Document of
The World Bank

Report No: ICR0000628

IMPLEMENTATION COMPLETION AND RESULTS REPORT
(JPN-25959 IBRD-70820 MULT-50016)

ON A

LOAN
IN THE AMOUNT OF
US$ 23.0 MILLION

AND A

GLOBAL ENVIRONMENTAL FACILITY GRANT
IN THE AMOUNT OF US$ 2.84 MILLION

TO THE

REPUBLIC OF ECUADOR

FOR A

POWER AND COMMUNICATIONS SECTORS MODERNIZATION AND RURAL SERVICES PROJECT (PROMEC)

December 16, 2008

Sustainable Development Department
Bolivia, Ecuador, and Peru Country Management Unit
Latin America and Caribbean Region

CURRENCY EQUIVALENTS
Exchange Rate Effective December 2008
Currency Unit = US$

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

ANDINATEL	Fixed line telecommunications operator in the Andean region
CAS	Country Assistance Strategy
CDM	Clean Development Mechanism
CENACE	Centro Nacional de Control de Energía (National Center for Energy Control)
CONAM	Consejo Nacional de Modernización (National Council for Modernization)
CONATEL	Consejo Nacional de Telecomunicaciones (National Telecommunications Council)
CONELEC	Consejo Nacional de Electricidad (National Council of Electricity)
ESCO	Energy Services Company
FERUM	Fondo de Electrificación Rural y Urbano Marginal (Rural and Marginal Urban Electrification Fund)
FODETEL	Fondo de Telefonia Rural (Rural Telephony Fund)
GHGs	Greenhouse Gases
ICR	Implementation Completion and Results Report
ICT	Information and Communication Technology
IDB	Inter-American Development Bank
ISR	Implementation Status Results and Report
MER	Ministry of Electricity and Renewable Energy (created 2007)
MEM	Ministry of Energy and Mines (eliminated 2007)
MIC	Ministry of Industry and Competitiveness (created 2007)
MICIP	Ministry of Commerce, Industry and Fisheries (eliminated 2007)
MSBs	Micro & Small Businesses
PACIFICTEL	Fixed line telecommunications operator in the coastal region
PAD	Project Appraisal Document
PDO	Project Development Objective
PERTAL	Public Enterprise Reform Technical Assistance Loan
PPF	Project Preparation Facility
PROMEC	Power and Communications Sectors Modernization and Rural Services Project
RET	Renewable Energy Technology
SENATEL	Secretaria Nacional de Telecomunicaciones (National Telecommunications Secretariat)
SENPLADES	Secretaria Nacional de Planificación y Desarrollo del Estado (National Planning and State Development Secretariat)
SUPTEL	Superintendencia de Telecomunicaciones (Superintendency of Telecommunications)
TOR	Terms of Reference
UEP	Public Enterprise Reform Unit, SENPLADES/CONAM
UNFCCC	United Nations Framework Convention on Climate Change

Vice President:	Pamela Cox
Country Director:	Carlos Felipe Jaramillo
Sector Manager:	Philippe Charles Benoit
Project Team Leader:	Susan V. Bogach
ICR Team Leader:	Susan V. Bogach

ECUADOR
Power and Communications Sectors Modernization and Rural Services Project (PROMEC)

CONTENTS

A. Basic Information

Country:	Ecuador	Project Name:	Power and Communications Sectors Modernization and Rural Services Project (PROMEC)
Project ID:	P063644,P072527	L/C/TF Number(s):	IBRD-70820,TF-25959,TF-50016
ICR Date:	12/30/2008	ICR Type:	Core ICR
Lending Instrument:	SIL,SIL	Borrower:	REPUBLIC OF ECUADOR
Original Total Commitment:	USD 23.0M,USD 2.8M	Disbursed Amount:	USD 17.2M,USD 2.4M
Environmental Category: B,B		**Focal Area**: C	
Implementing Agencies: CONAM (now SENPLADES)			
Cofinanciers and Other External Partners:			

B. Key Dates

Power and Communications Sectors Modernization and Rural Services Project (PROMEC) - P063644

Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	01/24/2002	Effectiveness:	04/08/2003	04/08/2003
Appraisal:	03/25/2002	Restructuring(s):		
Approval:	05/30/2002	Mid-term Review:		09/27/2004
		Closing:	06/30/2006	06/30/2008

Power and Communications Sectors Modernization and Rural Services Project - PROMEC - P072527

Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	01/15/1998	Effectiveness:		08/15/2001
Appraisal:	04/10/2000	Restructuring(s):		
Approval:	04/17/2001	Mid-term Review:		09/27/2004
		Closing:	06/30/2006	06/30/2008

C. Ratings Summary	
C.1 Performance Rating by ICR	
Outcomes	Moderately Satisfactory
GEO Outcomes	Satisfactory
Risk to Development Outcome	Moderate
Risk to GEO Outcome	Low or Negligible
Bank Performance	Moderately Satisfactory
Borrower Performance	Moderately Satisfactory

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

C.3 Quality at Entry and Implementation Performance Indicators			
Power and Communications Sectors Modernization and Rural Services Project (PROMEC) - P063644			
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		

Power and Communications Sectors Modernization and Rural Services Project - PROMEC - P072527			
Implementation Performance	**Indicators**	**QAG Assessments (if any)**	**Rating:**
Potential Problem Project at any time (Yes/No):	No	Quality at Entry (QEA)	None
Problem Project at any time (Yes/No):	No	Quality of Supervision (QSA)	None
GEO rating before Closing/Inactive Status	Moderately Satisfactory		

D. Sector and Theme Codes

Power and Communications Sectors Modernization and Rural Services Project (PROMEC) - P063644		
	Original	**Actual**
Sector Code (as % of total Bank financing)		
Central government administration	66	77
District heating and energy efficiency services	2	1
Information technology	11	6
Power	10	13
Telecommunications	11	3
Theme Code (Primary/Secondary)		
Climate change	Primary	Primary
Other financial and private sector development	Primary	Primary
Pollution management and environmental health	Primary	Primary
Regulation and competition policy	Primary	Primary

Power and Communications Sectors Modernization and Rural Services Project - PROMEC - P072527		
	Original	**Actual**
Sector Code (as % of total Bank financing)		
District heating and energy efficiency services	43	30
Information technology	19	
Power	19	70
Telecommunications	19	
Theme Code (Primary/Secondary)		
Climate change	Primary	Primary
Other financial and private sector development	Primary	Secondary
Rural services and infrastructure	Primary	Primary

E. Bank Staff

Power and Communications Sectors Modernization and Rural Services Project (PROMEC) - P063644		
Positions	**At ICR**	**At Approval**
Vice President:	Pamela Cox	David de Ferranti
Country Director:	Carlos Felipe Jaramillo	Isabel M. Guerrero
Sector Manager:	Philippe Charles Benoit	Susan G. Goldmark
Project Team Leader:	Susan V. Bogach	Philippe J-P. Durand
ICR Team Leader:	Susan V. Bogach	
ICR Primary Author:	Susan V. Bogach	
	Thomas Edward Haven	
	Karen Bazex	
	Fernando Lecaros	

Power and Communications Sectors Modernization and Rural Services Project - PROMEC - P072527		
Positions	**At ICR**	**At Approval**
Vice President:	Pamela Cox	David de Ferranti
Country Director:	Carlos Felipe Jaramillo	Isabel M. Guerrero
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	Fernando Lecaros	

F. Results Framework Analysis

Project Development Objectives (from Project Appraisal Document)
The Project will support the Government's efforts to deepen reforms in the telecommunications and electricity sectors, by strengthening regulatory institutions and improving environmental management of the sectors' activities, fostering competition and increasing private participation, promoting efficient use of energy, extending coverage in underserved areas and providing modern information and communication technologies (ICT)-supported services to micro and small businesses (MSBs), and enhancing communication and consultation in the sectors. (Note that the PDO in the Loan Agreement has some differences.)

Revised Project Development Objectives (as approved by original approving authority)
The PDO was not revised nor were the key indicators. However, several modifications were made to the core final outcome indicators in the legal agreement in December, 2006, at the request of the Borrower. None of these changes affected the Project

Development Objective or outcomes. Changes were made to the indicators for several reasons. First, the Baseline year was updated from 2000 to 2002 the baseline data and targets revised accordingly. Second, because of delays in implementation, the targets for a few of original core indicators were reduced. Third, an alternative indicator of the intended outcome was proposed by the implementing agency and accepted as technically valid. The changes made in 2006 are summarized in Section 1.4 below.

Global Environment Objectives (from Project Appraisal Document)
The GEF-funded components would promote private financing and management of projects to reduce greenhouse gas emissions, by removing barriers to the use of: (i) renewable energy technologies (RET) to extend electricity supply in rural areas; and (ii) energy efficiency measures.

Revised Global Environment Objectives (as approved by original approving authority
The GEO was not revised. However, a modification was made to the key indicator in December, 2006, at the request of the Borrower. The end year target for carbon dioxide emission reduction was reduced from 80,000 to 17,000 tons, based on mainly on results expected from the energy audit component. It should be noted that the Project exceeded the original target before closing due to the highly successful activities to promote compact fluorescent (CFL) bulbs.

(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 :	Number of thousand subscribers per SUPTEL employee			
Value (quantitative or Qualitative)	14.0 [In 2006, this baseline was revised up from a 2001 value of 8.8 to a 2002 value of 14.0]	14	17	48.7
Date achieved	12/31/2002	12/31/2005	12/31/2006	06/30/2008
Comments (incl. % achievement)	286 percent			
Indicator 2 :	Aggregate timeliness of CONELEC in completing selected regulatory tasks as established in its procedures (percent)			
Value (quantitative or Qualitative)	80	95	100	100
Date achieved	12/31/2002	12/31/2005	12/31/2006	06/30/2008
Comments (incl. % achievement)	100 percent			
Indicator 3 :	Timely presentation of CENACE transaction settling and billing information to Agents (percent). (Number of monthly requests p resented on time/Aggregate number of monthly requests)			

Value (quantitative or Qualitative)	80 hours	6 hours	100 percent	100 percent
Date achieved	08/31/2000	12/31/2005	12/31/2006	06/30/2008
Comments (incl. % achievement)	100 percent; Indicator units were revised in 2006 from hours of response time to percentage of requests on time.			
Indicator 4 :	Traffic in project-financed telecenters (minutes/day)			
Value (quantitative or Qualitative)	0	32	32	0
Date achieved	12/31/2002	12/31/2005	11/05/2007	06/30/2008
Comments (incl. % achievement)	0 percent: Contract was cancelled by CONATEL in June 2008, telecenters are not in operation.			
Indicator 5 :	Cumulative number of MSBs that have used business services from Micronet			
Value (quantitative or Qualitative)	0	30,000	8,000	513
Date achieved	12/31/2002	12/31/2005	11/05/2007	06/30/2008
Comments (incl. % achievement)	6.4 percent: Three Micronet centers were operating--the number of users increased rapidly from 513 users at end of June 200 8 to 1,315 users by end September 2008.			
Indicator 6 :	Number of electrified households in pilot project areas			
Value (quantitative or Qualitative)	0	2220	2000	1741
Date achieved	12/31/2002	12/31/2005	11/05/2007	06/30/2008
Comments (incl. % achievement)	87 percent. This includes 1346 households in PROMEC financed pilots and 395 households that received electricity after PROME C prepared the projects and secured other financing.			
Indicator 7 :	Reduction in energy consumption of users participating in energy efficiency pilot projects (percent)			
Value (quantitative or Qualitative)	0	38	15	32
Date achieved	12/31/2002	12/31/2005	11/05/2007	06/30/2008
Comments (incl. % achievement)	213 percent of revised 2006 target. Pilot projects were implemented successfully. Follow-up activities already underway unde r National Development Plan.			

(b) GEO 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 :	Actual thousand tons of CO2 reduced through the implementation of demostration projects (renewable energy-based rural electri fication and end-use energy efficiency.			
Value (quantitative or Qualitative)	0	80	17.2	93.1
Date achieved	12/31/2002	12/31/2007	11/05/2007	06/30/2008
Comments (incl. % achievement)	116 percent of original (not revised) target value. In next five years, cumulative total expected to be 407,000 tons from use of compact fluorescent lamps alone.			

(c) 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 :	n.a.			
Value (quantitative or Qualitative)	n.a.	n.a.	n.a.	n.a.
Date achieved				
Comments (incl. % achievement)				

G. Ratings of Project Performance in ISRs

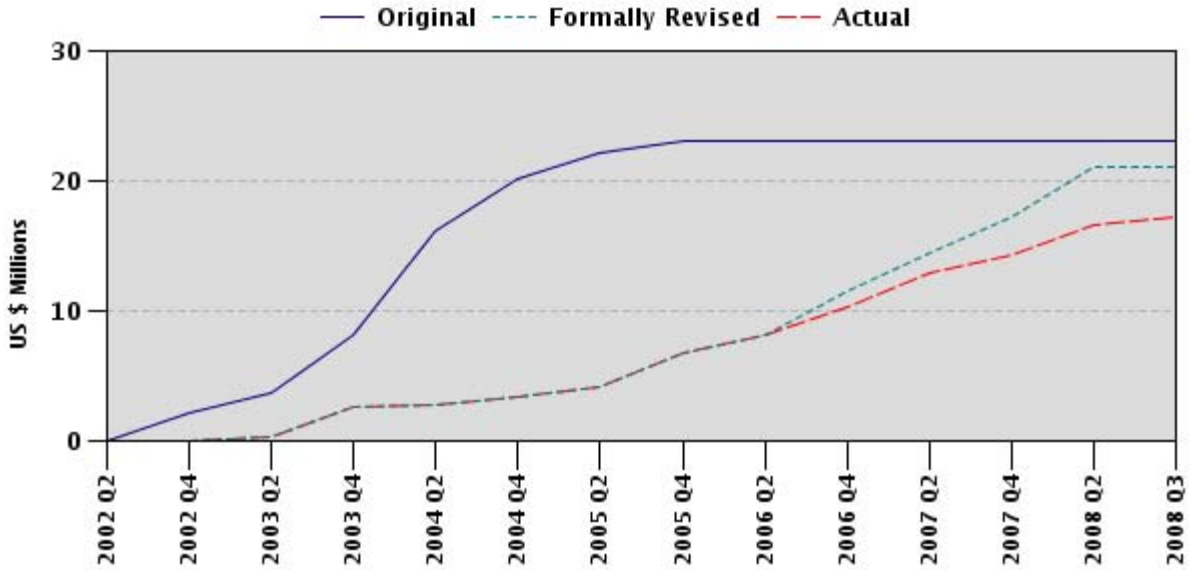
-						
No.	Date ISR Archived	DO	GEO	IP	Actual Disbursements (USD millions)	
					Project 1	Project 2
1	05/24/2002	S	S	S	0.00	0.00
2	11/25/2002	S	S	S	0.28	0.10
3	02/11/2003	S	S	S	2.41	0.10
4	06/12/2003	S	S	S	2.58	0.10
5	12/09/2003	S	S	S	2.74	0.05
6	02/26/2004	S	S	S	2.92	0.09
7	06/24/2004	S	S	U	3.38	0.09
8	11/22/2004	S	S	U	3.95	0.15
9	04/11/2005	S	MS	MS	6.07	0.45
10	06/29/2005	S	MS	MS	6.74	0.59
11	09/05/2005	S	MS	MS	6.74	0.68
12	02/21/2006	S	MS	MS	8.83	0.94
13	06/29/2006	S	MS	MS	10.26	1.20
14	12/01/2006	S	MS	MS	12.53	1.40
15	06/22/2007	MS	MS	MS	14.38	1.75
16	12/04/2007	MS	MS	MS	16.58	2.31
17	06/25/2008	MS	MS	MS	17.16	2.41

H. Restructuring (if any)

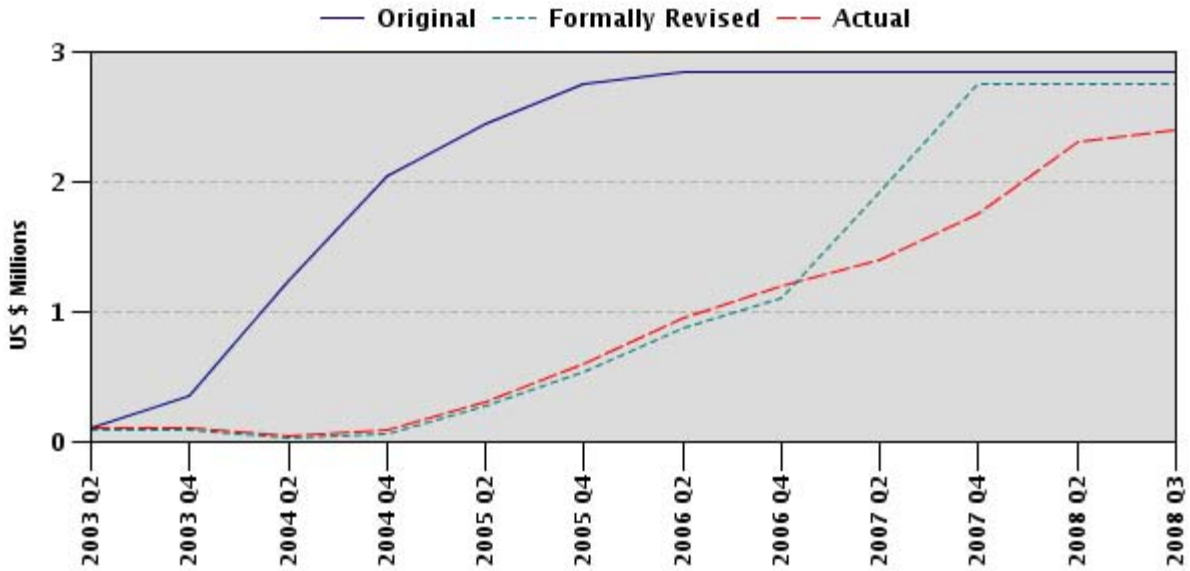
Not Applicable

I. Disbursement Profile

P063644



P072527



A. Basic Information			
Country:	Ecuador	Project Name:	Power and Communications Sectors Modernization and Rural Services Project (PROMEC)
Project ID:	P063644, P072527	L/C/TF Number(s):	IBRD-70820, TF-25959,TF-50016
ICR Date:	12/16/2008	ICR Type:	Core ICR
Lending Instrument:	SIL, GEF Grant	Borrower:	REPUBLIC OF ECUADOR
Original Total Commitment:	USD 23.0M, USD 2.8M	Disbursed Amount:	USD 17.14M, USD 2.41M
Environmental Category: B,B		**Focal Area**: C	

Implementing Agencies:
CONAM until March 2007, then SENPLADES.
Other agencies: National Electricity Council (CONELEC), National Center for Electricity Control (CENACE), National Telecommunications Council (CONATEL), Superintendence of Telecommunications (SUPTEL), Ministry of Energy and Mines/ Ministry of Electricity and Renewable Energy (MEM/MER), Ministry of Trade and Industry/Ministry of Industry and Competitiveness (MICIP/MIC)

Cofinanciers and Other External Partners: N/A

B. Key Dates

Power and Communications Sectors Modernization and Rural Services Project (PROMEC) - P063644

Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	01/25/1999	Effectiveness:	09/25/2002	09/25/2002
Appraisal:	08/06/2001	Restructuring(s):	n.a.	n.a.
Approval:	11/20/2001	Mid-term Review:	n.a.	09/27/2004
		Closing:	06/30/2006	06/30/2008

Power and Communications Sectors Modernization and Rural Services Project (PROMEC) - P072527

Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	11/14/2000	Effectiveness:	08/14/2002	09/25/2002
Appraisal:	08/06/2001	Restructuring(s):	n.a.	n.a.
Approval:	11/20/2001	Mid-term Review:	n.a.	09/27/2004

		Closing:	06/30/2006	06/30/2008

C. Ratings Summary	
C.1 Performance Rating by ICR	
Outcomes	Moderately Satisfactory
GEO Outcomes	Satisfactory
Risk to Development Outcome	Moderate
Risk to GEO Outcome	Negligible to Low
Bank Performance	Moderately Satisfactory
Borrower Performance	Moderately Satisfactory

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

C.3 Quality at Entry and Implementation Performance Indicators			
Power and Communications Sectors Modernization and Rural Services Project (PROMEC) - P063644			
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		

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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
GEO rating before Closing/Inactive Status	Moderately Satisfactory		

D. Sector and Theme Codes		
Power and Communications Sectors Modernization and Rural Services Project (PROMEC) - P063644		
	Original	**Actual**
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Central government administration	66	77
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Telecommunications	11	3
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Climate change	Primary	Primary
Other financial and private sector development	Primary	Primary
Pollution management and environmental health	Primary	Primary
Regulation and competition policy	Primary	Primary

Power and Communications Sectors Modernization and Rural Services Project - PROMEC - P072527		
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Sector Code (as percent of total Bank financing)		
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Power	19	70
Telecommunications	19	
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Rural services and infrastructure	Primary	Primary

E. Bank Staff		
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Positions	**At ICR**	**At Approval**
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Revised Project Development Objectives (as approved by original approving authority)

The PDO was not revised nor were the key indicators. However, several modifications were made to the core final outcome indicators in the legal agreement in December, 2006, at the

request of the Borrower. None of these changes affected the Project Development Objective or outcomes. Changes were made to the indicators for several reasons. First, the Baseline year was updated from 2000 to 2002 the baseline data and targets revised accordingly. Second, because of delays in implementation, the targets for a few of original core indicators were reduced. Third, an alternative indicator of the intended outcome was proposed by the implementing agency and accepted as technically valid. The changes made in 2006 are summarized in Section 1.4.

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The GEF-funded components would promote private financing and management of projects to reduce greenhouse gas emissions, by removing barriers to the use of: (i) renewable energy technologies (RET) to extend electricity supply in rural areas; and (ii) energy efficiency measures.

Revised Global Environment Objectives (as approved by original approving authority)

The GEO was not revised. However, a modification was made to the key indicator in December, 2006, at the request of the Borrower. The end year target for carbon dioxide emission reduction was reduced from 80,000 to 17,000 tons, based on mainly on results expected from the energy audit component. It should be noted that the Project exceeded the original target before closing due to the highly successful activities to promote compact fluorescent (CFL) bulbs.

(a) PDO Core 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 thousand subscribers per SUPTEL employee			
Value (quantitative or Qualitative)	14.0	14.0	17.0	48.7
Date achieved	12/31/2002	12/31/2005	12/31/2006	06/30/2008
Comments (incl. percent achievement)	286 percent.			
Indicator 2 :	Aggregate timeliness of CONELEC in completing selected regulatory tasks as established in its procedures (percent)			
Value (quantitative or Qualitative)*	80	95	100	100
Date achieved	12/31/2002	12/31/2005	12/31/2006	06/30/2008
Comments (incl. percent achievement)	100 percent.			
Indicator 3 :	Timely presentation of CENACE transaction settling and billing information			

	(percent). (Number of monthly requests presented on time/Aggregate number of monthly requests)			
Value (quantitative or Qualitative)	80 hours	6 hours	100 percent	100 percent
Date achieved	08/31/2000	12/31/2005	12/31/2006	06/30/2008
Comments (incl. percent achievement)	100 percent; Indicator units were revised in 2006 from hours of response time to percentage of requests on time.			
Indicator 4 :	Traffic in project-financed telecenters (minutes/day)			
Value (quantitative or Qualitative)	0	32	32	0
Date achieved	12/31/2002	12/31/2005	11/05/2007	06/30/2008
Comments (incl. percent achievement)	0 percent: Contract was cancelled by CONATEL June 2008, telecenters are not in operation.			
Indicator 5 :	Cumulative number of micro and small businesses that have used ICT business services from Micronet			
Value (quantitative or Qualitative)	0	30,000	8,000	513
Date achieved	12/31/2002	12/31/2005	11/05/2007	06/30/2008
Comments (incl. percent achievement)	6.4 percent: Three Micronet centers were operating--the number of users increased rapidly from 513 users at end of June 2008 to 1315 users by end September 2008.			
Indicator 6 :	Number of electrified households in pilot project areas			
Value (quantitative or Qualitative)	0	2220	2000	1741
Date achieved	12/31/2002	12/31/2005	11/05/2007	06/30/2008
Comments (incl. percent achievement)	87 percent. This includes 1346 households in PROMEC financed pilots and 395 households that received electricity after PROMEC prepared the projects and secured other financing.			
Indicator 7 :	Reduction in energy consumption of users participating in energy efficiency pilot projects (percent)			
Value (quantitative or Qualitative)	0	38	15	32
Date achieved	12/31/2002	12/31/2005	11/05/2007	06/30/2008
Comments (incl. percent achievement)	213 percent of revised 2006 target. Pilot projects were implemented successfully. Follow-up activities prioritized in the National Development Plan are already underway.			

(b) GEO 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 :	Actual thousand tons of CO2 reduced through the implementation of demonstration projects (renewable energy-based rural electrification and end-use energy efficiency).			
Value (quantitative or Qualitative)	0	80	17.2	93.1
Date achieved	12/31/2002	12/31/2007	11/05/2007	09/30/2007
Comments (incl. percent achievement)	116 percent of original (not revised) target value. In next five years, cumulative total expected to be 407,000 tons from use of compact fluorescent lamps alone.			

G. Ratings of Project Performance in ISRs

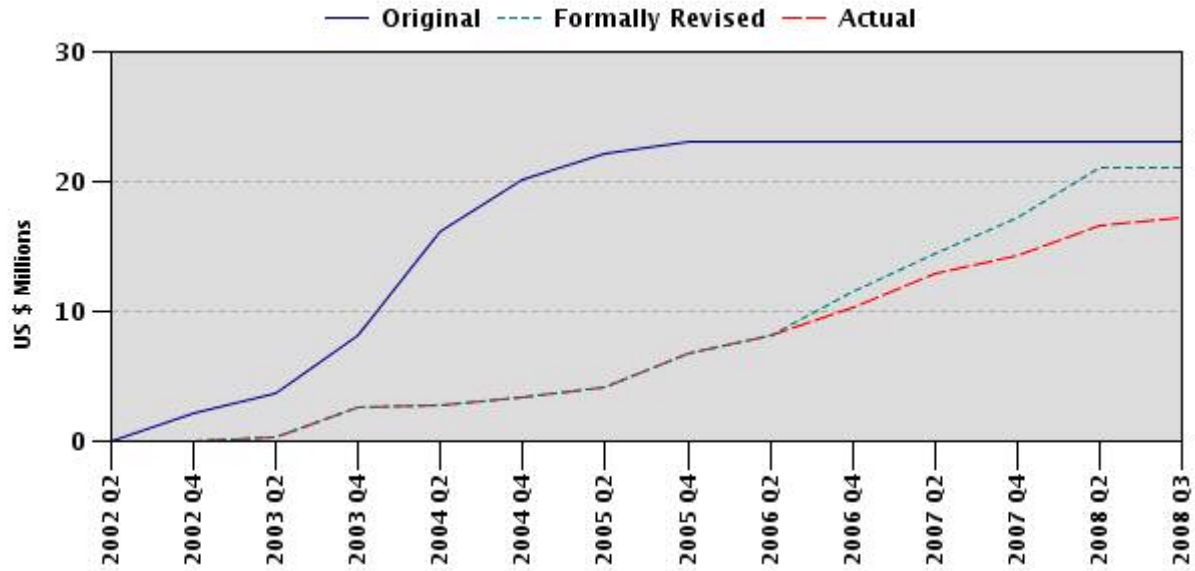
-						
No.	Date ISR Archived	DO	GEO	IP	Actual Disbursements (USD millions)	
					Project 1	Project 2
1	05/24/2002	S	S	S	0.00	0.00
2	11/25/2002	S	S	S	0.28	0.10
3	02/11/2003	S	S	S	2.41	0.10
4	06/12/2003	S	S	S	2.58	0.10
5	12/09/2003	S	S	S	2.74	0.05
6	02/26/2004	S	S	S	2.92	0.09
7	06/24/2004	S	S	U	3.38	0.09
8	11/22/2004	S	S	U	3.95	0.15
9	04/11/2005	S	MS	MS	6.07	0.45
10	06/29/2005	S	MS	MS	6.74	0.59
11	09/05/2005	S	MS	MS	6.74	0.68
12	02/21/2006	S	MS	MS	8.83	0.94
13	06/29/2006	S	MS	MS	10.26	1.20
14	12/01/2006	S	MS	MS	12.53	1.40
15	06/22/2007	MS	MS	MS	14.38	1.75
16	12/04/2007	MS	MS	MS	16.58	2.31
17	06/25/2008	MS	MS	MS	17.16	2.41

H. Restructuring (if any)

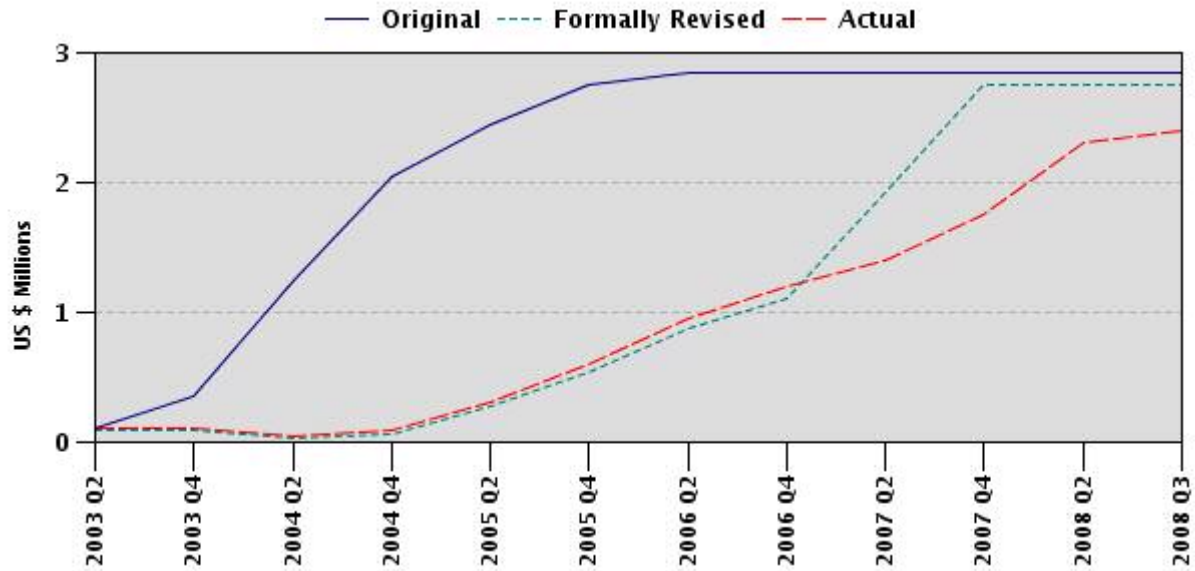
Not Applicable

I. Disbursement Profile

P063644



P072527



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1. Project Context, Development Objectives and Design

1.1 Context at Appraisal

a. Country Political and Economic Background. Political change characterized Ecuador during preparation and implementation of the PROMEC Project. During this period (2000-2008), there were five Presidents.[1] The Ecuadorian economy was weak throughout the 1990s, with falling GDP per capita and increasing public debt. This was exacerbated by external shocks and natural disasters in the late 1990s, finally resulting in Ecuador's default on payment of external debt in September 1999. That year, real GDP fell by over 7 percent while unemployment increased to over 16 percent and annual inflation to 60 percent. The economic crisis had a profound impact on the poor. The national poverty rate increased from 40 to 45 percent between 1990 and 2001, and the number of poor increased from 3.5 million to 5.2 million.

Under President Noboa, Congress approved laws implementing dollarization and Ecuador secured a restructuring of its foreign debt. After dollarization, the performance of the Ecuadorian economy strengthened. Real GDP growth averaged 4.7 percent per year in 2000-2006, compared to 1.7 percent annually in the 1990s. Annual economic growth increased to a high of 8 percent in 2004, then fell to 2.6 percent in 2007 and 2.5 percent in 2008.

In January 2007, President Correa took office after winning the November 2006 election. Under President Correa, a Constituent Assembly prepared a new Constitution that was approved in a referendum in late September 2008. High oil prices and improvements in tax collection have permitted significant increases in Government spending, including major commitments to investments in electricity and telecommunications infrastructure.[2]

b. Background of the Telecommunications and Electricity Sectors. *C*overage and quality of telecommunications services in Ecuador lagged far behind regional averages, with 9.1 main telephone lines per 100 inhabitants in 1999 (vs. 13.2 main telephone lines per 100 inhabitants for LAC) and 82 faults per 100 main telephone lines per year (vs. 20 faults per line in Bolivia and five in Mexico). National coverage of electricity was relatively high (80 percent of total population). However, in both sectors, rural coverage was low (rural areas had only 1.6 main telephone lines per 100 inhabitants and 45 percent of the rural population had no access to electricity in 1999), which accentuated the urban-rural poverty gap.

Ecuador initiated electricity and telecommunications reforms in the early 1990s, with the adoption of new sector legislation and regulations, the creation of regulatory and electricity wholesale market institutions, and the break-up of the national monopolies. The Bank provided support under the Public Enterprise Reform Technical Assistance Loan (PERTAL), which assisted the Government to prepare laws and create institutions with the aim of reforming both sectors. However, the initial effort to sell the regional telecommunications companies,

[1] Jamil Mahuad, July 1998 to January 2000, Gustavo Noboa, January 2000-January 2003, Lucio Gutierrez, January 2003-April 2005, Alfredo Palacios, April 2005-January 2007, Rafael Correa January 2007 to the present.

[2] Economist Intelligence Unit. Recent data on poverty levels is not available.

ANDINATEL and PACIFICTEL, failed. Privatization of these companies and electricity distribution companies has never taken place.

The PROMEC PAD was prepared after the closing of the PERTAL Project. The political environment during preparation and implementation was changing--support for reform, especially for privatization, was shrinking. For this reason, while the PAD maintains the objective and language of supporting the Government's reform program, the Project components and results framework were focused on pragmatic and achievable objectives—strengthening certain regulatory agencies and supporting efforts to increase the provision of rural services and energy efficiency.

According to the PAD, a number of issues in each sector needed to be addressed in order to improve efficiency and extend service coverage. In telecommunications, issues included: an incomplete legal and regulatory framework; insufficient institutional capacity and cumbersome regulatory setup; poor performance and financial weaknesses of the operators; and shortfalls of the previous privatization effort. In electricity, key issues were: gaps in the regulatory framework; weak institutional capacity; inadequate tariffs; sub-optimal investment in the sector; lack of access to electricity in rural areas; low level of implementation and monitoring of environmental guidelines; and inefficient use of energy.

Many of the structural and institutional issues identified during PROMEC preparation persisted throughout implementation. Constant political change undermined the ability of governments to resolve fundamental issues in both sectors.

c. Rationale for Bank Assistance. The 2000-02 Country Assistance Strategy (CAS) focused Bank assistance on three objectives: (i) increasing social services and safety nets for the poor; (ii) restoring macro-financial stability and economic growth (through, inter alia, expanding the role of the private sector); and (iii) promoting sustainable development and productivity by the poor (including improved environmental management and rural development). The PROMEC project contributed to objectives (ii) and (iii).

To contribute to the restoration of macro-financial stability and economic growth, the Project supported strengthening regulatory institutions, promoting energy efficiency and helped expand the provision of telecommunications, electricity, internet and business services in rural areas. To promote sustainable development and productivity of the poor, the Project supported the use of renewable energy for rural electrification and energy efficiency programs. The Project also supported the Government's action plan to improve the environmental management of activities in the electricity sector.

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

The Project Development Objective was to support the Government's efforts to deepen reforms in the telecommunications and electricity sectors, by strengthening regulatory institutions and improving environmental management of the sectors' activities, fostering competition and increasing private participation, promoting efficient use of energy, extending coverage in underserved areas and providing

modern information and communication technologies (ICT)-supported services to micro and small businesses, and enhancing communication and consultation in the sectors.[3]

Key indicators were defined in Section A of the PAD as follows (see also core numerical indicators defined in Annex 1 of the PAD and legal agreement):[4]

a. Regulatory and institutional development in the telecommunications and electricity sectors[5]

- Improved effectiveness of SUPTEL and the CONELEC to regulate the sectors, and undertake timely public consultations and dissemination of regulatory decisions.
- Completed environmental regulations and procedures in the electricity sector and strengthened capacity of CONELEC and other institutions including sector operators, to promote a better environmental management of sector activities.
- Establishment of a liberalized wholesale electricity market as shown by a greater number of private operators in the interconnected system, a larger volume of transactions and a more efficient administration of the wholesale market by CENACE.
- Increased number of private operators providing rural telecommunications decentralized rural electrification, energy efficiency services and ICT-based services to micro and small businesses.

b. Extension of rural electricity and telecommunications services

- Adoption of a sustainable strategy to extend electricity services, including efficient subsidization, financing and delivery mechanisms, and community participation.
- Successful completion of replicable pilot projects for rural telecommunications and electricity.

c. Expanded internet access and business services to micro and small businesses (MSB)

- Successful completion of a replicable pilot project for ICT-supported services to MSBs in urban and peri-urban areas, showing improvement in market outreach, competitiveness and growth.

d. Increased end-use energy efficiency

- Design and launching of a program to enhance efficiency in the use of energy.

[3] There are minor differences with the text of the PDO in the Legal Agreement, which i) includes renewable energy in the "promoting energy efficiency" clause; and ii) does not include the final clause on "enhancing communication and consultation in the sectors". This ICR uses the PDO of the PAD as it is more consistent with the results framework in Annex 1.

[4] In Annex 1 of the PAD, an additional core indicator was included for energy efficiency: GWh BBLF. This indicator was not in the legal agreement, nor tracked in the ISRs. Hence, it is omitted from this ICR's analysis.

[5] The telecommunications regulatory institutions are: (a) CONATEL, in charge of policy setting, awarding concessions, and major decisions; (b) SENATEL, the executive arm of CONATEL, that includes FODETEL, the universal service fund; and (c) SUPTEL, in charge of regulating and controlling operators. In electricity, CONELEC is the single regulatory agency that manages FERUM, the Rural Electrification Fund.

- Successful implementation of demonstration projects with good replicability prospects.

e. Implementation of effective public consultations and information mechanisms

- Systematic consultation and dissemination of regulatory and privatization decisions.
- Growing public consensus in support of the Government's sector reform and privatization program.

1.3 Original Global Environment Objectives (GEO) and Key Indicators (as approved)

The GEF-funded components would promote private financing and management of projects to reduce greenhouse gas emissions, by removing barriers to the use of: (i) renewable energy technologies to extend electricity supply in rural areas; and (ii) energy efficiency measures. Key indicators were:

- Actual tons of CO_2 reduced through the energy efficiency and renewable energy-based rural electrification programs.
- Estimated tons of CO_2 expected to be reduced through the implementation of subsequent energy efficiency projects and through use of renewable energy instead of fossil fuel-based rural electrification.
- Definition and adoption of a strategy, regulations and policies for the sustained development, with private participation, of (i) decentralized rural electrification, and (ii) enhanced energy efficiency.

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

The PDO was not revised nor were the key indicators. However, modifications were made to the core numerical indicators in the legal agreement in December 2006, for several reasons. First, the Baseline year was updated from 2000 to 2002 and some targets revised accordingly. Second, several of the original targets were reduced. Third, in one case, an alternative indicator of the intended outcome was adopted. The changes are summarized below.

- SUPTEL: number of subscribers per employee, the baseline was updated to 2002, and the targets revised upward accordingly.
- CONELEC: timeliness of response, the level of targets was increased to be consistent with CONELEC's Strategic Plan.
- CENACE: efficiency of transaction processing: indicator changed from average number of hours to the percentage of timely responses to requests for information of reconciliation and billing of accounts, on a monthly basis.
- Extension of Rural Services: the final target for number of households served with electricity was reduced from 2220 to 2000; and the final number of users of the business services pilot was reduced from 30,000 to 8,000, based on estimates of the business plan developed in implementation.
- Increasing End-use Efficiency: the final target for savings was reduced from 38 to 15 percent.

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

The GEO was not revised. However, a modification was made to the key GEF indicator in December 2006. The target for carbon emissions reduction at the end of the Project was reduced from 80,000 to 17,000 tons, based mainly on expected results of the energy audits. It should be noted that the Project exceeded the original target before closing, due to the successful CFL promotion activity.

1.6 Main Beneficiaries, original and revised

As intended, consumers and investors benefited from strengthened regulatory capacity in the electricity and telecommunication sectors. Citizens at large also benefited from the improved environmental management of resources. Residents of rural areas obtained increased access to modern telecommunications and electricity services, improving quality of life and offering additional opportunities for economic activity. Solar home systems were installed in the indigenous kishwa communities of Centro Sarayacu and Shiwacocha Sarayacu and Ponce Loma and Capirona in the Arajuno region, as well as in rural areas of Esmeraldas and Napo Sur. Micro and small businesses benefited from increased access to ICT services in Cuenca, Loja and Galapagos. At end September 2008, 1,315 clients had benefited from training offered in IT tools, use of the internet and preparation of business plans. Clients were artisans, owners of micro businesses, rural producers or students. The energy efficiency program performed energy audits in public buildings, hotels, hospitals and industries, helping identify opportunities for savings. However, because of the cancellation of the telecommunications pilot contract, rural households did not benefit from telecenter services.

1.7 Original Components (as approved)

Component A. Strengthening of Legal, Regulatory and Institutional Frameworks in the Power and Communications Sectors (IBRD US$ 10.3 million, corresponding to 43 percent of the loan).

This component aimed to improve supervisory, regulatory and technical capacity of the electricity and telecommunication regulatory agencies. A key assumption was that reinforcing these entities was an essential condition for sustainable improvement of infrastructure services and access in the urban and rural areas. It comprised the following sub-components.

A1. Strengthening of SUPTEL's supervisory and enforcement capacity
A2. Strengthening of CONELEC's regulatory capacity
A3. Improvement of CONELEC's environmental management of the Borrower's power sector
A4. Improvement of CENACE's electricity wholesale market administration

Component B. Extension of Power, Communications and Business Services to Rural and Peri-urban Areas Sectors (IBRD US$ 7.4 million, corresponding to 32 percent of the loan and GEF US$1.6, corresponding to 57 percent of the GEF grant.).

This component aimed to increase access to telecommunications, electricity and ICT-based business services to low income groups in rural and peri-urban areas. The implementation of

demonstration projects was seen as a way to test different models and ensure replicability of the models proposed. The component comprised the following sub-components.

B1. Rural Telecommunications Pilot Subprojects

B2. Development and implementation of the Ministry of Energy and Mines' (MEM) rural electrification program

B3. Carrying out of Rural Electrification Pilot Subprojects

B4. Development and implementation of Ministry of Industry, Commerce and Fisheries' (MICIP) program to bring information and communications development services to micro and small businesses in rural and peri-urban areas

Component C. Enhancement of Electricity End-use Efficiency (IBRD US$ 0.5 million, corresponding to 2 percent of the loan and GEF US$1.2, corresponding to 43 percent of the GEF grant.).

This component aimed to establish the technical and financial mechanisms needed to promote the efficient use of electricity at the individual and industry levels, remove barriers to efficiency enhancement and create related incentives. It comprised the following sub-components.

C1. Identifying barriers to efficiency enhancement, through surveys on electricity demand and efficiency enhancement options;

C2. Determining of strategies and policies to remove such barriers

C3. Carrying out Electricity Efficiency Enhancement Pilot Subprojects

Component D. Project Communications, Coordination and Management (IBRD US$ 4.9 million, corresponding to 21 percent of the loan).

This component aimed to support (i) coordination and monitoring of the project through the financing of the SENPLADES/CONAM Project Coordination Unit.; and (ii) provide assistance to CONAM in carrying out a communication process with stakeholders (including civil society). Key assumptions was that sustainability of project results would only be achieved through ownership by the community and sector stakeholders. It comprised the following sub-components.

D1. Management and monitoring of the Project by CONAM

D2. Coordination of implementation of the Project by the Implementing Agencies

D3. Carrying out of communications and consultation campaigns with stakeholders and civil society organizations

1.8 Revised Components

Components were not revised during execution.

1.9 Other Significant Changes

a. Implementation Arrangements. The implementing agency, CONAM, was merged with the National Secretariat of Planning (SENPLADES) in early 2007. SENPLADES maintained the Project Coordinating Unit and staff and respected all aspects of the legal agreement. This facilitated a smooth transition, and implementation of the Project was not affected. The current Government made other changes in 2007: the Ministry of Electricity and Renewable Energy

(MER) was created and took over the energy efficiency and rural electrification activities from the former Ministry of Energy and Mines (MEM); and the Ministry of Industry and Competitiveness (MIC) was created and took over the ICT services for micro and small businesses (Micronet) from the former Ministry of Commerce, Industry and Fisheries (MICIP).

b. Partial Cancellation of IBRD Funds and Extensions of Closing Date. In September, 2006, at the request of the Ministry of Economy and Finance (MEF), the Bank approved the cancellation of US$2 million of the Bank loan (from contingencies) and an extension of 6 months, to December 31, 2006. An additional 12 month extension to December 31, 2007 was approved in September 2006. A third extension until June 30, 2008 was approved in December 2007. The extensions totaled two years, making the project life six years rather than the four envisaged at preparation.

c. Cancellation of the Contract for Rural Telecommunications Pilot (Telecenters). This pilot involved a 10-year build-own-operate-and-transfer (BOOT) contract with a private company for 1,120 rural telecenters offering telephone, internet and computer services. The contract was signed in September 2006 with a termination date of August 2007. It was cancelled by CONATEL in June 2008, after the Project had paid US$1 million of the US$4.15 million committed and the telecommunications operator reported installation of half of the telecenters. CONATEL's resolution authorizing the cancellation indicated that the operator failed to meet the technical specifications and comply with the deadlines for installation of the telecenters. The operator appealed the decision but CONATEL denied the appeal. The project team is not aware of any current attempts by the parties to resolve the disputes arising under the contract.

d. Actual versus Planned Use of Funds. Annex 1 compares the original cost estimates by component with actual costs, as of November 2008, although it should be noted that the original cost estimates include a contingency of 12.7 percent. After correcting for this difference, the total cost estimates are similar for most components. However, the Component of Extension of Rural Services had lower than expected expenditures because US$3.15 million of the US$4.15 million of the IBRD loan that was committed to the telecenter pilot was not disbursed due to the cancellation of the contract. Also, the energy efficiency activities were completed at less than expected cost because of the use of less costly local consultants, and a focus on promotion of use of efficient compact fluorescent bulbs.

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design and Quality at Entry

The PROMEC Project was prepared following completion of the Public Enterprise Reform Technical Assistance (PERTAL) Project, which closed in December 1999, with a satisfactory rating. However, as noted in Section 1.1, political support for reform was waning at the time of PROMEC preparation, resulting in a pragmatic design focused on regulatory strengthening, extension of rural services, and energy efficiency.

a. Consistency with CAS. As noted in Section 1.1, the Project was well aligned with the CAS at preparation.

b. Soundness of the Background Analysis. The Project built on studies completed under a Project Preparation Facility (PPF) that supported technical studies to prepare the institutional strengthening and pilot project activities (see Annex 2 for details).

c. Complex Design. The project design supported carefully targeted interventions, as opposed to sweeping sector reforms and privatization, but was complex as it included many subcomponents and indicators of outcomes. Implementation required a coordinating agency (CONAM, later SENPLADES), and six implementing agencies. Coordination was challenging. A contributing factor to delays was changing leadership in the different agencies resulting from changes in government. The three rural service pilots (telecenters, electricity and ICT business services (Micronet)) contributed most to implementation difficulties and delays. While cutting subcomponents and eliminating implementing agencies could have simplified the Project and made it easier to manage, narrowing the scope could have reduced opportunities for Bank/Government partnerships in the sector and affected political support for the Project. It is notable that Government support for PROMEC remained strong throughout changing governments, in contrast to other Bank Projects, mainly due to support from SENPLADES/CONAM and the implementing agencies.

d. Development Objective and Some Indicators Should Have Been Reformulated. There were two types of disconnects between the development objective/indicators and the activities to be supported by the Project. First, the introductory phrase "The Project would support the Government's efforts to deepen reform…" and the mention of sector reform in some indicators should have been reformulated given the nature of the sub-objectives and activities that were aimed not at reform but improving specific aspects of sector performance. Second, several objectives mentioned increased access to telecommunications and electricity service, while activities to be supported were pilot projects whose main rationale should have been more modestly defined to reflect an objective of increasing knowledge about what works and what does not.

e. Other problems. The background studies for the economic and financial analysis are not in the Project files, making it difficult to compare the efficiency of actual results with the planned results. Also, there are minor inconsistencies between the PAD and the Loan Agreement in terms of the PDO, project description, and indicators, the most significant of which is the inclusion of "communication and participation in the sectors" as part of the development objective in the PAD, while it is not included in the loan agreement.

2.2 Implementation

There were no major project changes or restructurings that affected objectives or outcomes. Issues encountered were: (a) delays in start-up; (b) cancellation of the contract for the telecommunications pilot (telecenters); (c) difficulties in developing a sustainable model for provision of ICT services to micro and small business (Micronet); (d) difficulties in implementation of the rural electrification pilots; and (e) change in implementation strategy of energy efficiency activities.

a. Delays in Startup. The Project became effective 11 months after Board approval, in September 2002. Due to slow initial execution, the implementation performance rating was downgraded to "unsatisfactory" in May 2004. After the mid-term review, progress of each implementing agency was evaluated against the agreed procurement schedule and coordination between CONAM, the implementing agencies and the Bank was intensified. By April 2005, there was an improvement in implementation and loan disbursements, and the project status was upgraded to "moderately satisfactory". However, the late start-up compressed time available to complete the rural service pilot activities. Delays and problems in implementation were particularly acute in the rural telecommunications pilot (telecenters), where the implementation agreement between CONAM and CONATEL was not signed until September and it then took two years to reach agreement on the bidding documents for the build-own-operate and transfer (BOOT) contract. As noted above, the Project ultimately was extended for 24 months, mainly to permit completion of the rural service pilots.

b. Cancellation of Contract for Rural Telecommunications Pilot (see Section 1.9).

c. Problems in Developing a Sustainable Model for ICT Services Pilot for Micro and Small Businesses (Micronet). Micronet was delayed first by the need to complete design studies and then by the need to mobilize private financing. SEDYMYPE, a company with public and private sector participation, was established to operate the Micronet only in late 2006. By June 30 2008, three Micronet centers were operating in Cuenca, Loja and Galapagos, with a small but rapidly growing numbers of users. However, SEDYMYPE remains fragile as several private sector investors defaulted on their initial commitment. The company has not raised enough private capital to ensure its viability during the initial years required to establish the business.

d. Difficulties in Implementation of the Rural Electrification Pilots. These pilots were particularly challenging as they required the introduction of new institutional arrangements for operation and maintenance of solar home systems in isolated rural communities, under the supervision of the distribution companies. The first institutional arrangement tried in Arajuno, an electricity junta formed specifically for the Project, failed and is now being reorganized. The second project, in Esmeraldas, made use of an existing community organization to manage the systems and has been more successful in establishing a sustainable model of service, with regular collection of payments and delivery of service. This model was replicated in the third pilot in Napo, with variations. A low level of commitment by the distribution companies remains a problem. The Government is considering organization of a corporation to manage rural electrification with renewable energy to address the problem.

e. Change in Implementation Strategy of Energy Efficiency. An initial delay of about two years was caused by the failure of the initial implementation strategy that aimed to undertake all energy efficiency activities through a single international consultancy, which was cancelled after failing to deliver. At the suggestion of the Project Unit, the work was then split up among several smaller, individual consultancies which were contracted locally. The change in strategy not only achieved the desired results, but had the additional benefit of strengthening local capacity for further implementation of energy efficiency activities, thus enhancing sustainability.

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

Some shortcomings were evident in the M&E design. First, there were many different indicators, as shown in section 1.2 (11 main qualitative indicators, 3 GEF qualitative indicators). Second, while the core numerical indicators included in Annex 1 of the PAD and in the legal agreement are only seven, they do not correspond well or provide good guidance to the achievement of the qualitative key indicators. For example, the indicators on energy efficiency and rural electrification measure direct outputs of the pilots but do not reflect well the intended outcomes as expressed by the qualitative indicators. On the other hand, the core indicators for regulatory strengthening are very broad; for example it is difficult to link the number of subscribers per SUPTEL employee directly to Project assistance. For these reasons, the discussion on achievement of outcomes focuses more on qualitative key indicators than the core numerical indicators included in the legal agreements.

Monitoring was the responsibility of each of the implementing agencies, under the guidance of the Project Coordinating Unit. As stipulated in the loan and grant agreements, the Project regularly supplied to the Bank a quarterly progress report, including an updated procurement plan, financial management report, and an update of results indicators. Monitoring indicators were used to inform decision-making and resource allocation in some activities. For example, data from the first rural electrification pilot project was used to enable better design of the community organization in the second and third pilots. In other activities, use of monitoring data was more limited for two reasons. First, some of the indicators measure the impact of single stage technical assistance activities. Second, late implementation of pilot rural service and energy efficiency sub-components resulted in late availability of indicators that limited their usefulness.

2.4 Safeguard and Fiduciary Compliance

The Project complied with World Bank safeguard policies as identified in the PAD: (i) Environmental Assessment (OP 4.01, BP 4.01, GP 4.01); and Indigenous Peoples (OP 4.02). It also fully complied with fiduciary requirements. Safeguards and fiduciary aspects were rated as satisfactory in aide memoires and ISRs. No significant issues were encountered.

a. Environmental Safeguards. Environmental screening was required for all pilot sub-projects prior to approval. If negative impacts were anticipated, then an environmental assessment was required. In the case of the rural electrification, partial assessments were developed in order to ensure good environmental practices for aspects such as the disposal of batteries of the solar home systems. Regarding the ICT business service centers (Micronet), and energy efficiency sub-projects, it was concluded that no assessments were needed since they were developed in existing facilities. The Project also financed some hydroelectric studies, which included adequate environmental assessments. Screenings and assessments were reviewed and approved by the Bank environmental specialist in Quito. Moreover, the Project supported CONELEC's certification to evaluate and license the environmental impact of electricity projects. This will help ensure that future projects in the sector meet adequate environmental standards.

b. Social Safeguards. As with environment noted above, a social screening was required and carried out for all pilot projects. The analyses conducted more than met the Bank's social safeguards requirements. The Project Unit systematically incorporated communication,

participation and consultation in project implementation, especially in rural pilot activities, and documented the process. The Bank's social specialist in Quito noted that this had no precedent in Ecuador and was best practice. For example, the implementation of the rural electrification pilots included consultation with rural communities and indigenous populations prior to the Project activities, and their involvement in the operation and management of solar home systems.

c. Financial Management and Audits. Financial management was satisfactory, aided by centralization of project administration in the hands of experienced staff, combined with stability of staff and use of the SIGEF information system. Even though the Project involved six implementing agencies, requiring coordination activities and resulting in minor shortcomings in financial management, the Project provided timely and reliable financial information. Audits did not identify reportable conditions and unqualified opinions were submitted. Furthermore, financial monitoring reports were delivered in timely fashion and recommendations were implemented on an ongoing basis.

d. Procurement. The Project Unit was responsible for the procurement plan and undertaking the contracting processes, responsibilities that were handled in a satisfactory manner. The implementing agencies were responsible for defining contract contents and terms of reference, evaluating offers, and administering the signed contracts. The performance of the implementing agencies was mixed, with CENACE, CONELEC, and CONATEL demonstrating greater competence in this area. The participation of so many implementing agencies created some inefficiency, for example, overlaps between contracting committees in the Project Unit and the implementing agencies.

2.5 Post-completion Operation/Next Phase

The Project financed mainly technical assistance activities and pilot programs. The technical assistance for strengthening regulatory agencies and environmental management does not require explicit post-completion measures since the training/ equipment/capacity-building has been absorbed by the implementing agencies, and many of the tools and studies developed are in active use. In the case of CENACE, for example, the advanced technology systems are now an integral part of operations. In some cases, activities are being expanded, modified and replicated. For example, SUPTEL is expanding the radio spectrum monitoring system nationally and CENACE is adapting its information system model to be installed on the computer systems of market participants.

The current Government plans to address the longstanding fundamental problems by making structural changes to the sectors that would strengthen public sector management and investment. For example, in telecommunications, a new Telecommunications Law would create a new Ministry of Telecommunications and Information Society, consolidate the regulatory institutions into one agency under the Ministry, and consolidate public sector telecommunication companies into one institution. The Government also proposes major public investment programs in both sectors to improve coverage and assure quality of service.

In terms of sustainability of the Project's activities to strengthen regulatory agencies, these plans could have both positive and negative impact. On the positive side, strengthening of the regulation, control and monitoring system could result in more effective use of the regulatory

capabilities. On the other hand, changes in regulatory functions, institutional structures or personnel could result in a risk that some of the capacity would be lost. This risk would be low for SUPTEL, whose role is mainly one of technical supervision and control, and CENACE, whose advanced technology systems are now an integral part of its commercial operations, but would be moderate in the case of CONELEC, the single regulator for the electricity sector.

The second component of extension of rural services involved various activities, each of which faces separate issues with respect to sustainability:

Rural Telecommunications Pilot (Telecenters): The contract to implement this component was cancelled before completion. See Section 1.9.

Rural Electrification Plan and Pilots: As noted in Section 3.2, PROMEC financed provision of renewable electricity service to 1346 households, but perhaps more importantly assisted in the provision of an additional 395 households with financing from FERUM and others, and prepared a pipeline of projects to cover 996 additional households. The most important longterm impact of the pilots was to serve as instruments to assist in adapting the rules of the rural electrification fund, FERUM, to finance projects using renewable energy, to assist distribution companies and others to develop the capacity to prepare projects, and to contribute experience to the Rural Electrification Plan, 2008-2012. In this Plan, funding was increased from US$45 to US$130 in 2008 and US$120 million annually thereafter, including an allocation to renewable energy of US$9.6 million (see Annex 3).

However, PROMEC's pilot projects using solar home systems are works in progress that require follow-up by SENPLADES and the MER, including formal transfer of ownership of the systems from SENPLADES to the distribution companies, and institutional support to the community organizations that are operating the systems. The experience of the pilots demonstrated: (a) the importance of utilizing a strong existing community organization rather than a special purpose group created to manage the activity; and (b) the difficulty in ensuring that the distribution companies take responsibility for the operation of the systems. This experience has led the Government to think of alternative systems to support implementation of renewable rural electrification subprojects, possibly through a special purpose corporation.

ICT Services Pilot (Micronet): A public/private company, SEDYMYPE, was established in 2006 to operate the Micronet centers that provide ICT services to micro and small businesses. While the Ministry of Industry and Competitiveness (MIC, formerly MICIP) is in charge of the Government's participation, leadership and financing is expected to come from private sector partners. By June 2008, three centers were operating under a small management team. SEDYMYPE had arranged with local chambers of commerce, trade associations, and microfinance organizations to provide online training to their members. In 2008, SEDEMYPE received US$50,000 from the Corporation of Promotion of Exports and Investments (CORPEI), as well as an additional US$25,000 from Microsoft, in recognition of recent progress. In addition, free Internet services are being sought from SENATEL/FODATEL for two years. However, while these recent signs are positive, there is no certainty of adequate financing to carry SEDYMYPE through its next few years. Its sustainability is precarious and depends on private sector initiative.

The third component of energy efficiency was carried out successfully and has laid a solid foundation for scaling-up in the future. The prospects for sustainability and replication are good, as the Government has made strong commitments to scale up activities in the National Development Plan 2007-2010, that are already beginning to be implemented (see Section 3.2 and Annex 3 for details).

3. ASSESSMENT OF OUTCOMES

3.1 Relevance of Objectives, Design and Implementation

Given the focused nature of the Project's package of institutional strengthening, rural service extension and energy efficiency, almost all of the project components and objectives remain relevant. The Project's aim of strengthening regulatory agencies is highly relevant given the Government's plans to restructure and improve management of both sectors. There was a particularly strong match between the content and timing of the energy efficiency and renewable energy activities of the Project, and the strong priority given to these areas by the Correa Government, as expressed in the National Development Plan, 2007-2010 and the Rural Electrification Plan. Even the telecommunications pilot (telecenters), which was cancelled, and the ICT pilot for business services, which ran into difficulties in implementation, were still relevant given the Government's commitment to expand rural service provision.

According to the most recent (2003-2007) Country Assistance Strategy (CAS), the Bank Group's objective in Ecuador is to help the Government achieve its goals by providing assistance to: (a) consolidate the macroeconomic framework and lay the foundations for diversified and sustainable economic growth and poverty reduction; (b) increase opportunities and broaden access to economic resources, and make the needed structural reforms socially sustainable by mitigating the impacts on the poor and vulnerable; and (c) strengthen governance by helping the Ecuadorian officials build an accountable and efficient government, the services of which are accessible to all Ecuadorians. The PROMEC Project is relevant mainly to objective (c) to strengthen governance and increase access to services. Hence, it remains relevant to current Bank strategy.

The positive perception of the Project from successive Governments provides evidence of its ongoing relevance. The World Bank's portfolio in Ecuador has been scaled back significantly in recent years. However, the last four governments, including the current administration, have supported the Project.

3.2 Achievement of Project Development Objectives and Global Environment Objectives

Project Development Objectives

The Project was successful in achieving major objectives related to capacity building of regulatory agencies, improving environmental management of the sectors activities, promoting efficient use of energy and enhancing communication and consultation in the sectors. Highlights of achievement included the introduction of advanced technology systems to CENACE's operations center for the integrated national electricity system, making it one of the most modern

in Latin America, the successful promotion of CFL bulbs that reduced electricity demand significantly, and communication and participation activities that were rated by the Bank's social specialist as best practice in relation to rural pilot activities. The Project was less successful in completion of pilot projects in provision of rural telecommunications and electricity services, and in related fostering competition and private participation in rural service delivery.

Table 1 below summarizes the detailed analysis in Annex 3 of the Project Development Objective by clause from the Project Appraisal Document (PAD). Following each clause are selected qualitative Outcome/Impact Indicators from the results framework in Annex 1 of the PAD and their ratings, as well as quantitative "Core Indicators of Project Outcome/ Impacts".

Table 1: Summary of Achievement of Project Development Objectives			
Outcome	**Indicator**	**Assessment**	**Rating**
a): **Strengthening regulatory institutions**	1.1 Improved effectiveness of SUPTEL to supervise the sector and undertake timely public consultations and dissemination of regulatory decisions	The Project's TA assisted SUPTEL to improve its image, improve public consultations and dissemination programs, and adapt improve efficiency of its organization, procedures and computer systems. Additionally, radio frequency monitoring equipment was installed in Quito and Cuenca, resulting in better control of the radio-frequency spectrum. Based on the PROMEC experience, SUPTEL is investing to expand the radio spectrum monitoring system nationally.	*S*[6]
	1.2: Improved effectiveness of CONELEC to regulate the power sector and undertake timely public consultations and dissemination of regulatory decisions.	Regulatory effectiveness was improved by: (a) provision of tools and methodologies, such as those to calculate tariffs based on actual costs; (b) identification of reforms, especially for the wholesale market and international transactions; (c) establishment of a geographic information system to facilitate planning; and (d) provision of equipment to assist in supervision of service quality. While some tools were not fully used, such as tariff methodologies, they would provide valuable inputs for current Government plans. The Project did not undertake activities to improve public consultations and disseminate regulatory decisions.	*MS*
	1.4: Establishment of a liberalized wholesale electricity market, with an increased number of private operators and improved administration by CENACE	The Project strengthened CENACE's administration by financing three inter-related advanced technology systems for its operations center, making it one of the most modern in LAC. The first system manages energy dispatch in real time, improving control and reliability. The second improves efficiency of commercial transactions. The usefulness of both systems would not be affected by changes in sector structure. The third is an information system, customized to market rules that must be changed if the sector is reorganized. CENACE has contracted with the supplier to adapt the system. However, there is a moderate risk that the usefulness of the third system could decrease under an organization with fewer and mainly public actors. CENACE's administration was strengthened, losses were reduced and more accuracy achieved in transactions. The indicator of establishment of a liberalized market was not achieved because of changes in sector policy. Also, a liberalized electricity market could not have been achieved by the activities financed by the subcomponent and is therefore not a good indicator of the objective of the regulatory strengthening. Given the inclusion of this aspect in the indicator, the rating was reduced from satisfactory to moderately satisfactory.	*MS*
	Summary Rating Component (a)		**MS**
b): Improving environmental management of the electricity sector	1.3: Strengthened capacity of CONELEC and other relevant entities, to conduct environmental management of power sector activities.	Environmental management and control was strengthened in CONELEC and the Ministry of Environment. An environmental unit was created and accredited within CONELEC, to evaluate sector projects and give licenses. Capacity was also built in the Ministry of Environment to identify and promote Clean Development Mechanism (CDM) projects, resulting in two carbon emissions reductions contracts for hydroelectric facilities with private investment and development of a project pipeline in energy.	**HS**
c) Fostering competition and increasing private participation.	1.5: Increased number of private operators providing rural telecommunications, decentralized rural electrification, energy efficiency services and ICT based services	The outcome is evaluated as moderately unsatisfactory based on: (a) rural telecenters pilot with private company was cancelled; (b) rural electrification was carried out through public distribution companies and private community organizations whose performance is still to be demonstrated; (c) the mixed public-private company SEDEMPYE for the ICT based service pilot is operating precariously. While the energy efficiency activities successfully trained private sector companies in energy audits, hired 10 companies to perform audits, and used private companies to promote CFLs, this did not fully offset the lack of full achievement of the indicators for the rural service activities (see Annex 3 for details).	**MU**
(d) Promoting efficient use of energy	3.1: Successful implementation of a program to enhance efficiency in the use of energy	Significant results were achieved, including completion of studies analyzing barriers to energy efficiency, development of a strategy, and completion of activities to reduce energy use, including: • Sale of more than 1.69 million additional compact fluorescent (CFL) bulbs that reduced the average	**HS**

[6] Rating codes are as follows: HS- Highly Satisfactory, MS Moderately Satisfactory, S Satisfactory, MU Moderately Unsatisfactory, HU Highly Unsatisfactory

		consumption of participating residential and industrial users for light by 32 percent and peak demand in the entire system by 80 MW, saving 102,300 MWh per year. • Training of more than 100 representatives of private companies and educational institutions on energy audits, as well as completion of audits in commercial buildings, hotels, hospitals and industries. • Completion of standards and labeling of refrigerators, with the Ecuadorian Standards Institute (INEN); • Preparation and introduction to national curriculum of educational materials for schools.	
(e) Extending coverage of power and communications services to underserved areas.	2.1: Adoption of a sustainable strategy to extend telecommunications and electricity services to the poor, including the adoption of cost efficient financing and delivery mechanisms.	The Project-financed Tariff Rebalancing Study helped CONATEL to: (1) set local and long distance tariffs, reducing cross subsidies; and (2) reduce the interconnection rates for fixed to mobile calls. This Study was the first in Ecuador to use the Long Run Incremental Cost System used in Europe and the USA. The methodology continues to be used by CONATEL. This highly successful activity contributed to an exponential increase in access to telephone service which especially benefited the poor. The Project contributed experience to the Rural Electrification Plan by adapting the regulations of FERUM for renewable energy, carrying out pilot projects with renewable energy, preparing a pipeline of renewable projects, preparing guidelines for the preparation of projects by distribution companies, and analyzing the lessons learned. The Correa Government has recently made important commitments to adoption of sustainable strategies to improve telecommunication and electricity service coverage, through the National Connectivity Plan and the Rural Electrification Plan.	*MS*
	2.2: Successful completion of pilot projects for rural telecommunications, testing the cost-efficiency, subsidy optimization, service quality, effective community participation and replicability	As noted in section 1.9, the contract for implementation of this activity was cancelled in June 2008. While 560 telecenters were reported as installed by the telecommunications operator on August 2007, according to CONATEL they have not operated and the outcome was not achieved.	*HU*
	2.3: Successful completion of pilot projects for renewable energy-based decentralized electrification, testing several delivery and financing mechanisms and conditions for sustainability and replicability.	The Project provided solar home systems for 1741 households, including 1346 households where service was financed by PROMEC and 395 households where financing was obtained from FERUM and the private sector (87 percent of target). The Project also prepared a pipeline for an additional 996 households. As noted in section 2.5, important lessons were learned about the importance of using strong existing community organizations rather than special purpose organizations created for the Project in operation and maintenance. Given that distribution companies have not demonstrated willingness to support the community projects, the Government is considering creation of a renewable energy corporation to play this role. While the PROMEC pilots came close to meeting the target in terms of installations, more operating experience is needed before they are successfully completed.	*MU*
	Summary Rating Component (e)		**MU**
(f) providing modern ICT-supported services to micro and small businesses;	2.4: Successful completion of the pilot project for ICT-based business development services to MSBs in urban and peri-urban areas	Three centers are operating in Cuenca, Loja and Galapagos, providing services to micro and small businesses on legal advice, credit, finance, business plans, and marketing plans. While the revised target of 8000 businesses served was not reached, the number of users increased to 1315 by September, confirming the existence of a potential market and indicating strong growth potential. The sustainability of the Micronet centers depends on mobilizing additional financing from the private sector. Given the fact that the target was not met and sustainability is not certain, a rating of moderately unsuccessful has been assigned.	**MU**
g) Enhancing communication and consultation in the sectors		The participation and communication activities enhanced the Project's transparency and governance, contributing to the positive perception of stakeholders, implementing agencies and Government authorities. These activities were regarded as best practice by the Project's social specialist, especially in relation to inclusion of indigenous peoples and the poor.	**S**

Global Environmental Objective

The Global Environmental Objective is to promote private financing and management of projects to reduce greenhouse gas emissions, by removing barriers to the use of: (i) renewable energy technologies (RET) to extend electricity supply in rural areas; and (ii) energy efficiency measures.

GEF indicator 1: Actual tons of CO_2 reduced through (i) the implementation of pilot projects based on renewable energy technologies in rural areas; and (ii) the implementation of a program to enhance end-use energy efficiency.

While the end of the Project target was reduced from 80,000 to 17,200 tons in 2006, the actual achievement of the Project exceeded the original target, at 93,100 tons, mainly through the CFL promotion project. The CFL bulbs are expected to have an average life of 5 years, therefore the total CO2 reduction from the Project executed CFL activities alone is expected to be 407,000 tons.

Loan Agreement Quantitative Core Indicators

Objective	Indicator	Baseline (2002)	End-of-Project Target (2008)	End-of-Project Actual (2008)
Mitigation of climate change through reduction of greenhouse gas emissions	Thousand tons of CO_2 reduced demonstration projects (renewable energy-based rural electrification and end-use energy efficiency)	0	17.2	93.1

GEF indicator 2: Estimated tons of CO_2 that should be reduced through the implementation of subsequent investments resulting from project activities over the next five or ten years. Rating: Satisfactory

Building on the successful PROMEC experience, a follow-up program is under implementation, in agreement with the priorities in the National Development Plan, 2007-2010. Under the program, MER will donate 6 million CFLs to low income households. The result of the program will be a reduction of peak demand by 225 MW and an energy saving of about 289,000 MWh per year. CO2 will be reduced annually by an additional 230,000 tons over a period of 5 years.

GEF Indicator 3: Definition and adoption of a strategy, regulations and policies for the sustained development, with private participation, of (i) decentralized rural electrification, and (ii) enhanced energy efficiency.

Outcomes of PROMEC's activities in strategy development and policies are described in detail in Annex 3, and summarized in sections (d) and (e) of Table 1 above. PROMEC's activities contributed significant experience to the preparation of the Government's National Development Plan 2007-2010, which as noted above includes the promotion of energy efficiency activities, especially CFLs. Additionally, PROMEC's experience contributed to the preparation of the Rural Electrification Plan that is almost tripling funds available for rural electrification, and allocating a share to renewable energy.

3.3 Efficiency

The Project was conducted efficiently overall. It generated significant positive economic returns, with moderate shortcomings in terms of delays that resulted in an extension of two years and an unsatisfactory rating of several outcomes related to provision of rural services. The total cost of the Project was US$28.7 million as compared to the original estimate of $38.2 million (excluding contingencies). The Project completed almost all planned activities, with the exception of the rural telecommunications pilot (telecenters), where $1 million of the planned $4.15 million of the loan was spent and the contract was cancelled just before closing without achieving the intended outputs or outcomes.

The estimates of quantifiable economic and financial benefits are summarized in Table 2 (see Annex 4 for details). The benefits from reduction in electricity losses and savings due to better accuracy in CENACE's management of the wholesale market re estimated at an economic NPV of US$3.5 million and a financial NPV of $US0.5 million. While not entirely attributable to the Project, the NPV of the consumer surplus from reduction in telephone tariffs is estimated at US$78 million. The rural electrification pilots financed by PROMEC were estimated to have an economic NPV of US$0.1million and financial NPV of $0.08 million. Finally, the CFL promotion was estimated to have an economic NPV of US$40.6 million and a financial NPV of US$22.3 million (only CFLs additional to base case, see Annex 4). The energy efficiency impact was achieved at less than planned costs because the project used less costly local consultants and focused on CFLs, where the cost was limited to highly cost-effective promotion.

Table 2: Summary of Quantifiable Economic and Financial Benefits of the PROMEC Project

Benefit/Loss	Component	Amount of Economic Benefit	Amount of Financial Benefit
Reduction in electricity lost due to outage and savings due to better accuracy	A4 Improvement of CENACE's Wholesale Market Administration	ENPV US$3.5 million, EIRR 37 percent	FNPV US$0.5 million, FIRR 16 percent
Consumer surplus from reduction in telephone tariffs	A1 Strengthening SUPTEL's capacity (Tariff Rebalancing Study)	ENPV US$78 million	FNPV US$78 million
Avoided costs for conventional energy and consumer surplus for improved quality of light	B3 Carrying out of Rural Electrification Pilots (Esmeraldas Subproject only)	ENPV US$0.10 million EIRR 13 percent	FNPV US$0.08 FIRR ---
Value of electricity saved by households using CFLs	C3 Carrying out Electricity Energy Efficiency	ENPV $40.6 million EIRR 228 percent	FNPV $22.3 million FIRR 147 percent

3.4 Justification of Overall Outcome and Global Environment Outcome Rating

Rating—Overall Outcome: Moderately Satisfactory

Given the scope of the project design—i.e. strengthening of regulatory institutions, extension of rural service of telecommunications and electricity services and energy efficiency—the Project objectives and activities remain highly relevant to current Government and Bank priorities. As noted in the section on objectives, nearly all of the programmed activities and consultancies were undertaken and most of the objectives and results framework indicators were met.

Ratings for individual sub-objectives of the development objective are summarized from Table 1 below, resulting in an rating of moderately satisfactory for the overall outcome (see also comment in section 2.1 on reformulation of the development objective):

a) strengthening regulatory institutions	Moderately Satisfactory
(b) improving environmental management of the electricity sector	Highly Satisfactory
(c) fostering competition and increasing private sector participation:	Moderately Unsatisfactory
(d) promoting energy efficiency measures	Highly Satisfactory
(e) extending coverage of power and communications	Moderately Unsatisfactory
(f) providing modern ICT services to micro and small businesses	Moderately Unsatisfactory
(g) enhancing communication and participation in the sectors	Satisfactory
Summary Rating	**Moderately Satisfactory**

Four of the sub-objectives were rates as satisfactory while three were related as unsatisfactory. It is notable that the sub-objectives rates as satisfactory include outcomes that are broad and significant in scope and scale. The strengthening of regulatory institutions in both telecommunications and electricity sectors and strengthened environmental management of the electricity sector result in benefits to all consumers in both sectors. The energy efficiency activities had a significant impact both directly and through replication--promotion of CFL bulbs alone reduced national electricity consumption in Ecuador by just over 1 percent, and its replication is expected to triple this effect by 2010. In contrast, the outcomes that were rated as unsatisfactory are those of extension of services in telecommunications, rural electrification using renewable energy; provision of ICT services to businesses; and strengthening of private sector participation and competition related to rural service provision in both sectors. The Project's activities that were meant to lead to these outcomes were pilots, small scale, high risk, and mainly useful in terms of learning that could be used to develop larger scale activities. Considering the overall outcomes, a rating of moderately satisfactory is assigned.

Rating—Global Environment Outcome: Satisfactory

Given that the Global Environmental Outcome depends on the relevance, outcomes and efficiency of activities on renewable energy for rural electrification and energy efficiency described above, a Satisfactory rating has been assigned based on the relevance, significant outcomes in terms of sustainability and follow-up in the National Development Plan 2007-2010, and the high efficiency (benefit/cost) ratio of these activities.

3.5 Overarching Themes, Other Outcomes and Impacts

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

As noted in section 1.6 above, many of the activities on expanding service coverage of electricity, telecenters and ICT services were targeted toward low-income rural or marginal urban areas. The fact that now, more that 79 percent of the population has a phone, means that low-income, rural and marginal population has dramatically increased their access to phones, as compared to 27 percent in 2004. These results were mainly due to the private companies' investment to expand coverage in these areas, but also due to the increased affordability of the service as a result of the reduction of prices in 2004 that was assisted by the Tariff Study financed by the Project. For households that benefited or will benefit in future from solar home systems, the positive impacts are significant. The length of the day is extended by improved lighting, thus enabling social and productive processes to take place over a longer span of hours. Availability of electricity provides a healthy living environment with respect to lighting (e.g. better indoor air quality and better quality of light) and enables access to valuable information, through different means of communication (e.g. television, computers). There is also evidence that access to electricity enables the reallocation of household time (especially for women) away from energy provision and may increase female employment rates and encourage greater awareness of gender equality. [7]

(b) Institutional Change/Strengthening

(particularly with reference to impacts on longer-term capacity and institutional development)

The entire first component of the project is dedicated to institutional strengthening.

4. Assessment of Risk to Development Outcome and Global Environment Outcome

Rating—Overall: Moderate

The regulatory, supervision and control capacities of the regulatory agencies strengthened by the Project would become even more important given the Government's plan to strengthen the operations of the sectors through major structural changes, as noted in Section 1.1. Given the changes planned, there is a limited risk that the institutional strengthening and capacity building outcomes would be partially lost through changes in institutional structures or personnel. For SUPTEL and CENACE, the risk is assessed as low while for CONELEC it is assessed as moderate. The coverage extension activities also present some risks. The rural telecommunications pilot was cancelled and the sustainability of the ICT services pilot for micro and small businesses (Micronet) is fragile, depending on further private sector capital to a nascent business. The late implementation of the rural electrification pilots requires follow-up by SENPLADEs, MER and CONELEC to ensure support to the community organizations maintaining the systems. However, the Government plans to expand renewable rural electrification under the Rural Electrification Plan, and is considering creating a renewable corporation to support the existing pilots and future projects. With respect to energy efficiency,

[7] From draft of "Towards Universal Access in LAC: a Framework for Bank Support", LCSEG, 2008.

risks are considered low as the Government has made energy efficiency a priority and there are plans to dramatically expand the CFL replacement program, expand the standards and certification program and utilize fully the curriculum on energy efficiency prepared for the schools.

Rating—GEF: Negligible to Low
Given the current Government's strong commitment to renewable energy for rural electrification and energy efficiency, and risks are considered to be moderate to low. The Government's commitment can be seen in: (a) the creation of the Secretariat for Renewable Energy and Energy Efficiency; (b) ongoing CFL campaign and inclusion of renewable energy and energy efficiency as priorities in the National Development Plan; and (c) changes already made to increase the funding available for rural electrification and enable renewable energy projects to benefit from this financing.

5. Assessment of Bank and Borrower Performance

5.1 Bank Performance

(a) Bank Performance in Ensuring Quality at Entry

Rating: Moderately satisfactory

The Project team intentionally designed components that would be politically-supportable given a changing political environment and increased political support for public participation in both sectors. The Project was complex but given the political considerations at the time, and the continued Government support of successive Governments over time in a difficult environment, it seems to have made sense to include all of the components. The main issue was the inclusion of three challenging pilot activities in rural services that taxed implementation capacity. The PDO and some indicators should have been reformulated, as noted in section 2.1. There were no fiduciary issues.

(b) Quality of Supervision

Rating: Moderately Satisfactory

The Bank actively supervised the Project, frequently reengaging with new government authorities following changes at the presidential and ministerial levels. Support was attained from new authorities and efforts were made to accelerate project execution as much as possible. Fiduciary and safeguard aspects operated smoothly, and according to interviews with the implementing agencies, the technical advice of the Bank team was generally considered valuable. There were some minor shortcomings with respect to procurement requirements and delays in issuing no objections, given that almost all procurement processes were subject to prior approval.

(c) Justification of Rating for Overall Bank Performance

Rating: Moderately Satisfactory

Taking into account the rating of moderately satisfactory at preparation and supervision, an overall rating of moderately satisfactory is assigned.

5.2 Borrower Performance

(a) Government Performance

Rating: Moderately Satisfactory

Ownership and commitment to achieving the development objectives was strong from the Government as a whole. However, frequent changes in government administrations and ministers contributed to delays and a difficult institutional environment. The performance of the MEF was satisfactory. The Project enjoyed an adequate level of support and budget allocations were adequate and timely. The moderate shortcomings from the overall political environment combined with MEF's satisfactory performance resulted in assigning a moderately satisfactory rating for the Government's performance.

(b) Implementing Agency or Agencies Performance

Rating: Moderately Satisfactory

The implementing agencies can be split into three separate entities: the central coordinating agency (SENPLADES/CONAM), the Project Coordinating Unit (PCU) within SENPLADES/CONAM, and the other implementing agencies. The performance of SENPLADES/CONAM was satisfactory. Both were consistent in their support, demonstrated in maintaining a highly qualified team in the coordinating unit, providing leadership and support to the implementing agencies, intervening with higher authorities when necessary, and ensuring a smooth transition from CONAM to SENPLADES. The performance of the Project Coordinating Unit was also satisfactory. There was a high degree of continuity and competence within the technical and administrative staff although there were changes in the project coordinator. At critical times (e.g. during transitions in government), the project unit played an especially active role. Beneficiary/stakeholder consultations and involvement was exemplary and fiduciary and safeguards issues were skillfully handled. Coordinating with the six different implementing agencies was challenging at times but generally managed well. The Project Unit organized several off-site workshops with implementing agencies to discuss implementation progress and issues.

The performance of the six different implementing agencies—SUPTEL, CONATEL/SENATEL, CONELEC, CENACE, MER/MEM, and MIC/MICIP—was variable but moderately satisfactory overall. CENACE was a standout in terms of competence and commitment. In fact, CENACE opted to finance complementary institutional strengthening activities out of its own budget. he performance of CONELEC and SUPTEL was satisfactory in terms of moving activities forward. Weak institutional capacity and frequent changes of personnel in MEM/MER and MICIP/MIC negatively affected execution of their components. In the case of CONATEL/SENATEL the

long dispute with the telecommunications operator indicates the challenge of managing a complex BOOT contract.

The combination of satisfactory performance from SENPLADES/CONAM, satisfactory performance from the project unit, and a range of performance from the implementing agencies (which averaged out to moderately satisfactory), generated an overall implementing agency rating of moderately satisfactory.

(c) Justification of Rating for Overall Borrower Performance

Rating: Moderately Satisfactory

The difficult institutional environment (created by several government changes) and mixed implementation agency performance together with the strong performance of the SENPLADES/ CONAM and the Project Unit, resulting in an overall Borrower performance rating of moderately satisfactory.

6. Lessons Learned

a. Project Complexity is not only Negative. The Project included a wide range of components that spanned six different implementing agencies. One could argue that this breadth proved unwieldy and made the job of the project unit extremely difficult. It also resulted in delays because of the large number of coordination agreements required. Each change of government necessitated rebuilding relationships and convincing new leadership of the Project's validity. However, on the other hand, the involvement of a large number of implementing agencies that felt that the Project activities were useful meant that the Project had solid and continuous support in the Government. The most significant problems during implementation were not due to the complexity of the Project, but rather to implementation difficulties in the rural telecommunications and business services pilots.

b. Care is Needed in Including Several Pilot Activities. The PROMEC Project included three rural pilot activities with different implementing agencies (MEM/MER, MICIP/MIC and CONATEL/SENATEL) and delivery modes (distribution companies plus community organizations, mixed public-private company to be formed by the Project, BOOT contract). None of the implementation mechanisms (eg. locations, business plans, contracting documents) were fully prepared at effectiveness, which delayed pilot implementation and increased risks of failure. All three of the rural service pilot activities got off the ground late in the life of the Project, making it difficult to assure sustainability or draw lessons. The difficulty of including four small but significant pilot activities may have been underestimated at the design stage. It was the rural pilot activities that contributed most to Project delays and the need for extension, and the rural telecenter and ICT pilots were ultimately not successful. Lessons learned that need to be taken into account include:

> (a) by definition, a pilot has a possibility of success or failure. The risk is taken not because one necessarily expects success, but rather in the expectation that the pilot project would result in useful learning that can help define further activities to achieve a

defined objective. The indictor of success would not then be successful completion of the pilot, but rather valuable experience gained as a result of its implementation.
(b) care needs to be taken in including a number of pilots in a project, since pilot projects by their nature are small, innovative, high risk and time consuming. Each one needs considerable effort and time to develop, mature and yield lessons for replication;

(c) in order to have a chance of delivering results in a four or five years of a Project, implementation arrangements for pilot projects need to be defined during preparation;

(d) caution is needed in attempting to support the formation of a small, special purpose company within a Project. Small companies in general are risky by nature, often operate at a loss for several years and have a high risk of failure. The estimates in the business plan of Micronet were too optimistic. The company is still operating at a loss and may continue to do so for some time. The fate of the company now depends on obtaining additional working and investment capital from the private sector, a situation that was not foreseen in the business plan.

c. Communication and Community Participation Approach Highly Beneficial. PROMEC's communication and participation activities were considered by participants to be innovative, important and highly beneficial. The benefits were multiple: (a) helping create awareness of Project activities; (b) building consensus on implementation approaches; (c) building capacity of communities and individuals to participate in design and implementation; and, perhaps most importantly, (d) increasing accountability and transparency of the Project's activities and management to stakeholders. All of these factors contributed to the generally positive perception of the Project.

d. Implementation through Individual Local Consultancies rather than Large International Contracts can be Advantageous. As noted in Section 1.9, the plan to implement energy efficiency activities through a single large international consultancy with a firm failed due to poor performance of the international firm. At the suggestion of the Project Unit, the single international firm was replaced by several individual consultants available locally, that had international experience. While this required more management by the Project Unit and the MEM/MER, development of management capability in energy efficiency was in any case essential in order to ensure longterm sustainability. While obviously not all large international consultancies fail, there were significant advantages in terms of cost, flexibility and sustainability in the use of a number of small local consultancies.

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

(a) Borrower/implementing agencies

No comments were received from the Borrower.

(b) Cofinanciers

N/A

(c) Other partners and stakeholders
(e.g. NGOs/private sector/civil society)

Annex 1. Project Costs and Financing

Project Costs by Component (in USD million equivalent)

Power and Communications Sectors Modernization and Rural Services Project (PROMEC) - P063644			
Components	**Appraisal Estimate (from PAD) (USD millions)**	**Actual/Latest Estimate (USD millions)**	**Percentage of Appraisal**
A. STRENGTHENING OF LEGAL, REGULATORY AND INSTITUTIONAL FRAMEWORK IN ELECTRICITY AND TELECOMMUNICATIONS SECTORS	10.29	8.56	83
B. EXTENSION OF ELECTRICITY AND COMMUNICATIONS SERVICES TO LOW-INCOME GROUPS AND MSBS	7.35	3.84	52
C. ENERGY EFFICIENCY PROGRAM	0.51	0.13	26
D. PROJECT MANAGEMENT AND COMMUNICATION AND CONSULTATION ACTIVITIES	4.86	4.54	93
Total Baseline Cost	23.01	17.08	74
Physical Contingencies*			
Price Contingencies*			
Project Costs	23.01	17.08	
PPF[incorporated in component budgets]			
Front-end fee IBRD			
Total Project Costs	**23.01***	**17.08****	**74**

*Contingencies were included in the component estimates. US$ 2 million of contingency was eliminated from the loan in 2005, bringing adjusted budget to US$21 million.

** Difference from 17.14 USD millions reported as disbursed on p. iv is funds not yet disbursed in the Special Account.

Power and Communications Sectors Modernization and Rural Services Project - PROMEC - P072527			
Components	**Appraisal Estimate (USD millions)**	**Actual/Latest Estimate (USD millions)**	**Percentage of Appraisal**
A. STRENGTHENING OF LEGAL, REGULATORY AND INSTITUTIONAL FRAMEWORK IN ELECTRICITY AND TELECOMMUNICATIONS SECTORS	0.00	0.00	
B. EXTENSION OF ELECTRICITY AND COMMUNICATIONS SERVICES TO LOW-INCOME GROUPS AND MSBS	1.61	1.68	104
C. ENERGY EFFICIENCY PROGRAM	1.23	0.72	59
D. PROJECT MANAGEMENT AND COMMUNICATION AND	0.00	0.00	

CONSULTATION ACTIVITIES			
Total Baseline Cost	2.84	2.41	85
Physical Contingencies			
Price Contingencies			
Project Costs	2.84	2.41	85
PPF			
Front-end fee IBRD			
Total Project Costs	2.84	2.41	85

(b) Financing

P063644 - Power and Communications Sectors Modernization and Rural Services Project (PROMEC)				
Source of Funds	**Type of Financing**	**Appraisal Estimate (USD millions)**	**Actual/Latest Estimate (USD millions)**	**Percentage of Appraisal**
Borrower		6.96	3.11	45
Global Environment Facility (GEF)		2.84	2.41	85
International Bank for Reconstruction and Development		23.00	17.08	74
Local Sources of Borrowing Country		10.45	5.59	54
P072527 - Power and Communications Sectors Modernization and Rural Services Project – PROMEC				
Source of Funds	**Type of Financing**	**Appraisal Estimate (USD millions)**	**Actual/Latest Estimate (USD millions)**	**Percentage of Appraisal**
Borrower		0.00	0.00	00
Global Environment Facility (GEF)		2.84	2.41	85

Annex 2. Outputs/Contracts by Component

The following table was translated from a table in Spanish prepared by the Project Coordinating Unit in SENPLADES. The table summarizes contracts completed (right column) in comparison to activities included for each component in the legal agreement (left column).

	Legal Agreement Description	Contract Completion Status
Part A	**STRENGTHENING OF LEGAL, REGULATORY AND INSTITUTIONAL FRAMEWORKS IN THE POWER AND COMMUNICATIONS SECTORS**	
A.1	**Strengthening of SUPTEL's supervisory and enforcement capacity by:**	
	(a) designing and implementing: (i) a quality of service control system for telecommunications, radio and television operators; (ii) a new organizational structure and procedures; and (iii) a radio frequency spectrum monitoring and management system;	(i) and (iii) Completed: Acquisition and installation of radio frequency spectrum monitoring stations. Contract completed May 18, 2006. (ii) Management and corporate image for strengthening of SUPTEL. Contract ended July 13, 2004.
	(b) improving internal communication and information systems;	Completed • Provision of computer equipment hardware and software to monitor networks with: ISEYCO, contract ended July 22, 2005; COMPSESA, contract ended October 10, 2005; and, DIGITEC, contract ended November 18, 2005. Also included in contract in A1 point (ii)
	(c) training SUPTEL's staff in: (i) modern telecommunications regulation and technologies; and (ii) dispute resolution issues; and	(i) and (ii) Completed. • Consultancy to revise SUPTEL's Comprehensive Training Plan. Contract ended January 11, 2005. • Comprehensive Training Plan for SUPTEL undertaken. Contract through November 28, 2006.
	(d) (i) carrying out tariff rebalancing studies for telecommunications; and (ii) formulating revised tariff policies for telecommunications.	(i) and (ii) Completed • Consultancy for institutional strengthening of CONATEL related the calculation of tariffs and interconnection costs for local, long distance and mobile services. • Study on the treatment of international telecommunications traffic settlement, , tariffs and interconnection costs. Contract ended January 30, 2002 (PPF).
A.2	**2. Strengthening of CONELEC's regulatory capacity by:**	
	(a) revising the regulatory framework for electricity in the areas of: (i) third-party access to transmission and distribution; (ii) anti-trust; (iii) guarantees of existing contracts; (iv) exports and imports; and (v) tariff issues;	(i), (ii), (iii) and (iv) Completed • Consultancy: Review and supplementation of the regulatory framework for the electricity sector. Contract ended September 6, 2000 (PPF). • Preparation of the base document for the discussion forum about the electricity sector functioning and strategy moving forward. Contract ended February 2, 2004. (v) Completed

		• Methodology for determining the UPEs and calculation of the FRC. Contract ended August 30, 2004. • Local counterpart for the UPE and FRC consultancy. July 31, 2004. • Determination of normalized operation and maintenance costs for distribution. Contract ended February 24, 2006. • Identification of mechanisms to achieve economic balance in the Ecuadorian electricity sector, and proposals for reforms to the electricity sector law. Completed January 8, 2007.
	(b) developing modern information systems;	Completed • Acquisition and implementation of software applications for electrical studies. Contract ended February 27, 2004. • Design of geographic information system (GIS). Contract ended June 14, 2004. • Acquisition of peripheral equipment with: CONWARE, contract ended November 12, 2005; COMPSESA, contract ended November 27, 2005; and TECH NET, contract ended on December 6, 2005. • Provision of several ESRI products for the GIS. Contract signed on December 22, 2005. • Design of computational model for the systematization of data. Contract ended June 11, 2006.
	(c) providing technical assistance on specific regulatory issues for the power sector, including supervision and evaluation of: (i) the wholesale electric market; and (ii) quality of electricity services; and	(i) Completed • Review of the Wholesale Electricity Market rules. Contract ended November 4, 2006. • Revision of the rules on international electricity transactions. Contract ended November 4, 2006. • Local counterpart contract, ended November 4, 2006. • Development of a methodology to study projected demand in the electricity sector. Contract signed on February 1, 2006; delivery of the model in September 2006. (ii) Completed See A.2.(a) • Acquisition of control equipment. Contract ended April 26, 2004. • Acquisition of 4 *multimetros* and accessories. Contract ended June 18, 2004.
	(d) carrying out studies to: (i) analyze the impact of electricity costs in the evolution of prices in the Borrower's economy; and (ii) assess the contribution of the Mazar Project.	(i) Completed • Macroeconomic and sector analysis of the impact of energy price variations on the cost of living and cost of industrial production. Contract completed February 11, 2002 (PPF). (ii) Completed • Assessment of the contribution of firm energy from the Mazar facilitiy and analysis of the electricity market. Contracts ended May 9, 2001 and May 29, 2002 (PPF).
	Items not foreseen in the project description	Other contracts undertaken: • Strategic plan for CONELEC's institutional

		strengthening. Contract ended August 26, 2001. • Development of CONELEC's Strategic Training Plan. Contract ended August 15, 2003. In the World Bank's August 2002 Aide Memoire (paragraph 14), the Bank recommended contracting this consultancy.
A.3	**Improvement of CONELEC's environmental management of the Borrower's power sector by:**	
	(a) (i) strengthening CONELEC's environmental management unit referred to in Section 5.01 (c) (i) of this Agreement; (ii) establishing an inter-institutional environmental network among CONELEC, MA, and sector operators; and (iii) establishing environmental units within sector operators to facilitate compliance with environmental guidelines and promote energy efficiency measures;	(i) Completed • Assessment of the environmental regulations of Ecuador's electricity sector. Contract ended March 14, 2001 (PPF). • Assessment of telecommunications and electricity environmental regulations. Contract ended March 16, 2001 (PPF). • Establishment of CONELEC's Environmental Unit. Contract end date February 16, 2002 (PPF). • Acquisition of equipment to strengthen the Environmental Unit. Contract date October 2005. • Institutional strengthening program for the promotion of emissions trading in the electricity sector. Contract signed on July 17, 2006 and completed on January 16, 2007. (ii) Completed • Through Resolution 0173 on March 28, 2005, the Ministry of Environment accredited CONELEC as the environmental authority for the electricity sector. • In accordance with Article 5 of the environmental management law, CONELEC forms part of the Decentralized National Environmental Management System (SNDGA). (iii) Completed • According to the functions of CONELEC, it does not have the power to establish environmental units within sector operators. However, CONELEC has supported the creation of these units in some companies. Moreover, according to the PAD, the aim was not to establish, but to support the creation of environmental units within sector companies.
	(b) preparing and implementing CONELEC's manual for the environmental regulations for power sector activities issued pursuant to Section 5.01 (c) (ii) of this Agreement;	Completed • Development Environmental Management Procedures Manual. Completed August 15, 2004. • In addition, CONELEC issued the following environmental regulations and resolutions: - 55/02 for the creation of the Environmental Unit; - 086/03 to require environmental impact study; - 004/04 energy prices for projects with renewable resources; - 149/05 procedures for issuing environmental permits; - 003/06 Classification of L/T requiring EIA; - 138/06 Approval/ enactment of Environmental Manual

	(c) developing and implementing information and monitoring systems, including an environmental quality network to gather information on air quality, acid rain, water quality, and other environmental parameters; and	Partially Completed The two components developed by PROMEC: Geographic Information System (GIS) and Data Systematization are comprehensive and include the environmental component. The management plans for the generators and distributors include the annual reporting of quarterly emissions of NO_2 and SO_x, particularly for thermal generators, watershed management plans for hydro generators, and the status of PCB's in transmission and distribution, all of which CONELEC monitors as part of is environmental control function. This information was integrated into the GIS once applications were developed. Operating tests are now being carried out.
	(d) developing a database of economic and technical information to facilitate the design and implementation of generation projects using renewable technologies.	Partially Completed CONELEC has a portfolio of hydroelectric projects with technical characteristics and budget estimates. The Ministry of Energy and Mines has developed terms of reference for establishing wind potential and the development of a comparison program, as well as pre-feasibility studies.
A.4	**Improvement of CENACE's electricity wholesale market administration by:**	
	(a) carrying out studies on electricity wholesale market administration to update and improve systems for: (i) transactional circuit development; (ii) measurement of commercial operations; and (iii) preparation and exchange of information for operators;	i), ii) and iii) Completed • Complementary studies for the administration of the Wholesale Electricity Market for CENACE. Contract completed September 19, 2000 (PPF).
	(b) developing a short-term planning model to provide information on system reliability, cost of dispatch, and maintenance scheduling;	Completed • Carried out by CENACE with its own resources.
	(c) developing a medium and long-term planning model to forecast hydrology, and creating of a database on hydroclimatology;	Completed • Carried out by CENACE with its own resources.
	(d) setting up a system for the settlement of commercial transactions in the electricity wholesale market which allows the determination and evaluation of transactions;	Completed on August 31, 2007
	(e) developing an integrated commercial measurement system which allows: (i) remote control of information submitted by generating companies, distributors and large-volume consumers; and (ii) centralized verification and processing of this information to assess transactions carried out by electricity wholesale market operators;	(i) and (ii) Completed • Commercial measurement system for the National Energy Control Center: contract completed March 15, 2005.
	(f) upgrading information systems that support CENACE's technical and commercial functions and provide CONELEC and the operators with information on the functioning of different market segments; and	Completed • Provision, development and installation of an information system for the Wholesale Electricity Market SISMEM for CENACE. This was achieved on August 31, 2007.
	(g) developing a network architecture, and	Completed

	implementing integrated systems (including a real-time operations system).	• The contracts indicated in clauses (d) and (f) above are with the same company and include the integration of all systems. CENACE has contracted with 3 other firms for different phases of network connections. • Contract for the provision of an energy management system, EMS, for CENACE. Contracted ended October 14, 2005.
Part B	**EXTENSION OF POWER, COMMUNICATIONS AND BUSINESS SERVICES TO RURAL AND PERI-URBAN AREAS**	
B.1		
	(a) Carrying out of Rural Telecommunications Pilot Subprojects.	Cancelled. • On September 4, 2006 a contract was signed between CONAM and a telecommunications operator, for the implementation and operation of 1,120 community telecenters, with an investment of US$11,600,000. However, on June 27, 2008, CONATEL cancelled the contract with the operator (see Section 1.9 of main text)
	(b) Preparation and supervision of Rural Telecommunications Pilot Subprojects by CONATEL, including: (i) carrying out a demand study; (ii) drafting the bidding documents and conducting the bidding process; (iii) promoting the utilization of the telecenters by the community; (iv) training local staff in charge of the telecenters; and (v) monitoring the performance of the telecenters.	(i), (ii) and (iii) Completed • Elaboration of the Strategy to extend services to the rural areas, a business plan, social and community participatory studies, promotion, tender documents, and the contract for the community telecenters undertaken through 11 consultancies during 2004-2006 along with technical counterparts in CONATEL and PROMEC. (iv) and (v): not completed because contract was cancelled.
B.2	**Development and implementation of MER/MEM's rural electrification program, by:**	
	(a) (i) developing and implementing of a national plan and strategy for grid and off-grid rural electrification with stakeholder participation; and (ii) identifying, screening and selecting of Rural Electrification Pilot Subprojects;	(i) Completed • Consultancy on technical support for rural electrification. Completed June 30, 2001 (PPF). • Consultancy on preliminary market analysis of rural electrification. Contract ended February 3, 2002. • The Rural Electrification Strategy consultancy was completed March 21, 2006. Two additional studies were completed: • Determination of unsatisfied demand for electricity completed on July 19, 2006. • Determination of the ability and willingness to pay of the unserved rural population completed on July 12, 2006. ii) Completed • Initial photovoltaic pilot project design for Arajuno and Sarayacu; contract ended December 3, 2003. • Survey design for pilot projects; contract ended January 19, 2004. • Design of a micro-hydro pilot; contract ended April 29, 2005. • Design of a pilot project for rural electrification with photovoltaic systems for community centers. Contract

		ended August 5, 2005. • Program for the development of the photovoltaic and pico hydroelectric market; contract ended April 29, 2005. • Design of the second photovoltaic pilot project; contract ended June 1, 2005.
	(b) (i) identifying institutional, technical and financial barriers to rural electrification expansion; and (ii) developing and implementing of policy options to overcome such barriers, including: (A) strengthening promotional and technical capacity for off-grid electrification planning and implementation; (B) developing of alternative implementing mechanisms, including electric utility and non-utility concessions, community and non-governmental organizations' initiatives; (C) defining appropriate standards for required equipment, and training local support personnel; (D) providing public information and training on best practices, related technologies, and Rural Electrification Pilot Subprojects preparation and implementation; and (E) monitoring and evaluating this Part of the Project and Rural Electrification Pilot Subprojects.	(i) and (ii) Completed • The Rural Electrification Strategy (phase 1) mentioned above includes the scope of B.2 (b), except for the clause (E). For clause (E), the following has been done: • Technical and social evaluation of the electrification project with PV systems in community centers. Contract ended November 19, 2004. • Environmental assessment of rural electrification pilot projects with photovoltaic systems in the areas of Arajuno and Sarayacu. Completion date of the contract November 30, 2004. • Technical monitoring and management of pilot photovoltaic projects. Contract ended in June 2008. • Acquisition of equipment for technical monitoring [to the firm ONSET COMPUTER CO] was completed in October 2006. • Monitoring and evaluation of social, economic, and environmental impact of the electricity sector pilot projects. Contract was completed on February 6, 2007.
B.3	**Carrying out of Rural Electrification Pilot Subprojects**	Completed • Supply and installation of 123 photovoltaic systems for the Arajuno project. Contract completion date December 24, 2004. • Definition of sites for the implementation of the photovoltaic and pico hydropower market for decentralized rural electrification program. Contract completion date March 29, 2006. • International public bidding for the implementation of the photovoltaic and pico hydropower market for decentralized rural electrification program, Napo project. The contract was completed on June 23, 2008. • Definition of sites for the implementation of the second rural electrification project (Emeraldas) with PV systems. The contract was completed in June 2006. • International public bidding for the implementation of the Esmeraldas project. The contract was completed in April 2007.
B.4	**Development and implementation of MIC/MICIP's program to bring information and communications development services to micro and small businesses in rural and peri-urban areas in the territory of the Borrower, including:**	
	(a) carrying out an assessment of the Borrower's electronic business environment, including: (i) an overview of the regulations affecting Internet provision and utilization,	(i) and (ii) Completed • Market analysis for the preparation and development of MICRONET pilot projects. Completion date of contract February 11, 2002 (PPF).

	and the identification of major barriers to electronic commerce development; and (ii) an inventory of existing information technology infrastructure and businesses;	• Consulting on ICT for the MICRONET project (PPF). • Study of demand for telecommunications services in rural areas. Contract completion February 12, 2002 (PPF).
	(b) carrying out an assessment of international best practices to improve the Borrower's legal framework for conducting electronic business, including: (i) recognizing the legal status of hand-written signatures and messages as equivalent to that of electronic signatures and messages; (ii) defining the obligations of institutions providing electronic certification and services related to digital signatures; (iii) regulating electronic contracts; and (iv) defining of responsibilities for electronic fraud;	(i), (ii), (iii) and (iv) Completed • Financial, legal and implementation analysis for MICRONET. Contract end date February 2, 2002 (PPF).
	(c) carrying out an assessment of the Borrower's policy options in light of international best practices in the areas of: (i) data privacy and consumer protection; (ii) technological parks; (iii) taxation of imports of hardware and software; (iv) incentives to international Internet providers entering the Borrower's market; and (v) incentives for the introduction of new technologies; and	Completed • Consultancies on legal, financial, computing and technology, product design and marketing (business plan) elements conducted by 6 different consultants during 2004.
	(d) carrying out of Rural Business Development Center Pilot Subprojects.	Completed • Temporary management for the fundraising process and initial structuring of the MICRONET project, conducted by 3 consultants during 2005 and 2006. • Design and implementation of software tools. Contract completed in June 2008. • Design and implementation of MICRONET Internet portal. Contract completed in May 2007.
Part C	**ENHANCEMENT OF ELECTRICITY END-USE EFFICIENCY ENHANCEMENT OF ELECTRICITY END-USE EFFICIENCY IN THE TERRITORY OF THE BORROWER BY MER/MEM, BY:**	
C.1	**Identifying barriers to efficiency enhancement, through surveys on electricity demand and efficiency enhancement options;**	Completed • Consultancy for technical support to energy efficiency. Contract ended August 6, 2001(PPF). • The following consulting activities were completed by March 14, 2006: 1) Identification of Barriers and Measures, 2) Pilot Projects, 3) Equipment Specifications, 4) Standards and Labeling, 5) Technical and Marketing Studies, 6) Legal Framework and Training
C.2	**Determining of strategies and policies to remove such barriers, including:**	
	(a) tariff incentives;	a) Completed (see C.1). CONELEC has established "time of use" tariffs that promote the efficient use of energy for both medium and high voltage.
	(b) standards for efficient design and	b) and c) Completed (see C.1)

	utilization of electrical appliances and buildings; (c) dissemination of best efficiency enhancement practices and related technologies; and	The terms of reference and mechanisms for monitoring the implementation of energy audit contracts for the pilot projects were structured with the goal of establishing standard strategies for evaluating energy efficiency improvements, technical assistance to local energy service providers, and information gathering to evaluate the results of the project.
	(d) support to the establishment and operation of local energy services providers; and	d) Contract with ENERPRO-GEPROIN was completed in August 2007.
C.3	**Carrying out Electricity Efficiency Enhancement Pilot Subprojects.**	Completed • Design and implementation of the pilot projects: Replacing Incandescent Bulbs with Compact Fluorescent Lamps in the Residential Sector; and Public Lighting Management in Urban Areas. Contract completed in January 2007. • Two consultants were contracted to direct the pilot projects, with contracts ending in late 2006. • Acquisition of equipment for energy audits contracted with 10 different firms during 2006. • Energy audits for the industrial and hotel sectors contracted with 10 firms during 2006.
Part D	**PROJECT COMMUNICATIONS, COORDINATION AND MANAGEMENT**	
D.1	**Management and monitoring of the Project by SENPLADES/CONAM.**	Completed – Financial Management • Annual financial audits were contracted. • Periodic management audits (*Auditorias de Gestión*) were undertaken by the *Contraloría General del Estado*.
D.2	**Coordination of implementation of the Project by the Implementing Agencies.**	• Implementation of the project by the Implementing Agencies are evaluation by the World Bank during each supervision mission: CENACE CONELEC MER/MEM CONATEL/SENATEL/FODETEL; SUPTEL MIC/MICIP
D.2	**Carrying out of communications and consultation campaigns with stakeholders and civil society organizations:**	
	(a) by SENPLADES/CONAM, on the objectives and policies of the Borrower's reform programs for private sector participation in the power and communications sectors, including: (i) disseminating the importance, requirements and implication of such programs; (ii) building consensus around the reform programs; (iii) developing the communications capacity of other institutions of the Borrower instrumental for the private sector participation reform programs; (iv) designing internal communications mechanisms directed at staff of the enterprises slated for private sector participation; (v) improving media	(i), (ii), (iii), (iv), (v) and (vi) Completed • Emergency Communication Plans; contracts completed in 2001 and 2002 (PPF). • Strategic communications and public information plan for CONAM, defining consultation activities related to the state modernization process. December 31, 2001 (PPF). • Identification of social perceptions of the PROMEC project and modernization processes. Contract ended January 19, 2002 (PPF). • Specialized consultancy in mass communication, advertising and graphic design. Contract ended February 19, 2002 (PPF). • Communications consultant (international). Contract ended February 18, 2002 (PPF). • Redesign of the Communication, Consultation, and

	understanding of such reform programs; and (vi) improving the perceptions of international investors;	Social Participation Plan for PROMEC. In execution since September 2003. • Elaboration of a Stand in the Duran fair for the promotion of PROMEC. Contracts ended October 15, 2003. • Informative workshops about PROMEC, undertaken between March 11, 2003 and March 19, 2004, aimed at representatives of indigenous, campesino, and afro organizations. • Development of the corporate image of PROMEC. Contract ended March 12, 2004. • Elaboration of PROMEC's communications plan. Contract ended February 11, 2005. • Diagnosis of perceptions and expectations of the public regarding PROMEC. Contract ended August 20, 2004. • Design of the Web portal of PROMEC. Contract ended October 17, 2004. • MICRONET corporate image; contract ended on July 27, 2006. • Several consultation and social participation workshops with stakeholders and beneficiaries of PROMEC pilot projects. Since June 2003.
	(b) by CONELEC and SUPTEL, to: (i) undertake public consultation of major regulatory decisions; and (ii) systematically disseminate their respective sectors' programs; and	(i) Completed • Public hearings by CONELEC and CONATEL for the adoption of regulations and rules (ii) Not Completed
	(c) included in the Indigenous Peoples Development Framework.	Completed • The World Bank's indigenous peoples safeguards were considered and complied with. • 123 Kichwas families from Napo and Pastaza were beneficiaries of the Arajuno pilot project. • Workshops and dissemination materials in the native language. • Intercultural workshops for the Arajuno pilot project. • Periodic meetings were conducted with community leaders in Awá for the Mira project, in order to encourage their participation.

Annex 3. Detailed Assessment of Project Outcome/Impact

This Annex breaks down the Project Development Objective by clause from the Project Appraisal Document (PAD). Following each clause are selected qualitative Outcome/Impact Indicators from the results framework in Annex 1 of the PAD and their ratings, as well as quantitative "Core Indicators of Project Outcome/ Impacts". The analysis below will demonstrate that the Project was successful in achieving most of its objectives.

The objective of the Project is support the Borrower's reform programs in the power and communications sectors by:

(a): **Strengthening regulatory institutions.**

1.1: Improved effectiveness of SUPTEL to supervise the sector and undertake timely public consultations and dissemination of regulatory decisions. Rating: Satisfactory

The Project helped SUPTEL adopt a new organizational structure and procedures to become more efficient and effective. SUPTEL's computing infrastructure was improved and updated, training courses (technical, financial/administrative, legal, and ICT) were implemented, relevant books and technical documents were purchased. Additionally, radio frequency monitoring equipment was installed in Quito and Cuenca. These units are operating well and have allowed SUPTEL to better control the radio-frequency spectrum, detecting illegal users, clandestine radios, and solving interference problems.[8] SUPTEL is expanding the radio spectrum monitoring system nationally, investing US$15 million to purchase monitoring stations and improving the centralized database for the frequency records. Additionally, the Project assisted SUPTEL to improve its image, and to conduct public consultations and dissemination programs. It is reasonable to assume that training staff, providing it with technical assistance, improving its image and dissemination programs, and updating its antiquated systems with a modern radio frequency management and monitoring system contributed to the significant gains in SUPTEL's productivity in terms of the number of employees per subscriber (Core Indicator 1).

Objective	Indicator	Baseline (2002)	End-of-Project Target (2006)	End-of-Project Actual (2008)
Improved effectiveness of supervisory agency, SUPTEL	Number of thousand subscribers per SUPTEL employee	14.0	17.0	48.7

1.2: Improved effectiveness of CONELEC to regulate the power sector and undertake timely public consultations and dissemination of regulatory decisions. Rating: Moderately Satisfactory

PROMEC's technical assistance (including consultancies, equipment, and software purchases) strengthened CONELEC's planning, regulation, supervision, and control capacity. Consultancies have given the tariff unit the tools and methodologies to calculate tariffs based on actual costs. Reforms of laws, norms, and regulations were identified that would improve the operation of the

sector, with respect to third party access to transmission and distribution, anti-trust, guarantees of existing contracts, operation of the wholesale market and international transactions. Modern information systems were established, including a geographic information system (GIS) that facilitate CONELEC's planning processes. Equipment provided assists in supervision of required transmission and distribution quality levels. A strategic training plan was developed and implemented. While the political climate in Ecuador prevented some of the consultancy results from being adopted, for instance some of those related to tariffs and legal reforms, these tools provide valuable inputs for sector reorganization and tariff rebalancing plans of the Government. While the Project likely improved CONELEC's regulatory effectiveness and contributed to improvement of the core indicator of timeliness of completing regulatory tasks, it is not clear that there was an impact on its ability to undertake public consultations and disseminate regulatory decisions.

Objective	Indicator	Baseline (2002)	End-of-Project Target (2006)	End-of-Project Actual (2008)
Improved effectiveness of regulatory agency, CONELEC	Aggregate imeliness of CONELEC in completing selected regulatory tasks as established in its procedures (percent)	80percent	100percent	100percent

1.4: Establishment of a liberalized wholesale electricity market, with an increased number of private operators and improved administration by CENACE. Rating: Moderately Satisfactory

The Project strengthened CENACE's administration of the wholesale market. The Project financed three inter-related advanced technology systems for CENACE's operations center, making it one of the most modern in Latin America. This center serves the critical functions of dispatching electricity and handling commercial transactions in the wholesale electricity market. The first system financed, the energy management system, manages the dispatch of energy within the National Interconnected Energy System in real time. It permits supervision and control of energy dispatch from generators and ensures reliable and secure operation of the electricity system. It is useful regardless of the institutional or regulatory structure. The second system is a commercial measurement system that is useful for all types of market participants (public or private) and for the commercial management of the electricity system. The third system is an information system for the wholesale market, which is not only being used by CENACE, but also by major market participants. The information system for the wholesale market is customized to the current market rules, and would need to be changed if the Government reorganizes the sector. CENACE has indicated that it has contracted with the supplier to adapt the system as needed. However, the usefulness of the third system could decrease under a sector organization with fewer and mainly public actors. It should also be noted that, as sector policies changed, a fully liberalized wholesale electricity market with an increased number of private operators was not achieved. Also, the establishment of a liberalized wholesale market cannot be considered as an indicator of strengthening of CENACE, the operator of the market. Since the indicator was formulated in this way, the rating has been reduced from satisfactory to moderately satisfactory.

Loan Agreement Quantitative Core Indicators

Objective	Indicator	Baseline (2002)	End-of-Project Target (2006)	End-of-Project Actual (2008)
Efficient administration of wholesale market administrator, CENACE	Timely presentation of transaction settling and billing information (percent) (Number of monthly requests presented on time/ Number of monthly requests)	80percent	100percent	100percent

(b): Improving environmental management of the electricity sector.

1.3: Strengthened capacity of CONELEC and other relevant entities, to conduct environmental management of power sector activities. Rating: Highly Satisfactory

Environmental management and control capacity has been strengthened within CONELEC as well as the Ministry of Environment. An environmental unit within CONELEC was accredited by the Ministry of Environment to evaluate projects and give licenses. The Project also built capacity within the Ministry of Environment to identify and promote Clean Development Mechanism (CDM) projects. With the support of the Project, two carbon emissions reductions CDM contracts were signed for hydroelectric facilities with private investment. Moreover, the Project's trailblazing activities laid the foundation for several more CDM projects in the power generation sector.

(c) Fostering competition and increasing private participation.

1.5: Increased number of private operators providing rural telecommunications, decentralized rural electrification, energy efficiency services and ICT based services to MSBs.
Rating: Moderately Unsatisfactory

While the development objective is very general, the indicator relates directly to rural service extension and energy efficiency. In the telecommunications pilot, a contract was signed for establishment of rural telecenters with a telecommunications operator. However, as noted in Section 1.9, the contract was cancelled without achieving the intended outcome. In the case of the ICT service pilot, Micronet, a mixed company was established, SEDEMPYE, that is currently operating centers in Cuena, Loja and Galapagos, but is struggling to achieve financial viability. Three rural electrification service pilots are in operation with public electricity distribution companies and private community organizations, but as noted below their performance in the medium to long-term remains to be established. Finally, the energy efficiency activities of the Project trained 100 representatives of private companies and educational institutions in energy audits, as well as conducting audits through a number of the private ESCOs trained. Also, a promotion for CFL bulbs was carried out through private sector companies. Overall, the outcome is considered to be moderately unsatisfactory at the closing of the Project, mainly because of the cancellation of the telecenter component and the fragile status of the Micronet component.

(d) Promoting efficient use of energy.

3.*1: Successful implementation of a program to enhance efficiency in the use of energy. Rating: Highly Satisfactory*

PROMEC's energy efficiency activities achieved significant results, including completion of studies analyzing barriers to energy efficiency, development of a strategy for energy efficiency and the successful completion of activities that reduced energy use in the short and medium term. These efforts are particularly relevant to the priorities of the current Government, which has defined energy efficiency as a priority in the National Development Plan, 2007-2010, building on the results of the Project. The main results are summarized below:

(a) Sale of more than 1.69 million compact fluorescent (CFL) bulbs that reduced the average consumption of residential users' electricity consumption for light by 32 percent (equivalent to 8 percent of total consumption of average residential user) and peak demand in the entire system by 80 MW, saving 102,300 MWh per year. This led to a follow-up program, already underway, in which MER will donate 6 million CFLs to low income households. The result of the additional program will be a reduction of peak demand by 225 MW and an energy saving of 289,100 MWh per year.
(b) Training of more than 100 representatives of private companies, educational institutions and ESCOs on energy audits, as well as completion of energy audits in commercial buildings, hotels, hospitals and industries.
(c) Completion of standardization and labeling of energy use of refrigerators, with the Ecuadorian Standards Institute (INEN), a procedure that could be replicated for other appliances; and
(d) Preparation of educational materials on energy efficiency for school curriculums. Training for teachers was provided in four regional seminars and the teaching materials will be disseminated for use in schools around the country starting in March 2009.

Loan Agreement Quantitative Core Indicators

Objective	Indicator	Baseline (2002)	End-of-Project Target (2007)	End-of-Project Actual (2008)
Positive impact of demonstration projects	Reduction in energy consumption of users participating in the pilot projects (percent)	0	15percent	32percent

(e): Extending coverage of power and communications services to underserved areas.

2.1: Adoption of a sustainable strategy to extend telecommunications and electricity services to the poor, including the adoption of cost efficient financing and delivery mechanisms. Rating: Moderately Satisfactory

The Project made a significant contribution to this objective through a Tariff Rebalancing Study, which helped to extend coverage of telecommunications services to the rural, poor and marginal areas of Ecuador. The Study helped CONATEL to (a) adjust tariffs for fixed line service, eliminating most of the fixed line tariff subsidies; and (b) order a reduction of the fixed to mobile interconnection rates.[9] SENATEL issued a resolution in 2004 reducing the fixed-mobile interconnection rate, which caused the private companies to reduce their mobile rates from an average of US$0.25 per minute in 2004 to US$0.11 per minute in 2008. The number of mobile lines increased rapidly as a result, from 482,000 in 2000 to 6.246 million in 2007. The

[9] SENATEL Interconnection Order of July 15, 2004, reduced fixed to mobile interconnection rates from US$0.23 per minute to US$0.1131, and mobile to fixed rates from US$0.045 per minute to US$0.02 per minute average.

percentage of Ecuadorians with phones increased from 27percent in 2004 to 79percent in July 2008.

The Government recently approved a sustainable strategy developed by CONATEL, the National Connectivity Plan 2008-2010. The Plan calls for US$900 million investment to: (a) increase the coverage of fixed lines; (b) increase the participation of TELECSA in the mobile market, focusing on rural and border areas; and (c) expand the number of broadband lines. CONATEL intends to further revise tariffs, focusing subsidies on the low-income, rural and marginal population, reducing the tariffs for broadband services, and further aligning tariffs with costs. The new contracts with cellular phone companies include an obligation to pay 1 percent of revenues to the Universal Service Fund (FODETEL) to finance extension of services, representing a sustainable approach to providing service to rural residents and the poor.

With respect to electricity coverage, the Government introduced the Rural Electrification Plan, building on the successful experience with the Rural Electrification Fund (FERUM), but increasing financing from US$45 million to US$130 million in 2008 and $120 million per year for the next four years. Of this amount, US$9.6 million is allocated for renewable energy projects. The PROMEC Project provided experience that helped in the development of the Rural Electrification Plan, including help to adapt the regulations of FERUM for renewable energy, preparation of a strategy for rural electrification, studies of the unmet demand for electrification and the capacity and willingness to pay of the population without service, implementation of several pilot projects, preparation of a pipeline of renewable energy projects to be financed, preparing guidelines for the preparation of projects by distribution companies, and analyzing the lessons learned from the pilot projects.

2.2: Successful completion of pilot projects for rural telecommunications, testing the cost-efficiency, subsidy optimization, service quality, effective community participation and replicability of the models. Rating: Highly Unsatisfactory

As noted in section 1.9, the contract for implementation of this activity was cancelled in June 2008. While 560 telecenters were reported as installed by the telecommunications operator in August 2007, according to CONATEL the telecenters have not operated and the outcome was not achieved.

Loan Agreement Quantitative Core Indicators

Objective	Indicator	Baseline (2002)	End-of-Project Target (2007)	End-of-Project Actual (2008)
Positive impact of pilot projects for rural telephony and electricity	Traffic in project-financed telecenters (minutes/day)	0	32	0

2.3: Successful completion of pilot projects for renewable energy-based decentralized electrification, testing several delivery and financing mechanisms and conditions for sustainability and replicability.
Rating: Moderately Unsatisfactory

The Project implemented pilots using solar home systems to serve a total of 1741 households, reaching 87 per cent of the revised target. This included 1346 households (in Arajuno, Esmeraldas, and Napo Sur), where the projects were prepared and financed by PROMEC. Even

more importantly, the Project assisted service provision for 395 households where PROMEC prepared the rural electrification projects and secured financing from others, including FERUM and the private sector. An example is the Sarayacu Project, where the Empresa Electrica Ambato obtained funds from FERUM for provision of electricity with solar home systems for 140 households, after the Project was prepared by PROMEC. Studies were completed for service to another 646 households that provide a pipeline for future investments.

However, the pilots are still a work in progress. Arrangements to transfer the systems from SENPLADES to the distribution companies are still underway, and the implementation arrangements for the first pilot in Arajuno failed and are being reorganized. The second pilot in Esmeraldas featured a stronger community organization and better administrative organization that has resulted in more successful operation. Issues include a lack of interest by the distribution companies, an inequity between the monthly payments of the users in the pilots and the subsidized customers on the network, as well as complaints about the limited capacity of the PV systems. Maintenance has been an issue, particularly following heavy storms that damaged some panels. SENPLADES is following up on the issues and working on transition arrangements with MER and CONELEC. While issues remain, the pilots have provide valuable information for the expanded Government program under the Rural Electrification Plan, and the Project's main consultants have been hired by CONELEC or other renewable projects to continue the work.

Loan Agreement Quantitative Core Indicators

Objective	Indicator	Baseline (2002)	End-of-Project Target (2007)	End-of-Project Actual (2008)
Positive impact of pilot projects for rural telephony and electricity	Number of electrified households in pilot project areas	0	2000	1741

(f) Providing modern information technology services to micro and small businesses (MSBs).

2.4: Successful completion of the pilot project for ICT-based business development services to MSBs in urban and peri-urban areas. *Rating: Moderately Unsatisfactory*

At the close of the Project, three centers were operating in Cuenca, Loja and Galapagos. The centers provide a range of training services offered through an internet portal, including modules on legal advice, credit, finance, business plans, and marketing plans. While the Project did not reach its targets in terms of numbers of businesses served, Micronet has reached agreement with local business associations and chambers to provide training to their members. As noted in section 2.5, the sustainability of the Micronet centers depends on mobilizing additional financing from the private sector. Since the number of users was well below the end-of-project target at end June, and the sustainability of the operation is uncertain, the activity is rated as moderately unsatisfactory. It should be noted, however, that data to the end of September show an increase in the number of users to 1315, indicating strong growth potential.

Loan Agreement Quantitative Core Indicators

Objective	Indicator	Baseline (2002)	End-of-Project Target (2007)	End-of-Project Actual (2008)
Positive impact of pilot projects for ICT-based services micro and small businesses (MSBs)	Cumulative number of MSBs that have used business services	0	8,000	513 to end June, 1315 by end September

(g) Enhancing communication and consultation in the sectors. *Rating: Satisfactory*

The participation and communication activities of the PROMEC Project were particularly strong and contributed to its transparency and good governance, contributing to the positive perception of the Project by stakeholders, implementing agencies and Government authorities. These activities in relation to the rural services extension components were regarded as best practice by the Project's social specialist, especially in relation to inclusion of indigenous peoples and the poor. Activities aimed to assist the beneficiaries of the Project to participate in the definition of their problems and needs. Actions included: (a) assistance to all pilot projects to incorporate participatory approaches in preparation and implementation; (b) economic, social and environmental evaluation of rural electrification pilot projects; (c) one national and six regional workshops to present and discuss the activities of PROMEC; (d) workshops among implementing agencies and stakeholders; (e) applying a policy of positive social discrimination, including indigenous people and afroecuadorians; and (f) developing public information campaigns for the rural electrification, energy efficiency, telecommunication and business services pilots.

Annex 4: Economic and Financial Analysis of the PROMEC Project (Preliminary)

The Project Appraisal Document (PAD) did not provide sufficient detail on the methodology used to conduct the financial and economic analyses; hence the analysis carried out in this ICR does not replicate exactly that of the PAD. Given the broad scope of the project, economic and financial analyses have been carried at the level of project component /sub component, when relevant. Discount rate is 12 percent for all analyses.

Component 1: Strengthening of Legal, Regulatory and Institutional Frameworks

A1. Strengthening of SUPTEL's supervisory and enforcement capacity
A2. Strengthening of CONELEC's regulatory capacity
A3. Improvement of CONELEC's environmental management of the Borrower's power sector

These three components consisted in the provision of technical assistance for improvement of technical and institutional capacity of the two entities. Therefore, no financial or economic analysis was carried out.

A4. Improvement of CENACE's electricity wholesale market administration
The project financed the following systems for CENACE: (i) Energy Management System (SIMAE), (ii) Commercial Measurement System (SIMEC), and (iii) Information System for the Wholesale Market (SIMEM).

The Project conducted simple economic and financial analyses, while CENACE carried out a more comprehensive economic analysis (comprising systems developed at the same time as PROMEC but not financed by it), which is included in the Project Files.

Economic analysis
The main economic benefits of these systems are estimated to be two fold: (i) a reduction in electricity cuts and increase in energy provided to clients, (ii) an improvement in measurement of electricity transactions in the whole sale market.

The main assumptions were as follows:

- Yearly reduction in energy loss due to outage is detailed in the table 4.1 below,
- Improvement in accuracy of measurement: 0.095 percent (CENACE measurement over 2006-08),
- Costs: actual for the Energy Management System (SIMAE), and estimates for the two other systems (SIMEC and SIMEM).

Based on the economic analysis, the component shows good economic returns. Under relatively conservative assumptions, the ERR for the component is 37 percent, with an economic net present value of US$3.5 million.

Table 4.1: CENACE-Evaluation of Economic Benefits

	Expected Yearly GWh Due to Outages		Savings US$500/ MWh	Electricity Traded at Exchange Nodes	Savings due to better accuracy	Energy Cost	Savings due to better accuracy	Total Savings
Year	Without Project	With Project	US$ 000	GWh	GWh	US$/MWh	US$ 000	US$ 000
2006	5.49	2.59	1,449	14,376	13.61	64.89	883	2,332
2007	5.67	2.72	1,475	13,482	12.76	64.63	825	2,300
2008	5.91	2.90	1,509	16,316	15.44	50.91	786	2,295
2009	6.13	3.05	1,538	17,139	16.22	40.05	650	2,188
2010	6.34	3.21	1,569	17,974	17.01	39.34	669	2,238
2011	6.57	3.37	1,600	18,916	17.91	37.99	680	2,281
2012	6.8	3.53	1,633	19,807	18.75	35.58	667	2,300
2013	7.04	3.71	1,666	20,730	19.62	33.74	662	2,328
2014	7.28	3.88	1,701	21,689	20.53	35.46	728	2,429
2015	7.54	4.07	1,736	22,738	21.52	37.34	804	2,540

Source: CENACE, MEM

Table 4.2: CENACE-Economic Analysis

	1	2	3	4	5	6	7	8	9	10
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
BENEFITS (US$000)										
Reduction in outages	1,449	1,475	1,509	1,538	1,569	1,600	1,633	1,666	1,701	1,736
Better accuracy in measurement/processes	8,83	825	786	650	669	680	667	662	728	804
Total benefits (US$000)	**2,332**	**2,300**	**2,295**	**2,188**	**2,238**	**2,281**	**2,300**	**2,328**	**2,429**	**2,540**
COSTS (US$000)										
Energy Management (SIMAE)	2,537									
Commercial Measurement System (SIMEC)	625									
MEM Information System (SIMEM)	2,932									
Costs O&M SIMAE		298	708	708	708	709	346	116	513	513
Costs O&M SIMEC/SIMEM		50	380	380	380	380	380	380	380	380
Total costs (US$000)	**6,094**	**348**	**1,088**	**1,088**	**1,088**	**1,089**	**726**	**496**	**893**	**893**
NPV (US$000)	**3,547**									
IRR (percent)	**36.6**									

Source: CENACE, MEM

Financial analysis

The financial benefits of these systems are the same as those estimated for the economic analysis: but the pricing of those benefits differs since the price of non served electricity is estimated as the average of the final user tariff, the producers 'income and the average cost of electricity self-production.

The main assumptions were as follows:

- Yearly reduction in energy loss due to outage is detailed in the table 4.3 below,
- Improvement in accuracy of measurement: 0.095 percent (CENACE measurement over 2006-08),
- Costs: actual for the Energy Management System (SIMAE), and estimates for the two other systems (SIMEC and SIMEM).

The financial analysis yields good financial returns. Under relatively conservative assumptions, the IRR for the component is 16 percent, with a financial net present value of US$538,000.

Table 4.3: CENACE - Evaluation of Financial Benefits

	Expected Yearly GWh Due to Outages		Savings	Electricity Traded at Exchange Nodes	Savings due to better accuracy	Energy Cost	Savings due to better accuracy	Total Savings
Year	Without Project	With Project	US$ 000	GWh/Year	GWh/Year	US$/MWh	US$ 000	US$ 000
2006	5.49	2.59	1,106	14,376	13.61	64.89	883	1,989
2007	5.67	2.72	1,132	13,482	12.76	64.63	825	1,957
2008	5.91	2.90	1,036	16,316	15.44	50.91	786	1,822
2009	6.13	3.05	947	17,139	16.22	40.05	649	1,597
2010	6.34	3.21	961	17,974	17.01	39.34	669	1,630
2011	6.57	3.37	969	18,916	17.91	37.99	680	1,649
2012	6.8	3.53	969	19,807	18.75	35.58	667	1,636
2013	7.04	3.71	973	20,730	19.62	33.74	662	1,635
2014	7.28	3.88	1,008	21,689	20.53	35.46	728	1,736
2015	7.54	4.07	1,046	22,738	21.52	37.34	804	1,849

Source: CENACE, MEM

Table 4.4: CENACE - Financial Analysis

	1	2	3	4	5	6	7	8	9	10
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
BENEFITS (US$000)										
Reduction in outages	1106	1,132	1,036	947	961	969	969	973	1,008	1,046
Better accuracy in measurement	883	825	786	650	669	680	667	662	728	804
Total benefits (US$000)	**$1,989**	**1.957**	**1,822**	**1,597**	**1,630**	**1,649**	**1,636**	**1,635**	**1,736**	**1,849**
COSTS (US$000)										
Energy Management System (SIMAE)	2,537									
Commercial Measurement System (SIMEC)	625									
MEM Information System (SIMEM)	2,932									
Costs O&M SIMAE		298	708	708	708	709	346	116	513	513
Costos O&M de SIMEC/SIMEM		50	380	380	380	380	380	380	380	380
Total costs (US$000)	**6,094**	**348**	**1,088**	**1,088**	**1,088**	**1,089**	**726**	**496**	**893**	**893**
NPV (US$000)	**538**									
IRR (percent)	**16.0**									

Source: CENACE, MEM

Component B. Extension of Power, Communications and Business Services to Rural and Peri-urban Areas Sectors

B1. Rural Telecommunications Pilot Subprojects

The team did not carry out the economic analysis for the Telecenter component, because it was not successful. The private company that was selected to build and operate the telecenters claims to have installed 560 centers. However, CONATEL indicated that none of them entered into operation and CONATEL cancelled the contract in June 2008, after an initial payment of US$1 million.

Nevertheless, as mentioned in Section 3.2(e), the Tariff Rebalancing Study for CONATEL, led to SENATEL Interconnection Order, which allowed for an increase in installation of the number of mobile lines by private companies, and a significant reduction in prices for the services.

There are several benefits attributable to SENATEL Interconnection Order: (i) Consumer surplus from the reduction in prices, (ii) Increased competition in the sector, although the impact is limited as there were no new companies entering the market in this period, (iii) Voluntary reduction in prices by the companies in order to attract the lower income population to buy and use cell phones. In general, we have not seen this behavior in other countries if the operators are not pressured by competition., (iv) Increased purchasing power of the population: based on IMF data, total growth for the period 2004 to 2008 (June 30th) is 8.7 percent, which is relatively low compared with the reported increase in usage.

The team conservatively chose to assess only the consumer surplus from the reduction in prices. The results are very positive: the economic NPV is US$78 million over the period.

Table 4.5: CONATEL: Tariff Rebalancing Study – Economic benefits

	2004	**2005**	**2006**	**2007**	**2008**
Number of lines (million)	3.55	5.40	7.26	9.11	10.96
Minutes per month per user	52.00	58.75	65.50	72.25	79.00
ARPU (US$)	13.00	11.93	10.87	9.80	8.73
Average price per minute (US$)	0.25	0.20	0.17	0.14	0.11
Annual change in price		-0.05	-0.08	-0.11	-0.14
Annual change in consumption		81.00	81.00	81.00	81.00
Increase in surplus per user		1.90	3.41	4.63	5.65
Total increase in surplus (US$ million)		**8.50**	**21.56**	**37.90**	**56.69**
Study Cost (US$ million)	-0.04				
Cash Flow (US$ million)	-0.04	8.50	21.56	37.90	56.69
NPV (US$ million)	**78.34**				

B2. Development and implementation of MER/MEM's rural electrification program
The economic and financial analysis was carried out for the rural electrification sub-pilot project Esmeraldas carried out under the MER rural electrification program, based on the studies financed by PROMEC (see component B3 below).

B3. Carrying out of Rural Electrification Pilot Subprojects

Economic analysis
The economic benefits have two components : (i) the avoided costs for lighting and TV/radio (dry cells and rechargeable car-batteries) that households will not incur when the PV systems are installed, and (ii) the consumer surplus resulting from the increased consumption at lower per unit prices.

The analysis was carried out for the three sub pilots: Esmeraldas, Arajuno and Napo, in which a total of 1,346 systems were installed (302 100Wp systems, 1,031 200Wp systems and 13 400Wp systems).

The following assumptions were made:

- Households energy expenses: US$77.6 / month on average, based on survey data gathered in Arajuno and Esmeraldas, on average per year[10]
- Costs of PV systems: actual costs (exempt of VAT) were $1,280 for 100Wp systems and US$2,280 for 200Wp systems, on average per year[11]
- O&M costs: on average, US$54.2 per 100Wp system US$77.5 per 200Wp system per year[11]

Based on the economic analysis, the solar home systems (SHS) component o f the Project shows good economic returns. Under conservative assumptions, the ERR for the total sub component is 13 percent, with an economic net present value of about US$99,505.

Table 4.6: Rural Electrification Projects in Arajuno, Esmeraldas and Napo: Economic Cost Benefit Analysis

		Costs				**Benefits**		
						Partial Benefits		
Year	***Installed Systems***	***Initial Capital Expenditures***	***Replacement costs***	***Total Costs***		***Avoided Energy costs***	***Gain in Lighting Benefit from PV***	***Total Net Benefits***
1	679	-1,205,350	-40,470	-1,245,820		0	0	-1,245,820
2	1,346	-1,275,708	-83,378	-1,359,087		95,389	326,893	-936,804
3	1,346	0	-83,378	-83,378		95,389	326,893	338,904
4	1,346	0	-83,378	-83,378		95,389	326,893	338,904
5	1,346	0	-83,378	-83,378		95,389	326,893	338,904
6	1,346	0	-83,378	-83,378		95,389	326,893	338,904
7	1,346	0	-83,378	-83,378		95,389	326,893	338,904
8	1,346	0	-83,378	-83,378		95,389	326,893	338,904
9	1,346	0	-83,378	-83,378		95,389	326,893	338,904
10	1,346	0	-83,378	-83,378		95,389	326,893	338,904
11	1,346	0	-83,378	-83,378		95,389	326,893	338,904
12	1,346	0	-83,378	-83,378		95,389	326,893	338,904
13	1,346	0	-83,378	-83,378		95,389	326,893	338,904
14	1,346	0	-83,378	-83,378		95,389	326,893	338,904
15	1,346	0	-83,378	-83,378		95,389	326,893	338,904
16	1,346	0	-83,378	-83,378		95,389	326,893	338,904
17	1,346	0	-83,378	-83,378		95,389	326,893	338,904
18	1,346	0	-83,378	-83,378		95,389	326,893	338,904
19	1,346	0	-83,378	-83,378		95,389	326,893	338,904
20	1,346	0	-83,378	-83,378		95,389	326,893	338,904
NPV	US$	**99,505**						
EIRR	percent	**13**						

Financial analysis

The financial analysis focuses on the financial benefits to the customers. The user does not have any to make any down-payment for the system, which is provided free of charge, and the

[10] "Informe Final, PROMEC", Ing. Santiago Sánchez Miño, March 2004; and Senplades.

monthly fee for operations and maintenance is lower than the estimated monthly cost of energy for lighting before the installation of the SHS. Therefore, the NPV is positive at US$78,474 for the users (see table 4.7 below).

Table 4.7: Rural Electrification Projects in Arajuno, Esmeraldas and Napo: Financial Benefits to the Users

US$	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year
	1	2	3	4	5	6	7	8	9	10
Costs of PV system	95,464	95,464	95,464	95,464	95,464	95,464	95,464	95,464	95,464	95,464
Avoided costs	105,970	105,970	105,970	105,970	105,970	105,970	105,970	105,970	105,970	105,970
Net flow	10,506	10,506	10,506	10,506	10,506	10,506	10,506	10,506	10,506	10,506
	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year
	11	12	13	14	15	16	17	18	19	20
Costs of PV system	95,464	95,464	95,464	95,464	95,464	95,464	95,464	95,464	95,464	95,464
Avoided costs	105,970	105,970	105,970	105,970	105,970	105,970	105,970	105,970	105,970	105,970
Net flow	10,506	10,506	10,506	10,506	10,506	10,506	10,506	10,506	10,506	10,506
NPV (US$)	**78,474**									

B4. Development and implementation of MIC/MICIP's program to bring information and communications development services to micro and small businesses in rural and peri-urban areas.

As of end October 2008, the number of beneficiaries of the Micronet centers totaled 1,315 versus the 8,000 targeted. Micronet clients have followed training in ICT and business (including preparation of a business plan). Micronet is now introducing a new course to help MSBs build their financial plans.

After several years of operation, Micronet has not been able to reach break even. Nevertheless, it is worth mentioning that the targets for the component as indicated in the PAD ("Reaching a financial breakeven by year 2 and positive income of revenues by year 4") were not realistic, especially given that Micronet deals with very small and relatively informal businesses. Private sector investment in the company was much lower than original commitments obtained (only US$246,460).

Nevertheless, the concept developed by Micronet has encountered enthusiasm among local business stakeholders and its impact on MSBs has been widely recognized. As a result the firm recently received support (in the form of materials) from business associations, a financial donation (US$38.507) from Microsoft and the Corporation for Promotion of Exports and Investments (CORPEI) invested US$50,000 in Micronet in 2008. The company believes that a US$100,000 investment could provide the necessary inflow to finance the creation of the remaining 5 centers and therefore break-even. Some private companies have expressed interest in providing the necessary capital, but their participation has yet to be concretized.

Component C. Enhancement of Electricity End-use Efficiency

The analysis has been performed for the replacement of incandescent bulbs with CFLs (sub-component C3 " Carrying out Electricity Efficiency Enhancement Pilot Subprojects").

As described above, 1,045,000 CFLs were sold to residential customers through the commercial channels designed by the campaign in the regions participating in the pilot, and a total of 2,600,000 CFLs were sold throughout the country as a result of the public awareness created by the Project (with a baseline of 916,667 CFLs, net sales were 1,691,433).

Two main categories of CFLs were sold to customers: 23-Watt (32 percent of total) and 15 Watt (68 percent). CFLs use approximately 75 percent less electricity than the equivalent incandescent lamps given the same amount of lumen output.

Accumulated GHG emissions reductions resulting from the CFL component are expected to amount to 407,000 tons of C02e over five years. Corresponding reduction of peak demand is 80MW. This also leads to sizeable savings in postponement of investment generation.

Economic analysis

The replacement of incandescent lamps by CFLs has very high economic benefits. With an investment of US$4.8 million (before tax), and at an economic cost of energy estimated at US$11c/kWh, the replacement of incandescent bulbs by CFLs results in an economic NPV of US$40.6 million and an EIRR of 228 percent over five years (see table 4.8. below).

Financial analysis

The replacement of incandescent lamps by CFLs has good net financial benefits. With an investment of US$5.3 million (including taxes), and at a financial cost of energy (i.e. average tariff) estimated at between US$5c/kWh and US$13c/kWh, the replacement of incandescent bulbs by CFLs results in an economic NPV of US$22.3 million and an FIRR of 147 percent (see table 4.8. below).

Table 4.8: Economic and financial analyses: Replacement of incandescent bulbs with CFLs

Replacement of Incandescent Lamps by Compact Fluorescent Lamps	Residential Customers 200 kWh/month		Residential Customers 60 kWh/month	
Total Expenditures 4 years	CFL 23-Watt	Incandescent 100-Watt	CFL 15-Watt	Incandescent 60-Watt
Initial Investment (US$)	3.50	0.60	3.00	0.55
Electricity Tariff (US$/kWh)	0.13	0.13	0.05	0.05
Economic cost (US$/kWh)	0.11	0.11	0.11	0.11
Hours of use per day	3	3	3	3
Hours per year	1,095	1,095	1,095	1,095
Wattage (W)	23	100	15	60
Annual consumption (kWh/year)	25	110	16	66
Annual savings (kWh/year)	84		49	
Energy Cost per Year (US$)	3.15	13.69	0.79	3.15
Annual savings (US$/year)	10.54		2.37	
Life (years)	5	0.68	5	0.68
kWh in 5 years (kWh)	126	548	82	329
Energy Cost 5 Years (US$)	15.74	68.44	3.94	15.77
Life (hours)	5,475	745	5,475	745
Replacement cost 5 years cycle (US$)	0.00	4.41	0.00	4.04
Total Cost in 5 Years (US$)	19.24	73.45	6.94	20.36
Savings (5 years) (US$)	54.21	-	13.42	-
Energy Savings (kWh) (5 years) (kWh)	422	-	246	-

Economic and Financial Evaluation	Residential Customers 200 kWh/month	Residential Customers 60 kWh/month	TOTAL
FIRR (percent)	301	74	147
EIRR (percent)	291	198	228
FNPV (US$)	30.80	4.93	
ENPV (US$)	33.43	19.54	
FNPV (US$ million)			22.34
ENPV (US$ million)			40.57

Component D. Project Communications, Coordination and Management

No economic or financial analysis was carried out for this component.

Annex 5. Bank Lending and Implementation Support/Supervision Processes

(a) Task Team members

Names	Title	Unit	Responsibility/ Specialty
Lending			
Joerg-Uwe Richter	Sr. Economist		Task Manager (until 11/30/2000)
Philippe Durand	Sr. Energy Specialist		Task Manager (from 12/01/2000)
Eloy E. Vidal	Pr. Telecommunications Specialist		Telecom
Alberto Cruzat	Sr. Telecommunications Specialist		Telecom
Luis Carlos Guerrero	Financial Management Specialist		FM
Livio Pino	Sr. Financial Management Specialist		FM
Juan David Quintero	Sr. Environment Specialist		Environment
Pilar Larreamendy	Social Scientist		Social
Susan Goldmark	Sector Manager		
Kathy Bain	Sr. Social Scientist		Social
Clemencia Toffes	Regulatory Specialist		Regulation
Jose Manuel Bassat	Communications Officer		Communications
Luiz Gazoni	Sr. Procurement Specialist		Procurement
Patricia Hoyes	Financial Management specialist		FM
Dana Rysankova	Private Sector Specialist		Private sector
Lourdes Linares	Financial Management Specialist		FM
Eduardo Zolezzi	Senior Power Engineer		Electricity
James C. Hanna	Private Sector Specialist		Private sector
Marialisa Motta	Private Sector Specialist		Private sector
Michael Goldberg	Micro Finance Specialist		Private sector
Mike Jones	Consultant		Energy efficiency
Gabriela Arcos	Environmental Specialist		Environment
Issam Abousleiman	Disbursement Officer		Disbursement
David Varela	Senior Counsel		Legal
Macdonald Benjamin	Resident Representative		
K.Kadiresan, S.Ettinger, J.Besant-Jones, A.Revollo, S.Panneer, R.Taylor, A.Colliou, K.O'Sullivan)	Quality Enhancement Review Team		Quality enhancement
Supervision/ICR			
Susan Bogach	Senior Energy Economist	LCSEG	TTL at ICR
Philippe J-P. Durand	Lead Energy Specialist	PA9ES	TTL at approval
Ana Lucia Jimenez Nieto	Financial Management Analyst	LCSFM	Financial

Carla Avellan	Consultant	LCCEC	Communication, consultations
Eduardo H. Zolezzi	Consultant	LCSEG	Electricity
Eloy Eduardo Vidal	Lead Telecommunications Engine	CITPO	Telecom
Gabriela Arcos	Environmental Spec.	LCSEN	Safeguards
Harry Mike Jones	Consultant	LCSEG	Energy efficiency
James C. Hanna	Consultant	MNSED	Micronet
Luis M. Vaca-Soto	Consultant	LCSEG	Energy efficiency
Marcelo Amador Osorio	Consultant	LCSPT	Procurement
Pilar Larreamendy	Senior Social Development Econ	LCSSO	Safeguards
Fernando Lecaros	Sr. Energy Specialist	LCSEG	ICR author
Thomas Haven	Energy Specialist	LCSEG	ICR author
Karen Bazex	Energy Specialist	LCSEG	ICR author

(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		
FY99		0.00
FY00	5	36.34
FY01	35	161.82
FY02	13	52.07
FY03	4	2.54
FY04		8.77
FY05		0.35
Total:	57	261.89
Supervision/ICR		
FY02	7	48.94
FY03	17	93.35
FY04	13	100.63
FY05	14	115.39
FY06	20	149.79
FY07	12	90.84
FY08	16	88.92
Total:	99	687.86

Annex 6. Beneficiary Survey Results *(if any)*

N/A*

Annex 7. Stakeholder Workshop Report and Results *(if any)*

N/A

Annex 8. Summary of Borrower's ICR and/or Comments on Draft ICR

No Borrowers ICR or comments on draft ICR from the Borrower were received.

Annex 9. Comments of Cofinanciers and Other Partners/Stakeholders

Annex 10. List of Supporting Documents

CENACE, “Implantación de Proyectos IT en el CENACE: Determinación y Valoración de Beneficios para el CENACE y el Sector Eléctrico”, septiembre 2008.

Economist Intelligence Unit (2007). Ecuador: Country Profile 2007.

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World Bank (2001). Project Appraisal Document for a Power and Communications Sectors Modernization and Rural Services Project (PROME). Report No: 22519-EC. Washington, DC: World Bank.

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