<table>
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<tr>
<th>Project Name</th>
<th>PY Energy Sector Strengthening Project</th>
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<tbody>
<tr>
<td>Region</td>
<td>LATIN AMERICA AND CARIBBEAN</td>
</tr>
<tr>
<td>Sector</td>
<td>General energy sector (100%)</td>
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<td>Project ID</td>
<td>P114971</td>
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<tr>
<td>Borrower(s)</td>
<td>ANDE</td>
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<td>Implementing Agency</td>
<td>Republic of Paraguay</td>
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<tr>
<td>Environment Category</td>
<td>[ ] A [X] B [ ] C [ ] FI [ ] TBD (to be determined)</td>
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<tr>
<td>Date PID Prepared</td>
<td>October 14, 2010</td>
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<tr>
<td>Date of Appraisal Authorization</td>
<td>October 15, 2010</td>
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<tr>
<td>Date of Board Approval</td>
<td>November 30, 2010</td>
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I. Country and Sector Background
Country Context

1. Paraguay, a country of 6.7 million people and an area of 406,750 sq. km. nestled between Brazil, Argentina, and Bolivia, has known substantial economic growth over the last 5 years. After a deep financial and political crisis in 2002, GDP grew by 4.6 percent on average between 2004 and 2008, its strongest expansion since the 1970s. Paraguay’s rapid growth has been fuelled by rising domestic consumption and investment, and by a boost of exports due to high international commodity prices (especially in the agriculture sector), a crucial development as nearly 38 percent of Paraguay’s GDP is derived from trade and exports to Brazil and Argentina. Per capita GDP stood at US$2,350 in 2009.

2. However, despite recent economic growth, achieving the Millennium Development Goals (MDGs) by 2015 remains a considerable challenge for the country due to the isolation of rural populations (41.6 percent of total population in 2009), to high population growth rates (2.37 percent in 2007), and the impact of the 2008 financial crisis that impacted on high food prices and declining incomes. Attaining the MDGs will require redoubled efforts to provide services to poor and marginal areas beyond the eastern region around the capital Asunción.

3. The Government’s key priorities are set out in the 2008-2013 Economic and Social Plan. They include hastening Paraguay’s transition to a modern economy by improving governance and reducing corruption, addressing the needs of vulnerable groups, and restoring growth in light of the effects of the global crisis. The Plan includes clear objectives and measures for each of these themes and reflects a pragmatic economic policy stance. It also aims to strengthen the management of the country’s vast hydroelectric resources.

Paraguay’s Electricity Sector
4. The electricity sector plays an important role in Paraguay’s economy as it benefits from one of the best hydrological endowment in the world which constitutes a clear advantage in the country’s effort to diversify its economy. Current installed power generation capacity stands at over 8,766 MW, nearly five times Paraguay’s peak demand of 1,810 MW (2009), and a large share of it is exported to Brazil and Argentina. A significant share of its large hydroelectric generation capacity comes from the Parana River, located at its Southeastern border, which provides abundant water for the operation of the Itaipú, Yacyretá, and Acaray hydroelectric power plants. Revenues from electricity exports to Brazil and Argentina represent about 23 percent of total Government revenues and four percent of GDP. Access to cheap, abundant and clean hydroelectricity constitutes a clear advantage in the country’s efforts to gradually move into activities with high value-added such as manufacturing, agro-processing, metal and mechanical industries, or packaging. In the medium-term, the Government aims to further harness Paraguay’s abundant hydropower resources to generate economic benefits and to improve the country’s competitiveness.

5. Government Power Sector Strategy. The Government’s strategy aims to develop an optimal and efficient electricity sector within the existing institutional framework. The limited size of the market, the abundant power available from the existing Itaipú and Yacyretá hydroelectric plants, and the current regulations have limited interest from independent private generators in investing in Paraguay’s electricity market. The Authorities have therefore sought to promote the efficient management of resources within a public sector framework. This includes efforts to reduce losses, optimize the purchasing agreements with the bi-national generators, and introduce more efficient management practices in the Administración Nacional de Electricidad (ANDE), Paraguay’s main power utility. The Government also plans to strengthen the sector institutions in particular the role of the Vice Ministry responsible for Energy (VMME) and the regulatory framework and oversight capacities.

6. Resolving electricity issues is a key priority for the Government as it seeks to transform ANDE into an efficient and financially sustainable public sector enterprise. In January 2010 Congress approved an Emergency Plan as a response to the increased outages and frequency fluctuations of the summer of 2009-2010 (December – February). The Emergency Plan of US$40 million includes procurement of low voltage transformers, reactive compensation, renting of generators and purchase of fuel. In addition, ANDE’s structure was also reorganized with changes in key senior management positions: commercial, financial and technical.

7. ANDE submitted a 10-year Master Plan (2009-2018) built upon the following three broad objectives: (i) reducing power losses in distribution and transmission; (ii) expanding transmission system capability; and (iii) enhancing the company’s efficiency and revenues by increasing the exporting capacity of ANDE to neighboring countries. A priority investment from the Master Plan is the Itaipú-Asuncion 500 kV transmission line which is currently prepared for implementation by Itaipú Binational entity with concessionary financing from Brazil, and with expected commissioning date early 2013. The Master Plan is expected to cost about US$1.3

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1 Itaipú has an installed capacity of 14,000 MW owned and operated by the Itaipú bi-national entity co-owned with Brazil.
2 Yacyretá has an installed capacity of 3,100 MW owned and operated by Yacyretá bi-national entity co-owned with Argentina.
3 Acaray has an installed capacity of 250 MW owned and operated by ANDE, the public power utility.
4 See Sector Background Project File for more details on the sector.
billion\textsuperscript{6} with relatively little financing secured. Mobilizing financing including commercial financing is therefore a critical issue. The proposed Project finances priority investments of the Master Plan. It represents about one year of required investments.

8. \textit{Although the country is major electricity generator and exporter, its domestic consumption per capita remains low at 1,000 kWh/year} (about one third of the consumption levels of Brazil and Chile). ANDE expects electricity demand to increase by about 9 percent/year over the medium term corresponding to an additional 100 MW per year, driven mainly by an increase in the residential and commercial demand. The projected demand growth exacerbates the challenges faced by ANDE’s electric system (network capacity to increase supply, quality of service, large system losses and relatively low collection rates).

9. \textit{Despite its large generation capacity, Paraguay’s electricity service provision lags in quality and reliability, with high system losses and no reliable system to meter them.} System losses have increased steadily over the last 10 years, from 21 percent in 1999 to 34 percent in 2005 (well above the 13.5 percent weighted average for the LCR region). Through a loss reduction program launched in 2006 by ANDE with financial support from IDB,\textsuperscript{7} overall system losses slightly dropped to 33 percent in 2009 of which about 10 percent are estimated to be transmission losses and 23 percent distribution losses (technical and non-technical losses are estimated to split equally). However ANDE has no reliable system to meter losses at different voltage levels and geographical locations, and no remote metering. ANDE’s current target to further reduce system losses in 2010 to 32 percent is a modest goal. Reducing relatively quickly and significantly losses is an imperative but presents a considerable technical and financial challenge which will require additional efforts and resources.

10. \textit{Electricity service provision also faces significant outages and frequency fluctuations.} The current maximum capacity of the transmission system, estimated by ANDE to be 1,700 MW, has been reached (in 2009 peak demand reached 1,810 MW). In 2009 customers saw 16.9 interruptions for an average of 11.4 hours per interruption. These outages are due to the fact that transmission equipment are operating close to their thermal technical limits causing shutdowns of the system whenever there is a shock. Warm summer weather, heavy rains or thunderstorms regularly result in the activation of the transmission lines protection devices and in interruptions. In addition to outages, the long distances from the generating plants to load centers (of about 300 km.) result in frequency and voltage fluctuations that have hindered economic operators and households in the main load centers. Additional transformation and reactive compensation capacity to support ANDE transmission network is therefore critical to avoid a supply crisis and prevent the further deterioration of the quality and reliability of the electricity service.

\textsuperscript{5} It was initially considered for World Bank and European Investment Bank Financing.

\textsuperscript{6} Total investment requirements over the 2009-2018 period are estimated at US$1.3 billion, out of which generation investments are estimated at US$280 million, transmission investments at US$763 million, and distribution investments at US$266 million. An update of the investment requirements is currently prepared by ANDE.

\textsuperscript{7} The IDB’s National Electricity Administration Multiphase Power Transmission Project (US$105 million for phase I), aims to meet growing demand for electricity by expanding and upgrading the transmission grids, reducing loss levels, and supporting actions to modernize ANDE. Over the 2006-2011 period, the Project will finance a 220 kV transmission line (198 kms), two 66 kV transmission lines (35 kms), the replacement of about 220,000 meters, and the setting up of ANDE’s environmental and social unit, as well as improving financial corporate management.
II. Objectives

11. The higher level objective of the Project is to increase the delivery and the quality of the electricity services in Paraguay and to strengthen the performance of the public utility responsible for the provision of electricity services in Paraguay. In so doing the Project will contribute to the fulfillment of three of the GOP’s high-level objectives: poverty reduction, sustainable growth, and improved governance.

12. The specific Project objective is to increase the quantity and quality of the provision of electricity services by ANDE, while improving its performance.

III. Rationale for Bank Involvement

13. The Project is expected to increase the delivery and the quality of the electricity services in Paraguay and to strengthen the performance of the public utility responsible for the provision of electricity services in Paraguay. In so doing the Project will contribute to the fulfillment of three of the GOP’s high-level objectives which are included in the World Bank’s Country Partnership Strategy (CPS) for 2009-2013 with Paraguay: poverty reduction, sustainable growth, and improved governance. The Project is also in line with the Government priorities to support the sustainable development of the electricity sector as stated in the Economic and Social Plan of 2008-2013. A key element of the CPS strategy and of the Government’s objectives is to modernize the country infrastructure and improve the delivery of public services, in particular the electricity sector infrastructure.

IV. Description

14. The Project involves three components:

a. **Component 1: Modernizing ANDE’s Distribution Management System and Installing an Automated Meter Infrastructure (AMIs) for Large Consumers (Total cost: US$25 million; IBRD financing: US$20 million)**. This component includes the: (i) installation of a state-of-the-art Integrated Distribution Management System (Sistema de Gestión Integral de la Distribución Eléctrica- SGIDE) for technical and commercial distribution operations through a turn-key contract procuring hardware, software, database set-up and maintenance, training of ANDE staff in the use, maintenance and upgrading of the SGIDE; and (ii) installation of advanced metering infrastructure (AMIs) to large consumers to achieve loss reduction and increase private collection rate, thereby improving its performance. This activity complements IDB US$26.5 million ongoing loss reduction operation that focuses on replacing meters mostly at the residential level.

b. **Component 2: Improving the Performance of the Transmission Network (Total cost: US$96.25 million; IBRD financing: US$77 million)**. This component will provide resources to carry out engineering, procurement and construction (EPC) contracts

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related to the commissioning of two new and extension of 220 kV and 66 kV substations providing increased transformation capacity, and the installation of reactive compensation providing increased energy supply to the network. The new substations are directly below the existing transmission lines and the Project does not plan to finance transmission line investments.

c. **Component 3: Institutional strengthening of the Sector and of ANDE** (Total cost: US$3.75 million; IBRD financing US$3 million). This component will provide resources to: (i) implement recommendations to improve the performance of the electric sector, including ANDE, resulting from an integral assessment of the sector; and (ii) strengthen ANDE’s capacity in strategic planning, financial management and in investment planning, design and implementation, in particular with respect to mainstreaming and implementing social and environmental safeguards.

V. Financing
Source: ($m.)
- ANDE and Paraguay 25.00
- International Bank for Reconstruction and Development 100.00
Total 125.00

VI. Implementation

15. The Project will be implemented by the electricity state-owned enterprise (ANDE). Overall Project coordination will be provided by the General Planning and Corporate Policy Directorate (Dirección de Planificación General y Política Empresarial), within ANDE’s Presidency (Presidencia), benefitting from the experience accumulated during Project preparation. ANDE will assume fiduciary responsibilities for all the activities financed by the Bank loan, will produce the requisite interim and annual financial reports, and will use its line technical and operational departments as currently done for the projects funded by IDB and JICA. Ministry of Finance will monitor Project overall implementation compliance.

16. Through its General Planning and Corporate Policy Directorate (Dirección de Planificación General y Política Empresarial) ANDE will be responsible for the implementation of the Project three components. ANDE’s Implementation Team will include a Project Manager from the General Planning and Corporate Policy Directorate coordinating the activities and liaising with the stakeholders and experts from ANDE’s relevant departments: environmental and social experts, procurement specialists, financial management specialists, representatives from the Transmission Technical Department, the Distribution Technical Department, the Investment Control Unit, the Commercial Department, the Finance and Accounting Department, the Information Technology (IT) Department, the Legal Department, etc.

VII. Sustainability
17. The Project is designed to strengthen in a comprehensive manner the technical and financial performance of ANDE as it covers the distribution and transmission losses and customer management, the transmission system, and ANDE’s planning, implementation and monitoring capacities. Sustainability of the Project outcomes will also depend on the overall governance environment for the power sector. The requests from the Ministry of Finance and ANDE’s management to delineate and implement a comprehensive action plan to increase the overall performance of the power sector and for strategic advice are expected to further help sustain the improvements anticipated under the Project.

VIII. Lessons Learned from Past Operations in the Country/Sector

18. Project design has benefited from the Bank’s experience with similar power projects in other countries, as well as from recent project experience in Paraguay. The specific lessons incorporated into Project design show the importance of a comprehensive approach to power sector improvement including investments and institutional strengthening at the utility and also at the sector planning, regulatory and oversight levels. The following lessons have been incorporated in Project design: (i) strong implementation agencies with adequate capacity to ensure on-time implementation, which often requires support from external consultants providing strategic, technical advice and best practice; and (ii) strong political will and communication campaigns internally and externally to ensure ownership and support for investment, loss reduction programs, to allow utilities to gain social legitimacy; (iii) integration of social and environmental requirements into contract design and project implementation; and (iv) adequate implementation monitoring and evaluation systems and capabilities.

IX. Safeguard Policies (including public consultation)

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<th>Safeguard Policies Triggered by the Project</th>
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<td>Projects in Disputed Areas (OP/BP 7.60)*</td>
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X. List of Factual Technical Documents

XI. Contact point

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*By supporting the proposed project, the Bank does not intend to prejudice the final determination of the parties' claims on the disputed areas
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