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**Report No. 1353**

PROJECT PERFORMANCE AUDIT REPORT

ARGENTINA: EL CHOCON POWER PROJECT  
(LOAN 577-AR)

November 16, 1976

Operations Evaluation Department

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<u>Approx. Ave. Official Exchange Rate</u>		<u>Buenos Aires Cost-of-Living Index</u> (Year-to-Year average 1968=100)
1966	M\$N 207.00 = US\$1.00	66.59
1967	332.00	86.05
1968	350.00	100.00
1969	350.00	107.58
1970	378.00	122.20
1971	a\$ 4.20	164.61
1972	9.98	260.84
1973	9.98	418.16
1974	9.98	507.00
1975	40.00	650.00

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PROJECT PERFORMANCE AUDIT REPORT

ARGENTINA: EL CHOCON POWER PROJECT (LOAN 577-AR)

PREFACE

This memorandum presents the results of an audit of performance under Loan 577-AR for US\$82 million, signed on December 19, 1968. The audit is based on information contained in the Project Completion Report (PCR) issued by Latin America and Caribbean Regional Office; a review of Bank files, including appraisal and supervision reports; and discussions with Bank Staff. In addition, an Operations Evaluation Department mission visited the United Kingdom and Argentina for discussions with the main consultants and with officials of Hidroelectrica Norpatagonica Sociedad Anonima (HIDRONOR).

The memorandum summarizes at some points, and expands at others, the discussions of the PCR, here attached. The co-operation of HIDRONOR management is gratefully acknowledged.



PROJECT PERFORMANCE AUDIT BASIC DATA SHEET

ARGENTINA: EL CHOCON POWER PROJECT (LOAN 577-AR)

(Amounts (in US\$ mln))

(As of 6/30/76)

	<u>Original</u>	<u>Disbursed</u>	<u>Cancelled</u>	<u>Repaid</u>	<u>Outstanding</u>
Loan 577-AR	82.0	82.0	Nil	3.3	78.7

Project Data<sup>1/</sup>

	<u>Original Plan</u>	<u>Revisions</u>	<u>Actual or Est. Actual</u>
Conception in Bank	-		7/65
Board Approval	12/68		12/17/68
Loan Agreement	12/19/68		12/19/68
Effectiveness	3/21/69		3/21/69
Physical Completion	12/31/73		12/12/73
% of original project actually completed	100%		100%
Loan Closing	1/75		12/31/74
Total Costs (mln)	US\$ 265.4		US\$ 256.3
Internal (.financial) Rate of Return	n.a.		8%

	Month, Year	<u>Mission Data</u>			Date of Report
		<u>No. of Days</u>	<u>No. of Persons</u>	<u>Manweeks</u>	
Identification	5/66	7	1	1	6/13/66
Preparation	6/66	10	2	2 6/7	11/4/66
Preappraisal	5/67	7	3	3	6/2/67
Appraisal	8/68	20	2	5 5/7	9/10/68
Subtotal		44		12 4/7	
Supervision I	12/69	11	2	3 1/7	1/16/70
Supervision II	10/70	9	1	1 2/7	10/16/70
Supervision III	4/71	2	1	2/7	5/26/71
Supervision IV	8/71	5	3	2 1/7	9/14/71
Supervision V	6/72	3	1	3/7	6/28/72
Supervision VI	3/74	5	2	1 3/7	4/30/74
		35		8 5/7	
<u>Amended Project - to Include Stage 2</u>					

Loan 577-AR of US\$ same<sup>2/</sup> mln, signed January 16, 1973 for El Chocon Power Project.

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1/ All this information refers only to Stage 1 of the Project.

2/ Amendment to project description only.





PROJECT PERFORMANCE AUDIT REPORT

ARGENTINA: EL CHOCON POWER PROJECT (LOAN 577-AR)

HIGHLIGHTS

This is a case where a hydroelectric project has become economically more attractive since appraisal, because of the subsequent steep increase in fuel oil prices. The borrower's financial performance was adversely affected by the government's electricity tariff policy, in conflict with the concession agreement between the borrower and the government, and with the Bank loan agreement. The successful implementation and operation of this project, despite frequent changes in the entity's top management, illustrates the importance of competent and dedicated senior and middle management.

The following points may be of particular interest:

Problems with construction and operation of equipment (para. 5 and PCR paras. 18.02-18.04).

Conflict between Government's policy on electricity tariffs and Bank agreement with power enterprise on rate of return (paras. 9 and 10, and PCR para. 23.04).



PROJECT PERFORMANCE AUDIT MEMORANDUM

ARGENTINA: EL CHOCON POWER PROJECT (LOAN 577-AR)

1. HIDRONOR was established on December 13, 1967, as a stock corporation by the government for the purpose of carrying out the "El Chocon-Cerros Colorados Complex" (El Chocon) Project. The original shareholders of HIDRONOR were the government, and two government-owned electricity supply institutions, Servicios Electricos del Gran Buenos Aires S.A. (SEGBA) and Agua y Energia Electrica (AE). SEGBA is HIDRONOR's major customer, accounting for about three-quarters of its total sales in 1974. From December 1973, HIDRONOR's sole shareholder has been Corporacion de Empresas Nacionales, a government agency created to coordinate, supervise and control all state-owned institutions.

2. This was the third Bank loan to Argentina's power sector. (The first two loans, and the fourth loan<sup>1/</sup> of November 1969, were made to SEGBA). Its original objective was to assist only Stage I of the El Chocon project. In January 1973, the objective was extended to enable an estimated US\$12 million (actual US\$13 million) of the loan, (which would otherwise have remained undisbursed, PCR para.16), to assist Stage II of the project. This stage covers mainly additional generating units, flood control works and subsidiary dams, and is proceeding satisfactorily for completion in 1977, as scheduled. Stage I consists mainly of an earth fill dam; a powerhouse (suitable for 6 x 200 MW turbo-alternators); 3 x 200 MW turbo-alternators; and a 500 KV transmission system (of two single circuit lines) about 1080 km in length, to supply the electricity generated to HIDRONOR's main customers. Two other objectives of the project were to help irrigate additional agricultural land, and to control floods.

3. Stage I of the project was built substantially as planned, within the original time schedule and well within the budgeted cost. This good outcome was largely due to the main contractor and to the technical competence of the borrower, notwithstanding the frequent changes in its top management. The construction of Stage I within the budget meant a reduction in its costs in real terms. Among other factors, this reduction was due to lower than estimated costs for gates, penstocks and miscellaneous steel, together with lower financial charges, all of which factors could not have been foreseen at the time of appraisal.

4. However, the project suffered some technical failures, both before and after its completion. Three of these failures were serious, and, in the period 1973 through 1974, at times very much affected the standard of reliability of supply to SEGBA, the main supplier to Greater Buenos Aires, the largest electric power market in Argentina. It is not possible to calculate the loss to the economy which resulted from these incidents, but it would not be insignificant, bearing in mind the large numbers of industrial, commercial and residential electricity customers

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<sup>1/</sup> See Board document Sec M76-121, dated February 27, 1976, "Project Performance Audit Report: Argentina Third SEGBA Power Project", IBRD Report No.1055 and Document R72-131, dated March 1972, "Operations Evaluation Report: Electric Power", IBRD Report No.Z-17, for coverage of the earlier loans.

in StGBA's supply area. One of these technical failures concerned a turbine, another an alternator, and the third the 1080 km transmission line. Because the turbine failure was found to be due to a design fault (the borrower believes that this fault could not have been foreseen without actually running the machine), the defect was rectified by the supplier without any cost to HIDRONOR. The damage to the alternator, which kept the machine out of service for about 4 months, has also been rectified by the supplier at his own cost. The third failure, which interrupted the electric supply for about 14 days, occurred during the initial stages of operation of the project when 16 towers of the transmission line collapsed due to two very serious wind and rain storms. The collapse was caused by the failure of the foundations of the windward guy wires, due to an inadequate choice of these foundations, in an area which seems to become flooded and lacks good drainage - a factor apparently overlooked by the consultants and the contractor during the design of the foundations. They are currently being replaced by the original contractor with HIDRONOR only bearing the cost of the difference between the new foundations and the original ones. The responsibility for the incident has not yet been resolved. The borrower has kept the Bank adequately informed on the problem.

5. At the time of the appraisal, the project (Stages I and II), estimated to cost about US\$255/KW, appeared to represent the least-cost solution for providing the increased generating capacity required in the Greater Buenos Aires area between 1973 and 1978. Comparison for this purpose was made with an alternative thermal development; the cost of capital was assumed to be in the range of  $7\frac{1}{2}$  - 10%. The Stage I development, with a cost of about US\$400/KW, was a realistic and economic first phase of the project, meeting the expected increment in demand for the period 1973/1974. Even though sales have been below expectation (see para. 7), the economic justification for the project was enhanced by the quadrupling of fossil fuel prices during the same period. The large increase in fuel prices ensures that the project (Stage I and II) remains the least-cost solution in meeting the expected increase in demand in 1973-1980 in the Greater Buenos Aires area for costs of capital as high as 18%.

6. At the time of the appraisal, the internal financial rate of return on the incremental investment in the project itself was not calculated for either Stage I or Stage II. Using the most up-to-date estimates for the incremental costs and revenues (used as a surrogate for benefits) attributable to Stage I, gives an internal financial rate of return on the project's investment calculated over the life of the project, of about 8% (Annex A). These benefits do not include those accruing from additional irrigation, or from flood control, both considered at the time of appraisal to be comparatively small. In fact, however, Stage I has been estimated to have already prevented US\$24 million in damage that would otherwise have been caused by the 1972 flood.

7. From the financial aspects, the several devaluations of the Argentine peso over the period of the project's construction make any comparison between appraisal forecasts and actual results not very meaningful. Besides the lower than normal water availability in 1974 (HIDRONOR's first year of full operation) which lowered sales by about 20% compared to

estimates, two main factors directly affected HIDRONOR's financial performance in that year. The first factor was the method of valuing assets. HIDRONOR's Concession lays down that HIDRONOR's fixed assets in operation were to be valued in US dollars, the value being then reconverted into Argentine pesos at the mid-year financial exchange rate. This method has the disadvantages (not foreseeable at the time that the Concession was drawn up) of neither reflecting adequately economic conditions in Argentina, particularly the fact that exchange rates for the Argentine peso have sometime been maintained at unrealistically low levels, nor allowing for the gradual or smooth changes in asset valuation desirable (especially) for rate determination.

8. The second factor, which affected HIDRONOR's financial performance in 1974, was a change in the method allowed for setting electricity rates. This change was imposed by the Government. HIDRONOR's Concession lays down that electricity rates should provide an annual financial return (operating income to gross fixed assets in operation) of 8% and, in the Guarantee Agreement to the Bank Loan, the Government undertook to honor this aspect of the Concession. In practice, by Government Resolution No.171, effective from November 1973, HIDRONOR's rates were determined, like the rates of all electricity generating and transmitting undertakings in Argentina, by the sum of two factors, representing respectively: (i) the cost of energy (KWh); and (ii) the cost of power (maximum demand KW). The cost of energy was based upon the price of fuel oil, and the cost of power was indexed to the peso exchange rate and to the salary of a worker of a specified grade.

9. The base coefficients used in this method of rate determination turned out to be rather low in respect of HIDRONOR's actual costs. The result was an electricity price as low as 8 centavos per KWh sold - about one US cent at the 1974 exchange rate - and a correspondingly low annual financial rate of return of 3.6% in 1974 against 8% covenanted and expected at the time of the appraisal.

10. HIDRONOR has been aware of the impact of the pricing Resolution on its financial performance and has sought compensation from the Government for the difference in revenue arising from the rate to which it was entitled according to the Concession Law and the actual rate. In 1975, when the Bank, which had continuously taken a direct interest in the price that HIDRONOR charged for electricity, drew the attention of the Government to the likely serious effects of the electricity pricing Resolution, the Government raised the possibility of excluding HIDRONOR from the Resolution sometime in the future. This exclusion has not yet taken place even though the Bank has followed up the subject with the Government on several occasions.

11. As required under the loan agreement, HIDRONOR should have consulted the Bank before it granted two loans. In 1971 HIDRONOR granted a loan (about US\$18 million equivalent) to one of its main customers, Direccion de la Provincia de Buenos Aires (DEBA), to help finance the construction of a connection with HIDRONOR's system. The loan was on comparatively soft terms with 6% interest rate for 10 years, but considering the economic impact on the area supplied by DEBA (up until then mainly served by expensively produced thermal generation, and with a comparatively low standard of reliability), the loan appears to be justified.

12. HIDRONOR made another small loan (about US\$1 million equivalent) interest free and for a term of four years to its then shareholder AE. Its purpose was to build a transmission line from AE to the El Chocon project site to supply electricity to the site, during the construction of the project, and subsequently to interchange power between AE and HIDRONOR. HIDRONOR's other alternative for electric supply during the project construction would have been to install a generating set, larger than the present 'house set' at El Chocon, and to forego subsequent electricity sales to AE. On balance, HIDRONOR seems to have made the right decision.

13. The Bank played a positive role during the last stages of project preparation, in determining the optimum size and scope of the project and in revising the project description in 1973. Without the revision (which in itself was desirable), about US\$13 million of the loan would have remained undisbursed. Supervision missions by the Bank, approximately two every year immediately following the loan agreement, together with the normal flow of information between the Bank and the Government/Borrower, were adequate for all purposes for the first few years after the loan was approved; and, for technical purposes, probably for all years to date. However, the sporadic and infrequent supervision missions after 1971, averaging one every sixteen months, together with the inadequate flow of financial information from the borrower to the Bank, made it difficult for the Bank to maintain a continuous dialogue with the borrower and the Government on the borrower's financial problems. A more continuous contact on these matters might have been more useful.

15. Bank's attention was directed towards the successful implementation of the project and towards the overall success of the borrower. To a large measure these objectives were achieved - a reflection of the competence and dedication of the borrower's senior and middle management, notwithstanding the frequent changes in top management, and the difficult situation in the country and in the economy. Only the borrower's financial performance, for reasons beyond its control, fell well below the required level, despite appropriate financial covenants in the loan and guarantee agreements and subsequent Bank representation to the Government on tariffs. While there may have been an opportunity for the Bank to support institutional improvements in the power sector as a whole (PCR para.26.03), the Bank made no particular effort in this direction when making the loan. At a later stage (in the early 1970's) however, the Bank seems to have made a strong, but as yet, unsuccessful effort in support of coordinated sector planning, in particular the generation and transmission aspects.

ARGENTINA

HIDRONOR - EL CHOCÓN - STAGE 1

LOAN 577 - AR

INCREMENTAL FINANCIAL RATE OF RETURN

(US\$ Million Equivalent<sup>1/</sup>)

	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976-----2024</u>
CAPITAL COSTS	3.6	52.0	52.3	76.7	39.4	24.5	7.8	-	-
OPERATING COSTS	-	-	-	-	-	-	0.5	0.7	0.8----- 0.8
REVENUES	-	-	-	-	-	-	20.0	23.0	25.0----- 25.0
INCREMENTAL BENEFITS	-3.6 <sup>2/</sup>	-52.0	-52.3	-76.7	-39.4	-24.5	11.7	22.3	24.2----- 24.2

Rate of Return = 7.8%

1/ At constant price levels

2/ Only revenues from electricity sales are counted as benefits





PROJECT COMPLETION REPORT <sup>1/</sup>ARGENTINALOAN 577-AREl Chocón Power Project

1. Borrower: HIDRONOR, S.A. (Hidroeléctrica Norpatagónica Sociedad Anónima)
2. Guarantor: The Argentine Republic
3. Loan Amount: US\$82 million equivalent
4. Date Loan Signed: December 19, 1968  
(an amendment was signed on January 16, 1973)
5. Effective Date: March 21, 1969
6. Closing Date: December 31, 1974
7. Period of Grace: 6 years, 3 months
8. Terms of Loan: 25 years, 3 months
9. Interest Rate: 6 - 1/2%
10. Commitment Charge: 3/4 of 1%
11. Amortization: Semi-annual payments starting March 15, 1975 and ending on March 15, 1994, with a final payment of US\$3,625,000.
12. Exchange Rate: Original at time of Appraisal 1 US\$ = M\$N350 = \$a3.50. Latest (8/11/75) 1US\$ = \$a42.50
13. Appraisal Report: PU-1a, dated December 2, 1968
14. Fiscal Year: Calendar year
15. Project Description

15.01 The original project consisted of a part of the "El Chocon-Cerros Colorados Complex". The complex comprises an ultimate development of 1,200 MW at El Chocon, 450 MW at Planicie Banderita, and 500 kV transmission facilities to transmit power to the Greater Buenos Aires area. The original project (Stage 1) consisted of the following elements:

- (a) The El Chocon village, including housing, a church, a school, a rest house, commercial buildings, and a social and sports center, as well as paved streets, sidewalks, drains, water supply and sewerage systems, and an electrical distribution network;

<sup>1/</sup> This report was written in December 1975, taking into account the economic conditions prevailing at that time in Argentina.

- (b) The El Chocon earthfill dam across the Rio Limay capable of storing water up to a normal maximum level of about 381 meters above sea level. A gated concrete spillway on the right bank and a gated concrete intake structure on the left bank;
- (c) The El Chocon powerhouse on the left bank downstream of the dam and three 200 MW Francis-type turbine generators and related ancillary equipment. Steel-lined penstock tunnels to connect the intake to the powerhouse. A tailrace channel to return the water discharge from the powerhouse to the river; and
- (d) A 500 kV transmission system consisting of two single-circuit three-phase overhead lines about 1,080 kilometers long. A switchyard at the El Chocon powerhouse, intermediate switching stations near Puelches and Henderson, and step-down substation(s) near Buenos Aires.

15.02 On January 16, 1973 the Bank and the Borrower agreed on an amendment of the Loan Agreement in which the project was changed to consist of the following: (Stages 1 and 2):

- (a) The El Chocon village, including housing, a church, a school, a rest house, commercial buildings, and a social and sports center as well as paved streets, sidewalks, drains, water supply and sewerage systems, and an electrical distribution network;
- (b) The El Chocon earthfill dam across the Rio Limay capable of storing water up to a normal maximum level of about 381 meters above sea level. A gated concrete spillway on the right bank and a gated concrete intake structure on the left bank;
- (c) The El Chocon powerhouse on the left bank downstream of the dam and six 200 MW Francis-type turbine generators and related ancillary equipment. Steel-lined penstock tunnels to connect the intake to the powerhouse. A tailrace channel to return the water discharged from the powerhouse to the river;
- (d) The Portezuelo Grande diversion and flood control works diverting water from Rio Neuquen into the Los Barreales depression thus allowing regulation of the Rio Neuquen flows downstream;
- (e) The Loma de la Lata dam and regulating facilities controlling the flow between the Los Barreales depression and the Mari Menuco depression;
- (f) The Planicie Banderita power plant, including the intake in the Mari Menuco depression, steel penstocks, two 225 MW Francis-type turbine generators, and tailrace channel to return the water discharged from the turbines into Rio Neuquen;
- (g) A 500 kV transmission system consisting of two single-circuit three-phase overhead lines about 1,080 kilometers long. Switchyards at El Chocon and Planicie Banderita, intermediate switching stations near Puelches and Henderson, and step-down substation near Buenos Aires.

15.03 The change in project description was requested by HIDRONOR and accepted by the Executive Directors of the Bank due to the fact that the cost of that part of the project financed by the Bank loan turned out to be less than the original appraised estimate. As a result, it was estimated that about US\$12 million of the Bank's loan would remain in the Loan Account upon completion of the project. This was mainly due to:

- (a) Lower costs for gates, penstocks and miscellaneous steel; and
- (b) Lower financial charges.

16. Projected and Actual Disbursements of Loan

<u>Category</u>	<u>Projected</u> (in US\$ equivalent)	<u>Actual</u>
I. <u>Civil works at EL Chocon</u> (foreign cost)		
(a) Main contract (excluding construction equipment)	27,600,000	
(b) Construction equipment	<u>10,000,000</u>	
Sub-total	37,600,000	44,191,916.56
II. <u>Gates, penstocks, miscellaneous steel</u>	21,400,000	7,386,908.16
III. <u>Consulting Engineers Services</u>	6,300,000	7,035,777.42
IV. <u>Interest and other charges on the Loan during construction</u>	<u>16,700,000</u>	<u>10,400,000.00</u>
Total disbursements for Original Project	<u>82,000,000</u> =====	<u>69,014,602.18</u> =====
V. <u>Amendment</u>		
<u>Civil works at Planicie Banderita</u> (foreign cost)		
(a) Main contract (excluding construction equipment)	9,200,000	
(b) Construction equipment	<u>3,000,000</u>	<u>12,985,397.00</u>
Total disbursement for Amendment	12,200,000	12,985,397.00
Total disbursements	n.a. =====	81,999,999.18 =====

## 17. Objective and Justification

17.01 The project was designed to:

- i) Produce electric energy, to be consumed mainly by the end of 1973 by the Buenos Aires-Litoral system using the waters of the Rio Negro system; and
- ii) At the same time reduce floods in the valley.

Additionally the project was to help irrigate additional agricultural land. These objectives were met, including flood control as two heavy floods occurred in 1972 and 1975 which produced practically no damage at all. The project is estimated to have saved US\$24,000,000 equivalent in damage that would have been caused by the 1972 flood alone. Additionally 60,000 new ha. are being irrigated and land previously flooded periodically is now being used for agricultural production. The Chocon power plant began delivering energy to the Buenos Aires-Litoral system in 1973 and generated 2,570,000 MWh during 1974. 73% of total sales was delivered to Buenos Aires-Litoral system. This generation is about 20% less than estimated during appraisal due to lower than normal water availability.

17.02 At the time of appraisal, the project (Stage 1) was justified when compared with an alternative thermal development for equalizing discount rates between 7 1/2 and 10% (depending on two different estimates of the cost of the project). It appears evident, without repeating these calculations, that the project is justified today for much higher equalizing discount rates than those established at the time of appraisal, since:

- i) The cost of the project measured in current dollars is basically the same as at time of appraisal (in constant dollars, therefore, it decreased);
- ii) The capital costs of alternative thermal schemes are at least double than those used during appraisal; and
- iii) Fuel costs at least four times as much.

## 18. Construction Schedule and Problems Encountered

18.01 Stage 1 - The original schedule called for the first two generating units to be in service by mid-1973, and the third unit in January 1974. Actual completion dates of the three units are as follows:

Unit No. 1	12/29/1972
Unit No. 2	11/05/1973
Unit No. 3	12/12/1973

18.02 During tests of Unit No. 1 in April 1973 the turbine suffered a serious accident which was later revealed to have been caused by a faulty design. This design defect was corrected on all units by the supplier (Boving & Co. Ltd.), without any cost to HIDRONOR.

18.03 In March 1975 the alternator of Unit No. 3 had a serious accident when a fault between coils produced a fire inside the generator, damaging about a third of the windings (in agreement with HIDRONOR, the consultants had not considered it necessary to install fire extinguishing equipment). The cause of the accident was a bolt wedged in the windings and presumably left there inadvertently during erection. The alternator has been repaired and should by now have been commissioned. The responsibility for this accident has not yet been resolved between HIDRONOR and the supplier (Siemens).

18.04 Another important accident which occurred during the initial stages of operation of the project was that 16 towers of the 500 kV transmission line collapsed in January 1974 due to two very severe wind and rain storms which caused the failure of the foundations of the windward guy wires. Later investigation showed that the foundations were inadequately chosen and a major proportion of these foundations have been replaced. It is difficult to pin down the responsibility for this accident, but undoubtedly the consulting engineers, Merz and McLellan, must bear a part of the blame due to inadequate interpretation of the soil mechanics investigation. However, about 2,000 foundations have still to be replaced pending agreement on costs between HIDRONOR and the contractor.

18.05 Stage 2 - Construction is on schedule and the estimated completion dates should be met i.e. 6 units at Chocon in service by December 1975 and the two units at Planicie Banderita by December 1977.

## 19. Project Cost

19.01 The comparison of the cost estimates of the completed project present an inherent difficulty due to the conversion of local currency into dollars. The Bank had previously suggested that HIDRONOR convert local expenditures into dollars at the rate of exchange prevalent at the moment of disbursement. However, this had the disadvantage to result in unrealistically high cost estimates for 1973 and 1974 because the rate of exchange was artificially maintained during those years at a level that did not reflect internal costs in Argentina. Due to this, the last supervision mission recommended HIDRONOR to convert the actual local costs of 1973 and 1974 into dollars, adjusting the actual rate of exchange by means of the whole-sale price index, a method which represents more clearly the true value of the Argentinian currency. (Local costs for subsequent years could again be converted at rate of exchange). Using both methods the following values result, excluding interest during construction. (For Stage 1, more than 99% of total cost has been disbursed):

	<u>Appraisal Estimate</u>	US\$ million	
		<u>Previous Bank method</u>	<u>Present Estimate New Bank proposed method</u>
Stage 1	265.4	273.0 (+3%)	256.3 (-3.5%)
Stage 2	156.1	262.5 (+68%)	232.7 (+49%)

19.02 One can see that using either method the cost estimates for Stage 1 have not varied appreciably since appraisal. The difference in the cost estimates for Stage 2 are due to the fact that the design of Planicie Banderita was not completed at the time of appraisal and at the very best the cost estimates were rough guesses.

## 20. Consultants

20.01 HIDRONOR retained Sr. Alexander Gibb and Partners (U.K.) as the main consultant who subcontracted Merz and McLellan (U.K.) who were responsible for the engineering of the electro-mechanical part of the power plants and the transmission system. The overall performance of both consultants appears to have been good although HIDRONOR had initially some complaints about the technical competence of some of the people sent to Argentina by Merz and McLellan.

## 21. Main Contractors

Main contractors for the project were:

### 21.01 Stage 1 (Power Plant)

Civil works:	Impregilo-Sollazzo, S.A. (Italy)
Turbines:	Boving & Co. Ltd. (U.K.)
Generators:	Siemens A.G. (Germany)
Cranes:	" " "
Powerhouse Transformers:	Mitsubishi Shoji Kaisa Ltd. (Japan)
Breakers:	Brown Boveri. S.A. (Switzerland-Argentina)

### 21.02 Stage 1 (Transmission system)

500 kV Transmission line:	Anglo Argentinian Power Construction Consortium (U.K. - Argentina)
500 kV Breakers:	Brown Boveri, S.A. (Switzerland-Argentina)
Power Transformers:	Parsons Peebles Ltd. (U.K.)
Control Equipment:	Brown Boveri, S.A. (Switzerland-Argentina)
132 kV Cables:	Industrias Pirelly SAIC (Argentina)
Synchronous condensers:	A.E.I. (U.K.)

### 21.03 Stage 2

Generators:	Siemens A.G. (Germany)
Turbines:	Boving & Co. Ltd. (U.K.)
Civil Works:	Impregilo-Sollazzo, S.A. (Italy)

## 22. Organization and Management

22.01 The Borrower, HIDRONOR, created in 1967, is a stock Corporation whose shareholders are the Argentinian state, through the "Dirección Nacional de Energía y Combustibles", and two Government-owned institutions, "Empresa de Estado Agua y Energía Eléctrica" (AE) and "Servicios Eléctricos del Gran Buenos Aires" (SEGBA). Established at its inception to carry out and operate the Chocon-Cerros Colorados complex, including transmission lines and secondary installations, the Corporation has entered in 1973 into the second phase of its activities and is now selling bulk power to four Government-owned utilities, its main customer being SEGBA (73% of the total 1974 sales).

22.02 The management of the Corporation, from its inception has been efficient and competent when judging it from an over-all result stand point as the Corporation was able to complete a complicated project within the estimated time schedule and with a final cost below the original estimate (see para. 19). This has occurred in spite of numerous personnel changes in the Board and in the Executive Committee. These changes, in general, from the information available were due to reasons stemming from outside the Corporation. Some of these changes in top management were not communicated to the Bank as HIDRONOR was expected to do.

22.03. HIDRONOR's present financial management is adequate. Since the Bank's appraisal, the Corporation has considerably improved the presentation of its accounts which have been standardized according to the system prescribed by the Federal Power Commission for the utilities in the U.S. They are being computerized with the help of a university consultant, but the results are still too incomplete to be adequately appraised. External auditing is very satisfactorily performed by the Buenos Aires firm of Drysdale, Reig and Vazquez.

## 23. Operating Results

23.01 Because of the several devaluations incurred by the Argentinian currency over the project period, a comparison between appraisal forecasts and actual results is not altogether meaningful, and the corresponding figures are therefore given in separate tables. In the actual funds statement, the exchange rate which is used is the one at the end of each year. Consequently, no column has been included for the total figures over the project period.

23.02 The appraisal report expected electricity production to start in time for the winter peak of mid-1973, however, experimental operations already started in December 1972, and 1973 was considered by HIDRONOR as a testing period for the Chocon system. Therefore, with the agreement of the Corporation's auditors, HIDRONOR decided to capitalize the revenues resulting from this period of experimental operation. Because of the consequences of this procedure on the conditions of applicability of Sections 5.13 and 5.14 of the Loan Agreement, the Bank should clearly have been consulted before its implementation. Due to lower than normal water availability, the 1974 sales were inferior to the appraisal estimates by about 20%, therefore lowering the Corporation's operating income.

23.03 For purpose of rate base determination, Article 11 of the Concession requires that HIDRONOR's fixed assets in operation be valued in US dollars, the value being then reconverted into pesos at the mid-year financial exchange rate. This has the disadvantage of not reflecting economic conditions in Argentina due to unrealistic rates of exchange and of creating sharp variations in asset revaluations and rate determination.

23.04 Section 5.13 of the Loan Agreement requires the Borrower to obtain rates for the sales of electricity such as to provide the 8% return authorized by Article 14 of the Concession. However, this provision was never enforced and has been superseded in practice-without the Bank being informed- by Resolution No.171 dated April 17, 1974, with retroactive effect for HIDRONOR as of November 1973. The purpose of this Resolution was to unify the rates of all the electrical utilities involved over the country in the production and transmission of electricity and to determine them as the sum of two factors representing the cost of energy and the cost of power. The cost of energy was based on the price of fuel-oil at the date of the Resolution, while the cost of power was a linear function of the exchange rate of the US\$ and of the salary of a worker at the time of the computation, both variables being also indexed from the date of the Resolution as a basis. The drawbacks of this system are to completely separate the electricity rates from the internal characteristics of the company, especially in the choice of the base values of the indexation and, conversely, to link them to variables which were not directly related to the operations of the company but were dependent on macroeconomic factors or even political decisions. While, a posteriori, and taking into account the difficulties of pricing in a period of high inflation, the indexing system seems to have produced variations rather similar to those of the consumption index, the coefficients of the formula used for indexing were rather low and resulted in a 3.6% rate of return for the year 1974, instead of a projected 8%. Whereas the average revenue per KWh sold corresponding to a 8% rate of return should have been 14.1 centavos, the actual one was only 8.2 centavos (approximately one US cent at 1974 rate of exchange), which is extremely low, resulting in an implicit subsidy - and a corresponding economic distortion - for the main consumers, principally SEGBA.

23.05 When informed about the seriousness of the situation, HIDRONOR's present management explained that Resolution 171 had been issued without prior consultation of HIDRONOR. Replying to the Bank mission's inquiry, the Ministry of Economic Affairs raised the possibility of excluding HIDRONOR at a later date from the field of application of Resolution 171. It would therefore be desirable that during any future Bank loan to the Sector that during negotiations with the Government, the Bank obtain more reasonable tariff settings for bulk sales in Argentina, to eliminate the distortions described above, which undoubtedly affect the whole Sector.



Otherwise the ultimate consumer is subsidized because of unrealistically low prices, a practice that leads to wasteful consumption patterns.

#### 24. Financing Plan

24.01 The foreign exchange component of the project has been financed through borrowing. Disbursements were lower than forecasted for the first three years of the project, both because of the cost being inferior to the estimates (para. 15.03) and because of some delays in the works.

24.02 The Bank is HIDRONOR's largest creditor, US\$12 million of its US\$82 million loan having been reallocated, through an amendment to the Loan Agreement (para. 15.02).

24.03 In addition, the Corporation was able to obtain about US\$130 million from private banks from various countries, which was about three times the minimum expected at appraisal time. 90% of these loans were on relatively soft terms (about 15 years, and 5.5% to 8%) but two of them, obtained in 1973 and 1974 respectively from the Banco Central S.A., Madrid and from Lloyds & Bolsa Int., were on more stringent conditions. The first one of US\$2 million, was for 18 months, without grace period, and at a rate of 2% above the current interbank rate in London for deposits in dollars at six months, and the second one, of US\$9 million, was for 4-1/2 years, with a one year grace period, at a rate of 1.125% above the London rate. In view of Section 5.17 of the Loan Agreement which requires the Borrower to make its best efforts to obtain credit on such terms and conditions as shall be satisfactory to the Bank and the Borrower, the Bank should have been consulted on the two latter loans.

24.04 HIDRONOR granted in 1971 to the "Dirección de la Energía de la provincia de Buenos Aires" (DEBA) so that the latter may complete, in the Henderson substation, the interconnection with the El Chocon-Cerros Colorados project and the distribution system of DEBA. The loan, at 6% yearly on the unpaid balance was over an estimated period of ten years with a two year grace period and the total disbursements during the period 1972-74 amounted to \$176.6 million. By reducing the length of the transmission lines, the purpose of the project was to cut down electricity losses (by an estimate of 20 millions of Kwh a year) to improve the reliability of supply to the DEBA system.

24.05 Another loan was granted by HIDRONOR to the "Empresa del Estado Agua Y Energía Eléctrica" (AE) so that the latter may complete the construction of a 65 km transmission line from AE thermal power house Alto Valle to Planicie Banderita, and of a 50 km transmission line to El Chocon, of a transformer station at Planicie Banderita, of transmission lines from there to Loma de la Lata and Portezuelo Grande and of transformer stations at both locations. The loan, without interest, was over an estimated period of four years with one-year grace period and the total disbursements during the period 1972-74 amounted to \$12.2 million. The purpose of the project was to obtain a source of energy

for the construction of El Chocon and Planicie Banderita, and to feed energy into the AE system after the completion of the Chocon complex. As HIDRONOR did not need this energy after completion of the project, this was an economic solution for obtaining energy during project construction without bearing the cost of the investment and, at the same time, as a way for ensuring a back-up supply of energy for the plant auxiliaries, in case of emergency after completion of the project. While the construction programs corresponding to these two loans might well have been technically justified, one of the loans was interest-free and the second was at 6% interest, while at the same time the usual rate for medium-term loans available from Government development banks was not inferior to 15%. It is not clear whether such financial subsidization of DEBA and AE by HIDRONOR was justified by the benefits to HIDRONOR mentioned above.

24.06 As internal cash generation started in 1973 only, most of the resources needed for the local component of the project had to come from Government equity contributions which were specially important in 1974 (\$1,000 million, of which \$840 million were actually paid), indirectly coming from the El Chocon fund created by law 17574. In 1973 and 1974, and as a consequence of delays in the payment of the funds, the Corporation had to resort to medium-term loans from local banks in order to finance the project works. Granted at interest ranging between 11% and 20% and for periods from 5 to 15 years, these loans amounted to \$232.0 million in 1973 and \$54.6 million in 1974. However, until such loans were obtained, it was necessary to obtain short-term loans from the Banco de la Ciudad de Buenos Aires. At the end of the year 1974 however, the Corporation's cash situation was favorable due to delays in the works of the Alicopa complex.

24.07 The sharp fluctuations in working capital during the period 1971-1974 were created by a small number of accounts. The variations in capital stock receivables were the outcome of the subscription and payments of equity contributions, and the steady increase in receivables from 1972 onwards was the consequence of the DEBA and AE loans and, for 1974, of a considerable amount of customers receivable (\$121 million out of total sales of \$199 million, i.e., more than 7 months) mainly due to SEGBA's indebtedness (this account was settled in April 1975). The large increase in accounts payable in 1973 was brought about by debts due to contractors and by the starting of reimbursements of short-term and medium term loans from local banks.

## 25. Covenants

25.01 The Borrower has not complied with several of the covenants established during negotiations.

25.02 It did not comply with Section 5.13 of the Loan Agreement which requires to provide the return on investment authorized by the Concessions.

25.03 It did not comply with Section 5.17 of the Loan Agreement which requires the Borrower to make its best efforts to obtain credit on such terms and conditions as shall be satisfactory to the Bank and the Borrower.

25.04 It did not comply with paragraph (b), Section 6.02 of the Loan Agreement which requires the Borrower to comply with all the provisions of the Concession (and, in this case, the provision concerning the return on investment).

25.05 The question is debatable whether the Borrower complied with Section 5.04 paragraph (a) of the Loan Agreement which requires the Borrower to maintain its financial position in accordance with sound financial practices (cf. loans to DEBA and "Agua y Energia") and with Section 5.06 (d) which requires the Borrower to furnish to the Bank all such information as the Bank shall reasonably request concerning the administration, operations and financial condition of the Borrower (cf. major changes in management, loans to DEBA and "Agua y Energia"). The reason why this is debatable is that the Bank's requests occurred very infrequently due to insufficient supervision missions.

25.06 The Guarantor did not comply with Section 3.06 para (b), of the Guarantee Agreement which requires rates to be granted to the Borrower to provide the return authorized by the Concession.

## 26. Forecast Financial Performance

26.01 In the short run, HIDRONOR's financial prospects appear rather bleak. Despite a strong Government interference, mainly through the application of Resolution 171 and pressures on its upper management, the Corporation is struggling towards a minimum of managerial and financial independence. Any improvement will have to come through a strict application of the Concession, perhaps preliminarily amended in order to take into account the existing strong inflationary pressures and the more complex nature of the investments.

26.02 If the general conditions regarding tariffs remain unchanged, HIDRONOR will have to depend for its survival on subsidies or government equity contributions. The Corporation plans to implement from 1975 onwards a considerable investment program in order to build the Alicopa complex, but a definition of the Government energy policy, and of its financing, is anxiously awaited and will unfortunately depend on the drastic measures (recommended by a Bank Report of September 30, 1975) which will have to be taken in order to reform the Argentinian economy.

26.03 The above Bank Report also points out deficiencies found in the Sector as a whole as follows:

- (a) the great number of different entities engaged in generation, transmission and distribution of electric energy, with different degrees of competence;
- (b) lack of effective coordination of Sector planning; and
- (c) insufficient coordination between the electric power and other energy sectors.

It would seem from the above that the Bank, when granting this loan to HIDRONOR, should have been more insistent with the Argentinian Government to initiate steps to rationalize the institutional structure and/or the management of the Sector.

27. Lessons to be Learnt

27.01 From the financial point of view, HIDRONOR's relationship with the Bank has not been as close as expected during the construction and operating periods of the project, and the Bank was not informed about major operating and organizational developments, some of these being in violation of the spirit and letter of the covenants of the Loan Agreement.

27.02 Being a young Corporation, HIDRONOR was staffed with personnel who did not have any previous experience of relations with the Bank, but would have been quite receptive to a closer cooperation. The Bank should have lent more attention to the organizational aspects of institution building, and required periodic and detailed reports on operations and on the implementation of a sound management structure. The present management has declared its intention to maintain a constant and complete flow of information to the Bank.

Latin America and The Caribbean Regional Office  
September 24, 1976

HIDRONORVariations of Rate ParametersJanuary 1974 - July 1975

	<u>US\$</u> <u>(pesos)</u>	<u>Salary K</u> <u>(pesos)</u>	<u>Fuel Oil</u> <u>(pesos/Tm)</u>	<u>Energy</u> <u>(Mwh)</u>	<u>Power</u> <u>(Kw/monthly)</u>
January 1974	9.98	2,001	220	42.7	21.7
April 1974	9.98	2,350	245	47.5	23.2
November 1974	9.98	2,829	245	47.5	25.3
January 1975	9.98	3,287	245	47.5	25.3
February 1975	9.98	3,287	335	64.9	25.3
March 1975	15.10	3,542	335	64.9	35.0
June 1975	30.00	5,313	500	97.0	62.0
July 1975	35.50	5,313	500	97.0	69.0

FECHAS DE DEVALUACION DEL PESO ARGENTINO CON  
RESPECTO AL DOLAR ESTADOUNIDENSE - MERCADO  
FINANCIERO

<u>Fecha</u>	<u>Cotización del Dólar Estadounidense</u>	
13/ 3/67	\$	3,50
18/ 6/70		4,00
6/ 4/71		4,04
3/ 5/71		4,12
7/ 6/71		4,20
25/ 6/71		4,40
30/ 7/71		4,70
25/ 8/71		5,00
20/ 9/71		7,45
Octubre/71 (Promedio)		7,27
Noviembre/71 (Promedio)		7,84
Diciembre/71 (Promedio)		8,45
Enero 1972 (Promedio)		9,32
Febrero/72 (Promedio)		9,66
Marzo/72 (Promedio)		9,74
Mayo/72 (Promedio)		9,88
Junio/72 (Promedio)		9,93
Julio/72 (Promedio)		9,95
22/ 8/72		9,98
4/ 3/75		15,10
9/ 6/75		30,00
16/ 7/75		35,50
11/8/75		42,50

ARGENTINA

LOAN 577-AR

Principal Points of Loan Agreement

- Section 5.05 - Borrower must coordinate its operation and expansion with SEGBA and other electric utilities in the Greater Buenos Aires area to prevent waste of energy, duplication of facilities and unnecessary investment and obtain agreements with SEGBA and other electric utilities regarding the most economic operation of generating plants.
- Section 5.13 - revenues must be sufficient to provide the rate of return authorized by Hidronor's concession.
- Section 5.14(b)- test provides that debt service coverage for preceding year may not be less than 1.5 times the maximum future annual debt service.
- Section 5.16 - prevents Borrower from prepaying long-term debt without prior Bank approval.
- Section 6.01 - changing Borrower's statute or concession without Bank approval are conditions for terminating the loan.
- Section 7.01(b)- as a condition of effectiveness for the loan, Hidronor's concession must become effective.
- Section 7.01(c)- as a condition of effectiveness, satisfactory arrangements must be made for the sale of power to SEGBA.
- Section 7.01(d)- as a condition of effectiveness, satisfactory arrangements must be made with the Guarantor that the proceeds from the surcharges on crude oil and electricity will be made available to Hidronor.

Principal Points of Guarantee Agreement

- Section 2.02(a)- requires Guarantor to provide Hidronor with the proceeds from the surcharges on crude oil and electricity.
- Section 2.02(b)- requires Guarantor to provide Hidronor, or cause Hidronor to be provided with, sufficient funds to complete the Project.
- Section 3.06 - guarantees that Borrower will be granted tariffs sufficient to achieve the rate of return authorized by the concession.

Section 3.07 - Guarantor must coordinate expansion of facilities of all electric utilities which supply power to the Greater Buenos Aires area.



ARGENTINAHIDROELECTRICA NORPATAGONICA S. A.EL CHOCON PROJECT - LOAN 577-ARIncome Statements - Appraisal Estimates

(M\$N million) (US\$1 = M\$N350)

<u>Year ending December 31:</u>	<u>1973</u> <sup>/1</sup>	<u>1974</u>
Units generated (million Kwh)	1,535	3,200
Units sold (million Kwh)	1,473	3,072
Average revenue per Kwh sold (in pesos)	<u>3.60</u>	<u>3.46</u>
<u>Operating Revenue</u>	<u>5,309</u>	<u>10,631</u>
<u>Operating Expenses</u>		
Generation	263	525
Transmission	210	420
Administration	140	280
Depreciation	43	99
Amortization of non-power fixed assets	<u>137</u>	<u>274</u>
Total operating costs	<u>793</u>	<u>1,598</u>
<u>Operating Income</u>	<u>4,516</u>	<u>9,033</u>
<u>Interest Charges</u>		
Proposed IERD loan	856	1,860
Proposed foreign loans (El Chocon Project)	522	1,217
Proposed medium-term loans	60	137
Proposed future foreign loan A (Stage II)	162	609
Proposed future foreign loan B (Stage II)	<u>---</u>	<u>51</u>
Total interest charges	<u>1,600</u>	<u>3,874</u>
Less: Interest charged to construction	<u>3,896</u>	<u>1,864</u>
Net interest charges	<u>(2,296)</u>	<u>2,010</u>
<u>Net Income</u>	<u>6,812</u>	<u>7,023</u>
Rate of return (operating income to gross fixed assets in operation plus 4% for working capital)	8%	8%
Times total interest charges covered by operating income	2.8	2.3

<sup>/1</sup> Operations only during last six months of 1973.

ARGENTINAHIDROELECTRICA NORPATAGONICA S. A.EL CHOCON PROJECT - LOAN 577-ARINCOME STATEMENTS - ACTUAL RESULTS

(\$a million)(US\$1 = \$a 9.98)

<u>Year ending December 31:</u>	<u>1973</u>	<u>1974</u>
Units sold (million Kwh)	-	2,420.0
Average revenue per Kwh sold (in centavos)	-	8.2
<u>Operating Revenue</u>	-	<u>199.1</u>
<u>Operating Expenses</u>		
Generation	-	23.2
Transmission	-	21.7
Administration	-	28.9
Depreciation	-	9.2
Amortization of Non-Power Fixed Assets	-	<u>6.2</u>
<u>Total Operating Costs</u>	-	<u>89.2</u>
<u>Operating Income</u>	-	<u>109.9</u>
<u>Interest Charges</u>		
Long-Term Loans	-	185.3
Less: Interest Charged to Construction	-	<u>17.0</u>
Net Interest Charges	-	<u>168.3</u>
Other Income	-	16.7
Provincial Taxes	-	10.0
Exchange Losses	-	<u>6.5</u>
<u>Net Income</u>	-	<u>(58.2)</u>
Rate of Return		3.6
Times Total Interest Charges Covered by Operating Income		0.6

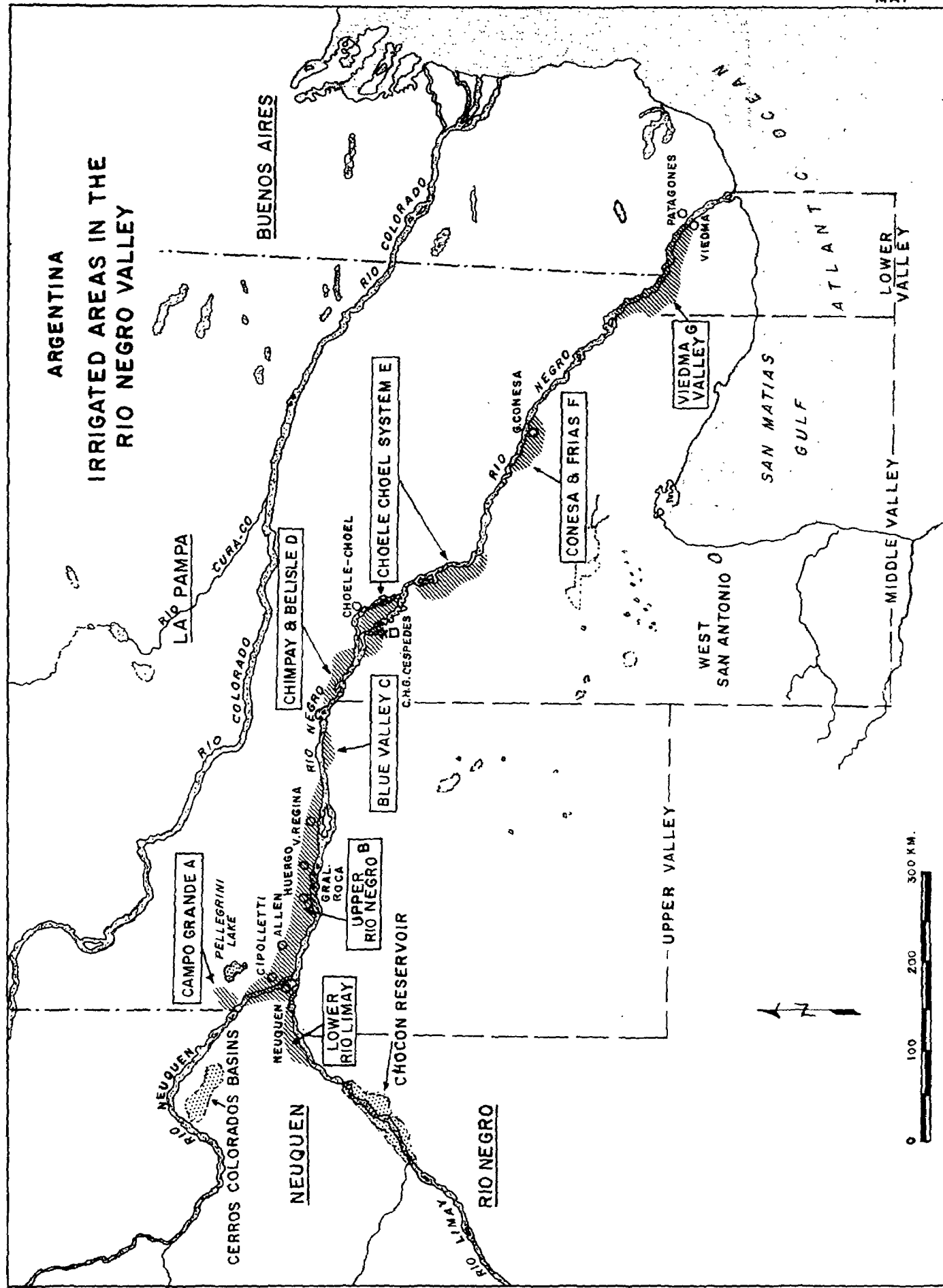
October 8, 1975

## EL CHOCON PROJECT

Source and Application of Funds Statements - Appraisal Estimate  
(M\$N million (US\$1 = M\$N350))

Year ending December 31:	1969	1970	1971	1971	1973	1974	1969-74
<b>SOURCES OF FUNDS</b>							
<b>Internal Cash Generation</b>							
Operating Income					4,516	9,033	13,549
Depreciation					43	99	142
Amortization of non-power fixed assets					137	274	411
<b>Total Internal Cash Generation</b>					<b>4,696</b>	<b>9,406</b>	<b>14,102</b>
<b>Borrowings</b>							
Proposed IBRD loan	9,251	6,178	6,386	4,123	2,412	350	28,700
Proposed foreign loans (El Chocon Project)	595	1,750	7,700	3,920	4,200	980	19,145
Proposed medium-term loans	19	96	403	780	1,044		2,342
Proposed future foreign loan A (Stage II)				2,835	4,270	4,515	11,620
Proposed future foreign loan B (Stage II)						1,575	1,575
<b>Total Borrowings</b>	<b>9,865</b>	<b>8,024</b>	<b>14,489</b>	<b>11,658</b>	<b>11,926</b>	<b>7,420</b>	<b>63,382</b>
<b>Equity Investments</b>							
Ordinary shares - Class A	10,190	8,150	8,990	13,298	17,710	18,370	76,708
Ordinary shares - Class "C"		6,585	6,585	3,292			16,462
<b>Total Equity Investments</b>	<b>10,190</b>	<b>14,735</b>	<b>15,575</b>	<b>16,590</b>	<b>17,710</b>	<b>18,370</b>	<b>93,170</b>
<b>TOTAL SOURCE OF FUNDS</b>	<b>20,055</b>	<b>22,759</b>	<b>30,064</b>	<b>28,248</b>	<b>34,332</b>	<b>35,106</b>	<b>170,654</b>
<b>APPLICATION OF FUNDS</b>							
<b>Construction Costs</b> (excluding interest during construction)							
<b>Stage I</b>							
El Chocon Project	18,585	20,755	27,195	13,790	8,575	2,730	91,630
Fortezuelo Grande	140	2,835	6,300	1,610			10,880
<b>Total Stage I</b>	<b>18,725</b>	<b>23,590</b>	<b>33,495</b>	<b>15,400</b>	<b>8,575</b>	<b>2,730</b>	<b>102,510</b>
<b>Stage II</b>							
El Chocon Project (completed)				350	1,610	4,270	6,230
Flandia Banderita				2,355	7,700	8,960	22,015
<b>Total Stage II</b>				<b>2,705</b>	<b>9,310</b>	<b>13,230</b>	<b>28,245</b>
<b>Total Construction Costs</b>	<b>18,725</b>	<b>23,590</b>	<b>33,495</b>	<b>21,105</b>	<b>17,885</b>	<b>15,960</b>	<b>130,755</b>
<b>Debt Service</b>							
<b>Amortization</b>							
Proposed IBRD loan							
Proposed foreign loans (El Chocon Project)		4	23	104		764	764
Proposed medium-term loans						468	468
Proposed future foreign loan A (Stage II)							
<b>Total Amortization</b>		<b>4</b>	<b>23</b>	<b>104</b>	<b>260</b>	<b>1,232</b>	<b>1,623</b>
<b>Interest</b>							
Proposed IBRD loan	466	893	1,241	1,533	1,712	1,860	7,705
Proposed foreign loans (El Chocon Project)	19	96	403	780	1,044	1,217	3,559
Proposed medium-term loans	1	5	22	61	120	137	346
Proposed future foreign loan A (Stage II)				92	323	609	1,024
Proposed future foreign loan B (Stage II)						51	51
<b>Total Interest</b>	<b>486</b>	<b>994</b>	<b>1,666</b>	<b>2,466</b>	<b>3,199</b>	<b>3,877</b>	<b>12,635</b>
<b>Total Debt Service</b>	<b>486</b>	<b>998</b>	<b>1,689</b>	<b>2,570</b>	<b>3,459</b>	<b>5,106</b>	<b>14,308</b>
<b>Dividends Paid</b>							
						6,661	6,661
<b>Redemption of Ordinary Shares - Class "C"</b>							
					137	274	411
<b>Executive Committee's Share of Profits</b>							
						24	24
<b>Increase or (Decrease) in Working Capital</b>							
Cash	844	(1,829)	(5,120)	4,573	12,421	6,760	17,649
Accounts Receivable					430	431	361
Materials and Supplies	40	40	40	40	40	20	220
Prepaid Expenses	10	10	10	10	10		60
Accounts Payable	(50)	(50)	(50)	(50)	(50)	(50)	(300)
<b>Total Increase or (Decrease) in working capital</b>	<b>844</b>	<b>(1,829)</b>	<b>(5,120)</b>	<b>4,573</b>	<b>12,851</b>	<b>7,171</b>	<b>18,100</b>
<b>TOTAL APPLICATION OF FUNDS</b>	<b>20,055</b>	<b>22,759</b>	<b>30,064</b>	<b>28,248</b>	<b>34,332</b>	<b>35,106</b>	<b>170,654</b>
<b>Cash Balances</b>							
Beginning of Year	4,966	5,810	3,981	(1,139)	3,434	15,855	
Increase or (Decrease) during Year	844	(1,829)	(5,120)	4,573	12,421	6,760	
End of Year	5,810	3,981	(1,139)	3,434	15,855	22,615	
<b>Times Annual Debt Service Covered by Internal Cash Generation</b>							





ARGENTINA  
IRRIGATED AREAS IN THE  
RIO NEGRO VALLEY

BUENOS AIRES

LA PAMPA

CAMPO GRANDE A

CHIMPAY & BELISLE D

BLUE VALLEY C

UPPER RIO NEGRO B

NEUQUEN

RIO NEGRO

CHOELE-CHOELE

CHOELE-CHOELE SYSTEM E

CONESA & FRIAS F

VIEDMA G VALLEY

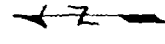
WEST SAN ANTONIO

SAN MATIAS GULF

LOWER VALLEY

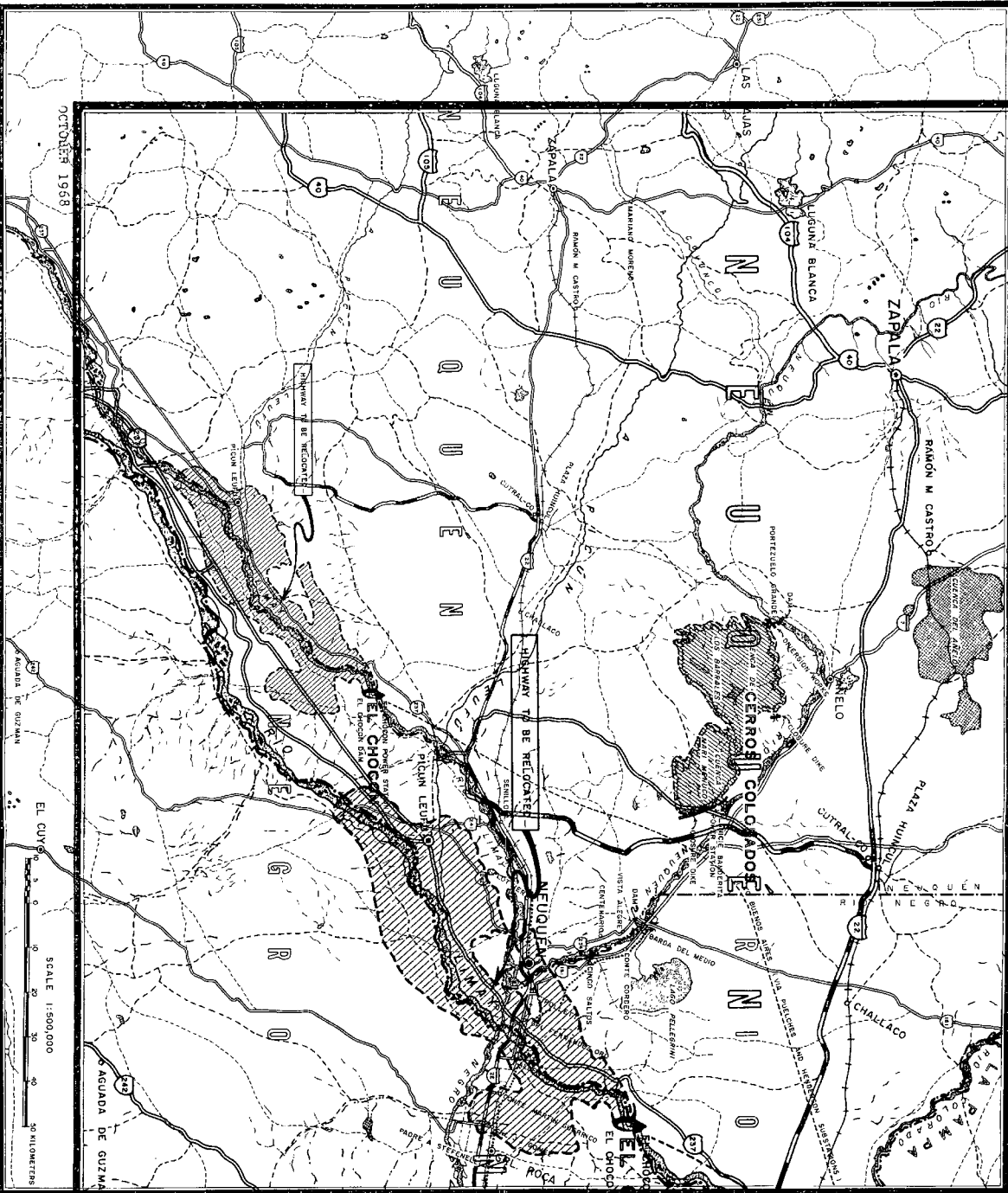
MIDDLE VALLEY

UPPER VALLEY





OCTOBER 1968



**EL CHOCON - CERROS COLORADOS DEVELOPMENTS**  
 REPUBLIC OF ARGENTINA  
 PROVINCIA DEL RIO NEGRO

