

Document of
The World Bank

Report No: ICR00003076

IMPLEMENTATION COMPLETION AND RESULTS REPORT
(IDA-H2510 / IDA-H5100)

ON A

GRANT

IN THE AMOUNT OF SDR 4.1 MILLION
(US\$ 6.0 MILLION EQUIVALENT)

AND AN

ADDITIONAL FINANCING GRANT

IN THE AMOUNT OF SDR 3.3 MILLION
(US\$ 5.0 MILLION EQUIVALENT)

TO THE

REPUBLIC OF HAITI

FOR AN

ELECTRICITY LOSS REDUCTION PROJECT

April 30, 2014

Energy Unit
Sustainable Development Department
Caribbean Country Management Unit
Latin America and Caribbean Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective August 31, 2013)

Currency Unit = Haitian Gourdes

HT Gourdes 1.00 = US\$ 0.0238

US\$ 1.00 = HT Gourdes 42

FISCAL YEAR

October 1 to September 30

ABBREVIATIONS AND ACRONYMS

AF	Additional Financing
AFD	French Development Agency
CIDA	Canadian International Development Agency
CMS	Customer Management System
CRI	Cash Recovery Index
CQ	Consultant Qualification
DA	Designated Account
EDH	Electricité d'Haïti
EGRO	Economic Governance Reform Operation
ECTAG	Economic Technical Assistance Grant
EU	European Union
FBS	Fixed Budget Selection
FMR	Financial Management Report
GOH	Government of Haiti
ICB	International Competitive Bidding
IDA	International Development Association
IADB	Inter-American Development Bank
LAC	Latin America and Caribbean region
MEF	Ministry of Finance
MTPTC	Ministry of Public Works, Transport and Communication (<i>Ministère des Travaux Publics, Transport et Communication</i>)
M&E	Monitoring and Evaluation
MOU	Memorandum of Understanding
NCB	National Competitive Bidding
O&M	Operation and Maintenance
PCU/UCP	Project Coordination Unit / <i>Unité de Coordination du Projet</i>
PEMFAR	Public Expenditure and Financial Accountability Review
PPIAF	Public Private Infrastructure Advisory Facility
PREPSEL	Electricity Loss Reduction Project (<i>Projet de Réduction des Pertes du Secteur de l'Electricité</i> , this project)
PRSP	Poverty Reduction Strategy Paper
QCBS	Quality Cost Based Selection
RMS	Resource Management System
SBD	Standard Bidding Document
SDR	Special Drawing Rights

TA	Technical Assistance
TOR	Terms of Reference
TSMS	Technical Service Management System

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HAITI
Electricity Loss Reduction Project

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A. Basic Information			
Country:	Haiti	Project Name:	HT Electricity Project
Project ID:	P098531	L/C/TF Number(s):	IDA-H2510, IDA-H5100
ICR Date:	02/02/2014	ICR Type:	Core ICR
Lending Instrument:	SIL	Borrower:	GOVERNMENT OF HAITI (MIN. ECON & FINANCE)
Original Total Commitment:	XDR 4.10M	Disbursed Amount:	XDR 6.66M
Revised Amount:	XDR 7.4M		
Environmental Category: C			
Implementing Agencies: DIRECTION GENERALE EDH			
Co-financiers and Other External Partners:			

B. Key Dates				
Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	01/19/2006	Effectiveness:	07/31/2007	07/31/2007
Appraisal:	04/05/2006	Restructuring(s):		06/25/2010 02/28/2012 02/28/2013
Approval:	08/03/2006	Mid-term Review:	07/08/2011	09/27/2011
		Closing:	02/28/2010	08/31/2013

C. Ratings Summary	
C.1 Performance Rating by ICR	
Outcomes:	Moderately Unsatisfactory
Risk to Development Outcome:	High
Bank Performance:	Moderately Satisfactory
Borrower Performance:	Moderately Unsatisfactory

C.2 Detailed Ratings of Bank and Borrower Performance (by ICR)			
Bank	Ratings	Borrower	Ratings
Quality at Entry:	Moderately Unsatisfactory	Government:	Moderately Satisfactory
Quality of Supervision:	Moderately Satisfactory	Implementing Agency/Agencies:	Moderately Unsatisfactory
Overall Bank Performance:	Moderately Satisfactory	Overall Borrower Performance:	Moderately Unsatisfactory

C.3 Quality at Entry and Implementation Performance Indicators			
Implementation Performance	Indicators	QAG Assessments (if any)	Rating
Potential Problem Project at any time (Yes/No):	Yes	Quality at Entry (QEA):	None
Problem Project at any time (Yes/No):	Yes	Quality of Supervision (QSA):	None
DO rating before Closing/Inactive status:	Moderately Satisfactory		

D. Sector and Theme Codes		
	Original	Actual
Sector Code (as % of total Bank financing)		
Transmission and Distribution of Electricity	100	100
Theme Code (as % of total Bank financing)		
Infrastructure services for private sector development	67	65
Other accountability/anti-corruption		5
Regulation and competition policy	33	30

E. Bank Staff		
Positions	At ICR	At Approval
Vice President:	Jorge Familiar Calderon	Pamela Cox
Country Director:	Mary A. Barton-Dock	Caroline D. Anstey
Sector Manager:	Malcolm Cosgrove-Davies	Susan G. Goldmark
Project Team Leader:	Frederic Verdol	Clemencia Torres De Mastle
ICR Team Leader:	Frederic Verdol	
ICR Primary Author:	Fernando Lecaros	

F. Results Framework Analysis

Project Development Objectives (from Project Appraisal Document¹)

The objectives of the Project were to contribute to the sustainable improvement in the quality of electricity services to customers and to the strengthening of the financial and operational performance of the electricity public utility (EDH).

¹ Formulation of the PDO in the PAD and in the Legal Agreement are slightly different: the PDO stated in the PAD has been selected here because it is the one approved by the Board, used in the results frameworks and monitored throughout project implementation.

Revised Project Development Objectives (as approved by original approving authority)

The PDO was not revised but Performance and Intermediate Indicators' baseline and values were revised with the Additional Financing (AF) in July 29, 2009 and the Restructuring in June 25, 2010.

(a) PDO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	Cash Recovery Index			
Value (percentage)	11.51	50	40	26.7
Date achieved	03/01/2011	07/29/2009	03/01/2011	07/01/2013
Comments (incl. % achievement)	Baseline and revised target values reset subsequently to January 2010 earthquake: 2011 baseline three times lower than 2006 value (31%). Value increased by 130% between baseline and final, but only 87% of expected progress was achieved.			
Indicator 2 :	Percentage of Customers served at least 6 hours per day in the zones served by EDH			
Value (percentage)	20	50		100
Date achieved	03/01/2011	07/29/2009		07/01/2013
Comments (incl. % achievement)	Target achieved and surpassed by 100%: all of power distribution circuits served by EDH had more than 6 hours of daily service by completion.			

(b) Intermediate Outcome Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	Number of Customers in the CMS Database			
Value (quantitative or Qualitative)	0		185,315	224,052
Date achieved	12/12/2005		03/01/2011	07/01/2013
Comments (incl. % achievement)	Customer Management System (CMS) software activity added at the additional financing level. Target revised after the 2010 earthquake. 100% achievement. End value higher than target because of the increased number of customers.			
Indicator 2 :	Number of Customers in the TSMS Database			
Value (quantitative or Qualitative)	0		185,315	224,052

Date achieved	12/12/2005		03/01/2011	07/01/2013
Comments (incl. % achievement)	Technical Service Management System (TSMS) software activity added at the additional financing level. Target revised after the 2010 earthquake. 100% achievement. End value higher than target because of the increased number of customers.			
Indicator 3 :	Number of EDH staff trained to use CMS and TSMS (not cumulative)			
Value (quantitative or Qualitative)	0		435	296
Date achieved	12/12/2005		03/01/2011	07/01/2013
Comments (incl. % achievement)	Target achieved at 47%. All EDH staff located where the systems have been installed were trained; systems have yet not been installed in the provinces.			
Indicator 4 :	Active Customers per Employee Ratio			
Value (quantitative or Qualitative)	80		100	98
Date achieved	12/12/2005		03/01/2011	07/01/2013
Comments (incl. % achievement)	90% achievement of the expected improvement.			
Indicator 5 :	Technical Assistance to EDH Management			
Value (quantitative or Qualitative)	Sub-standard procedures		Implementation of new procedures for financial management, internal control, human resources, technical management	Gap analysis conducted. New procedures for Commercial and IT management recommended. Individual experts funded under the project to support EDH management progressively diffused professionalism and commercial culture among management and staff.
Date achieved	12/18/2009		03/01/2011	07/01/2013
Comments (incl. % achievement)	Support to EDH management was timely after the 2010 earthquake, and seemed to have provided positive cultural change amongst EDH staff, albeit not sustainably.			
Indicator 6 :	Financial Management Plan for EDH			
Value (quantitative or Qualitative)	No financial management plan in place.		Implementation of (i) an accounting system, (ii) definition of manual of	Financial tool provided to EDH, funded under the project

			procedures, and (iii) inventory of assets	
Date achieved	12/18/2009		03/01/2011	07/01/2013
Comments (incl. % achievement)	Accounting assistance under progress since May 2013, funded under a World Bank project implemented by Haiti Ministry of Finance. Delivery expected for first Quarter of 2014.			
Indicator 7 :	Number of satisfied customers (large customers)			
Value (quantitative or Qualitative)	No baseline.		Survey to be done once the information systems operation is judged satisfactory to EDH.	Survey conducted in March 2014
Date achieved	12/18/2009		03/01/2011	03/31/2014
Comments (incl. % achievement)	The Beneficiary Survey conducted on 122 beneficiaries showed that: (i) 62% of large customers noticed improvement of the quality of service, (ii) 65% are satisfied by the new infrastructure (meters) or service provided, (iii) 31% have experienced issues with their electricity bill since the CMS is in place, and (iv) 23% have already called the EDH hotline put in place under the project (CSMS sub-component).			
Indicator 8 :	Employees satisfied with new system			
Value (quantitative or Qualitative)	No system in place.		First wave of implementation of the system took place in mid-2012 with 5,000 clients, via TSMS system.	Survey conducted in March 2014
Date achieved	12/18/2009		04/01/2012	03/31/2014
Comments (incl. % achievement)	The Beneficiary Survey conducted within a sample of 38 EDH staff showed that if 76% of the staff considers information systems as critical elements for EDH to improve its performance, only 37% believe that the current systems are functioning correctly. Overall, 39% of staff thinks that the PREPSEL has contributed to improve EDH performance.			

G. Ratings of Project Performance in ISRs

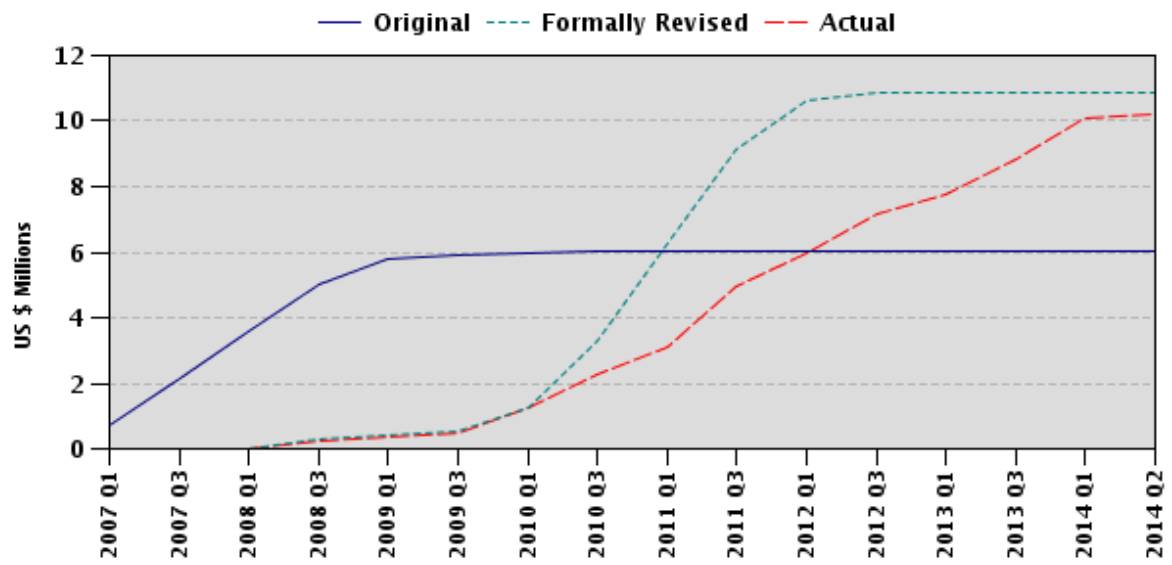
No.	Date ISR Archived	DO	IP	Actual Disbursements (USD millions)
1	10/26/2006	Satisfactory	Satisfactory	0.00
2	06/06/2007	Satisfactory	Moderately Unsatisfactory	0.00
3	11/12/2007	Satisfactory	Satisfactory	0.17
4	06/06/2008	Satisfactory	Satisfactory	0.26
5	12/16/2008	Satisfactory	Satisfactory	0.37

6	05/15/2009	Moderately Satisfactory	Moderately Satisfactory	0.51
7	11/15/2009	Moderately Satisfactory	Moderately Satisfactory	1.32
8	06/06/2010	Moderately Satisfactory	Moderately Satisfactory	2.83
9	02/20/2011	Moderately Satisfactory	Moderately Unsatisfactory	4.63
10	08/13/2011	Moderately Satisfactory	Moderately Unsatisfactory	5.93
11	05/21/2012	Moderately Satisfactory	Moderately Unsatisfactory	7.47
12	03/25/2013	Moderately Satisfactory	Moderately Unsatisfactory	8.91
13	09/12/2013	Moderately Satisfactory	Moderately Unsatisfactory	10.11

H. Restructuring (if any)

Restructuring Date(s)	Board Approved PDO Change	ISR Ratings at Restructuring		Amount Disbursed at Restructuring in USD millions	Reason for Restructuring & Key Changes Made
		DO	IP		
09/08/2009	N	MS	MS	0.54	Additional Financing (AF) supported costs overruns for the customer management systems and remote meters, and provided technical assistance to EDH Management and Minister of Public Works (MTPTC). Changes: added US\$ 5.0 million; extended closing date by two years, to February 28, 2012; added Component 4 'Technical Assistance to EDH Management'.
06/25/2010	N	MS	MS	3.05	Extension of closing date by one year (new date: February 28, 2013) and revision of the project indicators' baseline, subsequently to January 2010 earthquake.
02/28/2013	N	MS	MU	8.85	Extension of closing date deadline until August 31, 2013, to allow completion of remote metering activities.

I. Disbursement Profile



1. Project Context, Development Objectives and Design

1.1 Context at Appraisal

Political context at the project preparation period was very fragile. By 2003, Haiti's political situation had become very uncertain. External aid dried up, the World Bank closed its office in Haiti and many other donor agencies withdrew their support. Armed opposition forces entered from the Dominican Republic to remove President Aristide from power. He left the country on February 29, 2004 and a transitional government took office. The Bank renewed its official relations with Haiti in 2004.

Regarding the Economic context, Haiti already had its singular status of poorest country in the LAC region and in the Western Hemisphere. About 78 percent of its 8.6 million population lived below the poverty line (54 percent in extreme poverty). The country's economic situation and public institutions were then structurally weakened during the previous two decades by political instability and a series of conflicts, exacerbating poor governance practices and increasing Haiti's dependency on external assistance.

Haiti's Electricity sector was institutionally weak, technically inefficient and financially in deficit. Despite the low level of electricity service to the 25% Haitian population having access to electricity (10 hours of service per day on average, and a 90MW unmet demand at the evening peak, see Annex 8), the high level of losses (above 50%) and the high electricity generation cost resulted in a heavy public expenditure burden². The increasing rate of electricity theft – nurtured by a culture of non payment - and use of inefficient back-up generators were the main reasons leading to the development of the multi-donor support strategy to the Electricity sector³ in 2004. The IDA funded Haiti Electricity Loss Reduction Project (or PREPSEL) was designed and approved in line with this multi-donor support, consistent with the Bank's IDA Transitional Support Strategy (January 2005) and in parallel with other Bank Group assistance to the Government of Haiti in the Energy sector⁴.

The PREPSEL initially aimed to improve living standards of a representative sample of EDH customers, through power distribution loss reduction. The project design was aimed at putting EDH on a virtuous path of operational and service

² In 2005, national budget transfers to the vertically integrated state power utility EDH were US\$ 47 million, representing 7 percent of the national budget.

³ The multi-donor strategy has been jointly adopted in July 2004 by the international community, the GOH and EDH, under the Interim Cooperation Framework (ICF). Donors involved (CIDA, USAID, AFD, World Bank, EU and IADB) signed on October 21, 2005 a MoU with the GOH, providing almost US\$ 15 million to improve the transparency of the sector and increase the efficiency of investments realized.

⁴ ESMAP assistance on wood fuels alleviation, PPIAF assistance for various analytical studies on the electricity sector, and IFC's assistance to CIDA for the accounting assistance and financial audit in EDH.

improvement, in support of government's higher goal of enhancing quality of life and economic development.

It was recognized that the scale of the problem at EDH would require more resources to resolve than PREPSEL had to offer. Hence PREPSEL was aimed at specific discreet issues which, if successful could help to put EDH on the path to recovery, in concert with other efforts, also underway.

1.2 Original Project Development Objectives (PDO) and Key Indicators (*as approved*)

The objectives of the Project are “to contribute to the sustainable improvement in the quality of electricity services to customers and to the strengthening of the financial and operational performance of the electricity public utility (EDH)”. The PDO formulation in the PAD and in the Legal Agreement⁵ are slightly different: the PDO stated in the PAD has been selected here because it is the one approved by the Board, used in the results frameworks and monitored throughout project implementation.

Original **key performance indicators** for the project (to be achieved within 36 months, as per PAD results framework) were as follow:

Project outcome indicators:

- Number of electricity service interruptions decreasing from 126 to 15 per month in the project area, and from 257 to 220 per month for the large customers;
- Improvement of the Cash Recovery Index from 31% to 69% in the project area, and from 50% to 78% for the industrial customers;
- Endorsement by EDH and the Government of a final proposal on how to replicate the pilot project to reduce losses in the other areas supplied by EDH.

Component 1 indicators:

- Number of consumers in the whole country incorporated into the CMS and TSMS database amounting 220,758.
- Number of EDH employees successfully trained in the use of the new CMS and TSMS amounting 405 staff;
- Increase of Active customers / employee ratio from 79 to 114.

Component 2 indicators:

- Increase in the revenues billed to large customers by EDH in the project zone by Gourdes 31 million monthly, and respective increase of the revenues collected by Gourdes 62 million monthly;
- Number of interruptions per month in the project zone - also known as SAIFI index – decreasing from 126 to 15.

⁵ PDO formulation in the Legal Agreement is “to assist the Recipient in achieving sustainable improvement in the quality of electricity services to customers and strengthening the financial and operational performance of its power utility”.

- Monthly cumulative duration of interruptions - also known as SAIDI index – decreasing from 250 minutes to 180 minutes;
- Number of consumers regularized in the project zone increasing from 9,183 to 9,474;
- Number of EDH employees trained to perform commercial activities in the project area.
- Daily level of service in the project zone increasing from 18 hours per day to 24 hours per day;

Component 3 indicators:

- Number of satisfied customers in the project area as measured by periodic surveys and focus groups, amounting 7,769 (and 1,874 large customers) ;
- Number of EDH employees satisfied with the new information system amounting at least 625;
- Number of EDH employees satisfied with the evolution of the project amounting 1,938 staff.

1.3 Revised PDO (as approved by original approving authority) and Key Indicators, and reasons/justification

The Additional Financing (AF) approved by the Board on July 29, 2009 (Grant A-H5100, for \$5 million) did not include any change in the PDO formulation; the additional resources were oriented towards: (i) providing management support to EDH as a new project component (new Component 4); (ii) covering cost overruns under Component 1 (implementation of a new commercial approach for EDH) and Component 2 (Improvement in quality of service and increase in revenue collection of EDH through selected groups of customers); and (iii) making additional funds available for Component 3 (Participatory approach, project management, monitoring and impact evaluation, and replication strategy). The institutional framework, procurement and disbursement arrangements remained also unchanged.

Key changes regarding the indicators were linked to the enhanced scope of the project (original plus AF), now supporting EDH at the national level: key indicators had to be measured at the utility's level, and not only on the pilot zone of the original project. At this time, the IADB funded project was carrying out the replication of the original pilot, which led to removal of the now successfully achieved outcome of 'Endorsement by EDH and the Government of a final proposal on how to replicate the pilot project to reduce losses in the other areas served by EDH'.

The revised indicators are detailed in Table 1 below. The indicators measuring EDH revenues billed and collected in the pilot zone and for the large customers (component 2) were merged into the Cash Recovery Index (CRI), which measures collections for energy consumption over energy delivered.

Although the AF extended the project closing date by two years – from February 28, 2010 to February 28, 2012, the AF maintained the 2005 baseline, and kept also the original project target values (with two additional years to reach these values). Hence,

the PDO indicator “CRI” was to improve from 27% to 50% by end February 2012, and the PDO indicator “SAIFI” was to improve from 400 to 127 average monthly interruptions experienced by EDH clients.

The AF modified the key indicators as follows:

Table 1: 2009 Outcome Indicators

PDO	Original Project Outcome Indicators	New Project Outcome Indicators
Contribute to the sustainable improvement in the quality of electricity services delivered to customers in Port-au-Prince and to the strengthening of the financial and operational performance of the public utility in charge of providing these services (EDH).	- Improved quality of service provided by EDH in the project zone - Improved quality of service provided to large customers - Increase in the revenues billed by EDH in the project zone - Increase in the revenues collected by EDH in the project zone - Endorsement by EDH and the Government of a final proposal on how to replicate the project pilot to reduce losses in the other areas deserved by EDH	- Improvement in the Cash Recovery Index - Improvement in the quality of service provided by EDH <i>Indicators related to pilot zone and large customers are included in components 2.</i> <i>This indicator is being removed as the Project is already being replicated by the IADB, with the approval of EDH and the Government</i>
Intermediate Outcomes	Original Intermediate Outcome Indicators	New Intermediate Outcome Indicators
Component 1		
Adopt and implement modern commercial and service management systems for EDH as the basis for a more customer-oriented approach to providing electricity services.	- Number of consumers in the whole country incorporated into the new CMS database - Number of consumers located in the whole country incorporated into the new customer-installations link database and attended through TSMS - Number of EDH employees successfully trained in the use of the new CMS and TSMS	Same Same Same
Component 2		
Improving service to clients and increasing revenues billed and collected for EDH: a) In the project zone	- Number of interruptions per month suffered by each customer - Duration of interruptions - Number of consumers regularized in the selection zone - Amount billed in project zone - Amount collected in project zone - Number of EDH employees trained to perform commercial activities in the selection zone.	- Same - Same - Same - Same - Same - Same - Increase in the Cash Recovery Index in the project zone (<i>recoups improvement in amounts billed and collected</i>)

PDO	Original Project Outcome Indicators	New Project Outcome Indicators
b) Among large consumers	▪ Number of interruptions suffered by each large customer ▪ Duration of interruption suffered by each large customer ▪ Number of large consumers regularized ▪ Amount billed to large customers ▪ Amount collected from large customers ▪ Number of EDH employees trained to attend and follow up on large Consumers ▪ Number of satisfied customers in the project area as measured by periodic surveys and focus groups ▪ Number of large customers satisfied	▪ Increase in Cash Recovery Index of the large customers (<i>recoups improvement in amounts billed and collected</i>) ▪ Same ▪ Same
Component 3		
Execution, evaluation and replication of project through strategic participation	▪ Number of satisfied EDH employees ▪ Percentage of disbursement of the Project funds in relation to the Project implementation schedule ▪ Number and frequency of project progress reports presented to and approved by the Bank in relation to what was agreed upon in the Manual of Operations	▪ Same ▪ Same ▪ Same ▪ Successful training of MTPTC energy staff to supervise performance indicators (<i>new indicator</i>)
Component 4		
Technical Assistance to EDH management	N/A – New component	▪ Adoption and implementation by EDH of new, sound procedures in: ○ Financial management ○ Internal control ○ Human Resources (HR) ○ Commercial management ○ Technical management ▪ Implementation of the Financial Management Action Plan

1.4 Main Beneficiaries,

The main beneficiaries of the PREPSEL were EDH management and staff, directly benefiting from the modern infrastructure installed and the associated training / capacity building. The expected improvement in quality of electricity service directly benefited EDH customers, 92 percent of whom were residential customers, with a large majority of poor or low income customers. More generally, the whole Haiti population would benefit from the PREPSEL's success, through an improved performance of EDH translating to lower budget transfers and thus more public funds from the national budget for social services to the poorest.

In the original project, the direct beneficiaries were those located in the zone of influence of the project (around 9,000, of which about 8,000 were residential), and most large customers. The project was also expected to improve quality of service in 9 slums with a population of around 19,000. The PAD conceived the project as a pilot project to be replicated. If successful and replicated, the project would ultimately improve the living standards for Haitians, and, by improving economic conditions, it was expected to have a large impact on the economic activity of the country.

1.5 Original Components (*as approved*)

Component 1: Improvement in EDH management systems and practices (US\$ 2,640,000). The objective of this component was to improve the operational (technical and commercial) performance of EDH in a sustainable manner, by giving the company the information tools for a modern and efficient customer management and the services. The component financed the purchase and installation of two systems (the commercial management and technical management systems, CMS and TSMS) for EDH, which will help improve billing and quality of customer relation service.

Component 2: Improvement in quality and reliability of services and increased revenue collection of EDH for selected groups of customers (US\$ 3,245,000). In addition to ensuring the adequate implementation of CMS and TSMS in a specific zone of the metropolitan area and for the large customers, this component financed the purchase and installation of remote meters for large customers, as well as the purchase and installation of remote meters to accurately measure the production of the Independent Power Producers (IPPs)

Component 3: Participatory approach, project management, monitoring and impact evaluation, and replication strategy (US\$ 1,579,760). This component financed the communication and coordination costs of the project, also the monitoring of the project's indicators as well as a technical assistance to the MTPTC to oversee EDH's performance and advise the Minister on Energy-related topics.

1.6 Revised Components

The AF broadened the scope of activities under the Project, by adding a new component:

Component 4: Management support to EDH (US\$ 2,570,000). This component financed a program of technical assistance to support EDH management, consisting of the introduction of four international experts in EDH's management structure to enhance the performance of the Commercial, Technical, Finance/Administration and Planning Divisions and transfer capacity for improved management policies and practices to EDH.

The AF covered cost overruns under Component 1 (Total amount after AF was US\$ 3.68 million) and Component 2 (total amount after AF was US\$ 3.51 million). The AF also made additional funds available for Component 3 to finance the costs of the Project Coordination Unit and provide support to the Ministry of Energy during the two-year

extension (Total amount after AF was US\$ 1.08 million) during the two-year extension of the Project. The costs overruns involved are related to the overall slower implementation of all EDH activities after the 2008 hurricanes that mobilized most of EDH staff, engendering immobilization of suppliers and thus costly implementation delays.

1.7 Other significant changes

The AF of 2009 extended the original closing date of February 28, 2010 to February 28, 2012. The AF was signed on November 2, 2009. Two months later, in January 2010, the Port au Prince area was struck by a devastating earthquake which, with other natural disasters, significantly affected the project. In June 2010 the Government requested a reallocation of funds among the disbursement categories, an extension for submitting the project's audited financial statements, and an extension of the closing date. The Bank accepted these requests and the closing date was extended to February 28, 2013.

A restructuring took place in February 2013, which extended the closing date to August 31, 2013 and reallocated the funds of different components.

In August, 2012 the Bank approved a grant for US\$90 million (the Rebuilding Energy Infrastructure and Access Project, P127203), which complements the PREPSEL project by strengthening energy policy and planning capacities, improving the sustainability and resilience of the power sector, as well as restoring and expanding access to reliable electricity services, and providing financial assistance in the event of an Energy Sector Emergency. The second component of this project allocated \$77.8 million to enhancing EDH's infrastructure and management performance.

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design and Quality at Entry

Background analysis. The project was prepared in a period of five months. While coordinating closely with the other donors, the preparation team focused on the institutional arrangements and the operational project implementation mechanisms included in the project manual. The modernization of EDH's information systems and improved management of key clients were seen as the most valuable investments for the utility's performance improvement at the time of the preparation. The project did not activate any of the Bank's social or environmental safeguard policies, as its components were basically of a managerial and financial nature, requiring the purchase of mostly information systems (CMS & TSMS) and inert equipment (meters).

Project preparation. The project was prepared by building upon several previous studies which analyzed EDH's issues and possible ways of addressing them. One of these studies, on EDH management reform⁶, concluded that PREPSEL was not the timely

⁶ In 2006, US\$ 700 thousand study funded by PPIAF tried to address EDH management weakness through a management contract.

operation to address an ambitious management restructuring inside EDH (despite the recognized risks associated with a fragile management capacity at the time of the project preparation); the project scope was then narrowed to the improvement of EDH information and metering systems. Among the “high” risks identified during project preparation, the lack of Government’s political willingness to support PREPSEL’s loss-reduction measures was the most substantial. However, efforts to mitigate this risk within Haiti’s chaotic political economy ultimately were insufficient for the project’s technical solutions to reach their full potential during the project period.

Additional financing (AF) preparation. The AF was prepared when it became evident that the allocated budget was insufficient to complete some of the project’s components; these cost overrun issues⁷ also revealed an important need for assistance to the utility’s management and led to the creation of a new component to address this gap. The AF preparation (in early 2009) recognized that resources for implementing management strengthening measures at the time of the original project preparation (2006) were not available (some of the expected external resources to complement the PREPSEL on the loss reduction theme did not materialize).

Project Objectives and Indicators. The PDO was ambitious, and various external factors were able to increase or mitigate the impact of the project activities (generally the case for all projects aiming to improve power systems). Whereas the indicators related to the pilot zone were more realistic and reachable. These PDOs were important for the country’s economic development as they would directly improve the level of electricity service for the population and industries, and furthered the joint donors’ strategy on Energy and the Bank’s IDA Transitional Support Strategy (TSS). The objectives were representative of the country’s circumstances and development priorities at that time. However, with the AF, realism of the project objectives and indicators became less certain: the AF scaled-up the project’s impact area from the targeted pilot area in the original project (9,000 customers) to the whole EDH customer base (185,000 customers), for an increased project budget of only 83%.

Adequacy of Government commitment. GOH authorities had little involvement in project preparation, which was mainly a Bank effort. The MTPTC was positive towards the project but did not have the resources to participate in preparation. This had downstream repercussions, on project monitoring and governance.

Quality at Entry and Project Design. No Quality at Entry evaluation was carried out. The original PREPSEL design focused on technical aspects giving relatively less emphasis on, change management to accompany the installation of information systems. The original design lacked support to the EDH management to ensure their empowerment. These choices were understandable as the broader energy dialog included a donors MOU on Energy which strongly emphasized these aspects, as well as IADB’s support for EDH providing increased resources and pressure to perform. But the overall donor engagement of which PREPSEL was a part underestimated the tenacity of poor

⁷ The cost overrun issues were related to unexpected cost escalation consecutive to implementation delays after the 2008 hurricanes that hit the country (no hurricane costs, but an implementation capacity issue at EDH impeding to implement the project activities as scheduled).

governance at the ministry and utility levels, and set targets that could not be reached by a utility evolving in such a fragile environment. Even if the donor support had managed to modernize the utility and eradicate technical losses, the lack of transparency on fuel supply and private power generation, along with the low willingness to address the electricity theft, may still have led to the same ambivalent results (sustainable infrastructure in place but low progress due to poor governance).

2.2 Implementation

The PREPSEL had two very distinct implementation phases, before and after the earthquake that hit the metropolitan area on January 12, 2010. Where appropriate, the following sections differentiate these phases, in order to clarify the analysis and assessment.

The three restructurings involved in this operation also had an effect on the implementation, to a lesser extent: the 2009 AF allowed to accelerate implementation of Components 1 and 2, the 2010 restructuring allowed to adapt the project to the post-earthquake implementation environment and the 2013 restructuring allowed to achieve the implementation of component 2.

Factors that influenced project implementation:

- 2.2.1 **External factors:** Public sector weakness, lack of political will to conduct the Energy sector reform, the 2008 hurricanes and the 2010 earthquake in and around Port-au-Prince were important external impacts on the project.
- **Public sector weakness:** Haiti has a structurally weak public sector management capacity⁸. Many public sector institutions depend on external assistance to carry out their functions. Institutional capacity is increasingly concentrated in the NGO service sector attracting more qualified staff and paying higher salaries⁹.
 - **The lack of political will to eradicate electricity theft and improve sector transparency:** This negatively affected the implementation and sustainability of the PREPSEL, as the lack of implementation of easy actions and measures by EDH staff was rarely addressed by senior officials. The most emblematic example of this in the project was the installation of remote meters for the verification of energy generated by the IPPs. These meters were installed by EDH only in March 2013, after six years of unsuccessful attempts and the use of two World Bank budget support operations as leverage.
 - **The four hurricanes of 2008:** This rare climate event – four major tropical hurricanes hitting Haiti in a period of two months - diverted the focus of GOH, EDH and MTPTC to short-term disaster solutions in project areas. The project

⁸ 85 percent of the Haitians holding a University diploma live outside Haiti, the number of Haitian civil servant mapped in the Energy sector decreased from 80 to 3 between 1990 and 2006. In addition, part of EDH's most promising young professionals has left the utility in the early 2000s, to work in the private sector and abroad.

⁹ As a result, the Project PIU had to align the consultants' salaries to the market value.

implementation was delayed by several months during the hurricane season as almost all EDH capacity was mobilized on post-emergency repairs, engendering additional unexpected costs as EDH suppliers were mobilized and could not implement the work (installation of information systems).

- The 2010 earthquake: GOH physical and institutional infrastructure were devastated, as well as MTPTC's headquarters (the Ministry was relocated in the laboratory of Public Works, from 2010 to the end of the project.) EDH's dispatch center, some of the power distribution infrastructure as well as many of its commercial agencies and some of its administrative buildings (including the anti-fraud unit) were destroyed. The Peligre hydropower plant – largest and cheapest power generation plant supplying the metropolitan area – was damaged (dam structure) and had to stop production for a complete inspection. As of March 2010, the utility could only collect about 30 percent of the revenue it collected prior to the earthquake. But most importantly, this natural disaster profoundly altered the morale of each staff and consultants¹⁰. Project implementation returned gradually to the pre-earthquake path only nine month later, with the arrival of the four international experts hired under the project to assist EDH Directors.

2.2.2 **Internal factors.** Organizational and management issues in EDH were the most apparent internal factors impeding implementation of the project activities. Passive resistance was noted for activities aimed at improving sector transparency, suggesting internal fraud and corruption as a possible impediment to implementation.

- Organizational and Management issues in EDH: six different Managing Directors (MD) headed EDH during the project period, and project execution temporarily slowed as each new arrival came up to speed. Main management issues that affected the implementation were: (i) lack of accountability of the different sub-project leaders, managers and Directors at EDH; and (ii) the very irregular meetings of EDH Board¹¹ to endorse important decisions linked to the project.
- EDH's limited technical experience with the new systems and remote meters: this issue was linked to the more general issue of change management. EDH technical and commercial staff were resistant to the implementation of the information systems and the remote metering components, partly because these technologies were new to them or represented a giant step in the modernization of their work environment / habits. This internal resistance has not been addressed properly, which affected implementation and utilization of these systems.

¹⁰ 32 EDH staff and two PREPSEL team members (one member of the PIU and one international consultant) died during the 2010 earthquake, and virtually every Haitian lost family members. EDH management set up a refugee camp on one of their sites where more than 500 staff families lived for 7 months.

¹¹ EDH Board is chaired by MTPTC's Minister, with Ministries of Finance, Justice and Planning having a representation.

- Other technical issues: There were other paramount technical issues affecting project implementation; first, all the equipment funded under the project relied extensively on functional Communications systems (Internet, mobile phone network, radio frequency), which was far from obvious in Haiti. Second, this equipment relied on a constant and reliable electricity supply, which implied that EDH headquarters had to purchase backup power generation to ensure the continuity of commercial communication with its agencies in the field.

Project implementation during August 2007-End 2009. The original project was effective on July 31, 2007, one year after its Approval by the Bank. This delay in obtaining Parliamentary approval impeded the project to start implementation – and disbursement - for the first year. Similarly to other infrastructure investment projects, the initial activities focused on the preparation bidding documents for the CMS and the TSMS¹². On June 23, 2009, EDH signed the contract for the supply and installation of the CMS and the TSMS; the cost of these systems, including the training and licensing, amounted to around US\$3.5 million (60 percent of the initial project budget, and 132% of the initial budget for this component). This cost overrun originated the request for an AF, which was approved on September 08, 2009 for US\$5 million. These funds were allocated to achieve the purchase and installation of the CMS and TSMS (for an additional US\$1.5 million) and to finance the support to EDH through four delegate directors¹³ (around \$2.6 million) for improving the company's performance through experienced private sector managers. The project's first phase has also implemented the procurement process of the remote metering system for EDH's 2,100 industrial and commercial clients. Two successive unsuccessful tendering processes for this remote metering system also contributed to slower-than-expected implementation and highlighted the risk premium that potential suppliers attached to EDH.

Project implementation during January 2010-August 2013. The earthquake on January 12, 2010 marked a complete stop of PREPSEL implementation for a six month period. The power sector's physical infrastructure and human resources were affected, and the GOH and donor and plans for EDH's performance improvement had to be completely rethought. In March 2010, the Post-Disaster Needs Assessment (PDNA) estimated long term needs for the sustainable rebuilding and expansion of the power sector at \$300 million. While preparing a project restructuring to extend the PREPSEL deadline, the Bank also prepared a specific post-emergency operation, the Haiti Emergency Solar Lanterns Project (P120914). This US\$ 3 million grant to the GOH provided 55,000 solar lanterns to beneficiaries in the refugee camps. EDH management

¹² this preparation has started before the Board approval, but took several months before being ready for tendering, as some of the technicalities were new to EDH staff and engineers.

¹³ These four international experts were advisors to EDH Directors. EDH managing director insisted to use the function "Delegate Director", to facilitate the integration of these advisors within EDH teams. This strategy turned out to be successful, if we compare the more difficult interaction between EDH staff and other external advisors (Tetra Tech teams, other individual consultants hired under the PREPSEL). These consultants promoted gradually and consistently the diffusion of commercial and performance culture within EDH staff.

and staff actively participated in the operation, by providing the storage and transport capacity and by participating in the lantern distribution to the beneficiaries (mostly EDH customers).

Subsequent to the earthquake, EDH saw its revenues plunge as its already frail commercial operations became weaker, and as its customers' capacity to pay plummeted. The information systems contractor continued to install its equipment through 2011. Hardware installation proceeded normally, but feeding the software was extremely difficult, as the earthquake rendered the customer database obsolete (1.5 million people were in refugee camps or moved to the provinces). In end 2011, the project conducted an extensive field survey to update the customer database. This resulted in an increase in volume of revenues collected. This delayed commissioning of the CMS and TSMS until 2012, but allowed the project to provide an important volume of supervision to promote the expected impact of these information systems. The delegate directors contracted with the AF were recruited and they functioned within EDH from August 2010 until June 2013, which constituted the longest external support ever realized inside the utility.

The tragic consequences of the earthquake focused attention on Haiti's infrastructure, and enormous resources were pledged for reconstruction and rehabilitation. This included three coordinated projects for EDH: (i) a US\$ 78 million joint donor¹⁴ effort to rehabilitate and upgrade the EDH Peligre hydropower plant; (ii) a management contract for EDH financed by USAID and executed by the firm Tetra Tech (which ultimately became a technical assistance contract); and (iii) a US\$90 million grant (the Rebuilding Energy Infrastructure and Access Project) which was approved by the World Bank on September 26, 2012. With an allocated amount of US\$78 million to enhance EDH's performance, this unprecedented effort became the largest Bank operation in Haiti and the largest project in the Haiti Energy sector.

PREPSEL played a major role in the preparation phase of this new project, whose components and activities include the completion, scale up and sustainable improvement of the PREPSEL activities. PREPSEL also played a critical role in paving the ground for the Tetra Tech team inside EDH, thanks to the important preparatory work done by the delegate directors (while pursuing their respective support role to support EDH management).

2.3 Monitoring and Evaluation (M&E) Design, Implementation and Utilization

The monitoring arrangements as described in the PAD were in accordance with generally acceptable practices. They included a well-defined set of parameters, technical audits, monitoring and evaluation reports.

The absence of a reporting culture in EDH has been the main issue for the implementation of the M&E system. Data collection to fill the extensive list of project

¹⁴ IADB provided US\$ 60 million ; KfW and the OPEP Fund for Development also contributed, for a total additional amount of US\$ 18 million.

indicators turned out to be weak and very difficult to implement on a regular basis, leading to difficulties in confirming project implementation progress.

One positive outcome of the M&E system was the timely delivery of good quality technical audit reports, thanks to the professionalism of the PIU financial specialists. More generally, the PIU team played a major role in the collection of key data. This was partly due to the permanent coordination between the project PIU and EDH technical teams, but above all due to the very good networking skills of the PIU Coordinator (who was formally Director of Planning at EDH).

Utilization of the dataset collected by the Bank team along the years was critical during the post-earthquake PDNA exercise, as EDH was not able to provide the required baseline data to the team in charge of assessing the funding needs for rebuilding the power system. Also on July 2011, the mid-term review mission provided useful inputs on priority investments for the preparation of the new Bank energy operation.

The monitoring arrangements also included the design and update of a power sector performance dashboard¹⁵ that was assembled by EDH and the Ministry (MTPTC) and disseminated through the MEF website on a periodic basis. This dashboard is a key instrument for the improvement of transparency in the electricity sector, disclosing variables such as fuel consumption and power generation by power plant, and EDH revenue performance. Its public update and publication has been irregular since the closing of the MTPTC Energy Management Unit (UGSE), but MEF is still updating the dashboard and circulating it within GOH senior management.

2.4 Safeguard and Fiduciary Compliance

Safeguards. The project did not trigger any of the Bank's environmental or social safeguards. During its implementation no adverse social or environmental impacts were detected.

Financial Management (FM). The PIU's financial planning and budgeting skills were very useful for project financial management. Although submission of financial audits was late by several months for the first reports, all the project quarterly and annual audit reports since 2011 were submitted before the required deadline, and all were of satisfactory or higher quality. IADB also benefited from this well trained PIU, as the same team implemented both World Bank and IADB funded energy projects. Another FM requirement was the audit of EDH accounts. This activity was a project covenant although EDH accounts had not been audited since 2006. Reconstructing and auditing EDH accounts has proven to be a daunting exercise, and was not achieved prior to project closure, mainly due to internal resistance to achieve it. However, the task is being funded under the Bank's post-earthquake project.¹⁶ The auditing firm has been recruited and

¹⁵ *Tableau de Suivi du Secteur Électricité*

¹⁶ Haiti Infrastructure and Institutional Emergency Recovery Project (P120895).

work is being implemented under close supervision and coordination with the PREPSEL – Bank and PIU – teams.

Procurement. The project fully complied with the Bank’s procurement and Consultant guidelines. The procurement specialist hired in the PIU fully complied with the skills required, and all the PREPSEL procurement reviews were satisfactory. Moreover, the expertise gained by the procurement specialist along the years, both in Bank / IADB procurement practices and EDH / GOH public procurement guidelines, had been critical for successful procurements. However, engineering and cost estimates aspects of some procurements have led to problems. Notably, the first two remote metering procurements were unsuccessful, and the cost estimates for the information systems and the remote metering system were well below the actual costs.

The large procurement processes that started in 2008 and 2009 (information systems, remote metering systems, delegate directors) had their major disbursements only after the earthquake, which explains the ramp up of the project’s disbursement rate from 2010 to 2013.

2.5 Post-completion Operation/Next Phase

PREPSEL was initially designed as a pilot for potential scale-up. With the AF in 2009, the scope and expectations were significantly expanded, but it was understood that the PREPSEL alone would not be able to address alone all the structural issues of the Haiti Electricity sector . Following the earthquake, an exceptional IDA envelope of US\$ 500 million was provided for reconstruction efforts. This provided a unique opportunity – in terms of funding and leverage - to make a significant impact on Haiti’s sustainable Energy reconstruction and development. From May 2011 to September 2012, the Bank team in charge of the supervision of the PREPSEL also prepared with the GOH and EDH a new US\$ 90 million operation which includes continued funding for PREPSEL activities (deployment of CMS in the provinces, installation of remote meters for all industrial customers). The grant was approved by the Board on September 26, 2012. Applying lessons from PREPSEL, the team focused closely on effectiveness conditions, and the grant was declared effective on February 06, 2013.

PREPSEL was instrumental in designing and preparing this new operation (the largest grant to GOH on Energy, and the largest Bank operation in Haiti), by building on the infrastructure already provided, identifying the gaps and needs, and supporting the Client’s preparation effort. The existence of a highly capable and motivated PIU, considerably reduced the implementation risk for the new project. Complementary to the PREPSEL, some small grants were provided to help prepare specific components that were out of the PREPSEL scope¹⁷.

¹⁷ ESMAP funded a US\$ 195,000 study on Household Energy and the Spanish Fund for Latin America and the Caribbean provided US\$ 100,000 to analyze options for Energy Access Expansion .).

3. Assessment of Outcomes

3.1 Relevance of Objectives, Design and Implementation

The PDO can be divided into three parts: To contribute to: i) the sustainable improvement in the quality of electricity services to customers; ii) strengthening the financial performance of EDH; and iii) strengthening the operational performance of EDH. In view of the unfinished development agenda in Haiti's power sector, all three elements of the PDO were highly relevant at the time of appraisal, and remain so today. The project investments also were and are relevant because of the central importance of management systems and revenue collection in any well-functioning power utility. However, the project design and implementation relied on external factors (e.g., effective donor dialogue) which did not materialize (see Quality at Entry below) which somewhat diminished their relevance.

3.2 Achievement of Project Development Objectives

With respect to PDO (i) – sustainably improved quality of service - the related indicator (percentage of customers served at least 6 hours per day) shows a significant over-achievement. Hence this PDO can be considered to be met, although improvement in service levels resulted mostly from exogenous factors, most importantly the commissioning of the E-Power oil fired power station. Moreover, although they were not functioning at the full potential at the close of the project, the CMS and the TSMS are both in place and partially operating. This creates a foundation on which to build. The Bank's follow-on project, combined with the operations supported by other donors, as well as the current strategic donor dialog with is both coordinated and focused on the energy sector, provide a good opportunity to leverage PREPSEL's foundational work into increased sustainability and service levels,

PDO (ii) – strengthening EDH financial performance – is linked to the CRI target of 40% (previously 50%). However, the CRI at project close was only 26.7%. Although this is considerably better than the baseline of 11.51%, it is only amounts to 67% of the revised target value, and 53% of the previous target, and cannot be considered as meeting this objective.

The third PDO – strengthening EDH operational performance – referred to the new operational procedures for a more customer oriented approach in the execution of activities using the information systems (para 28 of the PAD). Its achievement is linked to the indicator 3 - Number of EDH staff trained to use CMS and TSMS, which was achieved at 47% (296 staff trained to new procedures for a target of 435 staff). Although staff training is an imperfect indicator, there are no other performance measures which suggest significant operational improvements. Hence this objective cannot be considered to be met. An action plan to train all EDH commercial staff on the adequate use of these systems have been put in place under the new project.

3.3 Efficiency

The economic evaluation focused on the benefits associated with an improvement of the CRI through a reduction of commercial losses (see Annex 3 for a detailed description). The values shown correspond to an estimate of the strict economic benefits associated with a reduction of theft; non-metered customers etc. by putting in place the CMS and TSMS, as well as providing management assistance through the AF. Other costs considered in the evaluation include those associated with the Transition Management Contract which was also responsible for feeding the CMS with the customer database. The values yielded by the economic evaluation model can vary significantly depending on parameters, such as the price elasticity of demand, which present a large degree of uncertainty. Annex 3 includes a sensitivity analysis showing how the NPV and EIRR may vary according to changes in the parameters, in particular assumptions regarding the price elasticity of demand. Net Present Value for the project has been estimated at US\$1.76 million, with an EIRR at 15%.

The evaluation also considered the financial benefits (US\$ 64 million), which are considerably greater than the strictly economic ones and therefore yield a rate of return (191%) far in excess of the economic IRR; this is representative of the reduction of commercial losses, and in the long run it has an economic effect by freeing public resources from having to support EDH and orienting them to sectors that are more dependent on Government monies. The financial benefits, in contrast to the economic benefits, are not significantly sensitive to the parameters mentioned above.

3.4 Justification of Overall Outcome Rating

Rating: **Moderately Unsatisfactory**

PDO Achievement: Considering the three PDOs together, the first was fully met, although much of the credit for this achievement is found outside the project. The second and third were not met.

Relevance: PREPSEL continues to be relevant to the recovery of the power sector as seen eight years after it was designed and approved, and it can boast of modest achievements despite the setbacks experienced;

Efficacy: The CMS and TSMS were successfully installed, EDH staff were trained to use the systems, the 500 remote meters were purchased of which 72 were installed to better monitor the largest customers, the 6 remote meters installed to verify the power generation of the IPPs, the customers database was totally updated and the technical assistance provided to EDH and MTPTC. These tangible achievements justify the project's efficacy. Less measurable achievements are the progressive diffusion of commercial and performance culture within EDH staff, and improvement in the Energy sector's transparency.

Efficiency: the project has generally delivered what was promised, although the costs were higher than estimated. The economic evaluation shows that the main activities can have real positive economic effects.

Despite a highly relevant PDO and investment choices, as well as reasonable efficacy and efficiency, the project design suffered from shortcomings as discussed below, and the PDO achievement was moderately unsatisfactory. This leads to an overall outcome rating of Moderately Unsatisfactory.

3.5 Overarching Themes, Other Outcomes and Impacts

(a) Poverty Impacts, Gender Aspects, and Social Development

Although the project was designed to target large customers, it was initially applied in an economically mixed area which also includes small users and slum dwellers. The project therefore had an important poverty reduction effect by providing a public service to families living under extreme conditions.

(b) Institutional Change/Strengthening

This is probably one of the major achievements of the project. Strengthening EDH's management capabilities to address the commercial issues of the utility is the essential element to achieve a functional company. The project had recognized this as a major challenge and has cooperated with other development partners in tackling it.

(c) Other Unintended Outcomes and Impacts (positive or negative)

Positive impacts on transparency consisted in the publication of the electricity sector dashboard and the installation of EDH meters at the IPPs energy delivery sites. Other indirect impacts were the subsequent operations and projects put in place, which built on PREPSEL's good implementation team.

4. Assessment of Risk to Development Outcome

Rating: **Significant**

Although PREPSEL's legacy does not face important physical risks (the hardware and software put in place will have a maintenance contract), its success will depend critically on the quality of human resources involved in managing it. Human resources in Haiti are a very scarce resource and there is a significant risk that negligence, combined with corruption, could impede sustaining a continuing recovery of EDH.

5. Assessment of Bank and Borrower Performance

5.1 Bank Performance

(a) Bank Performance in Ensuring Quality at Entry

Although the project supported a highly relevant set of investments, the technical design did not take adequate account of Haiti's poor communications infrastructure, and the project design also suffered from reliance on others to address the non-technical influences on the project, including client ownership and governance. Moreover, the changes introduced through the Additional Finance – especially selection of a highly ambitious CRI target for all of EDH – further eroded the potential for meeting PDO (ii).

Considering the highly relevant and appropriately targeted investments along with the above mentioned flaws suggests a moderately unsatisfactory rating for Quality at Entry.

Rating: **Moderately Unsatisfactory**

(b) Quality of Supervision

Despite the funding constraints for project supervision, the Bank team maintained a continuous dialogue with the authorities and with EDH management and contributed effectively to addressing the obstacles associated with the poor governance of the sector and the impact of multiple severe natural disasters.

Rating: **Satisfactory**

(c) Justification of Rating for Overall Bank Performance

Combining the preparation and supervision ratings requires taking into account the excessively ambitious objectives set out during preparation compared to the resources to be allocated to the project.

Despite a Moderately Unsatisfactory quality at entry, the implementation team maintained a strong focus on results and demonstrated considerable flexibility (e.g., AF and restructurings). The team's almost daily dialog with the counterpart served to maintain pressure on delivery. On balance, the Bank's performance is thus rated at Moderately Satisfactory.

Rating: **Moderately Satisfactory**

5.2 Borrower Performance

(a) Government Performance

Government did not take a proactive approach either when the project was prepared or during execution. This is a failing that has been consistently flagged by the World Bank team to the Borrower during supervision, given the multiple responsibilities of MTPTC and its poorly staffed energy units. The Government's lack of willingness to manage efficiently its power utility was also a factor that affected the decision process inside EDH¹⁸ and the implementation of the PREPSEL. The most illustrative example of this lack of involvement has been the publication of the Electricity sector dashboard¹⁹, where EDH, MTPTC and Ministry of Finance (MEF) had to coordinate in order to monitor and publish basic information on the power sector (generation, sales and revenues) for an improved transparency: despite the continued assistance of the donors to do so, only a dozen of this monthly dashboard has been published during the PREPSEL implementation period.

¹⁸ MTPTC Minister is the Chair of EDH Administration Board ; this Board was not meeting regularly before the monthly meetings in 2012-2013.

¹⁹ Tableau de Bord du Secteur de l'Electricité.

Rating: **Moderately Unsatisfactory**

(b) Implementing Agency or Agencies Performance

EDH management never realized the importance of PREPSEL for addressing the fundamental weaknesses of the company. However, the implementing unit (the PIU) of the project was well-directed and maintained management continuity, and it enabled the main elements of the project to be put in place. Overall, it would not be fair to downgrade the initial rating of the implementing teams, because of EDH bad performance (which is reflected in the GOH performance, as EDH is a public utility). The ICR recommends to keep the rating, to salute the outstanding work of the PIU team in adverse conditions (natural disasters, utility's inertia, management of multiple projects).

Rating: **Satisfactory**

(c) Justification of Rating for Overall Borrower Performance

The rating combines the Government and implementation agency (PIU) ratings. The very good performance of the PIU team has been offset by the Government and EDH management lack of ownership and willingness to tackle difficult issues and support implementation of the project.

Rating: **Moderately Unsatisfactory**

6. Lessons Learned

The preparation of small projects in weak institutional environments requires dedicating as many resources as possible to a careful and detailed planning of what can be expected in order to optimize the use of scarce funds.

When addressing the issues of poorly run institutions such as EDH it is necessary to focus not only on the abilities of lower level managers in charge of implementation, but also on the commitment of higher management. In the case of PREPSEL, EDH Managing Director was not fully committed to the project – with the exception of the EDH Direction team from August 2012 to August 2013 - and was responding to political pressures rather than to economic and financial objectives. This lack of exemplary ownership and leadership also crystalized the resistance to change at the EDH staff level. Retrospectively, the ICR agrees that the solution consisting on providing external assistance to EDH management through delegate directors was second best solution, and provided more positive results than the attempt to run a management contract for EDH with Tetra Tech; having experts within the EDH teams for a long period provided a real added value and a progressive knowledge transfer (supply driven, then progressively demand driven).

Focusing on customer service is the key towards utility rehabilitation, but requires actions at all levels of management, and not only at the operational level. Disregard for the consumer is a characteristic of many state-owned utilities, and should be addressed as a priority both during preparation and execution.

Main lesson on the M&E is to select realistic indicators and with a direct causality with the project activities, as it can become difficult to differentiate the impact of several factors on the same network infrastructure' performance.

Most of the lessons learned were utilized to build the US\$ 90 million grant to GOH on energy, both in the substance and in the implantation arrangements. The cost estimates of the infrastructure investments now take in account the specificity of the Haitian market for goods and services, the capacity building and technical assistance components now include components on the sustainability of the support provided, and the modernization of the systems and practices include a sufficient change management aspect.

7. Comments on Issues Raised by Borrower/Implementing Agencies/Partners

(a) Borrower/implementing agencies

Comments from the Borrower are summarized in Annex 5. Main lessons from the implementing agency's side have been on the lack of involvement at the highest level of EDH to ensure the adequate implementation of the project. The comments also pinpointed the need for a more substantial change management process, when a project intends to modernize infrastructure and processes.

(b) Co-financiers

Most of the strategic partners in the Haiti Energy sector welcomed positively the PREPSEL at its beginnings. In 2008, IADB followed up the PREPSEL with a similar project, the 'Rehabilitation of the Electricity Distribution System in Port-au-Prince Project', a US\$ 18 million grant to the GOH to enhance impact on the losses reduction. Initiated in 2009, the 'Peligre Hydropower Dam Rehabilitation Project' has been approved in 2010 (US\$ 78 million grant from IADB, KfW and the OFID), also in the objective to provide more clean and cheap electricity in the metropolitan area.

PREPSEL actions to improve transparency and good governance were the most valued activities in the opinion of the sector partners²⁰. In particular, the publication of the Electricity sector dashboard on MEF website and the installation of meters to measure generation of the private producers were positive signs allowing some donors to consider supporting the Haiti Energy sector.

²⁰ according to interviews during the Mid-Term review consultations

Annex 1. Project Costs and Financing

(a) Project Cost by Component (in USD Million equivalent)

Component	Appraisal Estimate (USD millions)	Actual/Latest Estimate ²¹ (USD millions)	Percentage of Appraisal
1. Improvement in EDH management systems	2.64	4.56	172.7
2. Improvement in quality and reliability of services and increased revenue collection of EDH (remote meters)	3.245	1.84	56.7
3. Participatory approach, project management, monitoring and impact evaluation, and replication strategy	1.58	1.36	86.1
4. Management support to EDH and technical assistance to MTPTC.	0.00	2.83	na
Total Baseline Cost	6.00	11.00	183.3
Physical Contingencies	0.00	0.00	0.00
Price Contingencies	0.00	0.00	0.00
Total Project Costs	6.00	11.00	183.3
Front-end fee PPF	0.00	0.00	0.00
Front-end fee IBRD	0.00	0.00	0.00
Total Financing Required	0.00	0.00	183.3

(b) Financing

Source of Funds	Type of Cofinancing	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
Borrower		0.00	0.00	0.00
IDA Grant		6.00	11.00	183..00
Local Sources of Borrowing Country		1.47	0.00	0.00

Annex 2. Outputs by Component

Component I:

²¹ Total including original grant plus AF.

The implementation of a set of modern computerized management tools such as: a Commercial Management System (CMS) and a Technical Services Management System (TSMS).

For both systems, a long international procurement process has been necessary. The first request for proposal launched did not succeed as (i) the technical specifications were too ambitious, and (ii) the allocated budgeted amounts for these markets were considerably lower than the proposals received.

Purchase and Implementation of a Commercial Management System (CMS): for a total amount of 3,702,538.72 USD

Outcomes	Numbers
Recruitment of an external consultant for the definition of technical and functional specifications of the CMS	1
Definition of technical and financial criteria for the CMS	1
Procurement process for the purchase of the system	2
Purchase of the system (hardware and software)	1
Supply and installation of the system	
Training sessions for the administrators of the system	3
Recruitment of a consultant for the selection and implementation of an IP communication network (voice and data) for the proper functioning of the communication systems	1
Extensive post-earthquake customers survey for the development of an up to date commercial database in CMS (EDH teams reinforced with young interns hired for the survey operation).	1
Update of Customers personal data subsequently to the earthquake	70,000
Recruitment of a consultant for the supervision of the CMS implementation	1
Supervision of the CMS implementation	
Evaluation of the system by external consultants (2011 and 2013)	2

All planned activities prior to the signing of a contract for the new Commercial Management system (CMS) supply and installation have been completed.

After an international tender process, the contract was awarded to the Spanish firm INDRA. Equipment and computer software, as well as the software package have been provided, configured and installed.

The first operating tests of the CMS have revealed a number of errors and anomalies that the supplier INDRA has had to correct.

Despite the operational validation of the CMS by EDH, recurrent billing issues conducted the project to conduct a complete assessment of the software and commercial process. The consultants hired to evaluate the system reckon that the problems encountered were not related to CMS software itself, but to the induced changes by its introduction in the internal management of EDH, and the relatively low level of competence of commercial agents in charge of its operations. One sustainable outcome of this sub-component on which EDH can build is the commercial database that has been partially updated subsequently to the 2010 earthquake, by carrying out extensive surveys during almost four months. Data from nearly 70,000 customers have been updated, and the number of active customers with up to date data in the system keeps increasing.

Purchase and Implementation of a Technical Services Management System (TSMS): for a total amount of 1,013,455.51 USD

Outcomes	Numbers
Recruitment of an external consultant for the definition of technical and functional characteristics of the TSMS	1
Definition of TFC for the TSMS	1
Procurement process for the purchase of the system	2
Purchase of the system (hardware and software)	1
Supply and installation of the system	
Training sessions for the administrators of the system	3
Recruitment of a consultant for the selection and implementation of a radio repeater network (VHF or UHF) for communication between the Distribution control center and teams working on the field.	1
Survey for the development of the technical and commercial database (combined units of EDH employees and students)	1
Update of Customers data	70,000
Recruitment of a consultant for the supervision of the TSMS implementation	1
Supervision of the TSMS implementation	
Evaluation of the system by external consultants	1

All activities prior to the signing of a contract for Technical Services Management System (TSMS) supply and installation have been completed. Just like the CMS, the contract was awarded to the Spanish firm INDRA after an international tender process.

Equipment, computer software, and software package have been provided, configured and installed.

Training of instructors and users has been made. As requested by the purchaser EDH, additional training sessions and updates have been made, so that almost 300 technical and commercial staff received training to use the TSMS.

EDH, has postponed the system implementation several times, due to the non-availability of a comprehensive and reliable database. The TSMS has been commissioned in January 2012.

For the Call Center and the Control Center, both related to the TSMS, necessary equipment for their implementation (offices, desks, computer hardware and software) were all provided by the project, and workspaces for these services were arranged by EDH.

An extensive customer satisfaction survey for CMS and TSMS users has started in early 2014. First findings (as of end March 2014) tend to demonstrate that the new EDH computerized management systems have somewhat contributed to deliver a better service to clients, but that all the commercial chain has to embrace the cultural change process linked to these systems for the overall service to be truly efficient.

Component II:

The implementation of a new approach of sales management focused on the customers, with the supply and the installation of remote meters to all EDH industrial customers (approximately 70 % of EDH commercial revenues in 2005).

Many approaches have been considered in order to improve EDH sales management. Each subproject is assessed individually below.

Support to the strengthening of the Anti-Fraud Unit: for a total amount of 62,562.58 USD

Outcomes	Numbers
Recruitment of an external consultant to assist in the hiring of Anti-Fraud unit's Head.	1
Strengthening of the anti-fraud unit with new EDH staff	1
Purchase of Supplies, furniture, and equipment for offices	
Training sessions for the anti-fraud members	2

All activities planned for the restructuration of the Anti-Fraud Unit were realized. Another external consultant has been recruited to support EDH with the restructuration of the unit. He also provided training for managers, technicians, and support staff of the Anti-Fraud Unit.

Office furniture and equipment planned for the Anti-Fraud Unit project have been bought and delivered.

Despite the Unit recommendations to EDH Board of directors, nothing has been to limit the electricity theft. As a result, total technical losses in the Port-au-Prince area were 45.9% in 2007, they reached 58.3% for the fiscal year 2012-2013.

Pilot project of Prepaid Meters and intervention within the slums: for a total amount of 41,923.05 USD

Outcomes	Numbers
Recruitment of a local consultant for the relations with the <i>slums</i>	1
Social and Economic studies for energy access within the <i>slums</i>	1
Recruitment of an external consultant to prepare key documents and supervise prepaid electricity meters' installation	1
Definition of technical and financial criteria for the prepaid electricity meters	1

The PREPSEL, in its initial design, was aimed to have a positive impact on all type of customers: large industrial customers, mixed socio-economic areas, and *slums*.

For the latest group, a local consultant was hired to study the challenge of supplying electricity in the *slums* near the project area, and also to propose new solutions to do so. The contract was terminated because of the consultant's unsatisfactory performance.

A pilot project to install prepaid electricity meters has been introduced in the PREPSEL. It included the installation of a number of prepaid electricity meters in *slums*, residential areas, and medium-sized commercial areas. An external consultant was hired to assist EDH in the definition of the Technical and Functional Characteristics, and in the process of purchasing, installing, and supervising these meters.

The process came to the phase of awarding a contract to the firm Landis & Gyr. However, after the January 12, 2010 earthquake, it was decided to restructure the project, and to eliminate some non-essential subprojects, including this prepaid meters activity.

Purchase and Implementation of “Remote Meters” for EDH large business customers: for a total amount of 1,409,682.09 USD

Outcomes	Numbers
Recruitment of an external consultant for the definition of technical and functional characteristics of the remotely-controlled electricity meters, and for the supervision of their installation	1
Definition of technical specifications for the remotely-controlled electricity meters	1
Procurement process to purchase the meters and have them installed	3
Supply of the meters	500
Installation of the meters	72
Training sessions	1
Survey to collect data from large business customers and diagnostics	1

One of the PREPSEL’s specific objectives was to increase EDH’s revenues in order to reduce the budget transfer from MEF to this utility. The project’s initial objective was to install remotely-controlled meters for all EDH major consumers (about 2,500, customers, representing 70% of company revenues). For this purpose, a series of activities were carried out, such as surveys with major clients, the hiring of an external consultant for the preparation of technical and functional characteristics of remotely-controlled meters to install, the preparation and publication of the call of tenders for the supply and installation of these meters.

Two calls of tenders were tendered out respectively on November 7, 2008, and on January 24, 2011. They were unsuccessful due to insufficient budget: smallest offer was above US\$ 3.6 million, more than twice the estimated budget. Interestingly, a very similar market that was ongoing in the neighboring country of Dominican Republic – under a World Bank loan to the Government – revealed that the same firms proposed the same remote meter and same installation / maintenance service for a proposed price representing one third of the price proposed to EDH. An ex-post analysis of this discrepancy demonstrated that the suppliers estimate a very high implementation risk at EDH, which explained this important premium in their offers.

A third was prepared and tendered on October 7, 2011, for the supply and installation of a smaller number of meters (500 meters). The contract was signed between EDH and the awarded firm INDRA on May 15, 2012. The expected end date was set for February 14, 2013. This end date was extended to August 31, 2013, to compensate for delays of materials delivery and problems encountered during the installation of the first meters.

This subproject has had mitigated outcomes. On the 500 meters supplied to EDH, only 72 have been successfully installed by August 31, 2013. The reasons for these results are various, and should be shared between the two parties. INDRA and its subcontractor NAFTEX made mistakes in equipment orders, which caused delays in delivery. According to the Buyer EDH, supplied materials were not of quality, and installation staff showed lack of required skills. The Technical team of EDH, supported by TetraTech specialists, were too lengthy to respond to INDRA’s requests. In addition, a pilot project recommended by Tetra tech experts generated important delays in the whole activity: implementation time for this pilot project, including time taken by TetraTech to enable or disable meters installed by INDRA, corresponded almost to the time of installation of 500 remotely-controlled meters.

Component III:

The implementation of a communications strategy at the same time external and internal, the management of the PREPSEL such as: the execution, the control, the follow-up and the evaluation.

Management of the PREPSEL: for a total amount of 1,391,493.00 USD

Outcomes	Numbers
Recruitment of the PCU Unit members: Coordinator, Procurement Specialist, Financial Specialist	5
Acquisition of Supplies, furniture, and equipment for offices	
Audit of the project: recruitment of specialized and authorized firms	2
Audit reports (annual basis)	7
Financial reports (every quarter)	29
Management of Procurement Processes	80+
Training sessions for the PCU members	6+

The PCU members were entirely hired by the beginning of November 2006; one Coordinator, one Procurement Specialist, and one Financial Specialist. Contracts were signed for one year renewable, and all the members were evaluated at the end of each year.

In November 2007, the Coordinator resigned, followed by the Financial Specialist in January 2008. New procurement processes have been launched and, in May 2008, the PCU had a new Coordinator and a new Financial Specialist. According to the World Bank Procedures, a new procurement process for the Audit has been launched after 3 years and a new firm took over until the end of the project

Due to limited budget, communication activities have been put on hold and have never been realized.

Component IV:

Technical Assistance to the management of EDH and the strengthening of a special Unit in charge of the Energy Sector Management (UGSE) connected with the MTPTC.

Technical Assistance to EDH: for a total amount of 2,491,348.93 USD

Outcomes	Numbers
Recruitment of an external consultant to support EDH in the selection of deputy directors.	1
Elaboration of the TORs for each deputy director	4
Procurement process for the recruitment of the deputy directors	4
Contract negotiated and signed with the deputy directors: 1 for Planning Department, 1 for Administration and Financial Department, 1 for Technical Department, 1 for Commercial Department	4
Lease of apartments for the deputy directors	4
Acquisition of appliances and equipment for their house	
Purchase of vehicles	4
Acquisition of Supplies, furniture, and equipment for offices	
Logistical support for the deputy directors: drivers, helpers, cell phones, ...	4 of each
Recruitment of an external consultant to realize the mid-term evaluation of the	1

deputy directors	
------------------	--

The deputy directors were recruited and joined the EDH management team since July 23, 2010. According to their contracts, the deputy directors produced on a regular basis reports on their activities. If the experts provided major deliverables (commercial action plan, investment plan for the rehabilitation of EDH distribution grids), and diffused a commercial and performance culture amongst EDH staff, the expected impact on EDH performance did not happen.

*Technical Assistance to MTPTC with the Creation of a Special Unit in charge of the Energy Sector Management (ESMU): for a total amount of **462,498.00 USD***

Outcomes	Numbers
Elaboration of the TORs for each ESMU Consultant	5
Procurement process for the recruitment of the ESMU Consultants	5
Lease of work spaces (office for ESMU)	1
Acquisition of Supplies, furniture, and equipment for offices	
Logistical support	

The Energy Sector Management Unit (ESMU) was created within the Ministry of Public Works, Transportation, and Communications, to assist the Minister in managing all topics related to the Energy sector. This structure was aimed to evolve to become either a Direction of Energy, a Secretariat of State, or, finally, a Ministry of Energy.

Three local consultants were hired in April 2010 to assist the Coordinator in implementing the ESMU. Thereafter, an Administrative Assistant and staff were recruited. They organized key events for the Energy sector dialogue and supported the – albeit irregular - publication of the Electricity sector dashboard to MEF website. The ESMU pursued its activities with reduced staff, until the appointment of its Coordinator, Dr. Rene Jean-Jumeau, as Secretary of state for Energy, and then as Delegate Minister in charge of Energy security.

The ESMU is then transformed and expanded to become the Office of the Minister in Charge of Energy Security. Archives are kept by the Minister, as well as equipment and materials acquired under the PREPSEL.

Annex 3. Economic and Financial Analysis

PREPSEL was mainly oriented towards the rehabilitation of EDH infrastructure, and the issues to be addressed were primarily of a financial nature: improving billing and collection through management systems and modern customer service technology. Consequently, the benefits of the project are mainly financial, although they have wider consequences: implementation of PREPSEL would rehabilitate EDH by transferring resources from users who are not paying for electricity service to EDH - either because of faulty billing, lack of meters, administrative negligence or theft - and this would reduce the transfers from the public budget, thereby allowing the resources to be oriented towards other higher priority sectors (e.g. health, education, or housing).

Nevertheless, the reduction of commercial losses has economic consequences as it leads to a better reallocation of resources and a reduction of waste. The analysis proceeds by

evaluating the economic benefits of the project (to the economy as a whole) and by evaluating the financial benefits to EDH.

Economic analysis

The project included four components (the fourth was added after the AF was agreed in 2009): (i) adoption and implementation of modern commercial and service management systems for EDH, (ii) improving service to clients and increasing revenues billed and collected for EDH, (iii) execution, evaluation, and replication of the project through strategic participation, and (iv) technical assistance to EDH management.

The indicators evolved during project execution; the benefits of the project would be evaluated according to performance regarding (a) improved financial performance of EDH as tracked through the CRI, and (b) improved service quality to customers as tracked by the percent of customers served at least 6 hours/day on average in EDH areas of supply.

Benefits associated with improvements in the CRI

The Cash Recovery Index combines the billing rate and the collection rate:

$$\text{CRI} = \text{Billing Rate} * \text{Collection Rate}$$

Where

$$\text{Billing Rate} = \text{Energy Billed (kWh)} / \text{Energy injected to the network (kWh)} \text{ and}$$

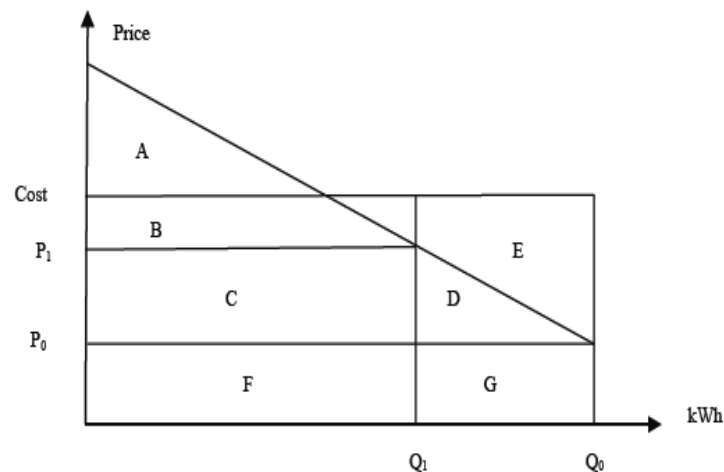
$$\text{Collection Rate} = \text{Paid Bills (in US\$)} / \text{Billed Energy (in US\$)}$$

$$\text{Energy injected (kWh)} = \text{Energy Billed} + \text{Technical Losses} + \text{Commercial Losses}$$

Improvements in the billing rate are associated with a reduction in technical losses and/or a reduction in commercial losses. Technical losses have not been assessed, but they have been estimated at 12.5% of energy injected.

The analysis of commercial loss reduction is more involved. Figure A3-1 illustrates the demand curve for users who are the subject of commercial loss reduction measures.

Figure A3-1-Economic and Financial Effects of Commercial Loss Reduction



In this figure, Q_0 is the energy consumed by users who are accountable for commercial losses; the initial consumption point is (P_0, Q_0) ; P_0 is not zero because users may be paying for the service, albeit at a low cost (for example through meter tampering). When commercial losses are reduced, users start to pay price P_1 (the tariff) and the new equilibrium obtains at (P_1, Q_1) because of a price elasticity effect. In this process,

- Consumer surplus is reduced by area D;
- The producer saves the cost of supplying $Q_0 - Q_1$, which is equivalent to area $E+D+G$. As the consumer was paying P_0 , the supplier's net saving is $D+E$;
- The net welfare savings are thus $D+E-D =$ area E. This is the net **economic** benefit of the reduction of commercial losses.

This benefit accrues even though the supply cost is still above the price (P_1) charged by the producer.

From a **financial** point of view,

- The producer saves areas $D+E$ due to lower consumption;
- Users now pay for area C, which they did not pay before the adjustment;
- Consequently the **financial** benefit of commercial loss reduction is given by area $C+E+D$.

The financial benefit of commercial loss reduction measures is always higher than the economic benefit (which could be quite modest depending on the price elasticity of demand).

The economic and financial evaluation will be conducted according to the previous methodology, using reasonable assumptions regarding the price elasticity of demand, as well as the P_0/P_1 ratio.

Table A3-1 summarizes the evolution of the different components of the CRI between May'11 and May'13. The table indicates how commercial losses have evolved during this period.

Table A3-1 Evolution of CRI, Collection Rate, and Billing Rate

	Billing Rate	Collection Rate	CRI	Technical Losses	Commercial Losses
May-11	30%	63%	19%	12.5%	57.5%
Jun-11	32%	63%	20%	12.5%	55.5%
Jul-11	33%	65%	21%	12.5%	54.5%
Aug-11	36%	62%	22%	12.5%	51.5%
Sep-11	36%	69%	25%	12.5%	51.5%
Oct-11	35%	69%	24%	12.5%	52.5%
Nov-11	34%	72%	25%	12.5%	53.5%
Dec-11	33%	72%	24%	12.5%	54.5%
Jan-12	32%	74%	24%	12.5%	55.5%
Feb-12	32%	77%	25%	12.5%	55.5%
Mar-12	32%	82%	26%	12.5%	55.5%
Apr-12	32%	92%	29%	12.5%	55.5%
May-12	32%	93%	30%	12.5%	55.5%
Jun-12	33%	96%	32%	12.5%	54.5%
Jul-12	34%	92%	31%	12.5%	53.5%
Aug-12	35%	95%	33%	12.5%	52.5%
Sep-12	36%	85%	31%	12.5%	51.5%
Oct-12	38%	87%	33%	12.5%	49.5%
Nov-12	39%	84%	33%	12.5%	48.5%
Dec-12	41%	81%	33%	12.5%	46.5%
Jan-13	41%	81%	33%	12.5%	46.5%
Feb-13	40%	82%	33%	12.5%	47.5%
Mar-13	41%	76%	31%	12.5%	46.5%
Apr-13	41%	71%	29%	12.5%	46.5%
May-13	43%	66%	28%	12.5%	44.5%

The management contract together with the management support to EDH helped to reduce commercial losses from 55% in May 2012 to 45% in May 2013; this is an important achievement, but it must be continued in order to reduce commercial losses to at least 30% in the next three or four years.

A first approximation to the benefits achieved with documented loss reduction can be estimated taking as a baseline January 2012 when the contractor for the CMS and the TSMS was on the last lap of putting in place the systems by loading them with the customer database (the contract terminated in April 2012). The results are shown in Table A3-2. The economic benefits of the project on a monthly basis are substantial with the assumptions indicated in the table, and they reach around \$450 thousand in June 2013. However, the financial benefits are much more considerable, as they reach \$3.4 million in

June 2013. This table illustrates the importance that should be attributed to commercial loss reduction for improving the financial condition of the utility.

Table A3-2 Estimation of Economic and Financial Benefits

	Jan-12	Apr-12	Jul-12	Oct-12	Jan-13	Apr-13	May-13	Jun-13
Net Energy GWh	80.43	81.64	82.87	84.12	85.39	86.68	87.11	87.55
Comm. Loss w/o project %	56%	56%	56%	56%	56%	56%	56%	56%
Comm. Loss w/o project GWh	45	45	46	47	47	48	48	49
Comm. Loss w project %	56%	56%	54%	50%	47%	47%	45%	45%
Comm. Loss w Project GWh	45	45	44	42	40	40	39	39
Loss Reduction (Q ₁) GWh	0.0	0.0	1.7	5.0	7.7	7.8	9.6	9.6
Elasticity	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4
P ₀ /P ₁ ratio	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Q ₀ Increment GWh	0	0	2	7	10	11	13	13
P ₁ Price US\$/MWh	290	290	290	290	290	290	290	290
Supply Cost US\$/MWh	290	290	290	290	290	290	290	290
Economic Benefit M\$	0.00	0.00	0.08	0.24	0.36	0.37	0.45	0.45
Financial Benefit M\$	0.00	0.00	0.59	1.79	2.73	2.77	3.40	3.42

The costs associated with the CRI improvements include the CMS and TSMS system (\$3.5 million), a fraction of the management support provided by the AF of PREPSEL (\$3.2 million), and some of the cost associated with the Haiti Transition Management Contract supported by USAID (estimated at around \$1.8 million), for a total of about \$8.5 million over Oct'10 to Apr'13.

For economic evaluation purposes, a conservative assumption would consist of improving the level of commercial losses from 44.5% in June 2013 to 40 percent in December 2014. This would yield the cash flow illustrated in Table A3-3.

Table A3-3 Cash Flow of Economic Benefits

	Oct-10	Nov-10	Dec-10	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12
Economic Benefits (M\$)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Costs																				
CMS Costs	0.5		0.5		0.5		0.5		0.5		0.5					0.5				
Delegate Directors	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
TMS costs																	0.2	0.2	0.2	0.2
Total costs	0.7	0.2	0.7	0.2	0.7	0.2	0.7	0.2	0.7	0.2	0.7	0.2	0.7	0.2	0.7	0.4	0.9	0.2	0.2	0.2
Net Benefits	-0.70	-0.20	-0.70	-0.20	-0.70	-0.20	-0.70	-0.20	-0.70	-0.20	-0.70	-0.20	-0.70	-0.20	-0.70	-0.40	-0.90	-0.20	-0.20	-0.20

	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14
Economic Benefits (M\$)	0.04	0.08	0.12	0.16	0.24	0.28	0.36	0.36	0.32	0.36	0.37	0.45	0.45	0.45	0.48	0.50	0.52	0.53	0.55	0.57	0.58	0.58	0.61	0.61	0.61	0.61	0.64	0.64	0.67	0.67	0.70
Costs																															
CMS Costs																															
Delegate Directors	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
TMS costs																															
Total costs	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Net Benefits	-0.16	-0.12	-0.08	-0.04	0.04	0.08	0.16	0.16	0.12	0.16	0.17	0.25	0.25	0.25	0.28	0.30	0.32	0.33	0.35	0.37	0.38	0.38	0.41	0.41	0.41	0.41	0.44	0.44	0.47	0.47	0.50

With these assumptions, the investment in CMS and TSMS yields an NPV of \$1.76 million and an EIRR of 15%.

The financial benefits are ten times larger than the economic benefits and the investment easily pays for itself during 2013.

Finally, it must be noted that the economic and financial evaluations have been assessed separately, but from a wider perspective the financial benefits also translate into economic benefits in the long run, as a viable EDH will reduce the flow of public funds

to support the enterprise, thereby freeing them for investing in other sectors which are more dependent on Government resources.

Discussion of results and sensitivity analysis. An EIRR of 15% is surprising for a project which continues to show indicators that are not within the expected range assumed when it was designed. This can be explained because, although the CRI remains within non-viable levels, the results achieved regarding commercial losses are considerable, around 10GWh per month as of June'13; although economic benefits are small relative to financial benefits, they are still considerable enough to justify the investment, together with the cost of additional human resources support (the *directeurs délégués*).

Nevertheless, the economic benefits depend upon factors which are taken as assumptions and can only be evaluated with considerable difficulty, namely the price elasticity of demand, and the P_0/P_1 ratio. The price elasticity of demand for electricity has been studied under different contexts; a recent study²² reports the following values:

	Short Run			Long Run		
	Mean	Low	High	Mean	Low	High
Residential	-0.3	-0.2	-0.6	-0.9	-0.7	-1.4
Commercial*	-0.3	-0.2	-0.7	-1.1	-0.8	-1.3
Industrial*	-0.2	-0.1	-0.3	-1.2	-0.9	-1.4

* The estimates for the commercial and industrial sector are from EPRI (2001).

An earlier study²³ focused on residential demand reported elasticities that vary between -0.35 (short run) and -0.85 (long run). A study on electricity demand applied to Latin America, which included Costa Rica, Paraguay, Colombia, the Dominican Republic, and Mexico reported long run price elasticities that vary around -0.45 to -0.65 depending on the sector and the country²⁴. Finally, an analysis for Ecuador²⁵ found much lower price elasticities for all sectors, on the order of -0.1.

The price elasticity used in the base case calculations is -0.4, which is within the range estimated by the different studies (but not specifically for Haiti). A sensitivity analysis with respect to the price elasticity of demand was conducted for more inelastic demands (i.e. more pessimistic conditions), and yielded the following results:

²² Neenan, B. and Jiyong, E. "Price Elasticity of Demand for Electricity: a Primer and Synthesis", Electric Power Research Institute, Palo Alto, CA, January 2008

²³ Espey, J. and Espey, M. "Turning on the Lights: a Meta-Analysis of Residential Electricity Demand Elasticities", *Journal of Agricultural and Applied Economics*, April 2004, pp. 65-81

²⁴ Westley, Glenn, "New Directions in Econometric Modeling of Energy Demand", Inter-American Development Bank, Washington, DC, February 1992.

²⁵ Lecaros, Fernando "Estudio Sectorial de la Demanda por Energía Eléctrica en el Ecuador", Instituto Ecuatoriano de Electrificación (INECEL) and Inter-American Development Bank, April 1986

Table A3-4 Sensitivity of Economic Results to the Price Elasticity of Demand

	$\epsilon=-0.1$	$\epsilon=-0.2$	$\epsilon=-0.3$	$\epsilon=-0.4$
NPV (M\$)	-6.50	-3.75	-0.99	1.76
EIRR (%)	-41%	-17%	0%	15%

As can be seen, a low price elasticity of demand yields a low economic return, which is normal: with inelastic demand, price becomes less and less relevant from an economic point of view.

The second variable mentioned above concerns the P_0/P_1 ratio; P_0 is the price paid by users responsible for commercial losses, and it is not necessarily zero, as losses could be due, for example, to faulty meters that provide a reading below the real value. The analysis assumes a ratio 0.1. If it is higher, benefits will decrease, and vice versa, as shown in the following table:

Table A3-5 Sensitivity of Economic Results to the P_0/P_1 ratio

P_0/P_1	0.05	0.1	0.2	0.3
NPV (M\$)	3.02	1.76	-0.55	-2.59
EIRR (%)	21%	15%	3%	-9%

As expected, an increase in the ratio to around 0.15 leads to an EIRR below the cutoff 12% rate.

Financial Analysis

Table A3-6 shows the financial benefits of the project and the corresponding cash flow.

Table A3-6 Cash Flow of Financial Benefits

	Oct-10	Nov-10	Dec-10	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12
Financial Benefits (M\$)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Costs																				
CMS Costs	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0	0.5	0
Delegate Directors	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
TMS costs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0.2	0.2	0.2	0.2
Total costs	0.7	0.2	0.7	0.2	0.7	0.2	0.7	0.2	0.7	0.2	0.7	0.2	0.7	0.2	0.7	0.4	0.9	0.2	0.2	0.2
Net Benefits	-0.7	-0.2	-0.7	-0.2	-0.7	-0.2	-0.7	-0.2	-0.7	-0.2	-0.7	-0.2	-0.7	-0.2	-0.7	-0.4	-0.9	-0.2	-0.2	-0.2

	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14
Financial Benefits (M\$)	0.29	0.59	0.89	1.19	1.79	2.10	2.71	2.73	2.44	2.76	2.77	3.40	3.42	3.44	3.61	3.79	3.96	3.98	4.16	4.34	4.37	4.39	4.57	4.60	4.62	4.64	4.83	4.86	5.05	5.07	5.27
Costs																															
CMS Costs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delegate Directors	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TMS costs	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total costs	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Net Benefits	0.1	0.4	0.7	1.0	1.6	1.9	2.5	2.5	2.2	2.6	2.6	3.2	3.2	3.4	3.6	3.8	4.0	4.0	4.2	4.3	4.4	4.4	4.6	4.6	4.6	4.6	4.8	4.9	5.0	5.1	5.3

At 12% discount rate, the cash flow of financial benefits yields a NPV of \$64 million, and a financial IRR of 191%. As expected, the financial benefits exceed by far the economic benefits of the project.

Regarding the sensitivity analysis, the corresponding variations yield the results shown in Tables A3-7 and A3-8.

Table A3-7 Sensitivity of Financial Results to the Price Elasticity of Demand

	$\epsilon=-0.1$	$\epsilon=-0.2$	$\epsilon=-0.3$	$\epsilon=-0.4$
NPV (M\$)	49.8	54.7	59.5	64.4
IRR (%)	162%	172%	182%	191%

Table A3-5 Sensitivity of Financial Results to the P_0/P_1 ratio

P_0/P_1	0.05	0.1	0.2	0.3
NPV (M\$)	69.6	64.4	54.3	44.7
EIRR (%)	200%	191%	172%	152%

Independently of the assumptions regarding the parameters, the financial benefits always yield positive results. This corroborates a well-known adage in the power sector: “there is no better investment than to reduce commercial losses”.

Annex 4. Bank Lending and Implementation Support/Supervision Processes

(a) Task Team members

Names	Title	Unit	Responsibility/ Specialty
Lending			
Solange Alliali	Senior Counsel	LEGLA	Legal
Karen Bazex	Energy Specialist	LCSFE	Consultant
Erik Magnus Fernstrom	Lead Energy Specialist	AFTG2	Energy
Stephan Claude Frederic Garnier	Power Engineer	AFTEG	Electricity
Mangesh Hoskote	Senior Power Sector Specialist	AFTG1	Electricity
Ghislaine Kieffer	E T Consultant	LCSFR-HIS	Consultant
Patricia E. Macgowan	Procurement Specialist	LCOPR	Procurement
Ahmadou Moustapha Ndiaye	Senior FM Specialist	LCOAA	Financial Mgt.
Clemencia Torres De Mastle	Senior Energy Specialist	AFTG2	Task Team Leader
Paul Altidor	Consultant	LCSFE	Consultant
Ulrich Cedric Myboto	Consultant	LCSEF	Consultant
Maria Elena Castro	Senior Social Scientist	LCSEO	Social
Charles M. Feinstein	Sector Leader	LCSFP	
Hilarion Bruneau	Senior Finance Officer	LOAG1	Financial Mgt
Xiaoping Wang	Energy Specialist	LCSFE	Energy
Supervision/ICR			
Frederic Verdol	Power Engineer	LCSEG	Task Team Leader
Karen Bazex	Energy Specialist	LCSEG	Task Team Leader
Pedro Antmann	Senior Energy Specialist	LCSEG	
Fernanda Pacheco	Program Assistant	LCSEG	
Maria E. Castro-Munoz	Consultant	LCSHH	
Josue Akre	Financial Management Specialist	LCCHT	
Hector Farina	Consultant	LCSEG	
Fowzia Hassan	Energy Specialist	MNSEE	
Michel E. Layec	Consultant	AFTG1	
Fernando Lecaros	Consultant	AFTG2	
Alois Ndorere	Consultant	LCSPT	
Joseph Kizito Mubiru	Lead Financial Management Spec	LCSFM	
Betonus Pierre	Consultant	LCSEG	
Yao Wottor	Senior Procurement Specialist	LCSPT	
Alberto J. Zoratti	Consultant	LCSEG	
Christophe de Gouvello	Senior Energy Specialist	LCSEG	Task Team Leader

(b) Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. of staff weeks	USD Thousands (including travel and consultant costs)
Lending		
FY06	46.19	250.89
FY07	7.90	39.65
FY08	0.18	6.00
Total:	54.30	296.54
Supervision/ICR		
FY06	0.00	0.00
FY07	34.51	154.78
FY08	24.19	101.39
FY09	24.09	102.38
FY10	42.98	181.93
FY11	71.20	281.73
FY12	22.33	106.36
FY13	29.42	113.50
Total:	248.73	1042.07

Annex 5. Beneficiary Survey Results

4.1 This Annex summarizes the EDH Staff and Clients Satisfaction Surveys conducted in February and March 2014. The surveys were entirely focused on the PREPSEL project activities and results, in order to estimate the level of impact of each activity, but also the level of knowledge of the overall project (outside of the direct stakeholders of the project).

Context:

4.2 PREPSEL Beneficiaries are (i) EDH and MTPTC staff provided with technical assistance and information systems, (ii) EDH industrial customers provided with remote meters, and (iii) EDH overall customers benefiting from the improvement of electricity service. Assessments took place during the project for EDH staff direct beneficiaries, subsequently to training sessions or other experience exchanges funded under the project.

4.3 The satisfaction surveys have been conducted by EDH between February 16, 2014 and March 10, 2014. EDH Managing Director hired a consultant to organize and monitor these surveys, as EDH Commercial Division did not take action to conduct these surveys²⁶. Main objectives were to assess the impact and perception of (i) the installation of the information systems (CMS and CSMS), (ii) the technical assistance to EDH Management through the international experts / Delegate Directors, and (iii) the installation of remote meters to EDH industrial customers.

4.4 During the survey period, 122 EDH staff and 126 EDH Clients have completed the survey. It is interesting to note that the proportion of individuals who did not want to do the survey was more important amongst EDH staff, despite the fact that EDH hired external consultants to conduct the assessment. This is partly due to the very unusual nature of this exercise inside EDH, and to the latent ‘fear of accountability’ which is impeding personal initiatives (e.g., innovation) inside EDH.

Main Results:

4.5 With no surprise, the PREPSEL was better known inside EDH than by the utility’s clients: 71% of staff questioned knew the project and its activities, against 13% for the customers. This is partly due to the presence of the four international experts as EDH Delegate Directors for almost 2 years (3 years for the financial expert), the longest in house mission of individuals inside the company. The communication actions initiated by these consultants contributed to spread the knowledge of the PREPSEL activities, and more generally the performance and commercial culture inside EDH.

4.6 The above result provides a relative understanding of the perception of EDH improvement by the beneficiaries: if 56% of EDH clients think that the company is progressively improving, only 39% of EDH staff believes that the PREPSEL has contributed to this improvement. A detailed assessment of EDH staff answers show that they strongly believe in the

²⁶ EDH Commercial managers’ inertia has conducted MTPTC to request the WB to extend the deadline – from February 28, 2014 to April 30, 2014 - for submission of the Recipient’s completion report, engendering the extension for the submission of this ICR.

positive impact of information systems, and are less convinced by the direct impact of remote meters and technical assistance (respectively, 71%, 47% and 26% of staff who evaluated the impact rather positive for the 3 main activities).

4.7 The main lessons learned from this assessment is the relative positive external perception of EDH improvement, on the overall level of service and in particular on the commercial services. Despite some important issues with the billing, the clients noticed substantial improvements in the bills recovery (mostly industrial clients, due to the creation of a dedicated service inside EDH Commercial Division), and on the metering and technical assistance to a lesser extent. The replication of these customer management methods to smaller customers will progressively allow having a harmonized efficiency on bills recovery, complementing the implementation of the action plan for the billing improvement.

Annex 6. Comments of Cofinanciers and Other Partners/Stakeholders

***Insert letter from Client commenting on Bank's draft ICR and summarize a few key points (with Team response) in Section 7 of Main Text

Annex 7. Summary of Borrower's ICR and/or Comments on Draft ICR

Summary of Recipient's Completion Report:

7.1 Le Projet de Réduction des Pertes dans le Secteur Electrique (PREPSEL) avait pour objectif principal de réduire les pertes techniques et commerciales sur le réseau de l'Electricité d'Haïti. Ses objectifs de développement étaient de :

- Contribuer à améliorer de façon durable la qualité des services d'électricité fournis à la clientèle
- Contribuer à renforcer les performances financières et opérationnelles de l'Electricité d'Haïti.
- Réduire à moyen et long termes les transferts de fonds du Trésor Public vers le Secteur Electricité.
- Et de renforcer l'Unité de Gestion du Secteur de l'Energie rattachée au MTPTC.

7.2 Le tableau suivant donne les principales dates et informations importantes du Projet de Réduction des Pertes dans le Secteur Electrique.

Projet de Réduction des Pertes dans le Secteur Electrique	Financement	
Identification des Prêts /Dons	BM IDA H 251-0- HA	BM IDA H 510-0-HT
Project ID	PO98531	PO98531
Approbation	03/08/06	08/09/09
Signature de l' Accord de don	11/09/06	02/11/09
Entrée en vigueur	31/07/07	15/12/09
Clôture 1	28/02/13	28/02/13
Clôture 2	31/08/13	31/08/13
Date limite des demandes de décaissement	31/12/13	31/12/13
Montant du don en US \$ (approuvé)	6 000 000	5 000 000
Montant décaissé (31 décembre 2013) en US \$	5 808 309	4 490 206
Montant non décaissé en US \$	191 691	509 754
Taux de décaissement par don	97 %	90 %
Montant total des deux dons en US \$	11 000 000	
Montant total décaissé en US \$	10 298 514	
Taux de décaissement global	94 %	

7.3 **Structure de Gestion du PREPSEL** . Afin d'assurer une gestion agile du PREPSEL, une structure organisationnelle simplifiée comprenant deux Unités ayant des responsabilités distinctes a été mise sur pied. Il s'agit de :

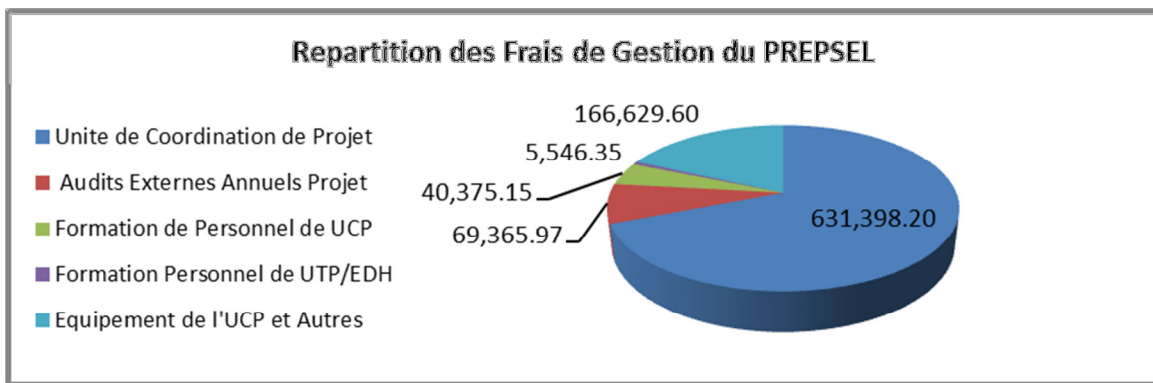
- 1- L'Unité de Coordination de Projets (UCP), constituée d'un nombre restreint de consultants et dépendant du Ministère des Travaux Publics. L'UCP gérait les aspects administratifs et financiers du Projet et servait d'interface entre les Consultants, les Fournisseurs de biens ou de services, la Direction de l'E'd'H, le Ministère des TPTEC, le Ministère de l'Economie et des Finances et les Bailleurs multilatéraux comme la Banque Mondiale et la Banque Interaméricaine de Développement.
- 2- L'Unité Technique de Projet (UTP), composée de cadres de l'Ed'H et dépendant de la Direction Générale de l'Ed'H. L'UTP traitait les aspects techniques du projet. Elle était souvent appuyée par des consultants externes recrutés par l'UCP et payés à partir des ressources du projet. Cet appui était apporté particulièrement dans les domaines où l'Ed'H ne disposait pas de compétences.

L'UCP et l'UTP travaillaient en étroite collaboration pour la réalisation de tous les processus de passation de marché du PREPSEL et le suivi des contrats qui en découlaient.

La mise en place d'une UTP et d'une UCP fortes et fonctionnelles a été l'une des conditions préalables pour la mise en œuvre du PREPSEL. Le Bénéficiaire ultime, Ed'H, avait procédé rapidement, en novembre 2006, à leur mise en place conformément à ce qui était prévu dans l'accord de Don IDA H2510.

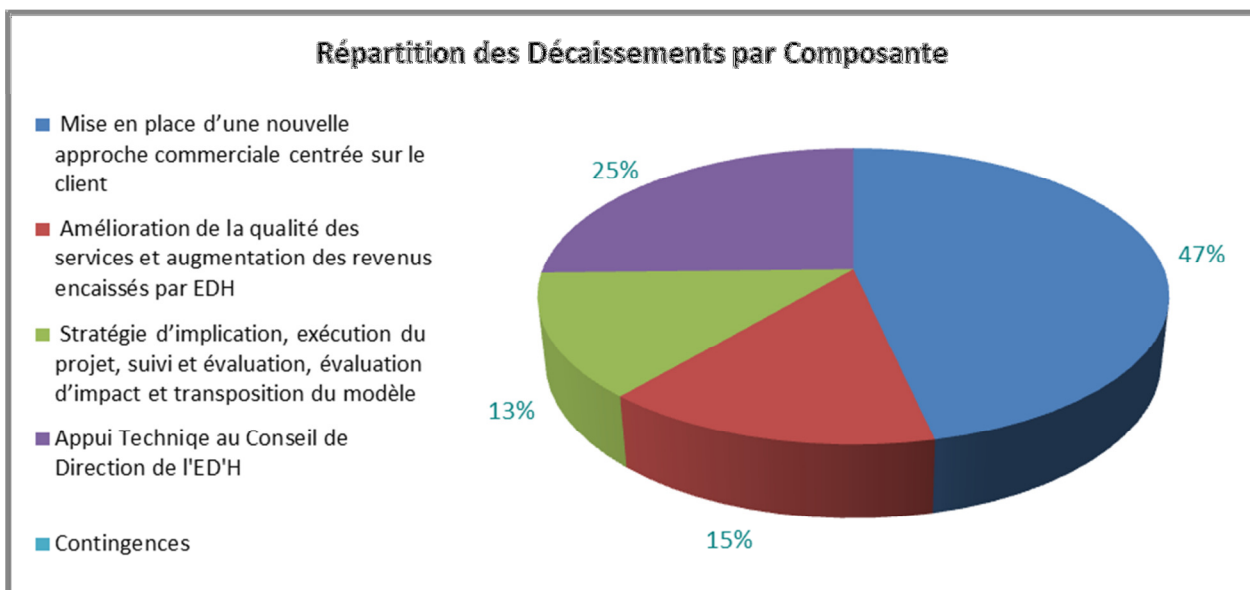
Suite à sa création, l'UCP a joué son rôle d'interface entre les différentes parties prenantes pour assurer la coordination des différentes activités du projet. Elle a aidé à l'avancement du projet notamment en gérant les processus de recrutement des consultants locaux et étrangers, les processus d'acquisition de biens et de services, et tous les aspects administratifs et financiers du projet.

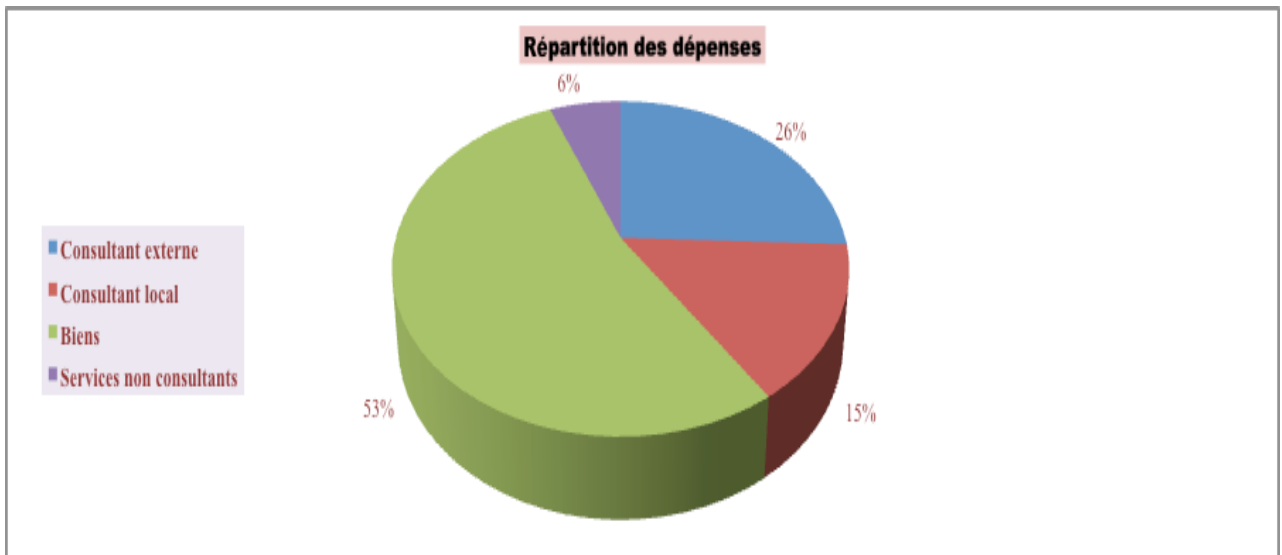
De sa date d'approbation (3 août 2006) à sa date de clôture (31 décembre 2013), les frais de gestion du PREPSEL totalisent 913,315.27 US\$ **soit 8.87 %** du montant total décaissé. Le tableau 9-3 et le graphe en tarte ci-dessous donnent la répartition détaillée de ce montant.



7.4 **La Gestion Financière du PREPSEL** La situation financière du PREPSEL à sa date de clôture est résumée par le tableau ci-dessous. Au 31 décembre 2013, le montant total avancé par la Banque à l'Unité de Coordination de Projet (UCP) s'élève à : 10 298 514.44 dollars américains soit 93.63% de l'enveloppe globale du projet qui était de : 11 000 000.00US \$. Le solde budgétaire total : 701 486.56 représente le montant qui n'a pas été décaissé et gardé par la Banque.

7.5 De façon plus imagée, les graphes en tarte ci-dessous donnent la répartition des décaissements par Composante et par Catégorie.





Considérations générales sur l'exécution du PREPSEL

7.6 Le PREPSEL : Une opportunité pour le Redressement de l'Ed'H. Le Projet de Réduction des Pertes dans le Secteur Electrique (PREPSEL) était un projet pilote de changement organisationnel qui devrait apporter des transformations majeures dans la gestion interne de l'Ed'H et qui reposait sur deux volets complémentaires : i) l'implantation de nouveaux systèmes de gestion informatisée de l'Ed'H et ii) un appui à la gestion interne de l'entreprise . Sa mise en œuvre effective en aout 2006 avait suscité beaucoup d'espoir . Car sa réussite devrait inciter la Banque ainsi que les autres bailleurs à contribuer beaucoup plus au redressement du sous-secteur électricité en Haïti.

7.7 Le PREPSEL a été développé dans un environnement hostile, résistant au changement. Lors de sa mise en œuvre effective, le projet a du faire face a un environnement interne plutôt hostile, résistant au changement, qui a rendu très difficile l'atteinte des objectifs fixés dans les délais impartis. On a ainsi constaté une forte résistance au changement de la part de certains responsables clés de Ed'H, notamment au niveau de la Direction commerciale et du Département du Système d'Informations, les plus touchés par le projet. Il a fallu l'intervention « musclée » du Directeur Général pour qu'une copie de la Base de Données Commerciales soit remise a INDRA pour commencer ses travaux d'analyse. Une collaboration tiède a été apportée au Fournisseur INDRA; comme conséquence, le projet a cumulé des retards importants et les systèmes SGC et SGST n'ont été mis en route qu'à la fin du projet.

7.8 Le Séisme du 12 janvier 2010 a perturbé le déroulement du PREPSEL. Le séisme du 12 janvier 2010 a perturbé le déroulement normal du projet (plusieurs mois d'inactivités) et a entraîné sa restructuration. Certains sous-projets comme la

réhabilitation des circuits de la zone pilote, l'installation des compteurs à carte prépayée et les interventions dans les bidonvilles ont été éliminées. Néanmoins, le Projet a réussi à implanter les systèmes de gestion SGC, SGST, le Call Center et le Centre de conduite du réseau.

7.9 Les faiblesses du Département Informatique et l'absence de décision pour sa restructuration.

Le maillon faible dans la mise en place de ces systèmes est le Département du Système d'information de l'Ed'H. Malgré les recommandations du fournisseur INDRA, du Consultant Eduardo Bergerie et aussi les visites d'entreprise réalisées à EDESTE et à EDESUR en République Dominicaine, aucune action concrète n'a été prise pour adapter la structure du DSI aux exigences minima que requiert la gestion des nouveaux systèmes SGC, SGST et RMS. Pour une gestion efficace des systèmes, INDRA avait recommandé d'avoir au moins 7 spécialistes : un Administrateur du système, un responsable fonctionnel pour chaque Application, un Spécialiste en base de données, un Spécialiste en Unix et un Spécialiste en Oracle. Les Directions qui se sont succédées à Ed'H ont tous reconnu les lacunes du DSI, mais n'ont entrepris jusqu'à présent aucune action appropriée pour y remédier.

7.10 Le recrutement des 4 Directeurs Délégués.

Le PREPSEL avait pu recruter, dans le contexte difficile qui prévalait en 2010, quatre Experts internationaux (Directeurs Délégués) pour aider la Direction Générale de l'Ed'H dans la gestion quotidienne des activités de l'entreprise. Ils avaient commencé leurs mandats à partir du 23 juillet 2010. Les résultats de leurs présences sont peu visibles ; car n'ayant aucune autorité, leurs actions se résumaient en des diagnostics et des recommandations qui ne sont pas toujours suivis.

7.12 Recommandations:

Le PREPSEL a été mis en œuvre, il y a sept (7) ans. Il est clôturé le 31 août 2013. Les systèmes SGC et SGST ont été fournis et installés, les Compteurs contrôlés à distance ont été partiellement installés, les quatre Directeurs Délégués ont été recrutés et intégrés à Ed'H. Mais on ne peut pas dire que les objectifs du projet ont été atteints ni qu'il a été soit un succès ou un échec total. Les résultats obtenus sont plutôt modestes et doivent être analysés en tenant compte des facteurs internes et externes qui avaient conditionné son exécution. INDRA est partie. Le Bénéficiaire ED'H doit relever tous les grands défis qui l'attendent dans la phase d'exploitation Pour assurer la pérennité des résultats du projet, nous recommandons au Bénéficiaire de :

- a. Signer un contrat de maintenance évolutive avec le Fournisseur des Systèmes.
- b. Mettre en place une structure adéquate pour gérer les systèmes (SGC, SGST et RMS). Cela implique la restructuration du département informatique, le recrutement d'un personnel compétent et la formation de ce personnel afin qu'il

- prenne effectivement en charge l'exploitation et la maintenance des systèmes ainsi que la gestion de la Base de Données Commerciales et Techniques.
- c. Assurer la formation continue des utilisateurs finaux des systèmes.
 - d. Sensibiliser tout le personnel de l'Entreprise sur les avantages des nouveaux systèmes.

Leçons apprises.

7.14 Dans la mesure où on considère le PREPSEL comme un projet pilote, nous pouvons tirer de cette expérience, les leçons suivantes. Pour tout nouveau projet :

- a. Il est nécessaire que le bénéficiaire soit impliqué dès le début. La première tâche est de définir l'Equipe du Bénéficiaire qui servira d'interface avec l'Equipe de la Banque en charge du Projet. Cette Equipe doit être nommée officiellement par le Conseil de direction du Bénéficiaire.
- b. Le Conseil de Direction doit s'approprier du projet. Il doit s'engager à prendre toutes les mesures nécessaires pour faire avancer le projet. On doit prévoir un budget pour organiser des retraites périodiques sur l'évolution du projet. Le Conseil de Direction doit y participer et au cours desquelles il doit réaffirmer son engagement à faire avancer le projet.
- c. Il faut une communication intense avec le niveau le plus bas de l'entreprise pour expliquer le projet et les changements qu'il va induire. La communication ne doit pas se faire seulement au niveau des cadres supérieurs. Les employés de soutien sont ceux qui exécutent au jour le jour le travail et pour bien le faire, il faut qu'ils le comprennent et se l'approprient.
- d. Pour certains projets, il est important de s'assurer que le personnel utilisateur final ait la capacité intellectuelle requise pour absorber la formation ou le transfert de technologie liée à l'implantation du nouveau système.
- e. Il faut prévoir une supervision externe de toutes les activités du projet. On ne peut pas compter sur l'Unité Technique de Projet pour cette activité, lorsque cette Unité est formée uniquement de cadres Bénéficiaires du Projet.

Le Bailleur et le Bénéficiaire doivent définir conjointement un cadre pour gérer l'Après projet.

Annex 8. Overview of the Haiti Energy and Electricity Sectors

Key Facts and Energy Balance

In 2011, Haiti's annual primary energy consumption was 2.7 million tons of oil equivalent (Mtoe), the lowest per capita consumption of the LAC region (0.22 toe/cap.). After particular energy consumption in 2010 due to the earthquake, the 2011 consumption went back around the 2009 level. The repartition among different energy uses is fairly constant since the last decade, among industries (17%), transports (19%), households (62%, mainly for cooking) and Commercial / Public services (2%).

The country's energy mix is composed of wood fuels (72%), imported oil products (25%) and hydroelectricity (3%). Oil products imports represent half of the country's expenses. Local energy resources, partially or totally untapped, are mainly on hydroelectricity (potential estimated between 150 MW and 270 MW), wind (at least 50 MW potential, according to a wind study conducted by the EU in 2006), lignite (proven reserves of 54 Mt, with a poor calorific content) and solar (average horizontal irradiance of 5 kWh/m².day, only local renewable energy source available for some rural areas).

Power Sector

The Power sector consumes about 20% of Haiti's fuel imports (diesel and HFO) to generate the large majority of the electricity produced in the metropolitan area. The table 1 below summarizes the generation capacity in Haiti for each type of fuel, in the metropolitan area and the 10 smaller grids. The low available capacity is due to insufficient maintenance and aging plants.

Table 1: Generation capacity

Interconnected system in Port-au-Prince			Secondary systems in the provinces		
(in MW)	Installed Capacity	Available Capacity		Installed Capacity	Available Capacity
Diesel	107.5	49	Diesel	38.1	26.3
HFO	64	32	HFO	27.2	25.5
Hydro	54	26	Hydro	6.9	2.8
Total	225.5	157	Total	72.2	54.6

Source: Tetra Tech, March 2012

Four IPPs own and operate 80% of the thermal plants in the metropolitan area: PBM (34MW HFO), Sogener (36MW Diesel, 20MW HFO), Haytian Tractor (21MW Diesel) and E-Power (30MW HFO). The capacity in the provinces is mainly operated by the state power company EDH and the small communities.

The metropolitan zone's power grid comprises (i) a 56 km transmission line (115 kV) from the Peligre hydropower plant to Port-au-Prince, (ii) a dispatch center operated manually and interconnecting three power plants by a 69 kV transmission line of 53 km, (iii) 9 substations transforming in 69 kV in distribution voltage, and (iii) 32 distribution

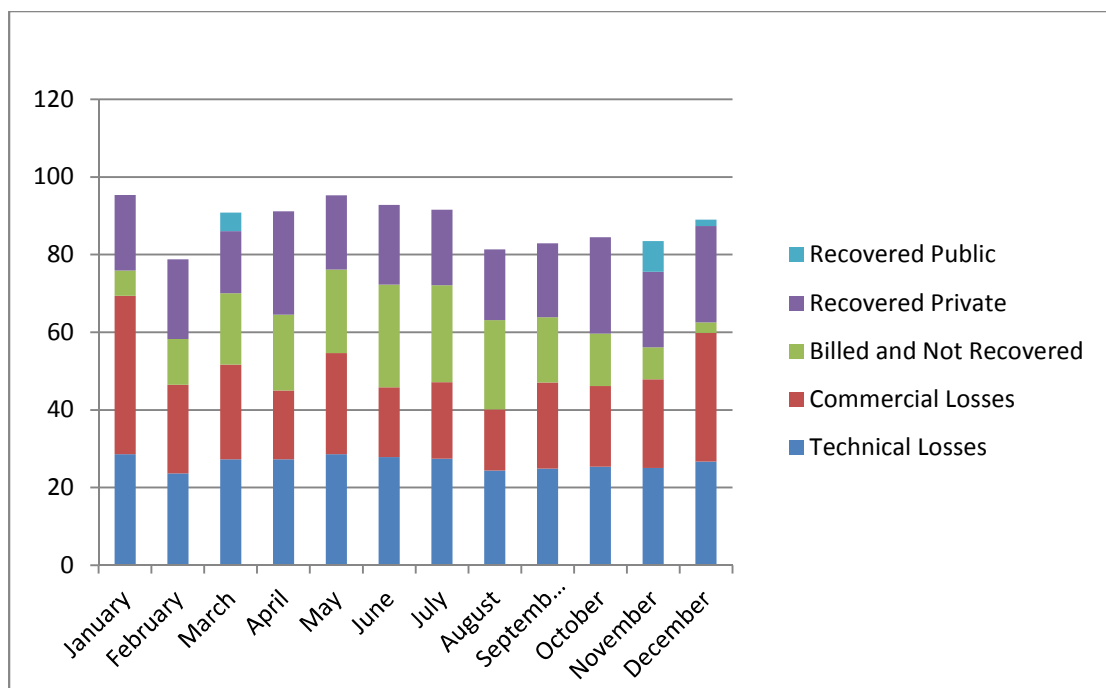
circuits totalizing 1,029 km and transforming 12.5-7.3 kV in 120-240 V. Punctual and structural overloads of some distribution lines and of the most part of the transformers are adding to their increased fragility since the earthquake and lead to a 30% average rate of technical losses on this grid.

According to EDH as of December 2013, the number of active customers (connected legally and paying bills) was 224,344; this number represents the 12% of the country's population who is legally electrified (electrification rate of 28% representing about 300,000 customers). The 1,270 industrial customers represent about 40% of the power demand.

Energy Balance and Losses

During the fiscal year 2012/13 (Oct. 2012-Sept. 2013), the total energy generated in Haiti was about 1,056 GWh. Graph 1 below shows the energy dispatch during this period of time:

Graph 1: Energy generated, Losses and collection in 2013 (in GWh)



Source: EDH, March 2014

Revenues generated by EDH from the energy collected represented USD 76 million during the fiscal year 2012/2013. The total losses represent USD 235 million. In order to pay EDH USD 200 million expenditures over the same period (mainly for payment of the IPPs), a USD 180 million budgetary transfer to the public company was necessary.

Annex 9. List of Supporting Documents

Project Appraisal Document, Report No: 36364 – HT, June 29, 2006

AF Project Paper, Report No: 49402 –HA, July 29, 2009

Legal agreements

PPIAF Feasibility Study for a Management Contract of EDH (March 2005)

Haiti PPIAF Urban Market Study (June 2008)

Etudes PPIAF : Analyse pour les Etudes Environnementales; Option d'Achat d'Energie (2005).

Rapports d'Avancement des Enquêtes Commerciales pour la Mise a Jour de la Base de Données Clients de l'EDH, Septembre/Octobre 2011

PREPSEL Beneficiary Assessment, B. Pierre, C. Cange, February/March 2014

Mission reports, Experience Exchanges with EDESUR (Santo-Domingo, 26-28 June 2013) and EDF (Martinique, 01 to 05 July 2013)

UCP, Rapport de Clôture du PREPSEL March 2014

UGSE, various quarterly reports

Financial audits 2007-2013

HAITI PREPSEL

CENTRALES:

-  Centrale hydroélectrique > 1 MW
-  Centrale hydroélectrique < 1 MW
-  Centrale thermique grands réseaux
-  Centrale thermique petits réseaux
-  Centrale assistée
-  Poste de répartition
-  Éolienne

RÉSEAUX:

-  23 Kv
-  69 Kv
-  115 Kv

ARTIBONITE

Région Électricité d'Haïti

-  Capitale de la République
-  Capitale de département
-  Villes et villages
-  Frontières internationales
-  Limites départementales
-  Réseau routier



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