

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PARAGUAY

NATIONAL ELECTRICITY ADMINISTRATION

MULTIPHASE POWER TRANSMISSION PROGRAM

PHASE II

(PR-L1058)

LOAN PROPOSAL

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REQUIRED ELECTRONIC LINKS	
1.	Annual work plan http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=37177704
2.	Monitoring and evaluation arrangements http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=37177684
3.	Environmental and social management report (ESMR) http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=37177664
4.	Procurement plan http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=37308259
OPTIONAL ELECTRONIC LINKS	
1.	Review of the strategic investment plan for Paraguay's electricity sector http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36667590
2.	Need study for a second 500 kV transmission line between Ayolas and Villa Hayes http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36667589
3.	Diagnostic assessment of energy policy http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36667584
4.	Report on ANDE's financial statements http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36667587
5.	Economic and financial evaluation of Component 1: 500 kV transmission line Ayolas–Villa Hayes http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=37177641
6.	Economic and financial evaluation of Component 2: Electronic meters for electric power http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=37177646
7.	Work profile for 500 kV transmission line Ayolas–Villa Hayes and additional reinforcement http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36667637
8.	Phase I performance evaluation http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=37177666
9.	Financial analysis of ANDE http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=37177651

ABBREVIATIONS

ANDE	Administración Nacional de Electricidad [National Electricity Administration]
CAF	Development Bank of Latin America
DPGPE	Dirección de Planificación General y Política Empresarial [General Planning and Business Policy Office]
EBITDA	Earnings before interest, tax, depreciation and amortization
EIB	European Investment Bank
EIRR	Economic internal rate of return
ESMP	Environmental and social management plan
GCI-9	Ninth General Capital Increase, or Ninth General Increase in Resources of the Inter-American Development Bank
GWh	Gigawatt-hours
ICAS	Institutional Capacity Assessment System
ICB	International competitive bidding
km	Kilometers
kV	Kilovolts
kWh	Kilowatt-hours
MOPC	Ministerio de Obras Públicas y Comunicaciones [Ministry of Public Works and Communications]
MVA	Megavolt-amperes
MW	Megawatts
MWh	Megawatt-hours
NCB	National competitive bidding
PCU	Program coordination unit
SIAF	Sistema Integrado de Administración Financiera [Integrated Financial Administration System]
SICO	Sistema Integrado de Contabilidad [Integrated Accounting System]
SIN	Sistema Interconectado Nacional [National Interconnected System]

PROJECT SUMMARY

PARAGUAY

NATIONAL ELECTRICITY ADMINISTRATION MULTIPHASE POWER TRANSMISSION PROGRAM PHASE II

(PR-L1058)

Financial Terms and Conditions						
Borrower: National Electricity Administration (ANDE) Guarantor: Republic of Paraguay Executing agency: ANDE			Flexible Financing Facility*			
			Amortization period:		25 years	
			Original weighted average life:		15.25 years	
			Disbursement period:		5 years	
Source	Amount (US\$)	Grace period:		5.5 years		
IDB (OC)	50,000,000	Inspection and supervision fee:		**		
Local (includes EIB and CAF funds)	216,840,000	Interest rate:		LIBOR		
		Credit fee:		**		
Total	266,840,000	Currency of approval:		U.S. dollars		
Project at a Glance						
<p>Project objective: To make the productive sector more competitive and raise the standard of living for the people of Paraguay through more reliable supply and more efficient use of the country's available electric power generation capacity. The specific objectives are: (i) to contribute to the financing of investments for a 500-kilovolt transmission line from Yacretá to Asunción and associated substations; (ii) to reduce electric power losses; and (iii) to contribute to the modernization of ANDE's management.</p>						
<p>Conditions precedent to the first disbursement: (i) Reduction of electricity losses to 29%; (ii) completion and publication of the comprehensive study of costs and rates; (iii) approval of the program Operating Regulations by order of the Office of the President of ANDE, on terms previously agreed upon with the Bank; (iv) Bank approval of the final environmental and social impact study, including the environmental and social management plan and an impact mitigation and compensation plan for flora and fauna; (v) Bank approval of the detailed resettlement plan, including a system for resolving complaints and claims; and (vi) signature of a coordination agreement between the Ministry of Finance and ANDE related to program execution progress.</p>						
<p>Special execution conditions: (i) Prior to works solicitation for the transmission line and expansion of the substations, the final technical design showing the final route of the transmission line, and the bidding documents including environmental and social specifications, must be submitted to the Bank; (ii) prior to award of the works contract for the transmission line and expansion of the substations, the environmental and social obligations, as well as a budget for actions related to environmental and social mitigation, in accordance with the environmental and social management report (ESMR) and the environmental and social management plan (ESMP), must be incorporated into the contracts; (iii) prior to the start of works for the transmission line and expansion of the substations: (a) the respective environmental permit must be secured; and (b) the supervision firm must be hired; (iv) prior to the start of works for the transmission line, at least 25% of the easement rights must be secured; and (v) the following financial ratios must be maintained: (a) minimum ratio of internal cash generation to debt service of 1.5; (b) maximum long-term debt to equity ratio of 1.0; and (c) minimum current assets to liabilities ratio of 1.2; and (vi) as a special condition for the disbursement of more than 50% of the loan proceeds: (a) implementation of separate accounting for the power generation, transmission, and distribution businesses; and (b) achievement of a collection level of 85%, to be maintained during the execution period.</p>						
<p>Exceptions to Bank policies: Partial waiver of Operational Policy OP-708 (see paragraphs 1.19, 1.20, and 1.21).</p>						
Project consistent with country strategy:				Yes [X] No []		
Project qualifies as:	SEQ <input type="checkbox"/>	PTI <input type="checkbox"/>	Sector <input type="checkbox"/>	Geographic <input type="checkbox"/>	Headcount <input type="checkbox"/>	

* Under the Flexible Financing Facility (document FN-655-1), the borrower has the option of requesting changes to the amortization schedule, as well as currency and interest rate conversions, subject in all cases to the date of the final amortization payment and the original weighted average life. The Bank will take market conditions as well as operational and risk management considerations into account when reviewing such requests.

** 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 applicable policies.

I. DESCRIPTION AND RESULTS MONITORING

A. Background and rationale

- 1.1 Paraguay has a surface area of 406,752 square kilometers and a population of about 6 million, 44% of them in rural areas. The country has 8,760 megawatts in electricity generation capacity,¹ compared to a peak demand on the order of 2,200 MW and some 11,000 gigawatt-hours per year. Nearly all generation is hydroelectric. The Asunción metropolitan area, which accounts for about 57% of demand, receives 80% of its electricity from the Itaipú and Acaray hydropower plants and 20% from the Yacyretá hydropower plant through 220-kilovolt transmission lines. The National Interconnected System (SIN) has the following infrastructure: (i) 16 km of 500 kV transmission line; (ii) 4,090 km of 220 kV transmission line; (iii) 1,409 km of 66 kV transmission line; and (iv) 70 transmission substations.
- 1.2 **Problem to be addressed.** The main problem in Paraguay's electricity sector is insufficient capacity for transmission from generation sources to consumption centers. A number of studies related to optimal development of the SIN, including connection with the regional electricity market, have been done in the past 15 years. These studies² helped to identify the problems and their main causes, as described below.
- 1.3 Overloaded transmission system. Current maximum capacity in the transmission system is 1,700 MW, which was surpassed in 2009.³ With peak demand currently around 2,200 MW, the main 220 kV transmission lines carry heavy loads during peak hours in excess of nominal capacity. Transmission losses (about 7.6% out of total system losses of 30.9%),⁴ and the requirements due to these overloads, are such that expanding the system based on 220 kV grids would not be enough to meet demand with the current system configuration. Overloads also make the system less flexible and responsive in the event of a failure. This calls for emergency arrangements and load reductions to avoid the risk of collapse.
- 1.4 Rapidly increasing demand. Energy demand in the SIN has grown more than 8.1% per year over the past 10 years, due mainly to population growth, high temperatures in recent years, and more intensive use of electricity by residential,

¹ Seven thousand megawatts corresponding to half of the capacity of Itaipú (a binational power plant with Brazil); 1,550 MW corresponding to half of the capacity of Yacyretá (a binational power plant with Argentina); and 210 MW corresponding to the ANDE-owned Acaray dam.

² The following diagnostic studies were used to identify problems in the transmission system: (i) Leme-CEMIG (1996), which identified the need for a 500 kV transmission line to connect Itaipú to the SIN; (ii) Fitchner (1995-1996), Comprehensive System Planning and Regional Electricity Integration; (iii) ANDE-Eletrobras (2004-2006), Optimization of the Transmission System; (iv) ANDE, Master Plan for Generation and Transmission 2012-2021; and (v) ANDE, National Electricity Market 2012-2020.

³ Source: ANDE, 2011 Annual Report (www.andegov.py).

⁴ System losses = (nonrevenue power) / (power supplied to the system). See electronic link, "Phase I performance evaluation."

- industrial, and commercial customers.⁵ Studies⁶ project a 7% annual increase in energy demand through 2020.⁷ A 500 kV grid is needed to address this growth, make the supply of electricity more reliable, and prevent overloads.
- 1.5 System vulnerability in the Asunción area. Some 80% of the power consumed in the Asunción metropolitan area comes from the Itaipú and Acaray hydropower plants through five 220 kV transmission lines. Meanwhile, the 220 kV double-triad transmission line from the Yacyretá power plant has limited capacity (up to 486 MW are withheld) and does not allow for optimal utilization of the power available from Yacyretá, which would be 1,550 MW. With this configuration, the reliability of the area's power supply is heavily dependent on the availability of these generation sources and vulnerable to failures in the transmission system.
 - 1.6 Lack of integration in the transmission system. The system has two electrically separated subsystems, one from Itaipú and Acaray to Asunción and the other from Yacyretá to the Guarambaré substation near Asunción. The maximum capacity of the latter subsystem is not being utilized due to a lack of synchronization between Yacyretá and the Paraguayan system and its 220 kV voltage level. This hampers optimal usage of the system and makes it less reliable and secure.⁸ Synchronizing the two subsystems demands a significant amount of transmission capacity from both generation sources, requiring 500 kV transmission lines from the power plants.
 - 1.7 High level of power losses. Another challenge in the sector is the system's high level of power losses, currently at about 30.9%, approximately one third of which correspond to nontechnical losses.⁹ The main cause of technical losses is delays in investment that force the system to operate at full capacity (ANDE semiannual report, January-June 2012). Delays in investment result from, inter alia, problems in bidding processes and delays in financing. Nontechnical losses result from, inter alia, unauthorized connections and aging electric power meters that are prone to metering errors and subject to tampering or fraud. The National Electricity Administration (ANDE) is installing electronic meters and expects to reduce total losses to 23.6% by 2017.¹⁰
 - 1.8 ANDE's management operations in need of modernization. The National Electricity Administration (ANDE) is an independent State entity that exercises a legal monopoly on public electricity service pursuant to its charter (Law 966/64). It reports to the Office of the Vice Minister for Energy and Mines, which is part of the Ministry of Public Works and Communications. ANDE is vertically integrated, tasked with the generation, transmission, and distribution of electric power.

⁵ Master Plan for Generation and Transmission 2012-2021, ANDE.

⁶ Long-term Study on 500 kV Grid, ANDE.

⁷ Disregarding structural changes in demand, such as the possible installation of an aluminum plant.

⁸ Review of the strategic investment plan for Paraguay's electricity sector (Support for Modernization of Paraguay's Electricity Sector, PR-T1045; ATN/OC-10340-PR, 2011).

⁹ For the period 1996-2006 (when the IDB was absent from the sector), the average losses were 27.2%

¹⁰ ANDE Electricity Loss Reduction Plan, 2010-2020.

Environmental and social management—especially in securing easements for transmission lines and environmental permits—is a major factor in the delays in major investment works for ANDE.¹¹ Modernization efforts have been pursued, including internal restructuring, implementation of management contracts with the national government, and strengthening of its environmental unit, inter alia. These efforts must continue, in order to enable ANDE to meet the sector’s current and future needs, with an emphasis on modernizing environmental and social management operations, which represent a bottleneck in project execution and a major reason for delays in installing transmission lines and substations and managing environmental liabilities.

- 1.9 **Rationale.** In view of the aforementioned factors, the following needs were identified: (i) continue the investments in the transmission system, particularly the interconnection of the Asunción metropolitan area with generation sites through construction of 500 kV transmission lines; (ii) continue the effort to reduce power losses, which remain at high levels;¹² and (iii) support the process of modernizing ANDE’s management operations. These activities are the areas of major focus of Phase II of the ANDE Multiphase Power Transmission Program (“Program Phase II”).
- 1.10 The bidding process for the 500 kV transmission line from the right bank of the Itaipú power plant to Villa Hayes (Asunción) was completed and a contract awarded with resources from Mercosur’s Structural Convergence Fund; the transmission line is now under construction and expected to go into service in 2013. For the 500 kV transmission line from Yacyretá to Villa Hayes, which will be financed with Phase II resources and was identified as a priority in ANDE’s Master Investment Plan, the engineering designs are being prepared, and the line is expected to go into service in 2016. The main benefits of this transmission line include: (i) meeting the growing demand in the Asunción metropolitan area; (ii) reducing technical losses in transmission; and (iii) improving the operability, security, reliability, and flexibility of the system with the electrical interconnection of the entire SIN. Reducing power losses will help reduce energy purchases and increase billing. Improved institutional and environmental management will lead to greater flexibility for the development of infrastructure works.
- 1.11 **Multiphase approach.** In 2006, with the aim of sustainably strengthening the power sector in stages, an agreement was reached with the Government of Paraguay to support an investment plan that, due to its complexity, lead time, and long-run scope of execution in terms of works, would require a time frame longer

¹¹ See electronic link, “Phase I performance evaluation.”

¹² The effectiveness of the selected intervention (in this case, the reduction of electric power losses) is based on existing evaluations of interventions in a context similar to Paraguay’s, where the applicability of the intervention can be reproduced. This condition is met in several countries of Latin America, Asia, and Africa. The most relevant case is in Chile, which reduced such losses by more than 15% between 1985 and 2007, significantly improving the financial sustainability of the distribution companies (*Reducing Technical and Nontechnical Losses in the Power Sector*, World Bank, 2009).

than one loan cycle. The ANDE Multiphase Power Transmission Program and its first phase (“Program Phase I”) was designed to meet these requirements, and approved by the Bank’s Board of Executive Directors in December 2006 under Operations Processing Policy PR-208, “Multiphase program loans.” Program Phase I (loan PR-L1010) for US\$69.5 million (total cost of US\$105.88 million), was ratified by the Paraguayan Congress on 18 January 2008, with an execution period running until January 2014. In early 2012, at the Paraguayan government’s request, preparation began on the second and final phase of the program (“Program Phase II”), structured as a multiphase program loan under policy PR-208 with the same general objective as Program Phase I, but with different specific objectives for Program Phase II and components based on the gains made in the first phase.

- 1.12 In Program Phase I, the following results were financed and achieved: Component 1: (i) 198 km of 220 kV transmission line (completed); (ii) 35 km of 66 kV transmission line Eusebio Ayala–Caacupé (completed); (iii) 35 km of 66 kV transmission line Presidente Franco–Ciudad del Este (20% complete); and (iv) interventions at 10 substations (85% complete). Component 2: (i) 324,485 single-phase and three-phase electronic meters installed; and (ii) power losses reduced from 34% in 2006 to 30.9%. Component 3: (i) development of the SIGAS environmental and social management system; (ii) development of the accounting separation of power generation, transmission, and distribution activities (60% complete); and (iii) progress on several consulting engagement relating to the management of environmental liabilities. Phase I has experienced delays, especially due to the time required for legislative ratification (2008), a turnover in leadership in the Paraguayan government (2008) and, on multiple occasions, at ANDE, and internal reorganization processes, protests in competitive bidding processes, and tenders where there were no successful bidders. Still, considering that the effective execution period has been four years, 75.04% of Phase I loan proceeds have been disbursed and 76% committed, exceeding the 50% and 75%, respectively, required to begin Program Phase II.
- 1.13 Under the multiphase structure, 10 targets were set as triggers for Phase II, including: (i) reduction of electricity losses to 29% (target 1); (ii) implementation of separate accounting for the power generation, transmission, and distribution businesses (target 2); (iii) completion and publication of a cost and rate study (target 3); (iv) presentation of a proposal for modernization of the legal framework governing ANDE (target 4); (v) updating of the Investment Master Plan (target 5); (vi) improved access to ANDE information (target 6); (vii) achievement of four financial targets (target 7); (viii) improvements in environmental management (target 8);¹³ (ix) submission of an environmental report with recommendations for

¹³ Other achievements include: (i) environmental mitigation programs incorporated into each contract, entailing an environmental impact study; (ii) adoption of an institutional policy for safe handling of oils; (iii) training of ANDE’s technical personnel in management and analytical methods to determine levels of polychlorinated biphenyls (PCBs); and (iv) procurement of equipment for better management of environmental liabilities (gas chromatography).

Program Phase II (target 9); and (x) relocation of ANDE's Environmental Unit (which became an Environmental Management Division) (target 10) (see loan PR-L1010, paragraph 3.16). Additionally, an external performance evaluation must have been completed (see loan PR-L1010, paragraph 3.15), consistent with the policy on flexible lending instruments (document GN-2085-2).

1.14 As of November 2012, the external performance evaluation has been completed (see electronic link), and 6 of the 10 targets listed above have not been met, with the exception of the following:

- (i) Reduction of electricity losses (target 1). A reduction from 34% to 30.9% was achieved, rather than the target of 29%. Although the target has not been met, the gains have been significant, especially considering that the increase in annual demand was on the order of 8% during the period 2006-2012. These gains include development of an electricity loss reduction plan; 324,485 electronic meters installed (for a total of 1,271,766 as of July 2012); hiring and training of more than 30 crews to inspect connections; and start of the process for an integrated power distribution management system (with support from the World Bank). The investments associated with reducing losses have a high return (28%) and contribute to improved sector sustainability. The 29% target is expected to be met in 2014 with progress in the replacement of electromechanical meters with electronic meters, installation of distribution transformers, and entry into service of the Itaipú-Villa Hayes 500-kV line.
- (ii) Separate accounting for the power generation, transmission, and distribution businesses (target 2).¹⁴ The diagnostic assessment and development of the separate accounting was completed by an international firm, and the project is in the pilot implementation stage. It is expected to be operational by 2014. Considering the nature of ANDE as a power sector monopoly under its charter, implementation of separate accounting is an important step in its modernization process and will contribute, among other things, to identifying areas of possible improvement, especially in the transmission and distribution segments, which will further contribute to sector sustainability.
- (iii) Cost and rate study (target 3). A preliminary cost and rate study has been done, and was used as the basis to prepare bidding documents for international competitive bidding to conduct the full study, slated for completion in late 2013 (the last full study was done in 2002). Under the sector's current governance structure, this full study will provide important information for rate analysis and decision-making in the medium and long term.

¹⁴ Given the nature of the market, institutional separation of the segments was not proposed, but rather separate accounting for the power generation, transmission, and distribution activities.

- (iv) Financial targets (target 7). Targets were set for four financial indicators, three of which have been met: (i) ratio of internal cash generation to debt service; (ii) long-term debt to equity ratio; and (iii) current assets to liabilities ratio. The unmet target was the collection ratio, which was to have been 85%, but reached only 80% (if only private sector clients are counted, this target has also been met). ANDE, in coordination with the Government of Paraguay, is working under the results management contract to consolidate the outstanding debts and ensure payment of the energy bills of public sector clients. With these actions, the target could be met by 2014.
- 1.15 Although the four targets described above have not been met, the appraisal is that they are on the way to being met. The set of actions completed and under way reflects the commitment of ANDE and the Government of Paraguay to meet these targets, and are an important step in the right direction for the ongoing efforts to modernize and strengthen the sector. The fulfillment of each one of these unmet targets will be addressed as described in paragraphs 3.4 and 3.5.
- B. Paraguay's energy sector**
- 1.16 Although Paraguay is a net importer of hydrocarbons, it is a great exporter of hydroelectric power. Electricity service coverage is 99.6% in urban areas and 96.3% in rural areas. Consumption is distributed among residential (42.3%), industrial (22.6%), and commercial (18.6%) customers, with the remaining 16.5% going to government customers and public lighting.
- 1.17 The Ministry of Public Works and Communications (MOPC), acting through the Office of the Vice Minister for Energy and Mines, is the agency that sets sector policy and is responsible for regulation and the quality of service. The National Economic Team—consisting of ministers of the MOPC and the ministries of Finance, Agriculture and Livestock, and Industry and Commerce, as well as the president of Paraguay's Central Bank—sets the rate policy for public utilities. There is no ad hoc regulatory agency for the sector. Power service is provided by ANDE, which also performs sector functions related to planning, investment decisions, and rate studies. ANDE is in charge of power generation, except for the Itaipú and Yacyretá hydropower plants, which are binational entities. Power is distributed by ANDE, with the exception of two small areas.
- 1.18 Electricity rates are proposed by ANDE and approved by the national government. Due to the sector's unique features, particularly its abundance of low-cost hydropower generation, rates have not been adjusted since 2002. The current national average rate is equivalent to about US\$0.073 per kilowatt-hour. Though rates have not been adjusted, changes in the exchange rate have meant an increase of more than 20% in terms of U.S. dollars.¹⁵ This is significant because ANDE's energy purchases and much of its equipment investments are made in foreign

¹⁵ December 2002: US\$1 = 6,900 guaranies; September 2012: US\$1 = 4,416 guaranies. Source: <http://bcp.gov.py>.

currency. Reduced power losses and the effort to address payment arrears among public-sector customers, along with other factors, are helping to drive up ANDE's revenues.

C. Consistency with Bank Operational Policy OP-708

- 1.19 In Program Phase I, a partial waiver of the Bank's Public Utilities policy (Operational Policy OP-708) was requested, based on: (i) the absence of a rate structure that reflects the costs of providing the service (no rate structure with an established methodology and rate adjustment mechanisms), and low efficiency in service delivery, particularly the high levels of electricity losses that affect ANDE's financial sustainability (losses as high as 34% in 2006); and (ii) the absence of an effective regulatory framework, particularly in terms of governance at ANDE, whose charter needs to be modernized (ANDE is vertically integrated with no board of directors and a president appointed by the executive branch; there is no regulatory agency); and the practice of intergovernmental transfers with no preestablished framework (the executive branch determines the amount of the transfers each year). These issues were addressed by the targets set to advance from the first to the second phase, with the exception of the intergovernmental transfers, which need to be addressed by another type of instrument, such as a comprehensive sector policy reform program.
- 1.20 Progress in the right direction has been made in these areas with Bank support in the last six years, notably: (i) in terms of the rate structure: (a) a preliminary study of costs and rates has been done, and the contract is being awarded for preparation of a comprehensive study (target 3); and (b) a power loss reduction plan is being implemented (target 1); and (ii) in terms of the regulatory framework: (a) a proposed amendment to ANDE's charter (Law 966/64) was prepared (target 4) (the proposed amendment is being discussed internally within ANDE); (b) the Environmental Management Division has been established within ANDE's hierarchical structure (target 10). Additionally, the commitment of the Government of Paraguay to improve the sector regulatory framework is reflected in such actions as submittal of a legislative proposal to create the Ministry of Energy, and implementation of results-based management contracts between ANDE and the Council of Public-sector Enterprises.¹⁶
- 1.21 The structural adjustments needed in the sector take time to accomplish. Progress in this regard has been slow, due to the special structure of Paraguay's power sector: 100% of demand supplied by highly cost-efficient, renewable hydroelectric sources;¹⁷ world's largest exporter of electric power; economic efficiency due to pricing that covers operating, maintenance, and investment costs with no need for

¹⁶ This council consists of the Ministry of Finance, the MOPC, the Ministry of Industry and Commerce, and the Office of the Attorney General.

¹⁷ ANDE's generation costs average approximately 114,720 guaranies per megawatt-hour (equivalent to approximately US\$26/MWh). Source: ANDE Annual Report 2011.

subsidies (ANDE receives no subsidies from the Government of Paraguay);¹⁸ ANDE's financial strength (see "Financial viability");¹⁹ and the small size of the distribution and transmission system. Thus, despite the progress made and the special features of Paraguay's power sector described above, certain aspects of the basic conditions of Operational Policy OP-708 have not yet been fully satisfied. The points of inconsistency with the policy's basic conditions are: (i) the absence of a rate structure that reflects the costs of providing the service, and low efficiency in service delivery; and (ii) the absence of an effective regulatory framework, particularly in terms of governance at ANDE. In view of the foregoing, a partial waiver of policy OP-708 is proposed for Program Phase II on the same terms as granted for Phase I.

- 1.22 **The Bank's engagement in the sector.** The Bank has a history of supporting Paraguay's electricity sector. In addition to Program Phase I, a technical-cooperation operation is underway to support preparation of Phase II (PR-T1112), as well as a technical-cooperation operation for Exchange of Experiences in Environmental Management on Electricity Projects (PR-T1124) between Colombia and ANDE. The Bank is also supporting the Paraguayan government in the design and development of a large-scale aluminum foundry project (US\$4 billion in private investment) (PR-T1117) for US\$266,000 (C and D funds). The European Investment Bank (EIB) and Development Bank of Latin America (CAF) are preparing parallel loans of US\$100 million and US\$50 million, respectively, to supplement the IDB resources in Program Phase II, reflecting the IDB's role as a catalyst in the sector.
- 1.23 **Other multilateral and bilateral agencies operating in the sector in Paraguay.** (i) CAF is providing a US\$75 million loan, along with a US\$20 million loan from the OPEC Fund for International Development (OFID), for a program to support the SIN's transmission and distribution network; (ii) the World Bank is providing a US\$100 million loan to improve the distribution management system and improve the transmission system through investments in 200 kV and 66 kV substations; and (iii) the Japan International Cooperation Agency is supporting the mechanization of the Iguazú hydropower plant, for US\$200 million.
- 1.24 **The Bank's country and sector strategy.** The Bank's country strategy with Paraguay (document GN-2541-1) prioritizes investments in the power transmission subsector and recommends focusing interventions on reducing power losses. Program Phase II is consistent with the principal points of the strategy.
- 1.25 **Consistency with GCI-9.** Program Phase II is consistent with the following priority objectives of the Ninth General Capital Increase (GCI-9): (i) support for small and vulnerable countries; (ii) climate-change mitigation and adaptation through the use of available renewable energy; and (iii) regional integration, as the

¹⁸ The current rates generate sufficient net income to cover the interagency contributions, which must be approved by the Congress as part of the Annual Government Budget Act.

¹⁹ The 2011 financial results show billings of US\$498 million, and EBITDA of US\$120 million.

transmission line connects the SIN to the Yacyretá power plant (a binational hydropower project with Argentina and Paraguay).

D. Objective, components, and cost

- 1.26 The general objective of Program Phase II is to make the productive sector more competitive and raise the standard of living for the people of Paraguay through more reliable supply and more efficient use of the country's available electric power generation capacity. The specific objectives of Program Phase II are: (i) to contribute to the financing of investments for a 500-kilovolt transmission line from Yacyretá to Asunción and associated substations; (ii) to reduce electricity losses; and (iii) to contribute to the modernization of ANDE's management. The activities of each component are designed to build on the efforts of Program Phase I.
- 1.27 **Component 1. Investments in the Yacyretá–Villa Hayes transmission line and substations.** Component 1 includes investments for: (i) construction of a 296 km, 500 kV transmission line from the Yacyretá reservoir to Villa Hayes, including construction of the Yacyretá–Ayolas (16 km) and Ayolas–Limpio (260 km) segments with self-supporting structures and four conductors per phase, as well as procurement and installation of conductors for the Limpio–Villa Hayes segment (20 km);²⁰ and (ii) expansion of the Ayolas and Villa Hayes substations, with construction of transmission-line input and output positions and transformers (no land purchase required). A portion of the counterpart resources will be covered with resources from the European Investment Bank (EIB) (US\$100 million) and the Development Bank of Latin America (CAF) (US\$20 million).
- 1.28 **Component 2. Power loss reduction.** Component 2 will finance the procurement of modern electronic meters to replace obsolete electromechanical meters (some 625,000 units), which will measure power consumption more accurately and help reduce fraud. ANDE will contribute by hiring inspection crews with counterpart resources. A portion of the counterpart resources will be covered with resources from the CAF (US\$30 million).
- 1.29 **Component 3. Modernization of ANDE's management operations.** ANDE is working to modernize its management operations with resources from other international agencies, such as the World Bank and CAF, and using its own resources. These efforts include strengthening of the billing system, adoption of modern information technology, and other actions. Building on this effort, Component 3 of this operation will finance the procurement of goods and services to modernize ANDE's environmental management operations, including the management of environmental liabilities, and will support the company's institutional capacity. Financing will be provided to: (i) purchase vehicles for the Environmental Management Division, to help manage and monitor its activities; (ii) purchase computer hardware to implement the IT system for monitoring

²⁰ The towers on this segment are double-triad structures, to be procured and erected with the financing for the Itaipú–Villa Hayes transmission line project (in execution).

environmental liabilities; and (iii) build a platform for storing damaged transformers.

E. Results Matrix

- 1.30 **Expected outcomes.** Program Phase II has a Results Matrix for evaluation purposes (Annex II). The expected outcomes are: (i) an increase in the power transported from Yacyretá to the Asunción area; (ii) a reduction in unserved energy due to more reliable power supply in the SIN; (iii) synchronization of the two transmission subsystems; (iv) reduction of technical and nontechnical power losses; and (v) improved environmental management by ANDE.
- 1.31 **Cost of Program Phase II.** The estimated total cost is US\$266.84 million, to be financed by: (i) the Bank, through a US\$50 million investment loan (19%);²¹ and (ii) budgeted counterpart financing from ANDE, including US\$100 million in resources from the EIB (37%), US\$50 million in resources from the CAF (19%), and US\$66.84 million in own resources (25%) (including US\$40.5 million in taxes and duties).²²

Table 1. Cost and Financing
(US\$ millions)

Item	Description	Total	Counterpart			Total
			EIB	CAF	ANDE	
1	Direct costs					
1.1	Component I: Transmission line investments	39.00	100.00	20.00	3.00	162.00
1.2	Component II: Loss reduction			30.00	3.00	33.00
1.3	Component III: Modernization of ANDE	1.00			1.00	2.00
2	Contingencies				11.34	11.34
3	Supervision, compensation, and taxes					
3.1	Supervision				8.00	8.00
3.2	Compensation	10.00				10.00
3.3	Taxes and duties				40.50	40.50
Total Phase II		50.0	100.0	50.0	66.84	266.84
Percentage		19%	37%	19%	25%	100%

²¹ The loan amount of US\$100 million was reduced to US\$50 million at the request of the Government of Paraguay.

²² ANDE has committed to make resources available to finance the components in full, in the event that the EIB and/or CAF loans are not secured.

II. FINANCING STRUCTURE AND MAIN RISKS

A. Financing instruments

- 2.1 Program Phase II will be conducted as an investment loan within the a sovereign-guaranteed program to be financed with Ordinary Capital resources, with an execution period of 25 years, and a grace period of 5.5 years. The disbursement period will be five years, in accordance with the following tentative schedule:

Table 2. Tentative Disbursement Schedule

Source	Year 1	Year 2	Year 3	Year 4	Year 5	Total
IDB (US\$ million)	0	10	10	15	15	50
%	0%	20%	20%	30%	30%	100%
Local (US\$ million)	0	43.37	43.37	65.05	65.05	216.84
%	0%	20%	20%	30%	30%	100%
Total (US\$ million)	0	53.37	53.37	80.05	80.05	266.84
%	0%	20%	20%	30%	30%	100%

B. Environmental and social risks and mitigation measures

- 2.2 **Environmental and social issues.** Program Phase II has been classified as Category “B” under the Environment and Safeguards Compliance Policy (Operational Policy OP-703), inasmuch as it will only generate localized, short-term adverse environmental impacts, including associated social impacts, and effective mitigation measures are available. The most significant impacts are: (i) relocation of some 90 dwellings and other buildings, as well as land use restrictions in the easement corridor; (ii) risk of collision for migrating birds and bats, especially on the segment that crosses the Paraguay River; (iii) the line’s crossing through a protected area (Yacyretá Ecological Reserve) and an area of importance for birds (Arroyos y Esteros); and (iv) removal of the tree canopy for the easement corridor, equivalent to some 500 hectares, and changes in the landscape. These and other impacts will be managed using the environmental and social management plan (ESMP), a resettlement plan, compensation plans for impacts on flora and fauna, and an impact monitoring plan.
- 2.3 During the design stage, the Bank conducted an environmental and social analysis that included an environmental and social impact study. This study looked at four possible routes, as well as alternatives for each possible route. The agreed route based on the impact study minimizes the impact, as the transmission line will avoid the most heavily populated areas and critical natural habitats. Moreover, ANDE has been conducting a public consultation process and will continue to do so throughout Program Phase II. With these arrangements, Phase II satisfies the Bank’s relevant environmental and social policies, in particular policies OP-703 (Environment and Safeguards Compliance Policy), OP-102 (Access to Information), OP-270 (Gender Equity in Development), OP-704 (Natural Disaster Risk Management), and OP-710 (Involuntary Resettlement).

- 2.4 Positive impacts during construction are related to the creation of temporary jobs and stimulation of local economies due to temporary demand for goods and services among contractors. Once operational, Phase II will help make power supply more available and reliable, especially in the Asunción metropolitan area.
- 2.5 The Bank will monitor compliance with the program Operating Regulations (OR), the ESMP, and other mitigation, compensation, and monitoring plans, and will conduct semiannual supervisory visits.

C. Fiduciary and execution risks

- 2.6 The borrower will be the National Electricity Administration (ANDE),²³ and the guarantor will be the Republic of Paraguay. ANDE will be responsible for loan execution, acting through its General Planning and Business Policy Office (DPGPE). The weaknesses identified during execution of operation PR-L1010 may be managed more effectively with the fiduciary measures identified at the workshop held for this operation. These included issues related to procurement and management of financial resources, administrative organization for loan execution, and the need for effective social management during works execution. Activities will be conducted to mitigate the effects of these risks, as described in the program OR.
- 2.7 **Procurement.** Procurements will be conducted in accordance with the Bank's procurement policies established in documents GN-2349-9 and GN-2350-9. The procurement plan will be managed through the Procurement Plan Execution System (SEPA) (www.iniciativasepa.org). No exceptions to these policies are anticipated.

D. Other key issues and risks

- 2.8 **Technical viability.** Given the ample availability of hydropower generation, the technical alternatives for the 500 kV transmission line are focused on options for transporting energy from generation sources to consumption centers. Technical viability was analyzed with support from an international expert, in accordance with international standards. The budget for the works was reviewed, and the following was verified: (i) reasonability of the direct and indirect construction costs; (ii) equipment quantities and transmission line lengths; and (iii) the proposed execution plan. Also, construction of this transmission line was confirmed to constitute the critical path for expansion of the SIN. In terms of reducing power losses, meter replacement has led to improved billing (in terms of kWh per sector) on the order of 10% to 50%.
- 2.9 **Economic viability.** The economic evaluation of Component 1 (transmission line) has an economic internal rate of return (EIRR) of 26.8% and a net present value of benefits of US\$464 million (discounted at 12%). The economic evaluation used the cost-benefit methodology with and without the project, taking into account the following: (i) investment costs; (ii) connected transmission system; (iii) economic

²³ The Government of Paraguay has adopted a policy whereby State enterprises are borrowers with the sovereign guarantee of the national government.

benefits from the decrease in power losses in the transmission system; (iv) economic benefits from the decrease in unserved energy in the event of a failure in power supply from the Itaipú plant; and (v) sale of incremental energy. Assumptions include: (i) net benefits of unserved energy, which is the most important factor, valued at an opportunity cost of US\$400 per MWh, which reflects the level of social, economic, and industrial development in Paraguay; and (ii) net benefits from the sale of incremental energy, calculated at the national average rate. A sensitivity analysis was done, assuming: (i) 20% variation in investment cost; (ii) decrease in the value of unserved energy of US\$300/MWh; and (iii) a 4.4% decrease in the growth rate of demand. The outcome of the sensitivity analysis was satisfactory. An economic evaluation of the interventions for Component 2 yielded an EIRR of 28.8% and a net present value of US\$26.5 million. A sensitivity analysis was done for increased investment costs and reduced benefits, with satisfactory outcomes.

- 2.10 **Financial viability.** An analysis was done of ANDE's financial capacity to meet current and future debt repayment obligations and pay for operating costs and planned investments in view of various rate adjustment scenarios. The base case assumptions were as follows: (i) 6% average annual increase in energy demand, with a 1% annual reduction in power losses for 2011-2015 and 0.3% for 2016-2021; (ii) purchase of energy from Itaipú and Yacyretá on terms similar to the current terms; (iii) 5% annual inflation; (iv) devaluation on the order of 2.9% per year in 2012-2016, and 4.9% per year in 2017-2019; (v) rate increases on the order of 12% in 2012-2021; (vi) intergovernmental transfers averaging US\$22 million per year; and (vii) US\$2.729 billion in investments in 2012-2021, financed with own resources and loans from international agencies. The outcomes show that the financial indicators are sound, reflecting the company's financial strength (see electronic link). In addition, sensitivity calculations were done for a 5% slower pace of rate increases vis-à-vis projected inflation, demonstrating that ANDE can service its debt, make its investments, and cover its operating costs.

III. IMPLEMENTATION AND MANAGEMENT PLAN

A. Summary of implementation measures

- 3.1 **Execution plan.** The executing agency will be the National Electricity Administration (ANDE), which will be responsible for technical, administrative, financial, and environmental execution (including bidding documents). ANDE will coordinate execution through its General Planning and Business Policy Office (DPGPE), which will serve as the program coordination unit (PCU). The PCU will be supported by the technical, business, and financial units and the Power Loss Management Division of ANDE. Supporting the PCU in procurement processes will be ANDE's Public Procurement Office.
- 3.2 ANDE will also be responsible to the Bank for: (i) coordinating the activities of Program Phase II; (ii) preparing physical/financial progress reports; (iii) submitting

- requests for the Bank's no objection and loan disbursement requests, and keeping accounting records; (iv) implementing and maintaining a control system to ensure proper use of resources, and maintaining document files; and (v) preparing and updating the initial project report, annual work plans, six-monthly status reports, evaluation reports, and the project completion report.
- 3.3 **Monitoring.** The following instruments will be produced by the executing agency: (i) annual work plans (AWPs); (ii) six-monthly reports based on the project monitoring report (PMR); (iii) an action plan, if necessary, for the following six months in areas requiring corrective action; and (iv) annual financial report and updates to projections.
- 3.4 **Conditions precedent to the first disbursement:** (i) Reduction of electricity losses to 29%; (ii) completion and publication of the comprehensive study of costs and rates; (iii) approval of the program Operating Regulations by order of the Office of the President of ANDE, on terms previously agreed upon with the Bank; (iv) Bank approval of the final environmental and social impact study, including the ESMP and an impact mitigation and compensation plan for flora and fauna; (v) Bank approval of the detailed resettlement plan, including a system for resolving complaints and claims; and (vi) signature of a coordination agreement between the Ministry of Finance and ANDE related to program execution progress.
- 3.5 **Special execution conditions:** (i) Prior to works solicitation for the transmission line and expansion of the substations, the final technical design showing the final route of the transmission line, and the bidding documents including environmental and social specifications, must be submitted to the Bank; (ii) prior to award of the works contract for the transmission line and expansion of the substations, the environmental and social obligations, as well as a budget for actions related to environmental and social mitigation, in accordance with the ESMR and the ESMP, must be incorporated into the contracts; (iii) prior to the start of works for the transmission line and expansion of the substations: (a) the respective environmental permit must be secured; and (b) the supervision firm must be hired; (iv) prior to the start of works for the transmission line, at least 25% of the easement rights must be secured; (v) the following financial ratios must be maintained: (a) minimum ratio of internal cash generation to debt service of 1.5; (b) maximum long-term debt to equity ratio of 1.0; and (c) minimum current assets to liabilities ratio of 1.2; and (vi) as a special condition for the disbursement of more than 50% of the loan proceeds: (a) implementation of separate accounting for the power generation, transmission, and distribution businesses; and (b) achievement of a collection level of 85%, to be maintained during the execution period.
- 3.6 **Evaluation.** The objective of the evaluation will be to verify fulfillment of the targets in the Results Matrix (Annex II). The planned six-monthly progress reports will address: (i) progress toward targets; (ii) degree of fulfillment of contractual obligations; (iii) effectiveness of the monitoring and evaluation system; and

(iv) lessons learned. A midterm evaluation will be also conducted to verify fulfillment in overall execution and progress toward targets, and a final evaluation will be conducted six months after project completion.

- 3.7 **Ex post socioeconomic evaluation.** Upon completion of Program Phase II, an ex post cost-benefit evaluation will be conducted to determine the socioeconomic benefits.

Development Effectiveness Matrix			
Summary			
I. Strategic Alignment			
1. IDB Strategic Development Objectives	Aligned		
Lending Program	i) Lending to small and vulnerable countries and ii) Lending to support climate change initiatives, renewable energy and environmental sustainability.		
Regional Development Goals			
Bank Output Contribution (as defined in Results Framework of IDB-9)	Km of electricity transmission and distribution lines installed or upgraded.		
2. Country Strategy Development Objectives	Aligned		
Country Strategy Results Matrix	GN-2541-1	Improve the transmission infrastructure and its efficiency.	
Country Program Results Matrix	GN-2661-4	The intervention is included in the 2012 Country Program Document.	
Relevance of this project to country development challenges (If not aligned to country strategy or country program)			
II. Development Outcomes - Evaluability	Highly Evaluable	Weight	Maximum Score
	9.2		10
3. Evidence-based Assessment & Solution	9.9	25%	10
4. Ex ante Economic Analysis	10.0	25%	10
5. Monitoring and Evaluation	7.1	25%	10
6. Risks & Mitigation Monitoring Matrix	10.0	25%	10
Overall risks rate = magnitude of risks*likelihood	Medium		
Environmental & social risk classification	B		
III. IDB's Role - Additionality			
The project relies on the use of country systems (VPC/PDP criteria)	Yes	Financial Management: Budget and Treasury.	
The project uses another country system different from the ones above for implementing the program			
The IDB's involvement promotes improvements of the intended beneficiaries and/or public sector entity in the following dimensions:			
Gender Equality			
Labor			
Environment			
Additional (to project preparation) technical assistance was provided to the public sector entity prior to approval to increase the likelihood of success of the project	Yes	OI (PR-T1112) will contribute to project preparation.	
The ex-post impact evaluation of the project will produce evidence to close knowledge gaps in the sector that were identified in the project document and/or in the evaluation plan.			

The POD presents the problems to be addressed by the project as well as its beneficiaries. It also includes the dimensions of the problems and the factors which have contributed to them. The proposed interventions are linked to the problems identified in the diagnosis.

The results matrix has vertical logic. Although there are no impact indicators, the outcomes and outputs are clearly stated and each has an indicator. All indicators are SMART and have baselines, targets and sources of information. With regards to the data required for the PMR, all outputs have annual targets, the costs are broken down by output as presented in the results matrix, and the sum of the costs equals the total costs of the project.

The project was analyzed using a cost-benefit analysis. The economic benefits are spelled out and the economic costs reflect resource costs to the economy. The assumptions are spelled out and a sensitivity analysis was undertaken of the assumptions. The project has a monitoring and evaluation plan. The evaluation plan follows the DEM guidelines. The operation will be evaluated using an ex-post cost benefit analysis.

Finally, the risk matrix presents the projects risks which are rated for magnitude and probability. Mitigation measures are presented for each risk as well as indicators to monitor its implementation.

**NATIONAL ELECTRICITY ADMINISTRATION
MULTIPHASE POWER TRANSMISSION PROGRAM
PHASE II**

**RESULTS MATRIX
MATRIX OF INDICATORS**

Objective	The general objective of the program is to make the productive sector more competitive and raise the standard of living for the people of Paraguay through more reliable supply and more efficient use of the country's available electric power generation capacity.
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Outcomes	Indicator	Unit	Base (2011)	2013	2014	2015	2016	Final target 2017	Comments/Mean of verification
Increased power transmission capacity from Yacyretá to the Asunción area	Maximum transmission capacity from Yacyretá to the National Interconnected System (SIN)	MVA	500	750 ¹	750	750	2,000	2,000	The line to be built will increase transmission capacity by 1,250 MVA. Means of verification: ANDE reports.
Reduced risk of power outages in the Asunción area due to failures in the transmission system	Unserved energy	% with respect to SIN power demand	0.0664	0.0098	0.0291	0.0367	0.0015	0.0015	Once the project enters service, the power supply in the SIN will become more reliable. Means of verification: ANDE reports.
Reduced power losses in the system	Total power losses corresponding to the domestic electricity market	Nonrevenue power as % of supplied power	31.10	29.31	26.16	25.40	25.36	23.63	Means of verification: ANDE reports.

¹ Entry into service of Itaipú-Asunción line.

Outcomes	Indicator	Unit	Base (2011)	2013	2014	2015	2016	Final target 2017	Comments/Mean of verification
Synchronized transmission subsystems ²	Synchronized transmission subsystems	Subsystems	0	0	0	0	0	1	Means of verification: ANDE report.
Improved environmental management by ANDE	Annual report of the system for monitoring the mitigation of environmental liabilities	Report	0	0	0	1	1	2	Means of verification: ANDE environmental reports.

Outputs	Unit	Base (2011)	2013	2014	2015	2016	Final target 2017	Means of verification
COMPONENT 1. Investments in the Yacyretá–Villa Hayes transmission line and substations								
500 kV transmission line installed, Yacyretá–Limpio segment	Segment	0	0	0	1	0	1	Final acceptance report for Works execution .
Milestones								
Foundations laid for transmission towers	Foundations	0	0	500	192	0	692	Work progress reports and final acceptance of the work (ANDE).
Towers erected	Towers	0	0	350	342	0	692	
Km of conductor and guard cables hung	km	0	0	0	276	0	276	
Km of 500 kV transmission line installed, Limpio–Villa Hayes segment	km	0	0	0	20	0	20	Final acceptance report for Works execution.
Ayolas substation expanded	Substation	0	0	0	0	1	1	Final acceptance report for Works execution.

² Synchronization of the subsystem from Yacyretá and the subsystem from Itaipú, to be achieved by building transmission capacity from the two generation sources.

Outputs	Unit	Base (2011)	2013	2014	2015	2016	Final target 2017	Means of verification
Milestones								
New positions installed at the 500 kV transmission line switchyard	Positions	0	0	1	1	0	2	Work progress reports and final acceptance of the work (ANDE).
Villa Hayes substation expanded	Substation	0	0	0	0	1	1	Final acceptance report for Works execution.
Milestones								
New positions installed at the 500 kV switchyard	Positions	0	0	1	1	0	2	Work progress reports and final acceptance of the work.
Bank of 500/220 kV – 600 MVA autotransformers installed.	Autotransformers	0	0	0	1	0	1	
New positions installed at the 220 kV switchyard	Positions	0	0	0	1	0	1	
COMPONENT 2. Power loss reduction program								
Electronic meters installed	meters	0	0	85,000	180,000	180,000	625,000 ³	ANDE report.
COMPONENT 3. Modernization of ANDE management								
IT system for monitoring the mitigation of environmental liabilities installed	IT system	0	0	1	0	0	1	Report on installation and testing of IT hardware at ANDE.
Vehicles purchased for the Environmental Management Division	Vehicles	0	0	4	0	0	4	Record in ANDE registry of assets.
Platform for storage of used equipment and oils built	Platform	0	0	0	1	0	1	Project completion and delivery report.
Environmental remediation of San Lorenzo site.	Site	0	0	0	0	1	1	Report to Ministry of Environment.

³ Including 180,000 meters to be installed during 2017.

FIDUCIARY AGREEMENTS AND REQUIREMENTS

Project number: PR-L1058

Project name: National Electricity Administration
Multiphase Power Transmission Program
Phase II

Executing agency: National Electricity Administration (ANDE)

Prepared by: Alberto de Egea and Mariano Perales, Fiduciary Specialists

EXECUTIVE SUMMARY

The institutional evaluation for fiduciary management of the project was based on: (i) the fiduciary context of the country; (ii) outcomes of the fiduciary risk assessment and the project risk management workshop; (iii) the analysis of ANDE using the Institutional Capacity Assessment System (ICAS) methodology; (iv) work meetings with the project team; and (v) meetings with personnel from the various areas of ANDE. As a result of this evaluation, the fiduciary agreements for procurement and financial management have been prepared and will apply to project execution.

I. FIDUCIARY CONTEXT OF THE COUNTRY

In general terms, the country financial management systems have a level of medium development. For the purpose of executing Bank-financed projects, they need to be supplemented with regard to specific financial reports and external control through auxiliary accounting systems and the involvement of the Office of the Comptroller General (CGR) in project audits or the engagement of Bank-eligible private audit firms. Financial control tools such as the Integrated Financial Administration System (SIAF), the Integrated Accounting System (SICO), and other subsystems enable the executing agency to make payment arrangements through the Central Bank for providers of goods and services; integration will make the SIAF-prepared annual financial statements of the program or project available in the near future, with support from parallel systems.

For procurement management, further efforts are needed to enhance national capacity and address needed improvements in public procurement such as market-development practices and real-time monitoring of contract execution through its various phases.

II. FIDUCIARY CONTEXT OF THE EXECUTING AGENCY

ANDE is an independent State entity that exercises a legal monopoly on public electricity service pursuant to its charter (Law 966/64). It is part of the Office of the Vice Minister for Energy and Mines, which in turn is part of the Ministry of Public Works and Communications. The president of ANDE is appointed by the executive branch. ANDE

plans investments and conducts studies. The National Economic Team approves ANDE's annual investment budget and authorizes rate adjustments.

The General Planning and Business Policy Office (DPGPE) is already familiar with Bank policies and procedures and will represent the executing agency in program-related administrative matters.

Weaknesses are noted in the planning and control areas, where the ICAS analysis indicates a level of incipient development, which entails high risk, and greater attention must be given to strengthening these areas.

These areas of risk reveal the effects of successive institutional reorganizations that were never completed, due to the number of projects with multiple external financing entities exceeds the capacity of trained human resources assigned to tasks related to planning and financial administrative management of current projects. This situation may affect execution of Phase II and compromise overall program management, from the planning of operations to the fulfillment of execution timetables and objectives.

III. FIDUCIARY RISK ASSESSMENT AND MITIGATION ACTIONS

1. ICAS 2012 yielded a score of 60.64% for ANDE's overall institutional capacity, indicating a level of medium development and medium risk for this operation. A score of 75.03%, indicating a medium level of development, was assessed to the execution capacity for the following subsystems: (i) administration of personnel; (ii) administration of goods and services; and (iii) financial administration.
2. An evaluation of control capacity shows that priority measures need to be taken as soon as possible. These measures would substantially enhance capacity, and should be implemented at an early stage of execution. The score of 33.33% for control capacity denotes a high level of risk; as such, procurement and financial processes are at risk of experiencing delays and having future expenses ruled ineligible.
3. ANDE's financial statements as of 31 December 2011, prepared by the independent auditing firm BDO, elicited significant comments, including the following:
 - (i) Lack of an accounting IT system for recording program operations.
 - (ii) Lack of a functions and procedures manual for the program.
 - (iii) High turnover rate the program's general coordinator and deputy coordinator.
 - (iv) Invoices paid on different dates.
 - (v) Payments made with local counterpart funds omitted from the program's financial statements.
 - (vi) Interest earned on savings and bank fees paid, not recorded in the program's financial statements.

- (vii) Contracts awarded and executed, not recorded in the Procurement Plan Execution System.
- (viii) Delays in fulfillment of the annual work plan (AWP).
- (ix) Significant delays in bidding processes.
- (x) Goods procured with program funds but not identified accordingly.
- (xi) No inventory of goods procured by the program.

Therefore, consideration should be given to the following opportunities for improvement for the execution phase:

Financial management:

1. Prioritize the program's planning, programming, and monitoring activities.
2. Establish greater coordination with the General Administration and Finance Office (DIGAF) for financial management and establish a system for continuous conciliation of records in SICO, Debt Management and Financial Analysis System, etc.
3. Establish a training program in matters related to project management, risk management, and fiduciary management in Bank-financed projects, as well as document preparation for procurement processes and financial reports for the Bank.
4. Incorporate management of instruments used for planning and programming of activities, costs, and timetables and multiyear financial programming, for preparing project execution plans, AWP, procurement plans, and financial plans; and include a planning and monitoring specialist in the program team.
5. Develop, approve, and implement organizational manuals specifying the duties of the Public Procurement Office and Financial Department.
6. In the phase corresponding to fulfillment of conditions precedent, the program Operating Regulations should be approved at the highest level of authority.
7. Another challenge is establishing a record-keeping system in coordination with the Financial Department.
8. For execution, the main challenge is supporting the DPGPE with an operations coordinator exclusively dedicated to project PR-L1058 and specialists in procurement and in administration and finance, as well as an engineer to serve as technical liaison with technical management entities involved in execution.
9. The Operating Regulations should require that administrative procedures governing activities and responsibilities of the program's financial administration be established, developed, and formally approved; these procedures should be documented in the duties and procedures manual, which must be updated on an ongoing basis throughout program execution.

Procurement management:

1. ICAS gave a score of 78.13% to the goods and services administration system, indicating a medium level of development and a medium level of risk.
2. Still, the ICAS matrix and the DPGPE's experience in executing project PR-L1010 reveal a number of risks that, due to their impact, should be addressed through fiduciary requirements to ensure effective project execution. These risks are: (i) frequent changes of leadership; (ii) an executing unit consisting of staff members not 100% dedicated to the project due to their various other duties; (iii) procurement processes centralized in the institution's procurement operations unit, which has new, inexperienced staff members; (iv) substantial delays in preparing bid documents; (v) errors in evaluations by the committee, which are then returned for reevaluation, causing processes to be repeated; (vi) evaluation times that fluctuate between 10 and 188 days for bid processes; and (vii) 60% of the processes take longer than six months to reach the "contract signing" milestone, according to an analysis of the Procurement Plan Execution System. These risks are also listed in the Consolidated General Report for FSO Countries, of August 2012, in which Annex V, Paraguay, addresses the energy sector.
3. ANDE has a medium level of overall institutional capacity, according to the ICAS report, for pursuing projects with multiple agencies, and is prone to difficulties and delays (project PR-L1010 is 75% disbursed at the end of the original four-year disbursement period). Significant improvements, however, are possible for this project if appropriate fiduciary measures are taken through the actions set forth in the strengthening plan recommended in the ICAS report for mitigation of the aforementioned risks. Consideration may also be given to a longer execution period for this operation, since the period for project L-1010 is now six years.

IV. CONSIDERATIONS FOR THE SPECIAL PROVISIONS OF THE LOAN CONTRACT

To facilitate negotiation of the contract negotiation by the project team, and by LEG in particular, the following agreements and requirements should be included in the special stipulations:

The following conditions precedent to the disbursement of resources should apply to the program:

- (i) The agreement entered into between the borrower and ANDE is in effect.
- (ii) The program Operating Regulations are approved and in effect.
- (iii) The Resettlement Plan for residences affected by the easement for the transmission line is submitted.
- (iv) An operations inspector with the professional qualifications of an auditor is assigned to mitigate the program's internal control risks. This condition could be included in the program Operating Regulations.

In addition, the following execution conditions should apply:

- (i) The exchange rate agreed upon with the executing agency for accounting purposes will be the exchange rate as of the date of expenditure, as indicated in the publication of the Central Bank of Paraguay.
- (ii) The program's financial statements will be annual statements completed at the end of each fiscal year and delivered 120 days after the end of the fiscal year. Similarly, ANDE's financial statements will be annual statements in accordance with the loan contract.
- (iii) Both sets of financial statements may be prepared by the Office of the Comptroller General (CGR) or Bank-eligible independent audit firms, prior to preparation of the audit reports.
- (iv) The Bank will determine the type of assurance audit to be performed on the project.
- (v) Prior to award of the works contract for the transmission line and expansion of the substations, the environmental and social obligations, as well as a budget for actions related to environmental and social mitigation, in accordance with the ESMR and ESMP, must be incorporated into the contracts, taking into account the following: (i) prior to the start of each of the works for the transmission line and expansion of the substations: (a) the respective environmental permit must be secured; and (b) at least 25% of the easement for the transmission line must be secured; and (ii) the following financial ratios must be maintained: collection ratio of 85% or higher; minimum ratio of internal cash generation to debt service of 1.5; maximum long-term debt to equity ratio of 1.0; and minimum current assets to liabilities ratio of 1.2.

V. FIDUCIARY AGREEMENTS AND REQUIREMENTS FOR PROCUREMENT EXECUTION

The fiduciary agreements and requirements for procurement apply to the execution of all procurement processes for the project.

1. Procurement execution

- a. **Procurement of works, goods, and nonconsulting services:** Contracts for works, goods, and nonconsulting services¹ generated under the project and subject to international competitive bidding (ICB) will use standard bidding documents issued by the Bank. Bidding processes subject to national competitive bidding (NCB) will use national bidding documents agreed upon with the Bank. The project's sector specialist is responsible for reviewing the

¹ "Policies for the Procurement of Goods and Works Financed by the Inter-American Development Bank (document GN-2349-9), paragraph 1.1: Nonconsulting services are treated as goods.

technical specifications for procurement processes during the preparation of selection processes. No direct contracting is expected at this time.²

- Procurement of information technology (IT) systems: The Bank's IT specialist may provide advice for the development of requirements for such procurement processes. No contracts using other procurement methods other than those of the Bank will be required.
 - No external support for bid evaluation needs to be provided to the executing agency, given ANDE's technical experience.
- b. **Selection and contracting of consultants:** Contracts for nonconsulting services generated under the project will use the standard request for proposals issued and agreed upon with the Bank. The project's sector specialist is responsible for reviewing the terms of reference for consulting services. No selection processes involving single source selection are anticipated initially.³ No external support for bid evaluation needs to be provided to the executing agency, given ANDE's technical experience.
- **Selection of individual consultants:** For the contracting of individual consultants, qualifications may be solicited via local or international notices, in order to form a short list of qualified individuals.
- c. **Advance procurement/retroactive financing:** None anticipated for this operation.
- d. **National preference:** None anticipated for this operation.
- e. Paragraph 1.23 of the proposal for operation development states that counterpart financing for Component 1, "Investments in the Yacyretá–Villa Hayes transmission line and substations," will be covered in part by a loan from the European Investment Bank that is currently in preparation. The procurement processes related to this cofinancing will be governed by paragraph V.1.a.

2. Table of threshold amounts (US\$000)

Works			Goods ⁴			Consulting services	
International competitive bidding	National competitive bidding	Price comparison	International competitive bidding	National competitive bidding	Price comparison	International publicity Consulting services	Short list 100% national
≥ 3,000	250 to 3,000	< 250	≥ 250	50 to 250	< 50	> 200	< 200

² Policies for the Procurement of Goods and Works Financed by the Inter-American Development Bank (document [GN-2349-9](#)), paragraph 3.6: Direct contracting must be duly justified.

³ Policies for the Selection and Contracting of Consultants Financed by the Inter-American Development Bank (document GN-2350-9), paragraph 3.9 et seq.: Single-source selection requires proper justification.

⁴ Includes nonconsulting services.

3. Main procurement processes

Activity	Procurement method	Estimated date	Estimated amount (US\$000)
Works			
Construction of 500 kV transmission line: Yacyretá–Limpio–Villa Hayes segment, including equipment and accessories, civil works, and electromechanical installation works	ICB	Nov. 2013	143,750
Expansion of Ayolas and Villa Hayes substations, including provision of equipment and accessories, civil works, and electromechanical installation works	ICB	Dec. 2013	58,750

4. Procurement supervision

Except when otherwise warranted, the ex post supervision method will be used. The use of ex ante or ex post reviews will be determined for each selection process.⁵ **The two procurement processes in the “Main procurement processes” table will be subject to ex ante review in their entirety.** Any minor procurement processes, **will initially be subject to ex ante review in their entirety**, at the request of the borrower, the Ministry of Finance. If agreed upon with the borrower, ex post reviews may be conducted for processes involving amounts equivalent to less than 10% of the thresholds set forth in item 2 above. Ex post reviews will be conducted every six months, in accordance with the project supervision plan.⁶

Threshold for Ex Post Review		
Works	Goods	Consulting services
300,000	25,000	20,000

Note: The thresholds for ex post review reflect the executing agency’s fiduciary capacity and may be modified by the Bank if this capacity changes.

5. Special provisions

For the evaluation of the fiduciary capacity of the DPGPE and the units of ANDE participating in the technical and fiduciary management of program PR-L1058 for procurement purposes, such entities and units must be strengthened to a minimum degree in all aspects; i.e., they must have the minimum human resources needed to operate, sufficient physical space, the furniture and equipment needed to perform their duties, and sufficient technological infrastructure to effectively manage procurement processes. All of this should be addressed in the fiduciary appendices of the Operating Regulations.

6. Records and files

ANDE’s General Planning and Business Policy Office (DPGPE) is tasked with coordinating the internal units involved in maintaining files and records on the program’s procurement processes. The DPGPE, however, must keep copies of all

⁵ Responsibility, support for reviews, and methodology are described in the document “[Guidelines for ex post review of procurement processes](#).”

⁶ Responsibility, support for reviews, and methodology are described in the document “Guidelines for ex post review of procurement processes.”

procurement records. The agreed formats and procedures described in the program Operating Regulations must be used in preparing and filing project reports.

VI. AGREEMENTS AND REQUIREMENTS FOR FINANCIAL EXECUTION

1. Programming and budget

ANDE will centralize coordination efforts through the DPGPE, which will serve as the program coordination unit (PCU). The PCU will receive logistical support from the Technical, Commercial, and Financial Departments and from the Technical Cabinet for the Power Loss Reduction Plan.

Budget programming, administration, and execution will be performed by the Financial Department, using the zero-based budget system. Prior to the first disbursement, the borrower must provide the resources needed for program startup to a minimum degree complementary to the resources to be provided by the Bank for the first year of execution.

2. Accounting and information systems

Accounting. The accounting principle is accrual; however, accountability for projects partially financed by the Bank will be on a cash basis, following country practices, and international accounting standards.

Parallel systems will be used, even though the SIAF is the primary tool for managing budget and accounting transactions, and is connected to SICO as the accounting subsystem along with others to help download information and prepare reports accessible to the Bank and other sources of financing. The accounting information for the project will be based on this system.

Information systems. The program execution unit will also be responsible to the Bank for: (i) coordinating all project-related activities; (ii) preparing physical and financial progress reports; (iii) submitting requests for the Bank's no objection and for loan disbursements, and maintaining the accounting records that will serve as the primary source for such requests and any financial report; (iv) implementing and maintaining a control system to ensure resources are properly used and protected, and maintaining files for documentation of transactions; and (v) preparing and updating the initial project report, AWP, semiannual progress reports, evaluation reports, and the project completion report before submitting them to the Bank. The program execution unit will be responsible for timely fulfillment of the provisions of the loan contract and project-related activities.

3. Disbursements and cash flow

Program disbursements will be made in the form of advance payments, which must be documented through submittal of a six-month financial plan and another financial plan covering a longer period, in order to help determine actual program demand based on the AWP, the project execution plan, etc. The executing agency will submit a financial plan and cash flow for each disbursement, as well as a progress report on fulfillment of

the risk mitigation plan approved by the project team leader. The subsequent disbursements will be subject to justification of 80% of the advance.

4. Internal control and internal audit

ANDE has an Internal Audit Office with sufficient and qualified staffed to perform its institutional functions. However, its engagement involving the project units has been insufficient. Given the internal control weaknesses for the project, as determined by the project external audit, it has been agreed that the PCU will engage professional audit services to monitor the program activities, so as to remedy the lack of true internal audit engagement.

5. External control and reports

The PCU will be responsible for financial accounting of transactions and disbursements and for maintaining the program's financial information. The executing agency, acting through the PCU, must submit the program's annual auditing reports, which will be prepared by the Office of the Comptroller General (CGR) or a firm of independent auditors acceptable to the Bank, in accordance with Bank policy (document OP-274-2) and the terms of reference previously agreed upon by the Bank. The audits shall continue throughout the execution period. Bank procedures will be used for the selection and contracting of the independent auditors. The audit costs will be financed with program resources.

6. Financial supervision plan

Financial supervision will be based on a three-prong approach: (i) review of disbursement reports and inspection visits; (ii) Bank-programmed supervisory site visits; and (iii) review of financial information from financial reports and execution reports.

Supervision activity	Supervision plan			
	Nature and scope	Frequency	Responsibility	
			Bank	Other
OPERATIONS	Review of progress report	Six-monthly	Fiduciary and sector team	
	Review of portfolio with executing agency and Ministry of Finance	Six-monthly	Fiduciary and sector team	
FINANCIAL	Inspection visits	Six-monthly	Fiduciary specialist	
	Financial audit	Annual	Fiduciary specialist	Executing agency
	Ex post review of risks and fiduciary mitigation plan	Annual	Fiduciary specialist	
PROCUREMENT	Ex ante review of procurement processes	N/A	PTL, with support from procurement specialist	Executing agency
	Updating of procurement plan	Quarterly until implementation of SEPA	PTL, with support from procurement specialist	Executing agency

Supervision activity	Supervision plan			
	Nature and scope	Frequency	Responsibility	
			Bank	Other
COMPLIANCE	Fulfillment of conditions precedent	Once	Fiduciary team	
	Budget allocation	Annual	Fiduciary specialist	Executing agency
	Delivery of audited financial statements	Annual	Fiduciary specialist	

7. Execution mechanism

ANDE will be responsible for:

- (i) Execution and supervision of proper use of loan proceeds;
- (ii) Timely and satisfactory provision of necessary human, technological, and budget resources;
- (iii) Submittal to the Bank of documentation needed to fulfill conditions for disbursement and other operational requirements for execution.

Other financial management agreements and requirements

N/A.