census, and the sixth report shall include the definitive solution selected.

- 7.02 The studies included in the Environmental Master Plan shall be completed in accordance with a schedule previously agreed upon with the Bank, and their results submitted for its consideration.

ANNUAL MEETINGS FOR EVALUATING THE ELECTRIC SUBSECTOR
(Annex A of the Guarantee Contract)

I. Annual Meetings

- 1.01 Pursuant to Appendix 2, paragraph 6, the guarantor, the national electric energy companies referred to in paragraph 2 of Appendix 2 ("companies"), and the Bank shall hold annual meetings, before May 31 of each year, for analyzing the financial and institutional evolution of the companies and the issues related to the subsector referred to in paragraphs 3, 4 and 9 of Appendix 2.
- 1.02 At such annual meetings, agreements shall be sought on actions to be taken and goals to be achieved regarding the financial and institutional evolution of the subsector and/or with the attainment of the financial and operative indicators established for each one of the companies in the respective loan and guarantee contracts. These actions may include, among others, tariff increases, cost reductions, transfers of funds, borrowings and institutional and normative issues. On the other hand, the goals may include, among others, liquidity test ratios, working capital ratios, operating efficiency ratios, financial structure indicators, account collection indicators, and percentages of tariff increases.
- 1.03 The objectives of the first annual meeting are to: (a) verify the compliance of the actions and goals previously agreed upon between the guarantor, the companies and the Bank; (b) agree, according to paragraph 1.02 herein, on actions to be taken in the next one-year period to achieve the goals agreed upon; and (c) review the long-term investment program resulting from the least cost expansion plan referred to in paragraph 9 of Appendix 2.
- 1.04 The objectives of the second annual meeting are to: (a) verify the advance of actions agreed upon between the guarantor and the Bank for the implementation of the studies on "Levels and Structure of Tariffs at Marginal Cost" and on the "Legal and Institutional Framework of the Electric Subsector" to which reference is made in paragraphs 3 and 4 of Appendix 2, respectively; (b) verify the compliance of the goals set at the previous annual meeting; (c) agree for the next one-year period, pursuant to paragraph 1.02 above, on actions to be taken on said period to achieve the goals agreed upon; (d) agree on the distribution to the companies of the Energy Funds; and (e) review the long-term investment program resulting from the least cost expansion plan referred to in paragraph 9 of Appendix 2.

- 1.05 Before April 30 of each year, the guarantor shall submit a report containing the following information for the previous year: (a) the financial statements of the companies for the year just ended; (b) the financial projections for the next five years, according to the format previously agreed upon with the Bank; (c) an analysis of the implementation of the actions agreed upon in the previous year's meeting; (d) the companies' investment program, with its respective financing plan based on an updated expansion plan; (e) the progress on the actions taken, issuing from the tariff study based on marginal cost, pursuant to the provisions of paragraph 3, Appendix 2; (f) the updated financing plan of the borrower; and (g) any other information that the Bank may reasonably request.

II. Indicators

- 2.01 The surplus referred to in paragraph 2, Appendix 2, shall not be less than the difference between operating revenues and cash expenses (these being defined as total operating expenses, less depreciation), expressed as a percentage of the cash expenses. Each company is required to achieve the following percentages:

	<u>AyEE</u>	<u>SEGBA</u>	<u>HIDRONOR, S.A.</u>
1988	7	7	22
1989	10	17	47
1990	18	19	39
1991	25	20	62
1992 (and thereafter)	27	23	65

- 2.02 The reasonable proportion referred to in paragraph 2, Appendix 2, shall be determined by relating net internal cash generation in one year with the investment program for the same year, including finance charges during the construction period. Said proportion shall not be less than the percentages shown below:

	<u>AyEE</u>	<u>SEGBA</u>	<u>HIDRONOR, S.A.</u>
1988	0	10	10
1989	5	40	10
1990	40	40	10
1991 (and thereafter)	40	40	40

III. Definitions

- 3.01 For purposes of the foregoing paragraph the meanings of the following items are understood as follows: (a) internal cash generation: the amount resulting from computing, for any given fiscal year, the operating revenues plus depreciation and provisions for that year, plus

amounts transferred in allotments from the Electric Funds, less operating costs and administrative and selling expenses; (b) debt service: the sum of amortization of principal in the same fiscal year as in (a) above (including sinking fund payments), total interest and other charges on all debt for more than one year for which the company is liable; (c) net internal cash generation: the difference between the internal cash generation and the debt service; and (d) investment program: the amount that each company should have invested in the respective year, as agreed to in advance with the Bank in the annual meetings to which paragraph 6, Appendix 2, refers.

PROPOSED RESOLUTION

ARGENTINA. LOAN 466/OC-AR TO AGUA Y ENERGIA ELECTRICA,
SOCIEDAD DEL ESTADO (AyEE)
(Amendment of Resolution DE-41/84)

The Board of Executive Directors

RESOLVES:

That clauses 8(c) and 8(e) of Resolution DE-41/84, as amended, approved on March 1, 1984, are amended to read as follows:

"8. Special Conditions:

.....

- (c) The borrower and the guarantor shall take appropriate measures acceptable to the Bank to ensure that revenues from tariffs of the borrower shall cover all operating expenses, not including depreciation, and generate a surplus to cover either all or part of the other expenses, which include depreciation and other financial obligations of the borrower. In addition, revenues from tariffs of the borrower, after providing for its operating expenses and the net service on its debt, shall internally generate sufficient cash so as to cover a reasonable proportion of the investment program. If such tariffs should fail to generate sufficient revenue to cover all financial obligations of the borrower, the borrower and the guarantor shall take such measures as may be necessary, which may include an increase in the rates, to meet such financial obligations.

.....

- (e) During the life of the loan contract, the borrower may not, without prior authorization of the Bank: (i) acquire or redeem any of its outstanding stock; and (ii) make loans or engage in any other type of lending, other than that which is normal in the conduct of its business, to other organizations."

PROPOSED RESOLUTION

ARGENTINA. LOAN 746/SF-AR TO AGUA Y ENERGIA ELECTRICA,
SOCIEDAD DEL ESTADO (AyEE)
(Amendment of Resolution DE-42/84)

The Board of Executive Directors

RESOLVES:

That clauses 7(c) and 7(e) of Resolution DE-42/84, as amended, approved on March 1, 1984, are amended to read as follows:

"7. Special Conditions:

.....

(c) The borrower and the guarantor shall take appropriate measures acceptable to the Bank to ensure that revenues from tariffs of the borrower shall cover all operating expenses, not including depreciation, and generate a surplus to cover either all or part of the other expenses, which include depreciation and other financial obligations of the borrower. In addition, revenues from tariffs of the borrower, after providing for its operating expenses and the net service on its debt, shall internally generate sufficient cash so as to cover a reasonable proportion of the investment program. If such tariffs should fail to generate sufficient revenue to cover all financial obligations of the borrower, the borrower and the guarantor shall take such measures as may be necessary, which may include an increase in the rates, to meet such financial obligations.

.....

(e) During the life of the loan contract, the borrower may not, without prior authorization of the Bank: (i) acquire or redeem any of its outstanding stock; and (ii) make loans or engage in any other type of lending, other than that which is normal in the conduct of its business, to other organizations."

PROPOSED RESOLUTION

ARGENTINA. LOAN 114/IC-AR TO HIDRONOR S.A.
HIDROELECTRICA NORPATAGONICA
SOCIEDAD ANONIMA
(Amendment of Resolution DE-209/82)

The Board of Executive Directors

RESOLVES:

That clauses 8(d) and 8(e) of Resolution DE-209/82, as amended, approved on December 2, 1982, are amended to read as follows:

"8. Special Conditions:

.....

(d) The borrower and the guarantor shall take appropriate measures acceptable to the Bank to ensure that revenues from tariffs of the borrower shall cover all operating expenses, not including depreciation, and generate a surplus to cover either all or part of the other expenses, which include depreciation and other financial obligations of the borrower. In addition, revenues from tariffs of the borrower, after providing for its operating expenses and the net service on its debt, shall internally generate sufficient cash so as to cover a reasonable proportion of the investment program. If such tariffs should fail to generate sufficient revenue to cover all financial obligations of the borrower, the borrower and the guarantor shall take such measures as may be necessary, which may include an increase in the rates, to meet such financial obligations.

.....

(e) During the life of the loan contract, the borrower may not, without prior authorization of the Bank: (i) acquire or redeem any of its outstanding stock; and (ii) make loans or engage in any other type of lending, other than that which is normal in the conduct of its business, to other organizations."

PROPOSED RESOLUTION

ARGENTINA. LOAN 430/OC-AR TO HIDRONOR S.A.
HIDROELECTRICA NORPATAGONICA
SOCIEDAD ANONIMA
(Amendment of Resolution DE-208/82)

The Board of Executive Directors

RESOLVES:

That clauses 8(d) and 8(e) of Resolution DE-208/82, as amended, approved on December 2, 1982, are amended to read as follows:

"8. Special Conditions:

.....

(d) The borrower and the guarantor shall take appropriate measures acceptable to the Bank to ensure that revenues from tariffs of the borrower shall cover all operating expenses, not including depreciation, and generate a surplus to cover either all or part of the other expenses, which include depreciation and other financial obligations of the borrower. In addition, revenues from tariffs of the borrower, after providing for its operating expenses and the net service on its debt, shall internally generate sufficient cash so as to cover a reasonable proportion of the investment program. If such tariffs should fail to generate sufficient revenue to cover all financial obligations of the borrower, the borrower and the guarantor shall take such measures as may be necessary, which may include an increase in the rates, to meet such financial obligations.

.....

(e) During the life of the loan contract, the borrower may not, without prior authorization of the Bank: (i) acquire or redeem any of its outstanding stock; and (ii) make loans or engage in any other type of lending, other than that which is normal in the conduct of its business, to other organizations."

PROPOSED RESOLUTION

ARGENTINA. LOAN 704/SF-AR TO HIDRONOR S.A.
HIDROELECTRICA NORPATAGONICA
SOCIEDAD ANONIMA
(Amendment of Resolution DE-210/82)

The Board of Executive Directors

RESOLVES:

That clauses 7(d) and 7(e) of Resolution DE-210/82, as amended, approved on December 2, 1982, are amended to read as follows:

"7. Special Conditions:

.....

(d) The borrower and the guarantor shall take appropriate measures acceptable to the Bank to ensure that revenues from tariffs of the borrower shall cover all operating expenses, not including depreciation, and generate a surplus to cover either all or part of the other expenses, which include depreciation and other financial obligations of the borrower. In addition, revenues from tariffs of the borrower, after providing for its operating expenses and the net service on its debt, shall internally generate sufficient cash so as to cover a reasonable proportion of the investment program. If such tariffs should fail to generate sufficient revenue to cover all financial obligations of the borrower, the borrower and the guarantor shall take such measures as may be necessary, which may include an increase in the rates, to meet such financial obligations.

.....

(e) During the life of the loan contract, the borrower may not, without prior authorization of the Bank: (i) acquire or redeem any of its outstanding stock; and (ii) make loans or engage in any other type of lending, other than that which is normal in the conduct of its business, to other organizations."

PROPOSED RESOLUTION

ARGENTINA. LOAN 528/OC-AR TO HIDRONOR S.A.
HIDROELECTRICA NORPATAGONICA
SOCIEDAD ANONIMA
(Amendment of Resolution DE-159/86)

The Board of Executive Directors

RESOLVES:

That clauses 8(d) and 8(e) are deleted and clause 8(f) of Resolution DE-159/86, as amended, approved on December 12, 1986, is amended to read as follows:

"8. Special Conditions:

-
- (f) The borrower and the guarantor shall take appropriate measures acceptable to the Bank to ensure that revenues from tariffs of the borrower shall cover all operating expenses, not including depreciation, and generate a surplus to cover either all or part of the other expenses, which include depreciation and other financial obligations of the borrower. In addition, revenues from tariffs of the borrower, after providing for its operating expenses and the net service on its debt, shall internally generate sufficient cash so as to cover a reasonable proportion of the investment program. If such tariffs should fail to generate sufficient revenue to cover all financial obligations of the borrower, the borrower and the guarantor shall take such measures as may be necessary, which may include an increase in the rates, to meet such financial obligations.