DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

HAITI

PÉLIGRE HYDROELECTRIC PLANT REHABILITATION PROGRAM

FIRST GRANT (HA-L1032)

GRANT PROPOSAL

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ELECTRONIC LINKS

Mandatory

1. Annual work plan:
   http://idbdocs.iadb.org/WSDocs/getDocument.aspx?DOCNUM=1773108
2. Monitoring and evaluation arrangements:
   http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1670165
3. Program environmental analysis report and environmental management plan:
   http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1670144
4. Procurement plan:
   http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1670143
5. Safeguards and environmental classification:
   http://idbdocs.iadb.org/WSDocs/getDocument.aspx?DOCNUM=1671090

Optional

5. Program technical-economic evaluation - Midterm report, October 2008
   http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1710378
6. Environmental and social assessment of the program
   http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1670162
7. Financial analysis of the Péligre Hydroelectric Plant (PHP) Rehabilitation Program and its impact on Électricité d'Haïti's financial projections - Final report, September 2008
   http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1671168
8. Sedimentation study of the PHP dam
   http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1670215
9. Map of the PHP
   http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=1720388

ABBREVIATIONS

AWP	Annual work plan
CMEP	Conseil de Modernization des Entreprises Publiques [Public Enterprise Modernization Board]
EDH	Électricité d'Haïti
ESA	Environmental and social assessment
ESMP	Environmental and social management plan
ESMR	Environmental and social management report
ESR	Environmental and Social Review
FSO	Fund for Special Operations
GPRSP	Growth and Poverty Reduction Strategy Paper
IRR	Internal rate of return
MEF	Ministry of Economy and Finance
MTPTC	Ministry of Public Works, Transport and Communication
MW	Megawatt
NPV	Net present value
OFID	OPEC Fund for International Development
OPEC	Organization of Petroleum Exporting Countries
PCU	Program Coordination Unit
PHP	Péligre Hydroelectric Plant
PPMR	Project Performance Monitoring Report
PTU	Program Technical Unit
SECCI	Sustainable Energy and Climate Change Initiative

PROJECT SUMMARY

HAITI
PÉLIGRE HYDROELECTRIC PLANT REHABILITATION PROGRAM
(HA-L1032)

Financial Terms and Conditions[1]		
Borrower: Republic of Haiti		
Executing agency: Ministry of Public Works, Transport and Communication (MTPTC), with the participation of Électricité d'Haïti .		
The program will be financed with this IDB grant (HA-L1032) in the amount of US$12.5 million to be approved in 2008, potential financing of US$15 million from the OPEC Fund for International Development (OFID) to be approved in 2009, and potential additional IDB financing (HA-L1038) of US$12.5 million to be considered in 2010, depending on FSO resources allocated to Haiti.		
Source	**Amount**	**(%)**
IDB 1 - HA-L1032 (Grant Facility)[2] 2008	US$12,500,000	31.25%
IDB 2 - HA-L1038[3] 2010	US$12,500,000	31.25%
Other sources/cofinancing (OFID)	US$15,000,000	37.05%
Total	**US$40,000,000**	**100.0%**
IDB disbursement period (HA-L1032):		5 years

Project at a Glance

Program objectives and description:

The objective of the program is to help restore and preserve Haiti's capacity to generate electrical power with renewable energy sources by rehabilitating the Péligre Hydroelectric Plant and to ensure the supply of electricity to Haiti's capital by rehabilitating the transmission line to Port-au-Prince.

Conditions precedent to the first disbursement:

- signature of a subsidiary agreement between the MTPTC, EDH, and the Ministry of Economy and Finance (paragraph 3.1);
- designation of the program coordinator and strengthening of the Program Coordination Unit (PCU) and Program Technical Unit (PTU) through the addition of technical, environmental, procurement, and financial specialists (paragraph 3.6);
- approval and entry into force of the updated program operations manual (paragraph 3.8).

Special contractual conditions:

- the final results of the rehabilitation studies, including the technical specifications for rehabilitation activities, are available before the procurement process is initiated (paragraph 2.12);
- The IDB may disburse up to US$250,000 once the conditions precedent to the first disbursement are partly met in order to cover the cost of meeting those conditions (paragraph 3.9);
- the consulting firm to support the PTU has been hired before the rehabilitation contract is signed (paragraph 3.6).
- a revolving fund will be established for up to 10% of the total loan amount (paragraph 3.12).

Exceptions to Bank policies: None.					
The program is consistent with the country strategy:				Yes [√]	No [ ]
The program qualifies as:	SEQ [ ]	PTI [ ]	Sector [ ]	Geographic [ ]	Headcount [ ]
Procurement: In accordance with IDB policies. See Annex II.					
ESR verification date: ESR 22-08 of 6 June 2008 (profile) and ESR 42-08 of 2008 (proposal).					

[1] The program will be financed according to the terms of document CA-474, Resolution AG-03/07, and Resolution AG-08/07.

[2] As indicated in Resolution-08/07.

[3] Document CA-474 and Resolution AG-03/07. After 2009, Haiti will be eligible to receive a blend of grant resources and loans from the FSO, including a nonreimbursable component of up to US$40 million.

I. DESCRIPTION AND RESULTS MONITORING

A. Background and results

1.1 The electricity sector in Haiti is served primarily by the public utility Électricité d'Haïti (EDH), which provides power generation, transmission, distribution, and marketing services. Created in 1971, EDH is an autonomous government entity whose mission is to plan, operate, and supply public electricity service for the country. The Ministry of Public Works, Transport and Communication (MTPTC) is responsible for setting policy and regulating the sector.

1.2 The electricity sector has not escaped the serious economic and social problems Haiti has faced in recent years. The coverage of electricity service is one of the world's lowest; fewer than one million of the country's 8.5 million inhabitants have access to electricity, representing only 10% coverage and average service availability of only five to eight hours per day. Haiti's nominal installed capacity is 267 megawatts, yet only 122 to 152 megawatts have been available in recent years. The Péligre Hydroelectric Plant (PHP) has provided 50% of the national system's energy supply in the last 10 years, and is the primary source of renewable resources. The remaining generation is from diesel-fired thermal power plants. The following table presents the electricity-generating capacity of the plants in operation:

Table 1: Electricity-generating Capacity

Plant	Nominal capacity MW	Available capacity MW	(%) of installed capacity	Generating source
Péligre	54	10-30	20	Hydraulic
Varreaux I	33	12.5	12	Thermal
Varreaux II	21		8	Thermal
Carrefour	50	12.0	19	Thermal
Alstom Power	50	50.0	19	Thermal
Sogener	23	23.0	9	Thermal
Other	36	14.5	13	Thermal/hydraulic
Total	267	122-152	100	

1.3 The Péligre dam, built to control the waters of the Artibonite Valley, was completed in 1956. By 1971, the installation of three 18-megawatt generating units was complete, and the PHP began to produce electricity. Since then, the PHP has performed two functions: (i) regulate and control flooding in the Artibonite Valley; and (ii) serve as Haiti's only large-scale renewable energy plant. The PHP's electro-mechanical equipment is nearing the end of its useful life, and one of the units is completely out of service. Average annual production has been only 162 of the potential 320 gigawatt-hour capacity under optimum operating conditions (i.e., average availability of 22 out of 54 megawatts) primarily due to reduced water volumes in the reservoir and the impact of electro-mechanical failures on the

generators' availability. The problems of an aging physical plant are compounded by sedimentation caused primarily by deforestation, inadequate management of the Artibonite Valley watershed, and natural effects of the environment, which further hinder the units' availability.

1.4 **The country's strategy.** The Growth and Poverty Reduction Strategy Paper (GPRSP), approved in November 2007, stresses the importance of improved infrastructure in Haiti and promoting critical reform in certain key sectors for growth, such as the energy sector. The GPRSP presents a unique opportunity to restore sector coordination between the various technical and financial partners supporting the strategy, including the IDB. Accordingly, sector groups have been established to coordinate technical and operational aspects of initiatives.

1.5 The IDB is part of the energy sector coordination forum, which has established a short- and medium-term strategy and long-term vision for power generation, transmission, distribution, and marketing. Within the GPRSP framework, the donor community is actively supporting short-term plans to ensure continuity of scarce public services. Actions under the GPRSP for the energy sector include increasing power-generation capacity through competitive purchases of energy, improving existing capacity, and restoring the sector's financial sustainability by reducing losses in the distribution network and establishing a balanced system of energy prices that considers the needs of the poor.

1.6 The program will include rehabilitation of the PHP's three generating units, the common electrical components, and the transmission line between the PHP and Port-au-Prince to enable the PHP to deliver as much electricity to the capital as possible over the next 20 years. In order to make the best use of resources from the IDB and other potential donors, the program's design is based on a modular technical and economic structure, with corresponding outcomes and indicators. In order to maintain generating capacity during rehabilitation, the program will guarantee availability of at least two of the PHP generating units while working on the third, and will maximize the benefits of renewable energy generated by the PHP through a secure, reliable transmission system.

1.7 **The Bank's country strategy.** The operation is consistent with the IDB's country strategy with Haiti, document GN-2465, which identifies one of the pillars of the IDB's activities as improving the conditions for supply of public services and basic infrastructure, including the transportation and electricity sectors. The program supports the Haitian government's priority of strengthening the electricity sector, with activities that will improve current conditions of energy supply and provide the basis for development in the medium term as part of the programming agreed with the country for 2008-2010.

1.8 **Contribution to the Sustainable Energy and Climate Change Initiative.** Program activities will significantly further the Bank's strategy of promoting renewable energies, reflected in the pillars of the Sustainable Energy and Climate Change Initiative (SECCI). Program resources will be used to finance electro-

mechanical rehabilitation and efficiency gains for the PHP, which is the principal source of renewable energy in Haiti, to extend its useful life and displace the use of fossil fuels to generate power. This will help reduce greenhouse gas emissions and improve local conditions with respect to emission of pollutants. According to preliminary estimates, the program will reduce carbon dioxide emissions by 70,000 tons per year, and is expected to be presented to the Clean Development Mechanism of the Kyoto Protocol. Moreover, for implementation of the Climate Investment Fund (CIF) for this program, the IDB is providing technical assistance to Haiti to support these processes.

1.9 The program is part of a strategy to support Haiti's energy sector that also includes a program to reduce losses in Port-au-Prince through physical rehabilitation of distribution networks, the first phase of which is in execution (HA-L1014); the second phase (HA-L1035) is expected to follow depending on progress. Under the framework of the SECCI, support will also be provided for development of a biofuels action plan, development of new hydroelectric generation sources, and design and implementation of an energy efficiency plan.

1.10 **Program strategy.** In light of the limited financing available for Haiti, the program has been designed to be financed with three technically independent operations that will yield the specific cumulative benefits of rehabilitating the PHP. The first operation is this US$12.5 million grant to be considered by the Board of Executive Directors in 2008. It will be followed by potential financing of US$15 million for 2009 from the OPEC Fund for International Development (OFID). Lastly, a request for potential IDB financing of US$12.5 million (HA-L1038) would be presented for consideration of the Board of Executive Directors in 2010. From a technical standpoint, the first operation will finance the rehabilitation of the PHP's first generating unit and common electrical equipment; rehabilitation of the second unit would be financed with OFID resources; and rehabilitation of the third would be financed with potential IDB resources (HA-L1038).

B. Objectives, components, and cost

1.11 The objective of the program is to help restore and preserve Haiti's capacity to generate electrical power with renewable energy sources by rehabilitating the PHP, and to ensure the supply of electricity to Haiti's capital by rehabilitating the transmission line to Port-au-Prince. The rehabilitation of the PHP is designed to: (i) restore and maintain its generating capacity; (ii) improve the efficiency of the plant's generating units; and (iii) improve the conditions under which energy is transmitted from the PHP to Port-au-Prince. The program is designed so as to maximize resources and gain access to additional cofinancing resources. The rehabilitation works will take five years, to ensure that the PHP can continue to supply electricity in Haiti during execution.

1.12 **Component I: Investments in rehabilitating PHP electro-mechanical components and transformers**: This component will finance electro-mechanical rehabilitation of the PHP and the related civil works. The program will successively

finance rehabilitation of the three 18-megawatt generators, including rehabilitation of the electro-mechanical components, the turbine and generating units, exciters, speed control, control panels, sluice gates, sluice valves, bearings, and insulation for the alternators. It will also finance common electrical works for the PHP, including rehabilitation of the external 13.8/115 kilovolt substation, protective equipment, 13.8-kilovolt electrical equipment, auxiliary services, remote control and command, signaling, and alarms. Technical studies are currently being conducted by Tecsult International to set the detailed rehabilitation plan. The studies are being financed by the IDB through technical-cooperation resources from the Infrastructure Fund and the SECCI. This component will address the immediate rehabilitation needs and the increased demand for energy transformation resulting from rehabilitation of the PHP.

1.13 **Component II: Investments in the 115-kilovolt transmission system between the PHP and Port-au-Prince:** This component will finance physical rehabilitation, including addressing swelling pylons, replacing insulation, charting flows in areas of high topographical vulnerability subject to erosion, and rehabilitating the transmission line from the PHP to the Port-au-Prince distribution substation. It is intended to make Haiti's electricity transmission system more reliable and create conditions to maximize the benefits of the electro-mechanical rehabilitation program. Technical studies are currently being conducted to determine the specific scope of the rehabilitation works on the existing transmission line to be financed under this component. The specific design of this component will reflect the current condition of the transmission line and the technical and physical rehabilitation necessary.

1.14 **Component III: Engineering and administration.** This component will support execution through institutional strengthening of the Program Coordination Unit (PCU) and the Program Technical Unit (PTU); program supervision, including environmental and social supervision; and audit and evaluation.

1.15 The program cost is estimated at US$40 million, of which the IDB will finance US$12.5 million in 2008 under this grant (HA-L1032). The following table presents a summary of program costs and financing.

Table 2. PHP Rehabilitation Program Costs and Financing
(in US$ millions)

Components	Program 2008 – 2011			
	HA-L1032	OFID[4]	HA-L1038[5]	Total
I. Rehabilitation of PHP equipment	10.38	8.20	8.20	26.78
II. Rehabilitation of the transmission line	0.00	4.00	0.00	4.0
III. Engineering and administration	1.08	0.62	1.02	2.72
3.1 Support for administration (PCU/PTU)	0.15	0.00	0.15	0.30
3.2 Consulting and supervisory firm	0.78	0.62	0.62	2.02
3.3 Evaluation and audit	0.10	0.00	0.10	0.20
3.4 Environmental and social management	0.05	0.00	0.15	0.20
Unallocated expenses	1.04	2.18	3.28	6.50
Total	12.50	15.00	12.50	40.00

C. Results framework and principal indicators

1.16 The program is expected to achieve the following outcomes: (i) restore and maintain the capacity and availability of the PHP's generating units; (ii) increase the efficiency of the generating units' operations; (iii) extend the useful life of the PHP by 20 years; and (iv) ensure transmission of energy from the PHP to Port-au-Prince. Based on this, the program will further the larger objective of sustaining the conditions of supply in Haiti's electricity sector through the use of renewable energy sources, which is consistent with the SECCI. The detailed indicators are presented in Annex I, Results Framework/Matrix of Indicators.

II. FINANCING STRUCTURE AND PRINCIPAL RISKS

A. Financing instruments

2.1 The program was prepared, bearing in mind available resources from the IDB in 2008, for US$12.5 million; US$15 million potential cofinancing from OFID to be approved in 2009; and US$12.5 million potential additional financing from the IDB (HA-L1038) to be considered in 2010. The proposed framework was defined in light of the limited IDB resources for Haiti. The potential second IDB operation would be presented to the Board of Executive Directors for consideration once the funds have been allocated and the form of financing has been determined for operations in Haiti during 2010.

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4 Potential financing under review by OFID to be approved in 2009.

5 Potential second IDB financing to be approved in 2010. The availability of these resources will be subject to the available resources for programming in Haiti.

B. Environmental and social risks and mitigation measures

2.2 The program will finance the different phases of electro-mechanical rehabilitation of the PHP. No significant adverse environmental impacts from the operation are anticipated. The program will have a positive impact in the country because, if the PHP were not rehabilitated, the installed capacity would have to be replaced in the short term with generation using fossil fuels, which would have negative local and global environmental and social impacts. The program's negative impacts, which will be of short duration and limited magnitude, will arise primarily during electro-mechanical rehabilitation activities.

2.3 **EDH institutional capacity in environmental and social management.** The PCU, in cooperation with EDH's environmental unit, will be responsible for supervising environmental and social management of the program. In light of the PCU and EDH's limited environmental and social management capacity, the program will be strengthened in this area by hiring an environmental specialist as for the PCU. The program must comply with Haiti's environmental and social policies and those of the IDB.

2.4 **Environmental and social impacts.** During program preparation, an environmental and social assessment (ESA) was conducted and an environmental and social management report (ESMR) was prepared, which included the results of the sedimentation study for the PHP and the environmental and social impacts of the electro-mechanical rehabilitation works planned for the program. As part of the ESA, an environmental and social management plan (ESMP) was also prepared for each phase of rehabilitation, focusing particularly on management of solid and liquid waste, occupational health and safety, and control and management of fires in accordance with environmental and social regulations in effect in Haiti, international best practices, and IDB environmental and social policies. To monitor and control compliance with program environmental and social measures, the rehabilitation contract and supervision activities will include compliance with the requirements of the ESMP. According to the results of the environmental and social review and the IDB Environment and Safeguards Compliance Policy (OP-703), this operation has been classified as category B (see Annex III).

2.5 **Results of sedimentation study for the PHP dam.** During the preparation phase, a study was conducted of the current condition and future trends for the dam that supplies the PHP and provides irrigation in the Artibonite Valley. The report determined that the volume of sedimentation in the dam would increase by 6 million cubic meters per year, equivalent to 2% of the dam's volume. In other words, the useful life of the reservoir is 50 years. The reservoir's current capacity is 297 million cubic meters, and the volume available for power generation is 249 million cubic meters. The dam's estimated loss of capacity over the next 20 years is 90 million cubic meters. According to bathymetry studies, this will not affect power-generation capacity, but may affect the system's capacity to contain flooding.

2.6 **Environmental and social management plan.** The ESMP describes the recommended social and environmental protection activities, including objectives and phases and the entities responsible for the proposed activities, supervision, and costs. EDH is coordinating with the local communities to create an interministerial commission to establish criteria and timetables for work on the dam that may affect the communities and the downstream irrigation system. The following activities have been identified: EDH studies to determine the maximum flow that can be released from the dam without causing flooding downstream; hydrological studies to predict flooding in the lake, allowing controlled opening of the sluice gates in advance; and a meteorological warning system to be developed under an agreement between EDH and the National Meteorology Service. The ESMP also includes activities to be conducted in cooperation with the Agricultural Intensification Projects (1490/SF-HA and HA-L1021). The activities include training for farmers in techniques to reduce sedimentation in the dam such as rational water use, handling and placement of sediment removed from irrigation canals, and methods of growing vetiver grass along the shores and riverbanks of the watershed; and models demonstrating techniques for growing fruit trees, contour farming, and planting cover crops. In order to mitigate the impact of rehabilitation works, the construction firm will be required to submit an ESMP with its technical proposal and financial bid that includes, at a minimum: (i) protection activities to be undertaken; (ii) training; (iii) health and safety protection measures for contractors; (iv) emergency plans in case of oil or fuel leaks; and (v) procedures for notification of environmental nonconformities and of contacts with local authorities or communities. The rehabilitation of the transmission line will have no environmental impact because it is an existing work. The costs of these activities are included in the program budget.

2.7 **Management of the dam.** It was determined that proper management of the Péligre system could extend the useful life of the dam by managing sediment, reconfiguring the turbine intakes, possibly extending the height of the dam, and soil erosion control in the watershed that feeds into the Péligre dam. Watershed management activities could lead to improvements in sedimentation behavior in the reservoir. Given the PHP's current operating conditions, the program is not expected to have a direct impact on the availability of water for irrigation in the Artibonite Valley. During the preparation phase, it was also agreed that EDH would coordinate management of the reservoir and operation of the downstream reservoir with stakeholders and Artibonite Valley users so as to mitigate the effects of sedimentation. It was recommended that the bathymetry be surveyed every 10 years to monitor the behavior of the dam.

C. Fiduciary risk

2.8 **Fiduciary risk.** The operation is considered to have high fiduciary risk. In light of the EDH's institutional weakness, the program design provides for a specialized firm to be contracted to support the PTU during execution and in program supervision activities.

2.9 There are execution risks relating to the MTPTC's overall capacity to manage the program through EDH, and Haiti's vulnerability and dependence on the PHP, which could affect the execution timetables for the works. The program also faces technical, logistical, and management risks in light of conditions in Haiti. The IDB's experience with EDH has shown the need for external support to EDH in many cases to meet the technical requirements of implementation.

Table 3. PHP Rehabilitation Program Risks and Mitigation Measures

Risk	Mitigation measure
Availability of resources from OFID and the IDB to complement program financing	The rehabilitation phases have been designed so that the technical and economic benefits of each phase are independent. The program's financing structure accommodates the specific requirements of each phase, including economic, technical, environmental, and social aspects.
Procurement, financial management, and control systems exhibit weaknesses	The PCU and PTU will include specialists in different areas (coordination, procurement, financial, technical) to facilitate the program's procurement, financial management, and control processes. Their members will be contracted based on profiles previously defined and agreed with the IDB, and their payment will be tied to performance and the delivery and acceptance of specific outputs.
Weak institutional procedures for program execution	The PCU and PTU members are required to be knowledgeable of IDB policies and procedures concerning fiduciary management of infrastructure programs.
Inadequate program accounting records	The specialists in the PCU are required to have knowledge and experience using appropriate systems to manage this type of program to design, implement, and establish program accounting and budget records and related training.
Weaknesses in applying IDB fiduciary policies	Training will be provided for PCU members on IDB policies concerning procurement, financial management, program management, reporting, review, and supervision.
Technical and execution risk	The PTU will be supported by a specialized firm with proven technical and execution capacity demonstrated in similar programs. That firm will be contracted by the program to support execution.
Risk of increased cost of materials	The PTU, supported by a specialized firm, will be encouraged to execute the program efficiently and effectively so as to avoid delays and reduce price exposure on equipment and materials for the rehabilitation program.
Environmental and social risks relating to use of water from the Péligre dam	The PCU and PTU's activities will include supporting EDH in coordinating with the entity responsible for coordinating use of water from the Péligre dam. The activities of the supervisory firm will also include overseeing compliance with the agreements set forth in the ESMR.

D. Other special considerations and risks

2.10 **Technical and economic feasibility.** From a technological perspective, the electro-mechanical rehabilitation primarily involves replacement and update of PHP

equipment using the same equipment and materials as those currently used by EDH in operating the plant. This update represents a significant technological challenge for EDH, and therefore the PTU (and the contractor firm) must be in a position to provide technological exchange with the EDH officials responsible for operating the PHP. The full bidding documents were prepared during program preparation to serve as a basis and guidance for program execution; this will help adequately mitigate the risk of EDH's limited technical capacity. Specifically, the PHP rehabilitation works will result in a more reliable energy supply for Haiti and increase know-how and technical capabilities and the ability to supply the country's electricity.

2.11 The rehabilitation program and timetable present a series of technically independent activities in light of the fact that conditions in Haiti's electricity sector preclude taking the PHP out of service to execute the program in one phase. This determination was made on the basis of preliminary findings of the study by Tecsult International and the recommendations of EDH. From an economic standpoint, the program is highly profitable. The estimated rate of return under various scenarios is on the order of 25%.

2.12 A special condition of execution will be the final results of rehabilitation studies, including technical specifications for the rehabilitation activities and the timetable of program activities.

2.13 **Sustainability of the investments.** Two types of program financial analyses have been conducted. A specific study considered the costs and benefits of the program itself. A second, general study analyzed the impact of the program on EDH financial projections. The specific study looked at income and expenses under two scenarios, with and without the program, and used the results to calculate the program's impact. The income and expense flows with and without the program are complete and include all the plant's finances. Because EDH is an integrated company that does not distinguish between selling (or buying) prices for the different segments—production, transport or distribution—it is not possible to assign an accurate value to transactions in the wholesale market. Accordingly, two alternative methods were chosen to value the income derived from the PHP's operations: (i) estimate the cost of an equivalent thermal plant that would have to be installed to cover demand if the PHP were not operating or ceased to operate (Option A); and (ii) calculate the portion of the current rate that covers or represents EDH's average cost of generation (Option B).

2.14 Both methods yield highly satisfactory internal rates of return (IRR) and net present values (NPV), indicating that the program is sound and robust. The IRR is between 25.4% for Option B and 26.1% for Option A. The NPV is positive for reasonable discount rates (8% to 12% and above). These results and conclusions did not change significantly even when it was assumed that, without the program, the PHP would function with only one turbine for the remainder of the period under analysis. The IRR was on the order of 19% to 20% for both options, and the NPV remained above zero using the same rates.

2.15 For the second financial analysis, model EDH financial projections were prepared covering the three principal statements: the income statement, statement of cash flows, and financial statement. The projections were based on a 10-year horizon beginning in fiscal year 2007–2008. An analysis of the change in financial indicators including earnings before interest and taxes (EBIT), defined as the difference between total income and the sum of operating costs and depreciation, demonstrated the advantages of undertaking the program.

2.16 Rehabilitation of the PHP will have a clearly positive impact on EDH's finances, because increased hydroelectric production will allow the Government of Haiti and EDH to avoid purchasing significant quantities of fuel on the international market. The surpluses generated with the program are significant enough to afford EDH a certain degree of financial autonomy. The program should be accompanied by significant management measures supported by the Government of Haiti, including adjustment of rate levels, which should be adapted to the growing cost of supply due to the increase in fuel prices over the last 12 months. An increase on the order of at least 30% is expected in 2009, followed by increases of 15% in 2010 and 2011. For their part, the Government of Haiti and EDH must deepen measures to reduce technical and non-technical losses in the medium term to below 30%. At the same time, EDH is not in a position to repay the outstanding debt on its books to multilateral institutions, despite the fact that most of it has been forgiven or reduced under debt-relief measures. Accordingly, these repayments were not included in the projections. Under these circumstances, the grants and financing from multilateral financial institutions for the investment program could enable EDH to operate without government support beginning in 2011.

III. IMPLEMENTATION AND MANAGEMENT PLAN

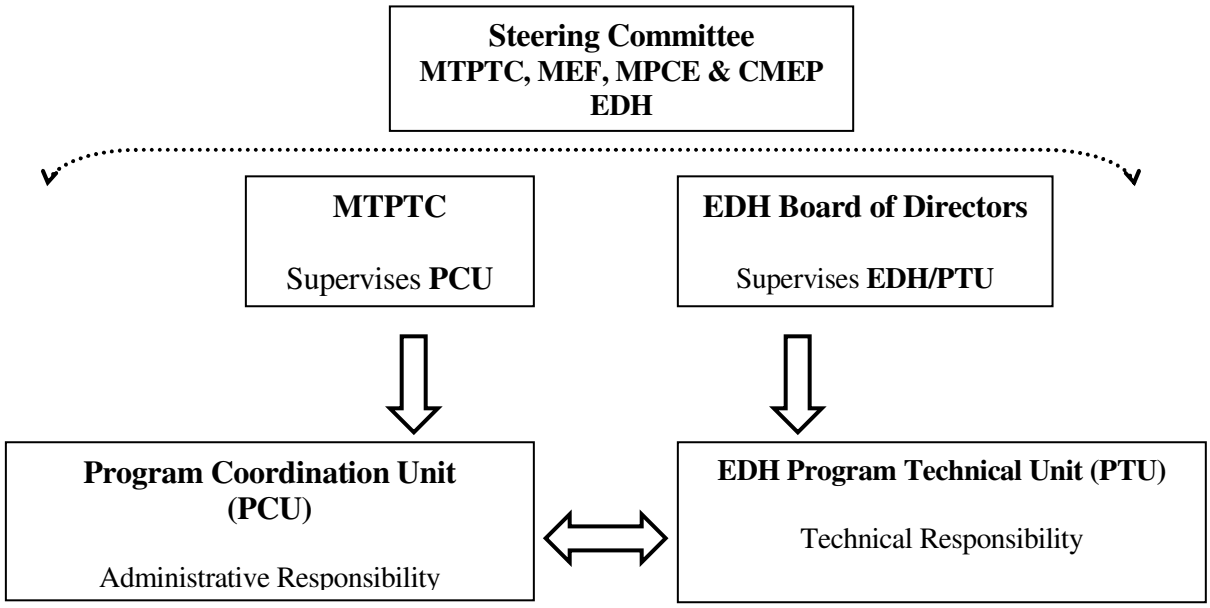
A. Summary of implementation arrangements

3.1 The borrower will be the Government of Haiti and the executing agency will be the Ministry of Public Works, Transport, and Communication (MTPTC), in cooperation with EDH. As a condition precedent to the first disbursement, the borrower, EDH, the MTPTC, and the Ministry of Economy and Finance (MEF) must sign an agreement defining EDH's responsibilities as a participant in program execution and the mechanisms for fulfilling those responsibilities.

3.2 The program will use the same execution mechanism as operation HA-L1014, which has proved efficient and effective. The execution mechanism establishes a Steering Committee at the head of the organizational structure, formed by representatives of the MTPTC, MEF, EDH, the Ministry of Planning and External Cooperation (MPCE), and the Public Enterprise Modernization Board (CMEP). The Steering Committee will be responsible for ensuring that program objectives are met while maintaining political support for the program at the highest level, in the context of the energy sector coordination forum. The PCU, which will be located at EDH and report to the MTPTC, will assume administrative and financial

responsibility for the program, and the PTU, established within EDH, will have technical responsibility for the program. Both units will submit program status reports to the Steering Committee. (See Figure 1).

Figure 1. Execution Arrangements



3.3 The PCU's functions were defined in light of the nature and sophistication of the program and EDH's institutional and technical weaknesses. The proposed structure is consistent with industry practice and the IDB's experience in sectors with characteristics such as those found in Haiti.

3.4 The PCU currently includes the following personnel: (i) a unit coordinator; (ii) a procurement specialist; (iii) an administrative and financial specialist; (iv) an environmental specialist; and (v) an accounting specialist for the IDB operation.

3.5 The PTU currently includes the following personnel: (i) the program chief; (ii) a commercial agency administrator for the Projet pour la Réduction des Pertes dans le Secteur Électrique [Project to Reduce Losses in the Electricity Sector] (PREPSEL); (iii) the major accounts manager; and (iv) other specialists supporting the program chief. In exceptional cases when the executing agency or EDH decides to fill positions in the PTU with qualified officials from the Haitian government or EDH, the executing agency must comply with applicable Haitian laws and regulations and obtain the IDB's prior no objection.

3.6 The PCU will be strengthened with a program coordinator and, if necessary, a procurement specialist, a financial management specialist, an environmental and social specialist, and a program assistant and equipment. The PTU will be

strengthened with a technical coordinator, EDH production management personnel, and an external consulting firm (which will include, at a minimum, an electro-mechanical rehabilitation specialist, an electrical equipment specialist, and a mechanical equipment specialist) to support the PTU during execution of the works and supervise the rehabilitation works. The firm must be hired before the rehabilitation contract is signed. The consulting firm's responsibilities will include transferring technology and know-how concerning PHP operating procedures. The strengthening of the PTU and PCU and contracting of the consulting firm will be financed by the program. Up to US$70,000 will be financed for computer equipment and office supplies and materials to support the PTU and PCU's operations during the five-year execution period.

3.7 The PCU and PTU will jointly prepare an annual work plan (AWP) that will include: (i) an updated procurement plan; (ii) an installation and supervision timetable; (iii) a timetable for executing the different works; (iv) a works maintenance plan; and (v) a timetable for preparation of semiannual reports and programming of monitoring and evaluation meetings. The first AWP must be presented as part of the initial report referenced in Article 4.01(d) of the General Conditions.

3.8 **Conditions precedent to the first disbursement**: (i) the PCU and PTU have been strengthened, as indicated in paragraph 3.6; and (ii) the updated program operations manual has been approved and has entered into force.

3.9 Without prejudice to meeting the special contractual conditions prior to the first disbursement, once the borrower has met the conditions relating to presentation of the legal report, designation of representatives, and preparation of the chart of accounts, provided in Article 4.01(a), (b) and (e) of the General Conditions, the IDB may disburse up to US$250,000 to cover expenses relating to meeting the special conditions prior to the first disbursement and preparation of the initial program report provided in Article 4.01(d) of the General Conditions.

3.10 **Procurement**. Procurement of goods and services, contracting of works, and selection and contracting of consulting services will be carried out in accordance with IDB policies (documents GN-2349-7 and GN-2350-7). The attached procurement plan presents a breakdown of the contracting processes to be used for the program.

3.11 **Disbursements**. Requests for disbursements will be accompanied by the supporting documentation required by the IDB for ex ante supervision.

3.12 **Revolving fund**. The IDB will establish a revolving fund for up to 10% of the loan amount, once the conditions precedent to the first disbursement have been met. Those funds will be kept in a bank account in the program's name. The PCU, in support of the PTU, will present consolidated reports on the fund's status to the Bank within 60 days following the end of each calendar six-month period.

B. Summary of arrangements for monitoring results

3.13 Annual administration missions will be conducted to maintain adequate technical, economic, environmental, financial, and operational monitoring. The PCU, in support of the PTU, must present semiannual progress reports to the IDB identifying progress on each of the components and overall program performance based on the indicators agreed in the Results Framework/Matrix of Indicators. The reports must also include: (i) a description of the activities conducted: (ii) an updated timetable of physical execution and disbursements; (iii) the extent to which the agreed performance indicators have been met; (iv) a plan of activities for the following six-month period; (v) a summary of program financial execution and the expected flow of resources for the following six-month period; (vi) a discussion of possible developments or events that may jeopardize program execution; (vii) a discussion of progress on program environmental and social management; and (viii) a year-end report and AWP, including an updated procurement plan. The results will be evaluated using the objective technical indicators identified in the Results Framework, which will be determined before, during, and after program execution and used to update the Project Performance Monitoring Report (PPMR).

3.14 The PCU, supported by the PTU, will compile, store, and maintain all necessary information, indicators, and parameters, including annual work plans, to assist the IDB in preparing the PPMR and the project completion report. The program provides for monitoring of physical and financial targets and evaluation of impacts through the program engineering and administration component. These reports will include semiannual updates of the program outcome indicators.

3.15 **Supervision.** The IDB Energy Division (INE/ENE) will supervise the program with support from the Bank's Country Office in Haiti. According to the AWP, the borrower must present semiannual progress reports within 60 days following the end of each calendar six-month period. The reports must be compiled by the PTU and contain the following technical information: (i) progress on works provided for each program component; (ii) a report on supervision of works for each component; (iii) the indicators referenced in the logical framework; (iv) a report of PTU activities and outcomes; and (v) any other technical aspects or considerations relating to progress in achieving the program technical outcomes. The semiannual report must contain a discussion of the program's management and financial status. This section, prepared by the PCU and approved by the Minister of Public Works, Transport and Communication, will contain the following information, without prejudice to any other IDB requirements: (i) the status of contracting processes; (ii) the status of procurements of goods and services; and (iii) a report on supervision of works for each of the installation contracts.

3.16 **External audit.** Throughout the execution period, the borrower will present consolidated annual financial statements for the program to the IDB within 120 days following the close of the respective fiscal year. The audit will be conducted by an independent firm of auditors acceptable to the IDB, in accordance with the terms of reference previously approved by the IDB (documents AF-400

and AF-500). The auditing firm will be selected and contracted in accordance with the procedures established in the external audit bidding documents (document AF-200). The cost of the audit will be financed with program resources.

C. Significant post-approval activities

3.17 In order to facilitate the start of execution, the IDB is supporting preparatory activities with resources from technical-cooperation operations ATN/SF-10745-HA, ATN/OC-10744-HA, and ATN/OC-11147-HA. This includes the design of each program phase, definition of activities relating to the specific scope of the rehabilitation contract, technical specifications for rehabilitation of the transmission line, and specifications for the consulting firm to perform program supervision activities.