

**ARGENTINA**

**ADDITIONAL FINANCING FOR THE NORTE GRANDE  
ELECTRICITY TRANSMISSION PROGRAM**

**(AR-L1095)**

**FINANCED IN PART WITH LOAN 1764/OC-AR (AR-L1021)**

**PROPOSAL FOR ADDITIONAL FINANCING**

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1.	Document PR-3064, Norte Grande Electricity Transmission Program (AR-L1021) – July 2006 <a href="http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1676581">http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1676581</a>
2.	Cost analysis and revised economic feasibility studies for the NOA-NEA Line. Final Consultant's Report – 23 October 2008 <a href="http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1713262">http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1713262</a>
3.	Evolution of the Argentine Energy Sector – Third Semiannual Report for Loan 1764/OC-AR – October 2008 <a href="http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1675816">http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1675816</a>
4.	Evolution of the Argentine Energy Sector – Fourth Semiannual Report for Loan 1764/OC-AR – April 2009 <a href="http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1999980">http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1999980</a>
5.	Evolution of the Argentine Energy Sector – Fifth Semiannual Report for Loan 1764/OC-AR – August 2009 <a href="http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=2175801">http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=2175801</a>

## ABBREVIATIONS

BOM	Build–operate–maintain
BTU	British thermal unit
CAF	Comité de Administración del Fondo Fiduciario para el Transporte Eléctrico Federal [Management Committee of the Trust Fund for Federal Electricity Transport]
CAMMESA	Compañía Administradora del Mercado Mayorista Eléctrico S.A. [Wholesale Electricity Market Management Company]
EHVL	extra-high-voltage line
FONINVEMEM	Fondo para Inversiones Necesarias que Permitan Incrementar la Oferta de Energía Eléctrica en el Mercado Eléctrico Mayorista [Fund for investments to increase electricity supply in the wholesale energy market]
IRR	internal rate of return
km	kilometer
kV	kilovolt(s)
kWh	kilowatt-hour(s)
MBTU	One million BTUs
MWh	megawatt-hour(s)
NEA	Noreste Argentino [Northeastern Argentina]
NOA	Noroeste Argentino [Northwestern Argentina]
NPV	net present value
O&M	operation and maintenance
VAT	value added tax

## PROJECT SUMMARY

### ARGENTINA

#### ADDITIONAL FINANCING FOR THE NORTE GRANDE ELECTRICITY TRANSMISSION PROGRAM (AR-L1095)

Financial Terms and Conditions				
<b>Borrower:</b> The Argentine Republic <b>Executing agency:</b> Energy Secretariat, acting through the Management Committee of the Trust Fund for Federal Electricity Transport (CAF).			Amortization period:	<sup>1</sup>
			Grace period:	<sup>1</sup>
			Disbursement period:	<sup>1</sup>
<b>Source</b>	<b>Approved financing</b>	<b>Proposed modification</b>	Interest rate:	<sup>1</sup>
IDB (Ordinary Capital) AR-L1021	US\$580.0 million	US\$580.0 million	Inspection and supervision fee:	*
IDB (Ordinary Capital) AR-L1095		US\$300.0 million	Credit fee:	*
Local counterpart contribution	US\$145.0 million	US\$357.5 million	Currency:	<sup>1</sup>
Total	US\$725.0 million	US\$1,237.5 million		
Project at a Glance				
<b>Project objective/description:</b> The objective of the program is to strengthen the national electric power transmission grid and to spur competition in the wholesale generation market. Also, the program is a prerequisite for alleviating poverty and narrowing the social and economic development gap between the Norte Grande region and the rest of the country. The program works will make it possible to meet system demand for electric power, particularly in this region, with timely, quality, low-cost service that is efficient and secure.				
<b>Proposed modification:</b> The proposed modification requested by the Argentine government authorities calls for increasing the amount of financing from the Inter-American Development Bank by US\$300 million and the local counterpart contribution by US\$212.5 million, these amounts being needed to cover the increase in total program costs resulting from the prices obtained in the international bidding, which reflect the higher prices of inputs, local labor, and other components.				
<b>Contractual conditions:</b> As a condition precedent to the disbursement of the proceeds from the additional financing, to be added to the terms of loan 1764/OC-AR, the Bank must receive the legal opinion stipulating the contracts' General Conditions on the validity of the obligations assumed by the borrower in connection with this additional financing (paragraph 3.3).				
<b>Exceptions to Bank policies:</b> When it approved the Norte Grande Electricity Transmission Program (AR-L1021, in progress, loan 1764/OC-AR) in August 2006, the Board of Executive Directors approved a waiver to the Bank's public utilities policy (policy OP-708) (paragraphs 1.11 and 1.12).				
<b>Project consistent with country strategy:</b> <div style="display: flex; justify-content: space-between; width: 100%;"> <span>Yes <input checked="" type="checkbox"/></span> <span>No <input type="checkbox"/></span> </div>				
<b>Project qualifies as:</b> <div style="display: flex; justify-content: space-between; width: 100%;"> <span>SEQ <input type="checkbox"/></span> <span>PTI <input checked="" type="checkbox"/></span> <span>Sector <input type="checkbox"/></span> <span>Geographic <input type="checkbox"/></span> <span>Headcount <input type="checkbox"/></span> </div>				

\* The credit fee and inspection and supervision fee will be established periodically by the Board of Executive Directors as part of its review of the Bank's lending charges, in accordance with the applicable provisions of the Bank's policy on lending rate methodology for Ordinary Capital loans. In no case will the credit fee exceed 0.75% or the inspection and supervision fee exceed, in a given six-month period, the amount that would result from applying 1% to the loan amount divided by the number of six-month periods included in the original disbursement period.

<sup>1</sup> Because the additional financing will be added to the amount of loan 1764/OC-AR, the financial terms and conditions will be those set out in the contract for that loan. Accordingly, the date of the first repayment installment and the deadline for completion of disbursements will be the same as for loan 1764/OC-AR.

## I. BACKGROUND

### A. The Norte Grande transmission program (AR-L1021, in progress, loan 1764/OC-AR)

- 1.1 The loan proposal for the Norte Grande electricity transmission program (AR-L1021, in progress, loan 1764/OC-AR)<sup>1</sup> was approved by the Board of Executive Directors of the Inter-American Development Bank on 2 August 2006. The objective of the program is to strengthen the national power transmission grid and to spur competition in wholesale generation. Also, the program is a prerequisite for alleviating poverty and narrowing the social and economic development gap between the Norte Grande region and the rest of the country. The program works will make it possible to meet system electricity demand, particularly in this region, with prompt, quality, low-cost service that is efficient and secure.
- 1.2 The program will finance a 1,220 kilometer 500 kilovolt (kV) electric power transmission line, linking the northwest and northeastern regions of Argentina (NOA-NEA line); provincial and regional transmission and subtransmission works, including transformer stations, and ancillary works as part of the Norte Grande Development and Integration Program; and support for development of the national energy sector.
- 1.3 The program will contribute to the objectives of the Bank's Sustainable Energy and Climate Change Initiative (SECCI), which promotes energy sustainability and the reduction of greenhouse gas emissions, given that a substantial part of the project benefits come from the savings produced by the line in the system's variable generation operating costs, owing to lower fuel consumption resulting from a better optimized national generation system, with the corresponding reduction in greenhouse gas emissions.

### B. Program implementation status

- 1.4 **Program financing.** The contract for the loan (1764/OC-AR) for the Norte Grande Electricity Transmission Program (AR-L1021, in progress) was signed by the Bank and the Government of Argentina, as the borrower, on 6 November 2006, and the program became eligible for disbursements on 14 June 2007. As of 30 September 2009, 60.8% of the loan proceeds, or US\$352.4 million, had been disbursed.
- 1.5 The program executing agency is the Energy Secretariat, acting through the Management Committee of the Trust Fund for Federal Electricity Transport (CAF), both of which are under the Federal Ministry of Planning, Public Investment and Services. Execution of component I proceeded more slowly than planned, partly because of the complexity of the bidding process for the build-operate-maintain contract, and partly because of the need to address a protest filed during the bidding process. To date, the works comprising the program's main component—the extra high voltage 500 kV power line and the associated transformer stations—are well

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<sup>1</sup> Document PR-3064 - Norte Grande Electricity Transmission Program (AR-L1021) – July 2006.

under way, with physical progress of about 30%. Under component II, for provincial works, progress has been made in the provinces of Formosa and Misiones, where expenditure on works—consisting of 132 kV subtransmission lines and transformer stations—has been recognized against the loan proceeds. At present, the review of the plans and bidding documents for the provincial works scheduled to start in 2009 and 2010 is being finalized.

- 1.6 **Environmental and social strategy.** The Committee on Environment and Social Impact approved the environmental and social strategy for the Norte Grande electricity transmission program AR-L1021 (loan 1764/OC-AR) at its 15 July 2005 meeting for the project concept document, and at its 10 February 2006 and 7 April 2006 meetings for the project report and the corresponding environmental and social management report. The scope of this proposal for additional financing (AR-L1095) does not require or entail any changes to the scope of the environmental and social strategy approved by the Bank for program AR-L1021.
- 1.7 Since program AR-L1021 (loan 1764/OC-AR), in progress, was approved by the Bank, there have been no changes in the baseline conditions or the Bank-approved environmental and social strategy considered in the environmental and social impact assessment for the operation. The institutional arrangements, processes, and responsibilities established for the environmental and social management of these operations also remain unchanged. The bidding and contracting processes have concluded for supervision of the component I works under operation AR-L1021 (loan 1764/OC-AR), in progress, which includes not only technical supervision, but also environmental and social supervision, currently under way. The required environmental permits and licenses have been obtained in keeping with the timetable for execution of works.
- 1.8 The project team reviewed issues relating to the program's execution mechanism and the status of the conditions and agreements contained in the program's environmental and social strategy, and based on its evaluation and the findings of the recent environmental and social supervision mission by the Bank's Environmental Safeguards Unit (VPS/ESG), the environmental management processes and procedures agreed on by the borrower, the executing agency, and the Bank are being adequately followed.

#### **C. Evolution of the energy sector**

- 1.9 Pursuant to the contract for loan 1764/OC-AR, clause 4.05, the borrower has submitted to the Bank five semiannual reports on the evolution of Argentina's energy sector that describe conditions in the sector and, specifically, the normalization process in the energy market. These semiannual reports have played an effective role in supporting the dialogue between the Bank and the authorities on trends in Argentina's energy sector. According to these reports, the energy policy guidelines initially issued in the April 2005 document "State of the Energy Sector" remain in full effect, making progress toward the long-term goal of normalizing energy markets, and although the situation has evolved more slowly than expected

at the time that program AR-L1021 (in progress, loan 1764/OC-AR) was approved, progress has been significant.

1.10 Below is a summary of recent actions by the Argentine government to achieve the long-term goal of normalizing energy markets:

- a. Increases in residential power rates. On 1 October 2008, new wholesale power market prices were approved that meant new rate increases, throughout the country, with residential consumers of more than 1,000 kilowatt-hours (kWh) per two-month period absorbing the portion of power generation costs that had previously been absorbed by the Stabilization Fund. The resulting nationwide distributor wholesale prices for residential consumers are on the order of: (a) US\$46/megawatt-hour (MWh) for two-month usage from 1,000 kWh up to 1,400 kWh; (b) US\$75/MWh for two-month usage from 1,400 kWh up to 2,800 kWh; and (c) US\$135/MWh for two-month usage of more than 2,800 kWh. These changes took effect in October 2008. Lower transitional rates were temporarily set, effective 1 June through 30 September 2009. As of October 2009, residential consumers again have to cover the costs (partial or total) of the generation system as set in the October 2008 resolution.
- b. Transparent subsidies. The provision approved in June 2009 was accompanied by an instruction to distribution companies to indicate on their bills the amount of subsidy for each type of consumer (residential, nonresidential, and industrial), namely the difference between the unsubsidized price calculated by the company that administers the wholesale market—Compañía Administradora del Mercado Mayorista Eléctrico (CAMMESA)—in its winter 2009 seasonal schedule and the rates ultimately billed as a consequence of the changes being introduced. This information enables consumers to see the amount of the bill that they will have to pay for their usage once the approved wholesale market prices are reestablished, and adjust their consumption decisions accordingly.
- c. Contract renegotiation and comprehensive rate review for power distribution and transportation value added. All public utility contracts for power distribution and transportation for the 11 federally regulated companies have been renegotiated as stipulated by the Public Emergency Act of January 2002, and the corresponding memorandums of agreement have been signed and approved by the government. The comprehensive rate review scheduled for 2008 and subsequently postponed to February 2009 has not yet been completed, but the studies are in progress. Nevertheless, the rate increases agreed on in the context of the memorandums of agreement signed by the Contract Renegotiation Unit (UNIREN) for all companies have been implemented and adjusted for cost increases. Although residential customers were not initially included, in July 2008, in keeping with the guidelines of the memorandums of agreement, the Argentine government authorized a new increase in distribution and

transmission value added for these companies that included residential customers, so the delay in completing the comprehensive rate review is not expected to have a significant impact on existing subsidy levels.

- d. Conversion of debt of the Rate Stabilization Fund. Article 18 of the General Public Administration Budget Act (law 26.422) of November 2008 defines as nonreimbursable all contributions made since 2003 via various executive orders and the debts that the sector had accumulated under the 2006 and 2007 national budgets. These “contributions” refer to loans from the National Treasury to the Electricity Master Fund and loans from the latter to the stabilization fund administered by CAMMESA. When these contributions became nonreimbursable, they were no longer considered a debt that the power sector would need to cover in the future. The funds contributed by the national government through April 2009, which put CAMMESA’s accounts on sound footing, amount to some 22.308 billion Argentine pesos (about US\$6.5 billion). Moreover, Article 19 of the above law provides that the national Executive Branch will continue to make the necessary nonreimbursable contributions from the National Treasury to the master fund, throughout 2009, to pay the fund’s current liabilities so that it can perform its specific functions and to sustain the wholesale power market by providing financial assistance to the stabilization fund. A source has thus been identified and implemented to cover the subsidies stemming from the delay in raising electric power prices.
- e. Increase in natural gas prices. Beginning in November 2008, higher natural gas prices took effect for residential consumers nationwide, with the increase segmented as a function of geographic location and consumption levels. This increase will be used to create a trust fund that will cover natural gas imports and all provision thereof needed to meet domestic demand. Parallel to these increases, the compensation paid to the natural gas producers that supply electric power producers will increase beginning in August 2009. The new price of natural gas was set at a minimum of US\$1.89/MBTU for Santa Cruz producers and a maximum of US\$2.14/MBTU for Neuquén basin producers. These figures are virtually twice the price received by producers previously. The aim of better compensating natural gas producers is to create incentives for raising production and to be able to substitute consumption of liquid fuels for electric power generation, reducing the generating costs for the wholesale power market.
- f. Introduction of new generating capacity through projects funded by FONINVEMEM (the government fund for investments to increase electricity supply in the wholesale energy market); the introduction of price signals for the siting of new generation facilities by private entities; and the call for bids, through Energía Argentina S.A., for implementation of various generation projects, including the recent call for bids to supply

1,000 megawatts from renewable energy sources. There has also been major progress in implementing the Federal Electricity Transport Plan to ensure sufficient transmission capacity in the system;

- 1.11 **Bank policies.** When it approved program AR-L1021 (in progress, loan 1764/OC-AR) in August 2006, the Board of Executive Directors approved a waiver to the Bank's public utilities policy (policy OP-708) because of inconsistencies between sector conditions in Argentina and that policy. The main issues were the not-yet-normalized rate regime and its impact on the long-term sustainability of the sector, as well as the incomplete renegotiation of concession contracts with electricity transport and distribution companies (paragraph 1.36 of document PR-3064).
- 1.12 As described in the preceding paragraphs, despite adverse conditions in 2008 and 2009 thus far, caused by higher fuel prices and the global crisis, the sector has taken actions toward normalization. For instance, the Argentine authorities have completed contract renegotiation with companies, established transitional rate regimes for those companies, introduced significant rate hikes, and adopted resolutions to make subsidies transparent and to designate a source of financing for the deficits generated. Full rate normalization, however, will necessitate additional actions and adjustments, particularly to better target subsidies granted via the recognition of generation costs, and to formalize the transitional increases in electric power distribution and transportation value added.

## **II. PROPOSED MODIFICATION**

### **A. Additional program financing**

- 2.1 The Argentine government authorities have requested that the Bank loan be increased by US\$300 million, and the local counterpart contribution by US\$212.5 million, these amounts being needed to cover the increase in total program costs resulting from the prices obtained in the international bidding, which reflect the higher prices of inputs, local labor, and other components. Table 1 below contains the updated program budget and financing, compared with the amounts initially approved, while Table 2 shows the status of program execution and a projection of disbursements by source. The proceeds of the additional financing will supplement the financing for works to be executed in 2010 and 2011.

**Table 1**  
**Financing (thousands of U.S. dollars)**

Item	Description	Approved loan			Proposed modification		
		IDB	Counter-part	Total	IDB	Counter-part	Total
a.	Component I: NEA-NOA interconnection	414,554	103,638	518,192	705,517	288,169	993,686
b.	Component II: Provincial and regional transmission and subtransmission grids	123,689	30,922	154,611	144,621	59,070	203,691
1	Works in the province of Misiones	42,006	10,502	52,508	49,227	20,107	69,334
2	Works in the province of Formosa	25,376	6,344	31,720	35,408	14,463	49,871
3	Works in the province of Corrientes	5,703	1,426	7,129	6,076	2,482	8,558
4	Works in the province of Salta	38,734	9,683	48,417	41,264	16,854	58,119
5	Works in the province of Catamarca	11,870	2,967	14,837	12,645	5,165	17,810
c.	Component III: Engineering, management, and inspection	18,277	0	18,277	19,123	0	19,123
1	Studies, consulting assignments, and audits	1,845	0	1,845	500	0	500
2	Technical/environmental inspection	11,805	0	11,805	13,660	0	13,660
3	Program execution unit	4,627	0	4,627	4,963	0	4,963
d.	Escalation and contingencies	23,480	10,439	33,919	10,739	10,261	21,000
	Program total	580,000	145,000	725,000	880,000	357,500	1,237,500
	% share	80%	20%	100%	71%	29%	100%

**Table 2 – Status of Program Execution and Projected Disbursements by Year (in US\$ millions)**

	EXECUTED AS OF AUG/09	REMAINDER 2009	2010	2011	TOTAL
<b>TOTAL EXECUTION</b>	<b>430.6</b>	<b>252.9</b>	<b>289.6</b>	<b>264.4</b>	<b>1,237.5</b>
Financing:					
IDB – 1764/OC-AR	323.7	138.8	80.0	37.5	<b>580.0</b>
IDB - AR-L1095	0.0	0.0	150.0	150.0	<b>300.0</b>
IDB subtotal	<b>323.7</b>	<b>138.8</b>	<b>230.0</b>	<b>187.5</b>	<b>880.0</b>
Local – executing agency	106.9	114.1	59.6	76.9	<b>357.5</b>
<b>TOTAL FINANCING</b>	<b>430.6</b>	<b>252.9</b>	<b>289.6</b>	<b>264.4</b>	<b>1,237.5</b>

2.2 In October 2008, international consultants helped to conduct an evaluation of the cost increase resulting from the international bidding process for the NEA-NOA interconnection line (at September 2008 prices) and a review of the impact on the project's economic feasibility. The results are presented in the next section. It should be noted that after this time, in light of favorable trends in some of the price indexes and in the exchange rate, the budget for the NEA-NOA line was adjusted

downward from an estimated US\$1,013.7 million in September 2008 to US\$993.7 million in May 2009, adjustments were made to the other components, and the cost escalation estimate was lowered. The findings of the technical analysis and of the economic feasibility review are not adversely affected by this cost reduction, so the September 2008 budget is maintained in sections B and C below for analytical purposes.

## **B. Justification for the higher program cost**

- 2.3 The results of all the international bidding processes for the program's main component—the NEA-NOA interconnection line—are given in the table below, which provides a comparison between the amounts budgeted for each bidding process under that component at the time the operation was approved and the figures resulting from the international competitive bidding processes evaluated in September 2008.

**Table 3**  
**Bidding Processes for the 500 kV NEA – NOA Interconnection Line**

Ref No.	Contract description	July 2006 loan proposal	Contract price September 2008	Percentage variation
11	Pylon structures - Eastern segment	10,879,000	24,219,468	123%
12	Conductors - Eastern segment	31,348,000	51,088,121	63%
13	Transformers - Eastern segment	13,378,000	20,220,000	51%
14	Pylon structures - Western segment	12,325,000	26,740,315	117%
15	Conductors - Western segment	35,500,000	58,127,138	64%
16	Transformers - Western segment	13,695,000	19,328,639	41%
17	Build–operate–maintain (BOM) – Eastern segment	161,441,000	314,459,016	95%
18	Build–operate–maintain (BOM) – Western segment	149,692,000	323,616,858	116%
Contract amounts without VAT <sup>(a)</sup>		428,258,000	837,799,554	96%
Contract amounts with VAT added		518,193,000	1,013,737,461	96%

(a) VAT = value added tax.

- 2.4 An analysis was done of the variations between the capital costs budgeted in July 2006 and those observed during September 2008, to compare the bids received for the works under component I with the corresponding typical international costs. This could not be done directly, however, as the two BOM contracts do not break down costs into supplies versus construction per se. To overcome this information gap, the analysis began by verifying the itemized budget for each works project presented by the consulting firm Tranelisa in May 2007.
- 2.5 The budget in question, for US\$774.3 million (in May 2007 dollars), including value added tax (VAT), was reviewed in the context of international price indicators and the total cost matrix constructed based on the direct construction

costs, and the review found the amounts to be acceptable. The budget was already 49.4% higher than that included in the July 2006 loan proposal, leaving the remaining 30.9% vis-à-vis the current bids to be explained. The explanation rests largely on higher prices for the commodities involved in the project—mainly steel, aluminum, and cement—as well as for labor. The analyses performed thus far show that about 50% of the remainder is clearly accounted for by changes in international prices. The other half is largely explained by three factors: (i) increased country risk; (ii) the lesser degree of competition likely associated with limited international competitive bidding (ICB); and (iii) the likely adoption by bidders of measures to hedge against exchange-rate risk, as their contracts are denominated in Argentine pesos or have a major peso component. The likelihood that bidders adopted measures to hedge against exchange-rate risk is suggested by the fact that the contracts that saw the largest price increases were precisely those that were exposed to exchange risk in their entirety.

- 2.6 The interconnection line accounts for 60% of the cost of component I. Although the cost of different extra-high-voltage lines (EHVL) varies widely, the budgeted amount does appear to fall within international parameters. The amount budgeted by Tranelisa is US\$313,350/km (May 2007), with costs varying significantly by segment. An EHVL is considered to have a cost statistically similar to the NEA-NOA line if its unit cost lies in the range of US\$277,547/km to US\$364,538/km. The corresponding value recognized by Colombia's Energy and Gas Regulatory Commission (CREG) for the "UCL11" construction unit was US\$278,200/km (December 2006 dollars), or US\$277,500/km in May 2007 dollars. Reports used in Mexico for budget purposes use a value of US\$290,726/km (May 2007 dollars) for 400 kV lines, which is similar once one adjusts for the higher voltage and for the different dates. The average cost for the 500 kV Comahue-Cuyo line, US\$297,000/km, also falls within this range. It was concluded that the budget for the NEA-NOA interconnection project is within the cost range one might expect.
- 2.7 It is important to note that the results mentioned in the above price analysis are mainly caused by the significant pressure on suppliers of electrical goods because of the high demand for their products in 2007 and the first half of 2008. The global economic slowdown should lower demand and have a moderating effect on prices, in addition to prompting government actions to influence currency parities. These trends could eventually result in lower program costs. Accordingly, prices should be reset at whichever time is most favorable for the country, and the effect would probably be to lower the contract amounts with respect to the October 2008 budget.

### **C. Revised economic feasibility analysis**

- 2.8 The economic analysis in the loan proposal for program AR-L1021 (in progress, loan 1764/OC-AR) was revised in light of newly available information.<sup>2</sup> Although the investment costs increased significantly, so did the benefits, which, combined

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<sup>2</sup> With the exception of the physical modifications to the electrical power system, which have no significant impact on the results and allow current simulations to be compared with those done in 2006.

- with a decline in operation and maintenance (O&M) costs, suggest that the NEA-NOA line's economic cost-benefit indicators will remain at acceptable levels, and will prove robust with regard to major changes in their main determining variables.
- 2.9 The revised economic analysis uses the same numeraire as the original, consisting of constant prices from which the VAT has been subtracted, as the only transfer.<sup>3</sup> The power simulations use the same hydrothermal dispatch model used in 2006, but with updated fuel price information; otherwise, the model was fed with the same demand projections and the same extra-high voltage transmission and generation system. Owing to limitations on available information, the analysis omits two important benefits whose inclusion would improve the economic results even further: one is the reduction of losses in the medium-voltage transmission system as flows move to the high-voltage system, and the other is the greater grid reliability resulting from the closure of the 500 kV system across northern Argentina.
- 2.10 The differences between the two analyses are: (i) the new investment costs—estimated at US\$915.1 million (October 2008 dollars)—consisting of US\$837.8 million in direct contract costs, plus US\$11.8 million for engineering, administration, and supervision, and US\$43.3 million for contingencies; (ii) the new O&M costs, valued at US\$3.2 million, which have already been set contractually as a fixed charge for annual operating expenses; (iii) the inclusion of the line's opportunity cost in the last year of the simulation horizons, which constitutes its salvage value; (iv) the conservative quantification of the savings in unserved energy, which the current appraisal separates into two intervals: for the first two years in which there is a reduction in unserved energy, the savings are quantified in the same way as in the original appraisal, at an outage cost of US\$1,500/MWh; for subsequent years, they are quantified at the total marginal cost of long-term generation, estimated at US\$418/MWh, thereby avoiding overestimating one benefit, reducing it to the equivalent of the costs freed up from the available corrective measure, which is to generate the unsupplied energy instead of restricting service; and (v) the updated quantification of the savings produced by the line in terms of variable generation operating cost, through new dispatch simulations using 2008 fuel prices (delivered at the generation plant): US\$693/ton for *fuel oil*, US\$1,039/ton for *diesel oil*, US\$347/ton for coal, with the price of gas determined for each region and plant (around US\$2 per million BTUs).
- 2.11 The 2006 evaluation assumed that the investment in the NOA–NEA line would be US\$370 million and concluded that the project had a net present value (NPV) of US\$106.6 million (December 2005 dollars) calculated at a discount rate of 12% back to January 2005 and an internal rate of return (IRR) of 17.9%. Modifying only the investment and O&M costs, without factoring in the changes described in the previous paragraph, the project would have an NPV of negative

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<sup>3</sup> Accordingly, the costs and benefits include other transfers such as direct taxes, taxes on earnings, and tariffs. Nor were corrections made to the cost of labor or to the shadow price of the investment or of the currency; consequently, the analysis is not based on economic efficiency prices.

US\$294.3 million, and the IRR would fall to 2.2%. Once the above modifications are included, the analysis finds that the project's NPV is US\$251.4 million (October 2008 dollars) calculated at a discount rate of 12% back to January 2007, and the new IRR is 17.7%.

- 2.12 Table 4 shows the results of the updated cost-benefit analysis and their sensitivity to major changes in the core variables determining the project's return indicators. The main findings are: (i) the economic return indicators are robust, remaining at acceptable levels even when their determining variables change significantly; (ii) the project's IRR continues to be positive, even when the benefit from its salvage value is not factored in; (iii) the savings from reduced unserved energy and the long-term marginal generation cost only account for 14% of the present value of the benefits, which is why the project is relatively insensitive to their valuation; and (iv) this being a typical interconnection project (rather than a transmission project), most of the benefits (86%) come from replacing costly resources on the margin with more efficient generation resources that make the line affordable. As a result, a decline in fuel costs is the only variable to which the project is highly sensitive, but fuel prices could drop by as much as 75% before the NPV becomes negative.

**Table 4**  
**Sensitivity of the Cost-benefit Analysis**

Scenarios	NPV	IRR %
1. NEA -NOA line; base case	251.4	17.7%
2. The investment costs increase:		
a. 15%	186.0	15.8%
b. 30%	120.6	14.2%
c. 45%	55.2	12.9%
3. O&M costs rise:		
a. 50%	246.6	17.6%
b. 100%	241.8	17.5%
c. 150%	236.9	17.4%
4. There is no salvage value	78.4	14.2%
5. The valuation of unserved energy falls:		
a. 50%	240.2	17.4%
b. 100%	234.6	17.3%
6. The long-term marginal cost falls:		
a. 50%	228.7	17.2%
b. 100%	217.4	17.0%
7. Unserved energy is not valued	149.8	15.5%
8. Fuel costs fall:		
a. 25%	131.0	15.1%
b. 50%	50.7	13.2%
c. 75%	-6.7	11.8%
9. The project is delayed by one year	223.1	17.5%

- 2.13 The timing of the project's scheduled entry into operation can be considered ideal, since it is not possible to build it in less time, and the effect of a one-year delay would be a loss in NPV of US\$28.3 million. The usage characteristics of the NEA-NOA line as an interconnection asset are clearly reflected in its flows in 2012, which, in the week analyzed, peak at 1,150 MW and have an average value of 410 MW east to west, with figures of 256 MW and 24 MW, respectively, in the other direction.

### III. RECOMMENDATION

- 3.1 **Recommended modifications.** Based on the policy on additional financing of cost overruns for operations in progress (document GN-2329) and the analysis made of the information in this report, and considering that this proposal meets the conditions set out in document GN-2329, since:
- a. The borrower has made the request before expiration of the present disbursement period;
  - b. The program is proceeding satisfactorily;
  - c. The cost overruns are the result of exceptional circumstances beyond the borrower's control;
  - d. Adjusting the project volume or coverage to the funding available would seriously jeopardize the possibility of achieving the project objectives;
  - e. The additional financing will make it possible to achieve the objectives of the operation without adversely affecting the economic, financial, institutional, and environmental feasibility of the operation;
  - f. The borrower does not have additional resources at its disposal, and has not been able to obtain financing from other sources on reasonable terms and conditions;
  - g. The borrower agrees to provide additional counterpart resources to exceed the original ratios approved in the project financing matrix, including cost overruns; and
  - h. Argentina is current on its payments with the Bank, in accordance with the policy in effect.
- 3.2 Management recommends that the Board of Executive Directors: (i) approve the modifications to loan 1764/OC-AR, increasing the amount of Bank financing by US\$300 million, drawn from the Ordinary Capital, and replacing the cost table with the one presented in Table 1; and (ii) authorize the President of the Bank or his designee to enter into the necessary contract or contracts with the Government of Argentina to implement these modifications.
- 3.3 In accordance with the Bank's procedures, the Board of Executive Directors is responsible for approving any increase in the amount of a loan. Pursuant to its

Regulations, the Board of Executive Directors must consider this matter by standard procedure. If the proposal is approved, Management will proceed to prepare an amendatory contract, to be signed by the Bank and the borrower to reflect the agreed changes. **As a condition precedent to the disbursement of the proceeds from the additional financing,** to be added to the terms of loan 1764/OC-AR, **the Bank must receive the legal opinion stipulating the contracts' General Conditions on the validity of the obligations assumed by the borrower in connection with this additional financing.**

- 3.4 Goods, services, and works will be procured, and consulting services selected and contracted, in accordance with the Policies for the Procurement of Works and Goods Financed by the IDB (document GN-2349-7) and the Policies for Selection and Contracting of Consultants Financed by the IDB (document GN-2350-7).

## **ANEXX I**

### **Development Effectiveness Matrix Summary**

**- Confidential document -**

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-\_\_\_/\_\_\_

Argentina. Loan \_\_\_/OC-AR to the Argentine Republic  
Additional Financing for the Norte Grande Electricity  
Transmission Program

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 Argentine Republic, as Borrower, for the purpose of granting it an additional financing to the one authorized by Resolution DE-81/06 to cooperate in the execution of the Norte Grande Electricity Transmission Program. Such financing will be for an amount of up to US\$300,000,000 from the Single Currency Facility of the Ordinary Capital resources of the Bank, and will be subject to the Financial Terms and Conditions and the Special Contractual Conditions of the Project Summary of the Loan Proposal.