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Report No: PAD1999

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED SCALE UP FACILITY CREDIT

IN THE AMOUNT OF EUR 302.3 MILLION
(US\$325 MILLION EQUIVALENT)

TO THE

REPUBLIC OF CÔTE D'IVOIRE

FOR AN

ELECTRICITY TRANSMISSION AND ACCESS PROJECT

March 9, 2017

ENERGY AND EXTRACTIVES GLOBAL PRACTICE
AFRICA REGION

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CURRENCY EQUIVALENTS

(Exchange Rate Effective January 31, 2017)

Currency Unit	=	EUR
EUR 0.93005952	=	US\$1
FCFA 580	=	US\$1

FISCAL YEAR

January 1 – December 31

ABBREVIATIONS AND ACRONYMS

AFD	<i>Agence Française de Développement</i> (French Development Agency)
AfDB	African Development Bank
AFREA	Africa Renewable Energy Access Program
ANARE	<i>Autorité Nationale de Régulation du Secteur d'Electricité</i> (National Authority for the Regulation of the Electricity Sector)
AWPB	Annual Work Plan and Budget
BOAD	<i>Banque Ouest Africaine de Développement</i> (West African Development Bank)
BOT	Build-Operate-and-Transfer
CEB	<i>Communauté Electrique du Bénin</i> (Benin Electricity Utility)
CIE	<i>Compagnie Ivoirienne d'Electricité</i> (Côte d'Ivoire Electricity Company)
CI-ENERGIES	<i>Société des Energies de Côte d'Ivoire</i> (State-owned Energy Asset Holding Company)
CIPREL	<i>Compagnie Ivoirienne de Production d'Electricité</i> (Ivorian Electricity Production Company)
CPI	Impregnated Paper Insulation Cables
CQS	Consultant Qualifications Selection
CSI	Synthetic Insulation Cables
CT	Compliance Team
DA	Designated Account
DFA	Directorate of Finance and Accounting
DPO	Development Policy Operation
E4All	Electricity for All
EDM	<i>Énergie du Mali</i> (Mali Electricity Utility)
EIRR	Economic Internal Rate of Return
EMP	Environmental Management Plan
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
EU	European Union
FA	Financing Agreement
FBS	Fixed Budget Selection
FCFA	<i>Franc de la Communauté financière d'Afrique</i> (African Financial Community Franc)

FIRR	Financial Internal Rate of Return
FM	Financial Management
FSRU	Floating Storage and Regasification Unit
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	Geographic Information System
GoCDI	Government of Côte d'Ivoire
GRS	Grievance Redress System
GTMP	Generation and Transmission Master Plan
GW	Gigawatt
GWh	Gigawatt Hour
HV	High Voltage
HVO	Heavy Vacuum Oil
ICB	International Competitive Bidding
ICR	Implementation Completion and Results Report
IDA	International Development Association
IFC	International Finance Corporation
IFR	Interim Financial Report
IMF	International Monetary Fund
IPP	Independent Power Producer
km	Kilometer
kV	Kilovolt
LCS	Least Cost Selection
LEC	Liberia Electricity Corporation
LNG	Liquefied Natural Gas
LSMS	Living Standards Measurement Survey
LV	Low Voltage
M&E	Monitoring and Evaluation
MV	Medium Voltage
MW	Megawatt
NCB	National Competitive Bidding
NPV	Net Present Value
PA	Project Account
PDO	Project Development Objective
PIM	Project Implementation Manual
PIU	Project Implementation Unit
PP	Procurement Plan
PRONER	<i>Programme d'Electrification Rurale</i> (National Program for Rural Electrification)
PV	Photovoltaic
QBS	Quality Based Selection
QCBS	Quality and Cost Based Selection
RAP	Resettlement Action Plan
RF	Revolving Fund
RFP	Request for Proposal
RPF	Resettlement Plan Framework
SBD	Standard Bidding Document
SCD	Systematic Country Diagnostic

SDR	Special Drawing Right
SoE	Statements of Expenditures ()
SOGPE	<i>Société de Gestion du Patrimoine du Secteur de l'Electricité</i> (Electricity Sector Asset Management Company)
SONABEL	<i>Société Nationale d'Electricité</i> (Burkina Faso Electricity Utility)
SOPIE	<i>Société d'Opération Ivoirienne d'Electricité</i> (Ivorian Electricity Company)
SORT	Systematic Operations Risk- Rating Tool
SUF	Scale Up Facility
ToP	Take-or-Pay
VAT	Value Added Tax
VRA	Volta River Authority
WAPP	West Africa Power Pool
WAEMU	West African Economic and Monetary Union
WB	World Bank

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REPUBLIC OF CÔTE D’IVOIRE
Electricity Transmission and Access Project

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PAD DATA SHEET*Côte d'Ivoire**Côte d'Ivoire - Electricity Transmission and Access Project (P157055)***PROJECT APPRAISAL DOCUMENT***AFRICA**Energy and Extractives Global Practice*

Report No.: PAD1999

Basic Information			
Project ID P157055	EA Category B - Partial Assessment	Team Leader(s) Manuel Luengo Yussuf Uwamahoro	
Lending Instrument Investment Project Financing	Fragile and/or Capacity Constraints []		
	Financial Intermediaries []		
	Series of Projects []		
Project Implementation Start Date 30-Mar-2017	Project Implementation End Date 31-Dec-2022		
Expected Effectiveness Date 01-Oct-2017	Expected Closing Date 31-Dec-2022		
Joint IFC No			
Practice Manager/Manager Charles Joseph Cormier	Senior Global Practice Director Riccardo Puliti	Country Director Pierre Frank Laporte	Regional Vice President Makhtar Diop
Borrower: Government of Côte d'Ivoire			
Responsible Agency: CI-ENERGIES			
Contact: Telephone No.:	Amidou Traoré 22520206201	Title: Email:	Managing Director atraore@cinergies.ci

Project Financing Data (in US\$ Million)							
<input type="checkbox"/>	Loan	<input type="checkbox"/>	IDA Grant	<input type="checkbox"/>	Guarantee		
<input checked="" type="checkbox"/>	Credit	<input type="checkbox"/>	Grant	<input type="checkbox"/>	Other		
Total Project Cost:		325.00			Total Bank Financing:		325.00
Financing Gap:		0.00					
Financing Source				Amount			
International Development Association Scale Up Facility				325.00			
Total				325.00			
Expected Disbursements (in USD Million)							
Fiscal Year	2017	2018	2019	2020	2021	2022	2023
Annual	0	49.00	82.00	113.75	48.75	16.50	15.00
Cumulative	0	49.00	131.00	244.75	293.50	310.00	325.00
Institutional Data							
Practice Area (Lead)							
Energy & Extractives							
Contributing Practice Areas							
Proposed Development Objective(s)							
The project development objectives are to contribute to the improvement of the efficiency and reliability of electricity supply and increased access to electricity in Côte d'Ivoire.							
Components							
Component Name				Cost (USD Millions)			
Reinforcement of Transmission Systems				115.60			
Rehabilitation, Reinforcement, and Extension of Distribution Systems in Abidjan and Selected Regional Capital Cities				95.40			
Rural Electrification and Support to Electricity for All Program				100.60			
Strengthening Institutional Capacity of the Electricity Sector and Project Management				13.40			

Systematic Operations Risk- Rating Tool (SORT)		
Risk Category	Rating	
1. Political and Governance	Substantial	
2. Macroeconomic	Moderate	
3. Sector Strategies and Policies	Substantial	
4. Technical Design of Project or Program	Low	
5. Institutional Capacity for Implementation and Sustainability	Substantial	
6. Fiduciary	Substantial	
7. Environment and Social	Substantial	
8. Stakeholders	Low	
9. Other		
OVERALL	Substantial	
Compliance		
Policy		
Does the project depart from the CAS in content or in other significant respects?	Yes []	No [X]
Does the project require any waivers of Bank policies?	Yes []	No [X]
Have these been approved by Bank management?	Yes []	No []
Is approval for any policy waiver sought from the Board?	Yes []	No [X]
Does the project meet the Regional criteria for readiness for implementation?	Yes [X]	No []
Safeguard Policies Triggered by the Project		
	Yes	No
Environmental Assessment OP/BP 4.01	X	
Natural Habitats OP/BP 4.04	X	
Forests OP/BP 4.36	X	
Pest Management OP 4.09		X
Physical Cultural Resources OP/BP 4.11	X	
Indigenous Peoples OP/BP 4.10		X
Involuntary Resettlement OP/BP 4.12	X	
Safety of Dams OP/BP 4.37		X
Projects on International Waterways OP/BP 7.50		X
Projects in Disputed Areas OP/BP 7.60		X

Legal Covenants			
Name	Recurrent	Due Date	Frequency
Recruitment of Project Implementation Unit (PIU) Staff		December 1, 2017	
The Recipient shall cause the Project Implementing Entity to ensure that, throughout Project implementation, the PIU is maintained with staff in sufficient number, with experience and qualifications satisfactory to the Association, in carrying out its responsibilities [including a procurement specialist, a Project accountant] and not later than two (2) months after the Effective Date the hiring by the Project Implementing Entity of [a procurement specialist, a Project accountant and] a social and gender safeguards specialist, all under terms of reference and with qualification and experience satisfactory to the Association. <i>[pending hiring prior to signing] (Schedule 2, Section I.A.5 of Financing Agreement FA and Section I.a.5 of Project Agreement)</i>			
Name	Recurrent	Due Date	Frequency
Recruitment of Owner's Engineer		April 1, 2018	
The Recipient shall cause the Project Implementing Entity, not later than six (6) months after the Effective Date, to hire the Owner's Engineer in accordance with terms of reference and qualifications acceptable to the Association. <i>(Schedule 2, Section I.A.7 of FA and Section I.7 of Project Agreement)</i>			
Name	Recurrent	Due Date	Frequency
Transfer of assets from the Government to CI-ENERGIES		April 1, 2018	
The Recipient shall complete the transfer of Assets to the Project Implementing Entity not later than six (6) months after the Effective Date. <i>(Schedule 2, Section I.H.1 of the FA)</i>			
Conditions			
Source Of Fund	Name	Type	
IDA	Execution of Subsidiary Agreement	Effectiveness	
The Subsidiary Agreement has been executed on behalf of the Recipient and the Project Implementing Entity. <i>(Article V, 5.01 (a) of the FA)</i>			
Source Of Fund	Name	Type	
IDA	Installation of accounting software	Effectiveness	
Description of Condition			
The Project Implementing Entity has procured and installed an appropriate accounting software to ensure timely recording of financial information as well as timely production of quarterly and annual financial statements. <i>[pending completion prior to signing] (Article V, 5.01 (b) of the FA)</i>			
Source Of Fund	Name	Type	
IDA	Appointment of Project Coordinator	Effectiveness	
Description of Condition			

The Project Implementing Entity has appointed a Project Coordinator in accordance with the provisions of Section I.A.6 of Schedule 2 to the Financing Agreement. *[pending completion prior to signing] (Article V, 5.01 (c))*

Source Of Fund	Name	Type
IDA	Retroactive Financing	Disbursement

Description of Condition

Notwithstanding the provisions of Part A of this Section, no withdrawal shall be made for payments made prior to the date of this Agreement, except that withdrawals up to an aggregate amount not to exceed EUR 55,268,860 may be made for payments made prior to this date but on or after January 1, 2017 for Eligible Expenditures under Category 1. *[pending completion prior to signing] (Schedule 2, Section IV.B.1. of the FA).*

Team Composition

Bank Staff

Name	Role	Title	Specialization	Unit
Manuel Luengo	Team Leader (ADM Responsible)	Senior Energy Specialist	Energy Specialist	GEE08
Yussuf Uwamahoro	Co-Task Team Leader	Energy Specialist	Energy Specialist	GEE07
Maurice Adoni	Procurement Specialist (ADM Responsible)	Senior Procurement Specialist	Procurement	GGO07
Jean Charles Amon Kra	Financial Management Specialist	Senior Financial Management Specialist	Financial management	GGO26
Abdoulaye Gadiere	Safeguards Specialist	Senior Environmental Specialist	Safeguards	GEN07
Agba Evelyne Euphrasie N'Guessan	Team Member	Temporary	Administrative	AFCF2
Alassane Agalassou	Team Member	Senior Energy Specialist	Energy Specialist	GEE07
Bassem Abou Nehme	Team Member	Young Professional	Financial Analysis	CNGNR
Camilla Gandini	Team Member	Gender Specialist	Gender and Energy	GTI01
Mariano Salto	Team Member	Energy Economist	Energy Economist	GEE01
Peter F. B. A. Lafere	Safeguards Specialist	Senior Social Development Specialist	Social Development	GSU01
Sunil W. Mathrani	Team Member	Senior Energy Specialist	Energy Specialist	GEE07

Thanh Lu Ha	Team Member	Senior Program Assistant	Administrative	GEE07	
Extended Team					
Name	Title	Office Phone	Location		
Locations					
Country	First Administrative Division	Location	Planned	Actual	Comments
Côte d'Ivoire	Gôh-Djiboua	Goubéko	X		Rural electrification
Côte d'Ivoire	Sassandra-Marahoué	Digba	X		Rural electrification
Côte d'Ivoire	Bas-Sassandra	Bas-Sassandra	X		Rural electrification
Côte d'Ivoire	Gôh-Djiboua	Gôh-Djiboua	X		Distribution network rehabilitation and extension
Côte d'Ivoire	Lagunes	Lagunes	X		Substations rehabilitation and expansion
Côte d'Ivoire	Sassandra-Marahoué	Sassandra-Marahoué	X		Rural electrification

I. STRATEGIC CONTEXT

A. Country Context

1. **Following the resolution of the political crisis in 2011, Côte d'Ivoire has experienced strong economic growth.** With a gross national income of US\$1,410 per capita in 2015 and a population of 23 million, Côte d'Ivoire is ranked as the third largest economy and population center in West Africa. It is the largest economy in the West African Economic and Monetary Union (WAEMU) and has major economic influence over the rest of the region. As a result of the intermittent political crisis from 1999-2011, the Ivorian economy grew by only two percent per year in nominal terms during that period. However, since the resolution of the political crisis in 2011, growth has been more robust, with the economy growing at an average of 9.7 percent from 2012 to 2013, before moderating slightly to 7.9 percent in 2014. Real gross domestic product (GDP) per capita increased cumulatively by more than 20 percent during the 2012-2014 period. All the main economic sectors, including agriculture, industry, and construction, have contributed to the renewed strong GDP growth and employment, which were supported by an upsurge of public and private investments. According to the International Monetary Fund (IMF), growth is projected at 8.5 percent in 2016, the largest in Sub-Saharan Africa, in response to the authorities' continued efforts to improve the business climate and address infrastructure gaps.

2. **In addition to establishing an appropriate macroeconomic framework and following prudent fiscal policy, the Government of Côte d'Ivoire (GoCDI) has dedicated significant resources in recent years to improve security and social cohesion.** The GoCDI has also adopted structural reforms to set the stage for resilient and private sector-led growth. Some of the main reforms are aimed at improving the business climate, ensuring financial stability and greater inclusion, and improving public governance and financial management.

3. **Despite the macroeconomic progress made since 2011, Côte d'Ivoire has only been moderately successful in reducing poverty.** The incidence of poverty has only slightly decreased, from 48.9 percent in 2008 to 46.3 percent in 2015, after having dramatically increased since the mid-1980s. Côte d'Ivoire is ranked 172 out of 187 countries in the 2015 United Nations Development Programme Human Development Index. The World Bank's 2015 Systematic Country Diagnostic (SCD) shows that there are disparities in access to basic services and gender disparities across wealth and urban versus rural groups.¹ This highlights, among other priorities, the importance of extending electricity services to improve living conditions and increase income generation activities, particularly for women.

4. **Though electricity services showed resilience throughout the crisis, the performance and development of the sector were compromised, and the impact of the crisis is still felt.** Very little investment took place and maintenance of the electricity network was neglected. During the period of political crisis and war in the North and West of the country from 2002 to 2010, the *Compagnie Ivoirienne d'Electricité* (CIE), the electricity service operator, continued to supply power throughout the country. The private generation companies Azito and CIPREL also withstood the crisis and continued to supply power effectively, despite a buildup of payment arrears as the national utility had insufficient revenues to pay these independent power producers (IPPs), and the GoCDI did not have sufficient resources to support the sector during the crisis period. The impact of the crisis also had a significant negative impact on the financial situation of the sector. Many of the challenges currently facing the

¹ Côte d'Ivoire - From Crisis to Sustained Growth: Priorities for Ending Poverty and Boosting Shared Prosperity - Systematic Country Diagnostic, World Bank, June 30, 2015.

sector are due to the lack of investment and minimal maintenance of networks during the long political crisis. Interestingly, the private sector presence in the energy supply chain, from gas production through power production to network management and power distribution, may have served as a bulwark against greater decline during the crisis years, as payment discipline through the supply chain was observed to a certain extent.

5. **The GoCDI sets the goal in its “Vision 2040” to become an industry-driven economy, united in its cultural diversity and democracy and open to the rest of world.** The country has established as its medium term objective in the National Development Plan 2016-2020 to become an emerging economy based on industrial development by 2020. The National Development Plan is built on five strategic axes: (i) strengthening the quality of institutions and good governance; (ii) acceleration of human capital development and social well-being; (iii) acceleration of structural transformation of the economy by industrialization; (iv) development of harmonious infrastructure over the national territory in an environmental friendly manner; and (v) strengthening of regional integration and international cooperation. Clearly, the energy sector plays a vital role in addressing these issues.

B. Sectoral and Institutional Context

6. **Sector institutions include both public and private sector players, with the latter playing a prominent role.** The key sector institutions include the *Société des Energies de Côte d’Ivoire* (CI-ENERGIES), the state-owned asset holding company that is responsible for managing assets in the electricity sector and planning and contracting investments.² The *Compagnie Ivoirienne d’Electricité* (CIE) is a private company that operates and maintains on behalf of CI-ENERGIES the national distribution network and hydro generation plants under a 15-year renewable, “*affermage*” (concession) contract.³ The IPPs CIPREL, Azito, and Aggreko dominate thermal power production, based on local natural gas production from majority private players (AFREN, Foxtrot, and Canadian Natural Resources). The *Autorité Nationale de Regulation du Secteur d’Electricité* (ANARE) is the regulatory agency, but with purely advisory functions. The Ministry of Oil, Energy and Development of Renewable Energies sets policy and plays an overarching surveillance role of the sector. Annex 6 provides more detailed sector background.

7. **Electricity sector activities in Côte d’Ivoire are governed by the 2013 National Energy Policy and 2014 Electricity Code.** The revised National Energy Policy adopted in 2013 sets an objective for the country to become an energy hub in West Africa. The policy has three main axes: (i) restore financial viability of the energy sector, including through tariff adjustments and loss reduction; (ii) generation of sufficient electricity and demand side management; and (iii) improvement of the sector institutional framework. Following this, the 2014 Electricity Code liberalized generation, transmission, and distribution, keeping only the dispatching activity under state monopoly and providing third party access to the transmission grid. A set of regulations to implement the Code are in process of being approved by the Cabinet.

8. **With an installed generation capacity of 1,775 megawatts (MW), Côte d’Ivoire’s electrical system is the third largest in West Africa, following Nigeria and Ghana.** Electricity domestic sales in 2014 was 5,563 gigawatt hours (GWh) and peak demand reached 1,148 MW. Domestic sales of

² Transfer of assets from the GoCDI to CI-ENERGIES, which should have taken place when CI-ENERGIES was established, is still pending.

³ The contract with CIE is set to expire in 2020; GoCDI has begun analysis on post-2020 options to provide clarity on the institutional structure of the electricity sector over the next decades.

electricity increased by 6.5 percent in 2015 reaching 5,928 GWh and it is expected that, fueled by economic growth, they will continue to grow around 10 percent per annum, reaching around 9,500 GWh by 2020. Installed capacity is expected to reach around 2,500 MW by 2020.

9. **Côte d'Ivoire is the only significant regional electricity exporter at present, despite the tight supply-demand balance in the country.** In 2016, it exported 1,650 GWh to five clients: *Énergie du Mali* (EDM), Volta River Authority (VRA) in Ghana, *Communauté Electrique du Bénin* (CEB) for Benin-Togo, the *Société Nationale d'électricité* (SONABEL) in Burkina Faso, and the Liberia Electricity Corporation (LEC). Going forward, Côte d'Ivoire is well positioned to be one of the main hubs of electricity trading in the sub-region as the West African Power Pool (WAPP) transmission line interconnections to Ghana, Burkina Faso, Mali, Liberia, Sierra Leone, Guinea, and beyond are under construction.

10. **The power sector is heavily reliant on domestic gas production.** Gas-fired generation capacity accounts for about 79 percent of Côte d'Ivoire's power generation mix. Hydropower contributed 16 percent while the remaining five percent is heavy vacuum oil (HVO). Domestic gas production available for the power sector is expected to ramp up from a current 185 mmscfd in 2015 to about 300 mmscfd by 2020 thanks to increases in output from existing gas suppliers. In parallel, the GoCDI has been exploring liquefied natural gas (LNG) import options with a technical assistance support from the World Bank; a reputable and experienced consultancy firm (Poten & Partners) confirmed the economic viability of LNG Floating Storage and Regasification Unit (FSRU) towards the end of this decade when domestic gas production reaches its plateau.

11. **While there is some scope to develop recent gas discoveries, particularly by Anadarko in offshore block CI-103, Côte d'Ivoire also has substantial untapped hydroelectric potential.** Hydro capacity is estimated at over 1,900 MW, which can theoretically generate about 10,000 GWh per year. The current installed capacity from hydroelectric power is 604 MW, or about 32 percent of current technical potential. Hydroelectricity generated per year is around 1,500 GWh, equivalent to 19 percent of total energy consumption per year. Currently only the 275 MW site on the Sassandra River (Soubré) is under construction, with financing from EximBank China, which would be the first hydro plant to be built in the past 30 years. It is due to be commissioned in July 2017 and transferred to CI-ENERGIES by GoCDI. Other attractive hydro sites are not yet at sufficiently advanced stages of technical preparation to be commissioned before 2022, but there are ongoing discussions with potential private developers to invest on a Build-Operate-and-Transfer (BOT) basis. Modest efforts are being made to develop small-scale, grid-connected biomass and solar photovoltaic (PV) projects. However, the country is at the nascent stages in development of these resources in part due to the lack of legal framework until the passage of the Electricity Code.

12. **The key Ivorian electricity sector challenges are (i) financial sustainability of the sector; (ii) lag in transmission and distribution network investments; and (iii) low level of household access to electricity.** Tariffs have not kept up with inflation and have not been reflective of the real costs of energy, hence putting at risk the long term financial sustainability of the sector. The transmission and distribution networks are old and overloaded and there has been little funding for rehabilitation and reinforcement over the past decade. Transmission losses on the high voltage (HV) grid are estimated at 6 percent while distribution technical and non-technical losses are in the range of 16 percent. At about 29 percent, the electricity access rate⁴ is relatively low compared to the country's per capita income. The electricity penetration rate⁵ is around 42 percent, and the electricity coverage rate⁶ is 78 percent

⁴ Electricity access rate = number of households connected / total number of households.

⁵ Electricity penetration rate = number of villages electrified / total number of villages.

indicating that a significant part of the population in electrified areas does not have a grid connection, despite proximity to the grid. This gap is mainly explained in rural areas due to the current barrier to access that the present high upfront connection charge represents.

13. **Tariffs remains a politically charged issue.** In July 2015, the GoCDI announced significant tariff increases spread over 18 months: a 10 percent increase on July 1, 2015, followed by a 5 percent increase on January 1, 2016, and an increase of 3 percent in every subsequent year. The increases were opposed by industries and the population, in part because they coincided with a reduction of services arising from the drought of 2016 impacting hydropower production. The revised tariff adjustment structure adopted in June 2016 was as follows: a 10 percent capped tariff increase in 2016 and a subsequent 5 percent increase in 2017 and 2018, followed by a 3 percent increase in 2019 and 2020.

14. **Improvements in the efficiency of electricity production, reduction of power losses, and the adjustment of tariffs provide the basis for the financial sustainability of the sector.** The year 2016 ended with a net benefit of three billion FCFA, and the power sector is expected to be in even better financial standing for the rest of the decade. Fuel cost per kWh produced is dropping as inefficient turbines (Vridi, Aggreko) are being replaced by combined cycles (Azito 4 and Ciprel 5) and more hydro production such as Soubré, which comes online in mid-2017. By 2020, an average electricity tariff of 74 FCFA/kWh is expected to be enough to cover operating expenses and capacity charges of IPPs (see financial analysis in Annex 5); it is also projected to be sufficient to cover asset renewals and the expansion of the grid, amounting to 1.6 trillion FCFA for the period 2016-2020. This is contingent upon (i) CI-ENERGIES maintaining an adequate optimization of gas supply and demand; (ii) electricity capacity being added to the grid at the same pace as the growth in electricity demand so as to avoid recourse to the use of liquid fuels; and (iii) achieving set targets for loss reduction and maintaining high levels of billing collection.

15. **In complement to this project, the World Bank approved in December 2016 a development policy operation (DPO), which includes measures to, inter alia, assist the GoCDI to bolster sector financial sustainability and increase the share of renewable energy in the country's generation mix.** To meet policy prior actions under the first DPO (P158463) in the series, the Ivorian Cabinet approved six sector-specific decrees, including: (i) governing concessions of activities in generation, transmission, dispatching, importation, distribution and commercialization of electricity; (ii) governing the sale of electricity generated from IPPs or surplus power from self-generation units; (iii) creating an independent regulator; (iv) determining modalities for setting and revising tariffs for electricity sales; (v) regulating third party access to the grid and wheeling of power; and (vi) governing the generation of power for direct distribution and commercialization. In addition, the DPO series includes a trigger, "The Government has adopted a regulation outlining modalities and procedures for determining tariffs for power generated by IPPs through Tendering Process, including for Renewable Energy Projects of installed capacities greater than 5 MW."

16. **The country is mobilizing funding for a major upgrade of the medium and high voltage network.** Total energy losses are about 22 percent and cannot be addressed without substantial investment in the network. CI-ENERGIES recently completed a Generation and Transmission Master Plan (GTMP), a Distribution Master Plan, a Rural Electrification Master Plan, and a Grid Automation Master Plan. The main selection criteria for investments defined in the Master Plans included developing capacities to meet the growing domestic and regional demand (including demand from increased

⁶ Electricity coverage rate = number of people living in villages electrified / total number of people.

access, mines, and industrial growth) and ensuring network security of supply by creating redundancies (n-1). Distribution and Rural Electrification Master Plans were driven by the objectives set for 2030 and associated intermediate targeted network expansion. These Master Plans estimate that investments of about US\$2 billion are required over the next decade in transmission, US\$680 million in urban distribution (greater Abidjan), and about US\$675 million for rural electrification. As new generation capacity and transmission line investments are ongoing, HV substations and the distribution network are increasingly the critical links of the energy value chain. They risk becoming the limiting factors that would constrain the sector's ability to underpin sustained economic growth. In addition, since Côte d'Ivoire's electricity grid is extensive, a large increase in access/connections could be achieved through densification, with relatively modest investments. However, an access expansion program will have to be accompanied by substantial grid rehabilitation and upgrading. Because the private sector has not been interested to invest and government funds are not sufficient, the country is mobilizing financial resources to invest in transmission lines and substation expansion from development finance institutions, including the African Development Bank (AfDB), the *Agence Française de Développement* (AFD), the European Union (EU), and the *Banque Ouest Africaine de Développement* (BOAD). Assistance from China of about US\$820 million has also been secured for the construction of new transmission lines and rural electrification (Table 2 below shows contributions from donors to the financing of the sector). Despite this major mobilization of resources, the financing is still not enough to cover all identified needs.

17. **The National Program for Rural Electrification (PRONER), launched in 2014, aims to increase the penetration rate of electricity to 80 percent by 2020 and the coverage rate to about 100 percent of the population.** PRONER is a strong commitment of GoCDI to electrify all localities with over 500 inhabitants in the coming years and maintain an annual rate of electrification of 500 new localities until 2020. This program is expected to require capital investments of US\$675 million over a five-year period.

18. **To accelerate access to electricity for the population, in May 2014 the GoCDI adopted the "Electricity for All" (E4All) Program.** E4All has a target of 200,000 new grid connections per year, both rural and urban, through a dedicated funding vehicle— the Fund for E4All (FE4All) —which would help eliminate the current barrier to access that the present high upfront connection charge of FCFA 150,000 (US\$250)⁷ represents. It would finance, for low-income households, the cost of both a grid connection and a standardized internal house-wiring kit. The lowest income beneficiaries would only pay a symbolic fee of less than US\$2 (FCFA 1,000) to participate and would be able to repay the cost of the connection over a time period as long as 10 years. The E4All program would be funded by the Government, by development partners and, given the significant funding needs, potentially by commercial loans from the capital market as a last resort. The design of the FE4All is under discussion, with arrangements to be in place by the end of 2017 (see sub-component 3.2 below). This initiative is expected to bring access to electricity to around one million low-income households over five years. The existence of an HV backbone transmission network covering large parts of the country makes this target feasible as investment requirements in medium voltage (MV) and low voltage (LV) lines are relatively cheaper and such lines are faster to implement. Given its current mandate as stipulated in the concession contract, CIE will be the main implementing vehicle for the "last mile," being responsible for customer connections and collecting revenues, via tariffs, from newly-connected clients under the program.

⁷ The connection charge currently covers the costs of connecting the client from the distribution network and installing the meter.

C. Higher Level Objectives to which the Project Contributes

19. **The proposed project contributes to the GoCDI's economic growth and poverty reduction objectives outlined in the National Development Plan 2016-2020 and the long-term objectives outlined in the Vision 2040.** The project objectives of addressing key bottlenecks in the electricity transmission and distribution system and supporting electricity access expansion will help support economic activity and household access to a modern energy source. One of the areas where the project will be heavily focused is the South West of Côte d'Ivoire, which is rich in cocoa and coffee plantations and characterized by high potential for agro-processing industries, but where village access to power is rather low. By providing power supply in these areas, the project will remove electricity supply constraints for productive industries, as well as lay the foundation for improving household electricity access and the development of income generating activities. This supports the GoCDI's objective of becoming an emerging economy by 2020 and an industrialized economy by 2040.

20. **The proposed project is anchored in the World Bank's twin goals of ending extreme poverty and boosting shared prosperity.** Timely investments to reduce load shedding, expand low-cost generation, improve sector governance, reduce transmission losses, and foster economic growth are foundational to the achievement of the twin goals. It is also consistent with the World Bank's Energy Sector Directions Paper, which is designed to help client countries secure affordable, reliable, and sustainable energy supply.⁸ Low service quality and access to electricity tends to undermine poverty eradication efforts, and high technical losses undermines affordability. Energy is also a key driver of socio-economic development and an important means of improving equity and reducing poverty. About 500,000 additional people, mostly from poor rural families, would gain access to electricity with support of the project. Access to electricity is also key for quality social services delivery, such as health and education, and expansion of electricity supply services is essential for continued economic growth in Côte d'Ivoire.

21. **The proposed project is aligned with the World Bank Group's 2016-2019 Country Partnership Framework⁹ objective of strengthening economic infrastructure to accelerate private-sector led economic growth.** The project aims to help currently under-served regions of the country attain acceptable levels of basic services, which depend upon a reliable supply of electricity. It would also go some way towards redressing the current heavy, Greater Abidjan-centric pattern of infrastructure service provision in Côte d'Ivoire. The preceding World Bank-funded Urgent Electricity Rehabilitation Project (P112573), which closed at the end of 2014, was the World Bank's re-engagement in the sector after a considerable gap. It addressed urgent distribution system rehabilitation needs and helped electrify unserved peripheral neighborhoods of Abidjan on a modest scale in the immediate post-conflict environment. The World Bank's added value in this operation is linked to the fact that the transmission network is a public asset and public investments are required to expand both the transmission and distribution network. Such public investments create opportunities for additional private interventions in power generation and distribution management.

⁸ *Toward a Sustainable Energy Future for All: Directions for the World Bank Group's Energy Sector*, July 2013.

⁹ Report No. 96515-CI.

II. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

22. The project development objectives are to contribute to the improvement of the efficiency and reliability of electricity supply and increased access to electricity in Côte d'Ivoire.

B. Project Beneficiaries

23. **Direct beneficiaries:** The proposed project will benefit current electricity consumers, as the proposed investments to upgrade and expand transmission and distribution system will help increase the reliability of the electricity grid. It will benefit future electricity consumers who will be connected to the electricity grid. The project will also provide targeted capacity building support to the sector entities involved in project implementation.

24. **Indirect beneficiaries:** The extension of the distribution network in urban and rural areas will result in more end-user connections to the grid and increase overall electricity access in the project areas. Increased access to electricity is a key element needed to generate income and jobs, promoting productive uses of electricity, thereby spurring growth and development outside Greater Abidjan.

C. PDO Level Results Indicators

25. Progress toward achieving the PDO will be measured by the following indicators (See Annex 1 for the full results framework):

- Cumulative duration of power outages per year in substations rehabilitated by the project (hours)
- Electricity losses per year in the project area (%); and
- People provided with new or improved electricity service - People provided with access to electricity under the project by household connections (grid or off-grid) (number) (Corporate Results Indicator).

III. PROJECT DESCRIPTION

26. The proposed project will finance priority investments to upgrade and extend the national transmission and distribution network and strengthen the reliability of power supply in Côte d'Ivoire. It will also accelerate access to electricity for the population in 10 regional capital cities and rural areas in South Western regions of Côte d'Ivoire.

27. The project components are based on the priorities identified in the recently adopted Generation and Transmission, Distribution, and Rural Electrification Master Plans. Using the Master Plans as a guide, the GoCDI decided on the particular investments and geographical areas to be covered by each of the GoCDI's donor partners in the sector. As such, the World Bank's interventions are located in South Western part of Côte d'Ivoire, including the capital city of Abidjan. All investment components under the project complement each other, i.e., investments under Component 1 will help to address key transmission system bottlenecks that in turn allow the expansion of the grid considered under Components 2 and 3.

A. Project Components

28. **Component 1: Reinforcement of Transmission Systems (US\$115.6 million equivalent).** The GTMP identified overloaded transmission lines and transformers in selected substations that reduce the ability of the grid to meet the (n-1) reliability criterion and cause a deterioration of quality of electricity supply and high energy loss levels. The main rationale for this component is to improve the quality and reliability of power supply and to ensure that the transmission system will be able to absorb the new generation capacity that is planned.

- **Sub-Component 1.1: Construction of a New Substation at Gagnoa and the Related Transmission Lines (US\$14.1 million equivalent).** This sub-component will finance a new substation (225kV/90kV) at Gagnoa, about one kilometer (km) of 225kV and five km of 90kV transmission lines from the substation to reduce the load on the existing substation and thereby reduce voltage drops.
- **Sub-Component 1.2: Upgrade Three Existing 90kV Substations to 225kV (US\$44.3 million equivalent).** This sub-component will finance a subset of investments identified in the GTMP, notably the upgrading of three existing 90kV substations (Youpougou 1, Bia-Sud, and Treichville) to 225kV. Upgrading these three substations will improve the dynamic behavior of the electricity network in Abidjan, which in turn will reduce electricity losses and better serve the increase in electricity demand.
- **Sub-Component 1.3: Improvement of Quality and Reliability of Supply in Selected 225kV/90kV Substations and 10 HV/MV Substations in Selected Towns (US\$57.2 million equivalent).** This sub-component will finance the supply and installation of HV/MV transformers in selected overloaded HV substations of Abobo, Taabo, Kossou, Man, and Ferke. The rationale of this sub-component is to improve the quality of power supply by maintaining the voltage level to comply with operating voltage standards in these substations. This sub-component will also finance transformers to improve reliability of supply (n-1), and reduce technical losses in 10 substations, namely Agboville, Attakro, Ayamé 2, Bongo, Bouake 1, Daloa, Danané, Dimbokro, Abengourou, and Dabou. It will also fund extension of MV¹⁰ feeders to cope with the growing demand in the aforementioned cities. The GTMP identified as priorities the reinforcement of these substations.

29. **Component 2: Rehabilitation, Reinforcement, and Extension of Distribution Systems in Abidjan and Selected Regional Capital Cities (US\$95.4 million equivalent).** As mentioned above, investments in expansion of the grid considered in Component 2 will benefit from the investments under Component 1 addressing key transmission bottlenecks in the area.

- **Sub-Component 2.1: Rehabilitation, Reinforcement, and Extension of Distribution Systems in selected Regional Capitals (US\$47.6 million equivalent).** The sub-component will finance rehabilitation, reinforcement, and extension of distribution systems in the towns of Gagnoa, Man, Soubré, Duekoue, Guiglo, Seguela, Odiéne, Katiola, Sassandra, and Touba. The reinforcement activities will consist of creating new substations and feeders and replacing equipment on the cities' MV and LV network to meet operation standards and reduce losses. Under this sub-component, 10,000 new household connections are expected to be made and better quality of supply for around 36,000 existing customers is expected through the restoration of robust voltage level, especially during peak periods.

¹⁰ In Côte d'Ivoire 15kV and 33kV is considered MV.

- **Sub-Component 2.2: Replacement of Overhead MV Lines with Underground Lines in Abidjan (US\$39.5 million equivalent).** This investment will finance the replacement of around 460km of the existing overhead conductors by underground cables. This will reduce the number of incidents of supply interruptions and will reduce the network operator's interventions. In addition, it will increase the capacity of the distribution system. The replacement of overhead lines by underground ones in Abidjan was recommended by the recently adopted Distribution Master Plan. Except for a few 33 kV feeders energizing low-load areas (Jacque Ville and Anyama), all feeders are expected to be underground by 2030 per CI-ENERGIES' newly adopted policy, which aims to reduce outages, decrease the level of unserved energy, and reduce environmental issues. In order to achieve this objective, all current and future reinforcements in the Abidjan network will be underground conductors CIS ALU 240mm.²
- **Sub-Component 2.3: Upgrade of MV Cables by replacing Impregnated Paper Insulation (CPI) Cables with Synthetic Insulation Cables (CIS) in Abidjan (US\$8.3 million equivalent).** This investment will finance the replacement of around 120 km of the existing overloaded and aged paper insulated MV cables with cables covered by synthetic insulation in Abidjan. The investment will also permit grid restructuring and upgrading to adapt the MV network to the increasing demand.

30. **Component 3: Rural Electrification and Support to Electricity for All Program (US\$100.6 million equivalent).** This component will finance the electrification of 201 localities in rural areas and provide support for the GoCDI's E4All Program.

- **Sub-Component 3.1: Improvement of Rural Electrification (US\$73.7 million equivalent).** This sub-component will provide funding for the MV and LV networks required to electrify 201 villages in selected rural areas in the regions of Gboklè, Haut-Sassandra, Nawa, and San Pedro. In addition, a qualitative study will be developed by the Africa Renewable Energy and Access (AFREA) Gender and Energy Program to investigate women and men's electricity needs and guide the project's proposed gender-targeted interventions. Two sets of trainings will also be conducted among women and men beneficiaries on the use and benefits of electricity, and among women beneficiaries on the productive use of electricity.
- **Sub-Component 3.2: Support to Electricity for All Program (US\$26.9 million equivalent).** The "Electricity for All" Program was approved by the Cabinet on May 27, 2014 with an objective to electrify all households within the villages that are already electrified and to achieve at least a 60 percent access rate by 2020. Experience shows that key constraints for access scale up in these areas are the ability of beneficiaries to pay the connection fee of around FCFA 150,000 (US\$250) at one time and the heavy connection and security formalities. The program will connect around one million households over five years (200,000 connections per year) and will cost around US\$257 million. The GoCDI is preparing the documentation to set up a multi-donor, revolving Fund for E4All (FE4All) by the end of 2017. Prior to the establishment of the FE4All, donor-financed projects that are at advanced stage of readiness will use a transitional revolving fund, similar to the one established under the previous IDA operation. Therefore, funds under this sub-component will be used to set up the transitional revolving fund to help finance household connection costs (including internal house wiring) to obtain grid supply in the above mentioned 201 villages (sub-component 3.1) and in 10 regional capital cities (sub-component 2.1) for low income households. This fund will follow the principles and technical specifications of the E4All Program. The scheme is designed

taking into account three categories of income among the population in the project areas as identified in the rural electrification master plan studies. The low-income category will pay only FCFA 1,000 and reimburse connection fees over 10 years. Based on analytical work informed by results of the pilot phase of E4All Program, part of the revolving fund would be used to finance the E4All Program in selected urban areas with low risk for reimbursement during the first two years of project implementation. Reimbursements from such connections would be used to finance further connections in the project areas, without affecting the project implementation period. Once the GoCDI E4All Fund has been fully operationalized, transfer of the resources of the revolving fund to the Government E4All Fund could take place.

31. Component 4: Strengthening Institutional Capacity of the Electricity Sector and Project Management (US\$13.4 million equivalent). This component will support capacity building and project management.

- **Sub-Component 4.1: Capacity Building (US\$1.6 million equivalent).** The support provided under this sub-component will finance the capacity building and training plan of CI-ENERGIES staff and other energy sector entities. Training needs have been identified in different areas, including project management, power distribution and rural electrification, electricity transmission, procurement, finance and accounting, and environmental and social safeguards. This component will also finance technical assistance to improve the monitoring and evaluation (M&E) system to track the performance of the power sector. In addition, as part of the project's efforts to support inclusive and equal access to electricity services for men and women, gender and energy trainings will be conducted by the AFREA Gender and Energy Program among CI-ENERGIES and CIE personnel and the contractor staff in charge of connecting the households and installing the kits under the Component 3.
- **Sub-Component 4.2: Owner's Engineers for Project Supervision (US\$8.5 million equivalent).** This sub-component will finance services of two engineering firms to supervise and control the quality of the implementation of engineering works financed under the project. One engineering firm will be dedicated to the supervision of Components 1 and 2, and another to Component 3.
- **Sub-Component 4.3: Project Management (US\$3.3 million equivalent).** This will include the cost of managing the project, including remuneration of key experts to be hired under the project to support the project implementation unit. Key experts will include a project coordinator, an accountant, a procurement specialist, and a social and gender development specialist. The latter will oversee the social and gender aspects of the project and ensure that these elements are integrated, monitored, and evaluated during project implementation. This sub-component will also finance a technical and financial audit of the project.

B. Project Costs and Financing

32. The lending instrument for the proposed project is Investment Project Financing. The total project cost is estimated at US\$325 million to be financed with an IDA Scale up Facility (SUF) credit. Part of the the IDA SUF credit, equivalent to US\$27 million, will be passed on by GoCDI as a grant to CI-ENERGIES to finance social connections (Component 3.2), while the latter will be responsible for debt service on the remainder of the SUF credit. Cost estimates by component are detailed in the table below. Cost estimates are based on the recently completed feasibility studies for different sub-activities of the project.

Table 1: Project Cost and Financing by Component (including price contingencies)

Project Components	Project cost (US\$ million)	IDA Financing	% Financing
1. Reinforcement of Transmission Systems	115.6	SUF	100
2. Rehabilitation, Reinforcement, and Extension of Distribution Systems in Abidjan and 10 Regional Capital Cities	95.4	SUF	100
3. Rural Electrification and Support to Electricity for All Program	100.6	SUF	100
4. Strengthening Institutional Capacity of the Electricity Sector and Project Management	13.4	SUF	100
Total Costs	325.0		100

C. Lessons Learned and Reflected in the Project Design

33. The design and development of this project has benefited from a rich menu of lessons learned from similar, large infrastructure operations in Africa and beyond, as well as other completed and ongoing World Bank-financed projects in Côte d'Ivoire, including in the energy sector. Key lessons are summarized below.

34. **Clarity of Implementation Responsibilities.** In the past, the two main electricity sector implementing entities, CI-ENERGIES and CIE, have experienced instances of overlapping responsibilities and/or lack of proper coordination. For instance, CIE was not routinely consulted on technical specifications for planned investments, although eventually the infrastructure will be handed over to CIE for operation and maintenance. Under the proposed project, CIE has been involved from the identification phase to ensure that they agree with CI-ENERGIES on the prioritization of investments. Furthermore, CIE and CI-ENERGIES signed on January 31, 2017 an agreement on respective roles and responsibilities during project implementation, and CIE will be involved in the design of technical specifications and technical quality control, participating in the commissioning of the infrastructure during the implementation phase up to the commissioning.

35. **Linking Distribution and Rural Electrification to Access.** Traditionally, distribution projects in Côte d'Ivoire did not include electricity connections, which were contractually the responsibility of the network operator. CI-ENERGIES would build the distribution network and then rely on CIE to implement consumer connections to the limited number of customers with the means to pay the high connection fees. This, together with the high administrative cost of servicing a few low-end customers in remote, scattered locations, explains why for many years CIE had little incentive to expand access outside peri-urban areas in medium and large urban centers. This is one of the key reasons that the access rate is still very low in the country while the grid reaches more than 70 percent of the population. Under this project, distribution network upgrading and connections, including to lower-income customers, will be undertaken in a planned and coordinated manner between CI-ENERGIES and CIE under the framework of the E4All Program. The E4All Program will pre-finance connection costs for eligible new clients, who will repay them into a revolving fund to finance more connections in the future. CIE, given its contractual responsibility for new customer connections, will implement this program. Through a protocol, signed on February 23, 2017, with CI-ENERGIES, CIE will connect new clients and collect the

initial fee and subsequent repayment charges. CIE will be reimbursed the costs of connecting these clients by the Fund at an agreed standardized cost per connection.

36. Dedicated Project Implementation Unit within CI-ENERGIES, Recruitment of Owner's Engineers. During the first phase of implementation of the previous World Bank project, procurement and execution of infrastructure works proved to be challenging and were often delayed given that the project implementation unit was directly managed by one of the senior directors of CI-ENERGIES in addition to his other daily responsibilities. A project coordinator was then hired at a later stage, which helped to speed up project implementation. In light of this, the project will hire a dedicated project coordinator and key experts. Experience from previous projects also pointed to the need for owner's engineers to supervise project implementation rather than relying on staff of the implementing agency to supervise and control quality of works given the growing volume of work and human resource capacity constraints. Two owner's engineers will be hired, one for the supervision of Components 1 and 2, and another for supervision of Component 3. The owner's engineers will work with implementing agency counterparts to help build their capacity to manage the project as CI-ENERGIES will assign counterpart staff to work alongside the consultants' personnel.

37. International Best Practice for Rural Electrification and Access Inspired the Design of Project Component 3. International experience in countries such as Vietnam and Peru, which have reached near universal rates of electrification, has demonstrated that in rural electrification programs it is critical to: (i) include user connections (the "last mile") in the conception of the program; (ii) set the initial connection fee at a level that is affordable for all households; and (iii) permit recovery of the connection charge through the tariff over a long period of time so that the effective tariff remains affordable for low-income users. By incorporating these international experiences, the proposed project will contribute to sustainability of the GoCDI electrification program.

38. Lessons Learned from the Revolving Fund for Access Scale-up. The previous World Bank project in Côte d'Ivoire set up a revolving fund for access scale-up, with a special account managed by CI-ENERGIES. The revolving fund allowed low-income households in urban areas to pay an upfront connection of FCFA 20,000 and the remainder was advanced by the fund and reimbursed in 13 bi-monthly payments (FCFA 5,000 per invoice in addition to the energy consumption). Lessons learned suggested that: (i) the initial subscription was low due to high upfront payment (even if it was lower than the total connection costs); (ii) the repayment period was too short for poor families; and (iii) the component was a modest first step but was not sufficient to meet the huge demand in terms of increasing access, especially in electrified parts of the country. The proposed project will be targeting low-income customers in rural areas with no capacity to pay an upfront fee of FCFA 20,000 or to reimburse the balance in just 13 bi-monthly payments. Therefore, the new scheme is designed taking into account three income categories among the population in the project areas as identified in the rural electrification master plan studies where the low-income category will pay only an initial fee of FCFA 1,000 and reimburse the balance of the costs over in 10 years. While the previous fund under the preceding IDA project was only US\$2 million, the proposed project will provide about US\$27 million to the new fund on a grant basis.

D. Partnership Arrangements

39. The proposed project will be implemented in coordination with other donors engaged in the electricity sector. In addition to the World Bank, the power sector in Côte d'Ivoire is supported by several donors, including the AfDB, AFD, the EU, and the Exim Bank of China. While the GoCDI has allocated to each donor specific areas of intervention, donors are convened on regular basis to ensure a

coordinated approach to sector interventions. The table below shows the active donors and their contributions to the GoCDI’s power sector investment plans.

Table 2: Donor Contributions to the Power Sector Investments

Item	Required Investment (US\$ million)	Commitments (US\$ million)	Donor Financiers
Transmission Master Plan (2016-2030)	2,000	1,081.61	BOAD, AfDB, World Bank, China
Distribution Master Plan (2016-2030)	680	177.23	AfDB, World Bank, EU
Rural Electrification Master Plan (2016-2020)	675	219.10	World Bank, EU, China
E4All Program (2016-2020)	270	21.30	EU, AFD, World Bank

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

40. **CI-ENERGIES will be the implementing agency for the project.** CI-ENERGIES has recent experience with the previous World Bank-funded project and thus has staff who are familiar with World Bank procedures. Taking into account lessons from implementation of the previous project, CI-ENERGIES will set up a new dedicated PIU before the project’s effectiveness, led by a full-time Project Coordinator, who will report directly to the Director of Project Implementation and Equipment of CI-ENERGIES.¹¹ The Project Coordinator and key project specialists (procurement specialist, accountant, and social and gender specialist) will be hired under the project as consultants responsible for project implementation, complementing CI-ENERGIES staff, who will also be involved in project implementation. The roles and responsibilities of CI-ENERGIES and PIU staff are detailed in the Project Implementation Manual, adopted by CI-ENERGIES on February 24, 2017.

41. **The decisions and guidance on the implementation of the project lie with the Director-General of CI-ENERGIES.** A Project Oversight Committee composed of Directors of CI-ENERGIES and delegates from the Directorate General of Energy in the Ministry of Oil, Energy and Development of Renewable Energies, CIE, the Ministry of Budget and Government Portfolio, and the Ministry of Finance and Economic Planning will be put in place to facilitate the timely implementation of the project. The Project Oversight Committee will meet quarterly to assess project performance and challenges, assist in finding solutions to challenges, and review the action plan for the following quarter to determine where external assistance to the PIU might be required. The representative of the Ministry of Budget and Government Portfolio will be responsible for solving issues related to customs clearances and import taxes. The ultimate decision-making authority on project implementation lies with the Director General of CI-ENERGIES.

42. **As the future operator of the infrastructure, CIE will be closely involved in project implementation.** This includes providing inputs in planning, technical specifications, and supervision of the implementation and commissioning of the infrastructure. An agreement has been established between CI-ENERGIES, and CIE to define their respective roles and responsibilities during project implementation. CIE will appoint a focal point for the project and engineers dedicated to providing inputs to CI-ENERGIES on the supervision of the project implementation working with the PIU and the

¹¹ The Project Coordinator will deal directly with the Director General of CI-ENERGIES in terms of fiduciary management (signing of contracts, managing payment orders, etc.).

owner's engineers. The role of CIE for the execution of Components 1, 2, and 3.1 will be limited to technical inputs and commissioning of completed works to ensure compliance with grid standards and proper synchronization with the grid.

43. **Special arrangements will be put in place for the implementation of the revolving fund to support the Electricity for All Program.** A revolving fund to finance connections fees will be set up and managed by CI-ENERGIES. A procedures manual for the management of the fund has been established by CI-ENERGIES. CIE will provide new connections. Modalities for the implementation including tariff structure for connections, procurement procedures, subcontractors to be used, specifications of materials and security standards have been agreed upon in a protocol between CIE and CI-ENERGIES signed on February 23, 2017 and approved by the World Bank.

B. Results Monitoring and Evaluation

44. CI-ENERGIES, as the implementing agency, is responsible for project M&E and for consolidated reporting on project implementation progress. It has a well-established M&E system that tracks progress on the implementation of all its ongoing energy projects. The agreement between CI-ENERGIES and CIE covers also M&E aspects as CIE is the source of information for some of the selected indicators.

45. The project-level M&E framework will track progress during implementation, measure intermediate outcomes, and evaluate project impacts. The results framework in Annex 1 outlines key performance indicators, data collection methods, a timetable for collection, and responsible agencies. This framework will be used to supervise and monitor project implementation.

46. Specific attention will be devoted to monitoring and evaluating the project's gender and social aspects. Activities, targets, and indicators to assess the gender interventions have been integrated in the Project Implementation Manual. During the first year of the project's implementation, sex-disaggregated data will be gathered through a Living Standards Measurement Survey (LSMS) study to provide a baseline for the project's indicators. The target for the proportion of connections provided to female- and male-headed households in rural and urban areas will be decided based on the results of the LSMS study. Data from the LSMS and the qualitative study on women's and men's energy needs will also help select the gender outcome indicator to evaluate how the project facilitated women's access to and use of electricity.

47. The PIU will prepare project reports that are in form, content, and substance satisfactory to the World Bank. Reports will be prepared for each semester during project implementation, and will be submitted to the World Bank no later than 45 days after the end of the period covered by the reports. Monitoring of results and outcomes will be reported in the PIU's project implementation reports. Furthermore, the World Bank will supervise the project over its lifetime and its results and outcomes on a regular basis to evaluate the project's achievement of the PDO. If necessary, corrective actions will be discussed and agreed upon with the GoCDI including, for example, during the project's mid-term review.

C. Sustainability

48. The sustainability of the Ivorian power sector and the investments financed under this project will depend upon: (a) the financial health of CI-ENERGIES and its ability to generate sufficient revenues to fully cover its expenditures; (b) CIE and CI-ENERGIES' ability to maintain and operate the assets

sustainably; and (c) the GoCDI's continued commitment to support a power sector reform program, including the implementation of a tariff adjustment roadmap.

49. This specific project is designed in such a way that the investments in substations, transmission and distribution lines and access are planned to meet the growing demand in the project areas over the medium to long-term.

50. The long-standing (over 25 years) and positive involvement of the private sector in generation and power distribution in Côte d'Ivoire is a clear indication of a sustainable power sector development. Despite years of political turmoil and economic disruption, the sector managed to avoid payment defaults. Electricity losses performance by CIE¹² is one of the best in Sub-Saharan Africa and has been a key factor in preventing the sector from falling into the trap of interlocking illiquid cross-debts that is a frequent feature of power utilities in Sub-Saharan Africa. Current willingness by private investors to expand both the local gas production capability and power generation is further indication of confidence in the long-term solvency of the country's power sector, which is unusual in Sub-Saharan.

51. The investments to be financed by the proposed project will improve cash flows for the sector by cutting losses and raising revenues. The access component is designed in such a way that the revolving funds collected from new customers through bi-monthly bills will be used to expand the access program in the new areas. Given that the repayment of the connection cost is to be kept affordable by stretching it out over a long period, this feature will help expand the program in the long term. In addition, it is designed in such way that we will ensure that all the expansion investments will benefit from the revolving fund regardless of the final decision on the creation of the FE4All. The activities funded under Component 4 for capacity building will help in supporting the institutional capacity to maintain and operate the assets sustainably.

V. KEY RISKS

A. Overall Risk Rating and Explanation of Key Risks

52. Given the scope of rural electrification and substations investments supported under the project and the nature of the access expansion component (grid extension in rural areas and connections), the overall risk rating is substantial. The key risks are discussed below.

53. **Political and Governance Risk.** This risk is rated substantial. Since the end of the post-election crisis, the GoCDI has taken important steps to attenuate political tensions and foster a climate of reconciliation and social cohesion. The Dialogue, Truth and Reconciliation Commission recently presented its report and recommendations to compensate victims of the crisis. The security situation has improved significantly. All security services and legal institutions are once again under the full control of the GoCDI, completing the country's administrative reunification. Progress has been made in disarming, demobilizing, and reintegrating former combatants, some of whom have been incorporated into the security forces and the civil service. The AfDB has relocated its headquarters to Abidjan. United Nations security forces will be fully withdrawn by mid-2017. While encouraging progress has been made in restoring peace and stability, many of the root causes of the country's recent conflicts have yet to be fully addressed, including important issues involving the security of land tenure and high levels of

¹² Overall Electricity losses in 2015 were 21 percent (CIE Annual report 2015).

unemployment,¹³ especially among the country's youth. *Mitigation:* While none of these risks are addressed directly by the project, it will contribute to greater resiliency in weathering such risks by helping to reduce public discontent with the overall service quality of the power sector and to reduce the pressure of youth out-migration from rural areas by increased access to electricity services in currently unserved villages.

54. **Sector Strategies and Policies Risk.** This risk is rated substantial. Under the Urgent Electricity Rehabilitation Project, a number of studies on sector strategies and policies were prepared: (i) gas pricing study; (ii) institutional framework for energy efficiency; (iii) tariff study and on social impact study of electricity tariffs; and (iv) a legal review of the institutional framework of the electricity sector. Many of the recommendations from these studies were implemented and a substantial tariff increase applied in July 2015. The National Assembly adopted a new Electricity Code in March 2014. The adoption of the mechanism to adjust tariff levels every year should help maintain the viability of the sector, although the recent political backlash against tariff hikes shows that this is susceptible to reversal. Experience elsewhere has shown that tariff increases are more acceptable if there is a credible promise of improved services. The GoCDI's master plans in generation, transmission, distribution, and rural electrification/ access expansion give clear guidance on future sector development. The recent presidential announcement on future liberalization of the sector is a good sign that the GoCDI remains politically committed to a long-term reform vision with a coherent sector-wide strategy. However, there remains much analysis and reflection to be done on the post-2020 sector structure, when the current *affermage* (concession contract with CIE is up for renewal. In addition, the sector still lacks discipline in following a least cost generation plan, due to pressure from ad hoc, unsolicited proposals for new IPPs, which creates a risk of higher cost of power generation. *Mitigation:* A programmatic series of two DPOs is being implemented in parallel to this IPF. The first operation of this DPO series (P158463, IDA credit of US\$75 million equivalent, single tranche) supports reforms to improve the performance of the electricity sector and encourage further private participation in power generation, including in renewable energy. This DPO will constitute a risk mitigation tool for sector risks.

55. **Institutional Capacity for Implementation and Sustainability Risk.** This risk is rated substantial. CI-ENERGIES has acquired experience with World Bank guidelines on financial management, procurement, and safeguards policies. However, a lack of sufficient qualified human resources with a growing investment portfolio of almost US\$1.5 billion (10 times investments over the last five years) may pose a risk to implementation capacity. The level of commitment of institutions involved in project implementation to effectively coordinate on the ground is a potential risk. Despite the presence of owner's engineers, CIE's role is instrumental in implementation (M&E, physical implementation and commissioning), as most of project activities will take place on the existing network it manages. In addition, as CIE's current contract expires in 2020, there is a risk of CIE attention being diverted to an "exit strategy" if the new institutional arrangements envisaged by GoCDI post-2020 do not include a major role for CIE (thereby creating a possible sustainability risk from transitional disruptions). *Mitigation:* The World Bank will proactively pursue a dialogue with GoCDI on the possible post-2020 institutional reforms to the sector during project supervision. The legal agreements for the project will oblige GoCDI to ensure that any successor entity to CIE will be obliged to accept the commitments of CIE regarding implementation of the proposed project, post-2020. In addition, the PIU has been reinforced with an M&E Specialist to minimize "transitional disruptions" if/when CIE's contract expires in 2020.

¹³ The World Bank is helping to reinforce social and political stability through the Côte d'Ivoire Emergency Youth Employment and Skills Development Projects (P122546 and P151844) and Support to Côte d'Ivoire Land Tenure Technical Assistance (P148791).

56. Furthermore, the proposed project faces the risk of delays in implementation and/or increases in costs, both for investments and for electrification due to the remoteness of villages and provincial towns to be electrified. *Mitigation:* To mitigate this latter risk, the PIU will be strengthened through the hiring of two owner's engineers to strengthen supervision and implementation functions. In addition, further capacity enhancement will be undertaken under the project's Component 4. To mitigate risks of delays, advance procurement has been undertaken and price contingencies have been included in the cost of project activities. A cooperation agreement between CIE and CI-ENERGIES for the implementation of the project was signed on January 31, 2017.

57. **Fiduciary risk.** Fiduciary risk is rated substantial. CI-ENERGIES' annual financial statements are regularly audited and handled by qualified persons. The financial management (FM) assessment of CI-ENERGIES revealed that the financial statements audited by its statutory auditors (*Commissaires aux Comptes*) do not include the accounts of donors-funded operations nor the assets and liabilities of the electricity sector. Furthermore, the overall FM performance of the previous World Bank-funded project managed by CI-ENERGIES was rated moderately satisfactory in the project's Implementation Completion and Results Report (ICR)¹⁴ due to some internal control weaknesses and financial reporting challenges derived from the accounting software used to manage the project. Taking into account the country context and the nature of the project activities, including the risks associated with financial management of the revolving fund for the electricity access scale up, the FM risk is considered substantial. The procurement risk has been assessed as moderate. *Mitigation:* Inside CI-ENERGIES, a PIU will be responsible for handling the project FM. The PIU will be responsible for ensuring compliance with the financial management requirements of the World Bank and the GoCDI, including forwarding the quarterly Interim Financial Reports (IFRs) and audited annual financial statements to IDA. Procurement and FM capacity at CI-ENERGIES will be reinforced to ensure that fiduciary aspects under the proposed project are executed as smoothly as possible. The project will hire a procurement specialist and an experienced accountant to strengthen the PIU's fiduciary capacity.

58. **Environmental and Social risks.** This risk is rated substantial. The project entails site-specific and largely reversible environmental and social impacts, thus the project is rated as Environment Category B. While many of the localities of the investments under the project are known, transmission line routings and other details are being finalized based on detailed feasibility studies. Thus, a framework approach to environmental and social safeguards has been taken (more below in Section IV). In terms of social risks, it is recognized that the arrival of external male workers for construction, rehabilitation, or maintenance of the proposed infrastructures may occur and could potentially have negative impacts on the local population, especially women and girls who might engage in relations with campsite workers. Potential negative consequences of such transitional relations include contracting sexual transmitted infections, adolescent pregnancy, and sexual and gender-based violence.¹⁵ Labor influx might also have critical negative impacts on local children. Given the already existing practice of child labor in the country,¹⁶ the start of new infrastructure works and the opening of new campsites could increase the

¹⁴ Report No. ICR3428.

¹⁵ A 2008 UNFPA study found that among 12,413 interviewed Ivorian persons, nine out of 10 respondents reported experiencing violence at least once in their lives, 84 percent being survival of physical violence and 21 percent of sexual violence.

¹⁶ The 2013 national survey on the employment and working situation of children estimates that in Côte d'Ivoire 48.1 percent of children aged 14-17 work 40 hours a week and 20.9 percent of children aged 5-13 work 30 hours per week. It is also reported that 1,202,404 children are involved in hazardous work and 3,364 are victims of internal labor trafficking. In terms of sector

likelihood of children getting engaged in new works. Nevertheless, it has to be noted that since 2015 the GoCDI has put in place the national committee to monitor the actions against the trade, exploitation and labor of child, chaired by the first lady. *Mitigation:* As part of the preparation of the project, consultations were held with the communities in the project area in August 2016. An Environmental and Social Management Framework and Resettlement Policy Framework (ESMF and RPF) have been prepared for activities under Components 2 and 3 where specific sites are not known. In addition to the ESMF and RPF, an ESIA of the Gagnoa substation was also prepared. To make sure that all potential adverse impacts associated with activities for Yopougon1, Treichville, and Bia-Sud sub-stations are under control, an Environmental Audit has been completed. In order to prevent and address the potential social risks related to the labor influx, codes of conduct on child protection and gender-based violence will be integrated in the bidding documents and in the contracts of all employees, contractors, and consultants contributing to the development of the project's infrastructure. A compliance team (CT) will be also established to coordinate and monitor the application of the codes of conduct. In order to operationalize the principles enshrined in the codes of conduct, the CT will develop an action plan on child labor and an action plan on gender-based violence.

59. ***Climate and Disaster-related risks.*** The project has been screened for short- and long-term climate change and disaster risks. A significant part of the project activities will be implemented in the South-West of Côte d'Ivoire, an area of strong winds. Screening was done on the risk of high winds adversely affecting the transmission and distribution infrastructure. This risk was found to be low. In general, the potential impacts of climate and disaster risks on project activities (construction of new substation and transmission lines, upgrading of existing substations, rehabilitation and extension of distribution network) are expected to be minimal. The project also has important climate mitigation co-benefits as detailed in the economic analysis below.

VI. APPRAISAL SUMMARY

A. Economic and Financial Analysis

Economic and Financial Analysis of the Project

60. This section provides a summary of the economic and financial analyses for the proposed project, notably the investments under Components 1, 2, and sub-component 3.1. Sub-component 3.2 and Component 4 are excluded because of the difficulty in valuing the outcomes of technical assistance and the revolving fund at this stage.

61. The selection of activities under the project components was based on the priorities identified in the recently adopted master plans for Generation and Transmission, Distribution and Rural Electrification. The master plan together with the pre-feasibility studies prepared by CI-ENERGIES provided the majority of the assumptions used to estimate the economic benefits and costs for the project components. Broadly, the economic benefits from the proposed project may be classified into three categories: (i) the increased reliability in electricity supply (reduction in losses, outages and voltage fluctuations); (ii) the increased supply of electricity to meet the existing suppressed demand and expected growth in demand; and (iii) the supply of electricity to new customers in rural areas.

distribution, 28,906 girls and boys between 5-17 years of age, respectively 21,853 and 7,324, are engaged in the production and distribution of electricity, gas, and water and 24,718 boys in the construction sector.

62. The results of the economic analysis show that the overall project is economically viable with a net present value (NPV) of US\$145.9 million (at 6 percent discount rate) and an economic internal rate of return (EIRR) of 10.8 percent. A sensitivity analysis, in the form of switching values, has been performed for costs and demand drivers. The results show that the project would remain economically feasible even if there were an increase in investment costs up to 60 percent, or if operational expenditures increase up to 9 percent of the CAPEX. Annex 5 presents the full economic analysis.

63. *Rationale for Use of Public Funds and Value-added of World Bank Support.* The World Bank has been a close partner of CI-ENERGIES in the development of the Ivorian electricity sector and is well positioned to continue its commitment to the expansion and modernization of electricity supply in the country. Moreover, the proposed transmission and distribution investments would be difficult and costly to finance from private sources since such investments by their nature typically have very long payback periods. However, investments in transmission and distribution are a crucial precondition for private investment in generation. Drawing on expertise and experience from work in different regions, the World Bank's engagement under this project will enable adoption of best practices in design and execution of network expansion and electrification access, thus ensuring technically and socially efficient delivery. Further, World Bank financing enables the GoCDI to source loans at rates that would ensure the financial viability of the transmission extension that is critical for increasing access to electricity and supporting inclusive economic growth. Finally, the expansion of electricity access under Component 3 will require the use of public and concessional funds that are more easily mobilized if there is World Bank presence in the financing plan of the investment program.

64. **Greenhouse gas (GHG) accounting.** The implementation of the project will result in an estimated net reduction of 2,875,890.758 tons of CO₂ equivalent (Components 1 and 2 will result in a reduction of 2,876,633.76 tons while Component 3 will result in an increase of 743 tons)¹⁷ during the overall lifetime of the project. This is due to reduction in technical losses and avoided thermal generation compared to the "business as usual (BAU)" scenario, with a marginal positive impact on the EIRR. The economic benefits have been computed assuming a cost of carbon of US\$30 per ton.

Financial Appraisal of the electricity sector

65. Since the approval of the World Bank-supported partial risk guarantee operation for the Foxtrot gas field expansion in May 2013,¹⁸ the sector has made significant strides in terms of financial sustainability. While in 2011 and 2012, the sector was running at a deficit of more than FCFA 100 billion (US\$167 million), the comprehensive Power Sector Recovery Plan that was supported by IDA put the sector on a sustainable path, although still fraught with challenges.

66. These challenges encompassed (i) availability of gas supply, which became a bottleneck for new, efficient IPPs to reach financial closure; (ii) depreciation of the euro-pegged FCFA vis-a-vis the U.S. dollar; (iii) increased reliance on liquid fuel (HVO), particularly in 2015 as a result of a 30 percent drop in hydro-generation; and (iv) absence of a tariff adjustment. As shown in Table 3 below, the sector deficit¹⁹

¹⁷ Based on four registered Clean Development Mechanism projects for Côte d'Ivoire, the lowest combined margin Emission Factor is 0.6006 tCO₂/MWh. This value is for a project that was registered in 2012.

¹⁸ Report No. 76301-CI.

¹⁹ Sector balance is akin to net income found in an income statement. However, since 2010, given the difficulty for the sector to cover its operating expenses, net income was not being netted by asset depreciation. Going forward, as the sector balance consolidates, it is expected to include it.

grew again to 69 billion FCFA (US\$115 million) in 2015 from a 22 billion FCFA (US\$37 million) deficit in 2013 as a consequence of the above mentioned factors.

Table 3: Historical Net Sector Financial Balance Excluding Depreciation

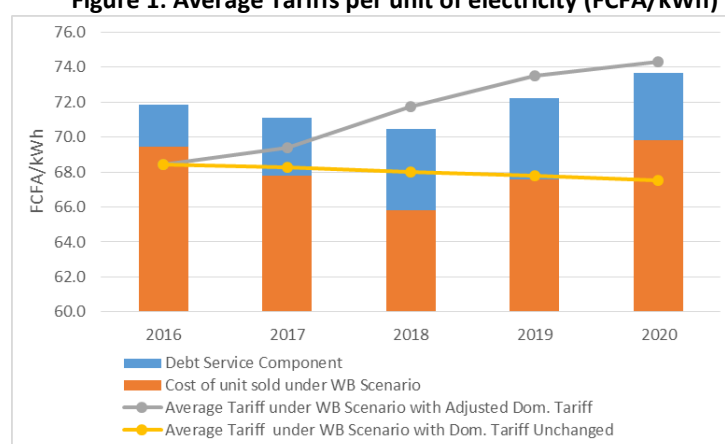
<i>Billion FCFA</i>	2010	2011	2012	2013	2014	2015	2016
Sector Balance prior to Subsidy	(81.5)	(107.9)	(107.0)	(21.9)	(41.9)	(68.7)	3.3
Subsidy ²⁰	-	-	62.8	22.8	50.7	28.8	-
Net Sector Balance	(81.5)	(107.9)	(44.2)	0.9	8.8	(39.9)	3.3

67. Recurrent financial issues have prompted the GoCDI to take bold measures, particularly the 10 percent tariff adjustment in July 2015, followed by another 5 percent in January 2016. However, the GoCDI had to partially backtrack in mid-2016, under social and industry pressure. Instead, a 10 percent capped increase was introduced and the GoCDI has committed to implement a 5 percent increase in 2017 and 2018, followed by a 3 percent increase for 2019 and 2020.

68. Despite the partial tariff setback, 2016 ended up with a positive sector financial balance marking a significant improvement over 2015. Fuel costs per kWh produced are expected to drop with the replacement of inefficient gas turbines (Vridi, Aggreko) by more efficient combined-cycle plants (Azito 4 and Ciprel 5) in 2018 and the increased hydro output from the Soubré hydro plant to be commissioned in mid-2017. The financial surplus is expected to range between FCFA 16 and 66 billion annually for the period stretching to 2020 under a conservative scenario.

69. For the period 2017-2020, if anticipated tariff adjustments indicated above go as planned, with an average tariff reaching 74 FCFA/kWh (12.8 US cents/kWh) by the end of the decade, the sector would have the capacity to service its debt, as highlighted in the graph below. However, an unchanged domestic tariff would be enough to only cover operating expenses. This is contingent, particularly in 2019/20, upon CI-ENERGIES maintaining an adequate optimization of gas supply and demand and that generation capacity is added to the grid at the same pace as electricity demand. Details of the financial analysis carried out during project appraisal are given in Annex 5.

Figure 1: Average Tariffs per unit of electricity (FCFA/kWh)



B. Technical

70. **The project uses well established technologies and presents no unusual construction or operational challenges.** The equipment and the technologies involved in construction and operation of substations and transmission and distribution lines are standardized and well known. Project costs are based on estimates derived from recently commissioned lines and substations financed by CI-ENERGIES and CIE. The cost estimates have been evaluated and are aligned with current market prices. The ongoing detailed feasibility studies will specify all pre-construction tasks, including installation design, detailed cost estimates, and implementation schedules, procurement strategy, tender processes and documents, engineering-procurement-construction packaging, bid evaluations, and contract awards for physical implementation. As for project implementation, two owner's engineers will be contracted to support oversight of activities under Components 1, 2, and 3. The owner's engineers will help to ensure that design, construction, and commissioning are carried out in accordance with international quality standards. Component 3 includes a revolving fund for the E4All Program that could be challenging in terms of project coordination and management. However, the experience of the implementing agency in the management of the previous World Bank-supported revolving fund was vital in the design of the project component.

C. Financial Management

71. The FM arrangements for the project have been designed with consideration for the country's post-conflict situation while taking into account OP/BP 10.00, which describes the overall FM World Bank policies and procedures. The arrangements also aim to facilitate disbursements and ensure effective use of project resources while using the country's own systems to the extent possible.

72. An assessment of CI-ENERGIES was carried out in October 2016 and January 2017. The main findings arising from this assessment were as follows: (i) CI-ENERGIES Directorate of Finance and Accounting (DFA) is familiar with the World Bank-financed projects financial management procedures and requirements; and (ii) there is an acceptable governance structure comprising a board of directors, an audit and risks management committee and an investment and strategies committee. However, the audited financial statements of CI-ENERGIES that are audited by two statutory independent auditors "*Commissaires aux Comptes*" do not include the accounts of donors-funded operations nor the assets and liabilities of the electricity sector previously managed by state-owned enterprises (SOGPE and SOPIE) and transferred to CI-ENERGIES by law. Furthermore, the overall FM performance of the previous World Bank-funded project "CI- Urgent Electricity Sector Rehabilitation (P112573)" managed by CI-ENERGIES was rated moderately satisfactory due to some internal control weaknesses and financial reporting challenges derived from the accounting software used to manage the project.

73. To address the issues faced during the implementation of the P112573 project, CI-ENERGIES is requested to use a ring-fenced financing mechanism for the fiduciary aspects of the new project. A PIU has been established to manage the overall FM aspects of the project. A dedicated accountant familiar with the World Bank FM procedures and requirements will be recruited to support the DFA of CI-ENERGIES. A new accounting software with a dedicated module for project management is being configured and deployed/installed. The project activities will be included in the scope of work of the Internal Audit department of CI-ENERGIES. Finally, the project annual accounts will be audited by the statutory independent auditors "*Commissaires aux Comptes*" based on terms of reference approved by the World Bank.

74. The residual FM risk after mitigation measures has been rated substantial, taking into account the country context and the nature of the project activities, mainly the risks associated with the activities of sub-component 3.2, the revolving fund to support the E4All Program.

75. The project will be supervised on a risk-based approach. Based on the current overall residual FM risk, the project will be supervised twice a year to ensure that project FM arrangements still operate well and funds are used for the intended purposes and in an efficient way. The supervision intensity will be adjusted over time taking into account the project FM performance and FM risk level.

D. Procurement

76. A formal assessment of the capacity of the proposed project executing agency, CI-ENERGIES, and of the PIU to implement procurement actions was carried out in September 2016 to ensure that IDA standards are adequately met. The detailed procurement responsibilities and activities of these entities are provided in Annex 3. The lead responsibility for project implementation will be vested with CI-ENERGIES. Key staff of the PIU will come from CI-ENERGIES, CIE, or be recruited by the PIU on a fixed-term, contractual basis. The PIU within CI-ENERGIES will be responsible for fiduciary management (procurement and financial management). The mission gauged the capacity of CI-ENERGIES and its ability to perform procurement activities in accordance with World Bank procedures and guidelines.

77. As noted above, CI-ENERGIES implemented the Urgent Electricity Rehabilitation Project that closed in 2014 with a disbursement rate of 99 percent. CI-ENERGIES also has been entrusted with the fiduciary management (procurement and financial management) of current projects financed by BOAD, AfDB, two other projects named ENERGOS and CNECK funded, respectively, by the EU and China. Almost none of the works contracts under the previous project were executed within their deadlines. Delays were due in particular to: (a) the socio-political crisis; (b) the low capacity of local contractors; and (c) the unavailability of the site and lack of preparatory activities for the works. To mitigate such risks, the following measures are envisaged in the proposed project: (i) set realistic timeframes; (ii) ensure the existence of effective implementation capacity of the winning contractors; (iii) revise the tender allotments so that tenders can be of interest to both national and international companies that have the capabilities and qualifications to bid; (iv) arrange to recruit qualified technical firms in order to have reliable technical studies and realistic costs estimates, otherwise, recruit consulting firms for the detailed technical studies of works in sufficient time prior to the launch of bids; and (v) recruit an owner's engineer for the control of works prior to the launch of works.

78. The fiduciary team of CI-ENERGIES does have a Procurement Director, a Head of the procurement service, three procurement assistant specialists, and an assistant contract management working on projects funded by donors other than the World Bank.

79. The assessment concluded that despite the previous experience in World Bank's procurement procedures, CI-ENERGIES will have to have to strengthen its team in the PIU with the hiring of one procurement specialist, as the size and scope of the investments have increased significantly. In addition, the manual of procedures used for the last IDA project has been updated and adopted by CI-ENERGIES.

80. Procurement for the proposed project will be carried out in accordance with the World Bank's "Guidelines: Procurement of Goods, Works, and Non-Consulting Services under IBRD Loans and IDA Credits and Grants by World Bank Borrowers" dated January 2011, revised July 2014, "Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits and Grants by World Bank

Borrowers” dated January 2011, revised July 2014, and the provisions stipulated in the legal agreement. Anti-corruption guidelines which apply to this project are: “Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants”, dated October 15, 2006 and revised in January 2011.

E. Social (including Safeguards)

81. The project areas in South West Côte d’Ivoire are characterized by high potential agribusiness development, especially in the cocoa and coffee sectors. By increasing availability of sufficient bulk power supply in these areas, the project will ease electricity supply constraints and lay the foundation for rural economic growth by improving development of income generating and productive electricity use activities. Household electricity access, including support to finance internal house wiring, was a key priority need for many households expressed through consultations with communities. It will increase the well-being and human development indicators of the population in these areas, and reduce inequalities between neighborhoods and neighboring villages.

82. The extension of the transmission and distribution network, the installation of HV substations, and the electrification of 201 villages is likely to result in limited involuntary resettlement and land acquisition. OP/BP 4.12 on Involuntary Resettlement is triggered, and a Resettlement Policy Framework (RPF) that will guide the involuntary resettlement, land acquisition and, in some cases for the rural electrification program, voluntary donations of land and/or easements has been developed by the Borrower, consulted and disclosed by the World Bank on January 26, 2017 and in-country on January 26, 2017. An Environmental and Social Management Framework (ESMF) that will guide the social screening and the inclusion of social aspects in the development of Environmental and Social Management Plans (ESMP) for subprojects that have not been fully identified has been developed, consulted, and disclosed by the World Bank on January 31, 2017 and in-country on February 1, 2017. An ESIA for the Gagnoa 2 substation has been prepared, consulted, and disclosed by the World Bank on January 25, 2017 and in-country on January 31, 2017 to guide the process in addressing social impacts related to the construction of the substation. An audit report of the land acquisition process in Gagnoa involving one land-owner is included. Social and environmental audits for the substations of Bia-Sud, Treicheville, and Yopougou 1 to be rehabilitated have been prepared, consulted, and disclosed by the World Bank on January 25, 2017 and in-country on January 31, 2017. These audits confirm that no permanent or temporary resettlement will be required.

Gender

83. In Côte d’Ivoire, poverty affects both women and men with slight differences between them: 47.4 percent of women and 45.5 percent of men are poor. There are larger gender disparities in educational attainment, where 45 percent of women are literate compared to 65 percent of men. Women are also more represented in the informal sector and 90 percent of them are concentrated in low-productivity occupations. Despite their critical role both in the production and commercialization of agricultural products, women own only 18 percent of agricultural land as customary law usually excludes them from land ownership.

84. As part of the project’s preparation, the World Bank team held interviews with potential project beneficiaries to learn about their main energy needs and investigate how the project can better support them. The interviews highlighted some gender-specific dynamics that often discourage women’s participation in decision-making processes that influence their access to and use of electricity. During

community meetings, women rarely participated in the discussion as they usually left it to the men to speak on their behalf. With regard to household dynamics, women often were not consulted when meters and kits were installed and the husband usually decided whether or not to get the electricity connection. In addition, CIE data reported that only 17 percent of their employees are women. This anecdotal evidence suggests that, in contrast with their core role in the household and agriculture spheres, women's roles in the energy sector as consumers, suppliers, and decision makers are often underestimated.

85. Consequently, specific gender interventions will be integrated in the project with the support of the World Bank's AFREA Gender and Energy Program. These activities will include: (i) a qualitative study to investigate women's and men's electricity needs; (ii) training of CI-ENERGIES and CIE employees to raise awareness on the importance of integrating women's specific needs in any project design and execution; (iii) capacity building activities among female and male beneficiaries on energy use and efficiency; (iv) capacity building activities among female beneficiaries on productive use of electricity; and (v) four pilot projects on the productive use of electricity. The social development consultant supporting CI-ENERGIES will be in charge of coordinating the gender-sensitive interventions. Detailed descriptions of the gender activities, including specific process indicators, are included in the Project Implementation Manual.

Beneficiary Feedback

86. Support for the GoCDI's E4All Program, including provision of financing for household connections and internal house wiring, will be the focus of beneficiary feedback activities under this project (in 201 villages). The scope and set-up of the beneficiary feedback system will be agreed under the E4All Program in the first year of the project, but will include at least one beneficiary satisfaction survey that takes into account feedback of multiple household members provided with an electricity connection under the program. Before the identification of the direct beneficiaries who will be the final consumers (mostly households, industries, local authorities, and the deconcentrated services of the GoCDI), a framework for dialogue and consultation with stakeholders composed of administrative authorities and traditional authorities in the regions covered by the project, local civil society (associations, NGOs), and women's and youth organizations, will be established. A Citizen Engagement Plan, public information disclosure, and consultation process to be implemented by the PIU will be defined. The Citizen Engagement Plan will highlight methods to be used by the PIU to communicate with stakeholders who may be affected by the project. The goal of the Citizen Engagement Plan is (i) to build a trusting relationship with affected communities and other interested stakeholders; and (ii) to receive feedback from beneficiaries, in particular during the first year. Feedback is likely to be sought in regard to land acquisition, execution of works, and access modalities during implementation. The Citizen Engagement Plan will include a grievance redress mechanism.

F. Environment (including Safeguards)

87. The planned project will finance physical infrastructure investments and triggers OP/BP 4.01 on Environmental Assessment, OP/BP 4.04 on Natural Habitats, OP/BP 4.36 on Forests, and OP/BP 4.11 on Physical Cultural Resources. It will likely entail site-specific and largely reversible environmental impacts. For this reason, the project is rated as Environment Category B.

88. To be in compliance with OP/PB 4.01, an ESMF was developed by the Borrower. The ESMF contains specific chapters to address all issues related to Natural Habitats, Forests, and Physical Cultural

Resources. The ESMF was consulted and disclosed within Côte d'Ivoire on February 1, 2017 and by the World Bank on January 31, 2017. The ESMF outlines an environmental and social screening process, including institutional responsibilities for screening, review and clearance, and implementation of mitigation measures and monitoring, for future investments. This screening process consists of (i) an environmental and social screening form to determine potential adverse environmental and social impacts and record the outcome of consultations; (ii) an environmental and social checklist with generic mitigation measures to be adapted to the specific investment; (iii) a summary of the World Bank's safeguard policies; (iv) an ESMP, including environmental monitoring indicators and capacity building activities; (v) Environmental Guidelines for Contractors; and (vi) generic environmental impact assessment terms of reference. It is also designed to serve as a guide for developing ESIA's including ESMPs as needed.

89. In addition to the ESMF, an ESIA for the Gagnoa substation was also prepared. To make sure that all potential adverse impacts associated with activities for Yopougon1, Treichville, and Bia-Sud substations are under control, an Environmental Audit was carried out. As the ESMF, all these safeguard instruments have been reviewed, consulted upon and disclosed both in Côte d'Ivoire and by the World Bank on the dates indicated above.

90. The Financing Agreement requires the GoCDI to prepare and submit to the World Bank for prior approval and disclosure any required ESIA's including ESMPs in accordance with the ESMF, for the activities proposed to be carried out during implementation. Prior to commencing any works, the GoCDI will take all actions required by the ESMP and obtain the World Bank's confirmation that the works may commence. Finally, the GoCDI, through the PIU, will report quarterly to the World Bank on the environmental safeguard measures taken through a specific Safeguard Monitoring Report and a summary of this report will be included in the periodic project progress reports.

G. World Bank Grievance Redress

91. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit <http://www.worldbank.org/GRS>. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

Annex 1: Results Framework and Monitoring

CÔTE D'IVOIRE: Electricity Transmission and Access Project

PDO Statement: The project development objectives are to contribute to the improvement of the efficiency and reliability of electricity supply and increased access to electricity in Côte d'Ivoire.

These results are at Project Level

Project Development Objective Indicators								
		Cumulative target values						
Indicator Name	Baseline (2016)	2017	2018	2019	2020	2021	2022	End Target
Cumulative duration of power outages per year in substations rehabilitated by the project (hours)	3,773	3,773	3,773	3,660	3,396	3,207	3,207	3,207
Electricity losses per year in the project area (%)	15	15	15	14.5	14	13.5	12.5	12.5
People provided with new or improved electricity service - People provided with access to electricity under the project by household connections (grid or off-grid) (number) (Corporate Results Indicator)	0	0	48,000	125,142	535,056	623,316	623,316	623,316
Intermediate results indicators								
		Cumulative target values						
Indicator Name	Baseline (2016)	2017	2018	2019	2020	2021	2022	End Target
Component 1: Reinforcement of Transmission Systems								
Number of reinforced high voltage substations (number)	0	0	0	3	15	18	18	18
Number of new high voltage	0	0	0	0	1	1	1	1

substations constructed (number)								
Average power outage duration in reinforced substations (hours)	26.5	26.5	26.5	24.5	23	21.5	20	20
Increased bulk supply capacity in the project area (MVA)	0	0	0	280	1,812	1,908	1,908	1,908
Component 2: Rehabilitation, Reinforcement, and Extension of Distribution Systems in Abidjan and 10 Regional Capital Cities								
Households provided with an electricity connection in urban areas under the project (Number)	0	0	8,000	10,147	16,587	18,733	18,733	18,733
of which are female-headed households (%)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Distribution MV lines constructed under the project in urban areas (km)	0	0	0	311	467	778	778	778
Distribution LV lines constructed under the project in urban areas (km)	0	0	0	361	542	903	903	903
Distribution MV lines rehabilitated under the project in urban areas (km)	0	0	0	46	137	275	458	458
Distribution LV cables rehabilitated under the project in urban areas (km)	0	0	0	11	34	68	113	113
Average time of outages in Abidjan (hours)	23.3	23.3	23.3	22.9	22.0	21.3	20.0	20.0
Average time of outages in 10 capital cities affected by the project (hours)	14.2	14.2	14.2	10.2	8.5	7.0	5.0	5.0
Component 3: Rural Electrification and Support to Electricity for All Program								
Villages electrified (number)	0	0	0	40	160	201	201	201
Households provided with an electricity connection in rural areas	0	0	0	10,710	72,589	85,153	85,153	85,153

under the project (number)								
of which to female-headed households (%)	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Distribution MV lines constructed under the project in rural areas (km)	0	0	0	298	1,224	1,522	1,522	1,522
Distribution LV lines constructed under the project in rural areas (km)	0	0	0	224	1,461	1,763	1,763	1,763
Beneficiary Satisfaction Survey Completed	0	0	0	0	0	1	1	1
Component 4: Strengthening Institutional Capacity of the Electricity Sector and Project Management								
Staff trained under the project (number)	0	60	80	100	100	100	100	100
Project-related grievances registered under the project grievance redress mechanism and addressed (percentage)	0	100	100	100	100	100	100	100

Indicator Description
Project Development Objective Indicators

Indicator Name	Description (indicator definition etc.)	Frequency	Data Source / Methodology	Responsibility for Data Collection
Cumulative duration of power outages per year in substations rehabilitated by the project (hours)	This indicator measures the total amount of hours that substations rehabilitated by the project will not be available because of an outage in one year	Annual	CIE	CI-ENERGIES
Electricity losses per year in the project area (%)	This indicator is calculated by dividing total electricity losses by the total net injected generation in the project area. Reduction of losses in financed substations will be added to reduction of losses in rehabilitated distribution network. The baseline is the actual electricity losses in the project area at the beginning of the project.	Annual	CIE	CI-ENERGIES
People provided with new or improved electricity service - People provided with access to electricity under the project by household connections (grid or off grid) (number) (Corporate Results Indicator)	The indicator measures the number of people that have received new or improved electricity service through operations supported by the World Bank. The baseline value for this indicator is expected to be zero.	Annual	CIE This indicator will be calculated by multiplying the number of household connections times the average household size = 6	CI-ENERGIES
Intermediate Results Indicators				
Indicator Name	Description (indicator definition etc.)	Frequency	Data Source / Methodology	Responsibility for Data Collection
Component 1: Reinforcement of Transmission Systems				
Number of reinforced high voltage substations (number)	This indicator measures the number of substations rehabilitated and commissioned under the project	Annual	CI-ENERGIES progress reports	CI-ENERGIES

Number of new high voltage substations constructed (number)	This indicator measures the number of new high voltage substations constructed and commissioned under the project	Annual	CI-ENERGIES progress reports	CI-ENERGIES
Average power outage duration in reinforced substations (hours)	This indicator measures the average power outage duration in hours in reinforced substations. It provides a reference on the improvement of the reliability of the substations reinforced	Annual	CIE	CI-ENERGIES
Increased bulk supply capacity in the project area (MVA)	This indicator measures the capacity in MVA of the substations affected by the project	Annual	CIE	CI-ENERGIES
Component 2: Rehabilitation, Upgrading, and Extension of Distribution Systems in Abidjan and 10 Regional Capital Cities				
Households provided with an electricity connection in urban areas under the project (number)	This indicator measures the number of household connections completed in urban areas under the project	Annual	CIE	CI-ENERGIES
of which female-headed households (%)	This indicator measures the percentage of connections provided to female-headed households in urban areas under the project	Annual	CIE	CI-ENERGIES
Distribution MV lines constructed under the project in urban areas (km)	This indicator measures the length in km of the distribution lines constructed under the project. The baseline value for this indicator is expected to be zero.	Annual	CI-ENERGIES progress	CI-ENERGIES
Distribution LV lines constructed under the project in urban areas (km)	This indicator measures the length in km of the distribution lines constructed under the project. The baseline value for this indicator is expected to be zero.	Annual	CI-ENERGIES progress	CI-ENERGIES
Distribution MV lines rehabilitated under the project in urban areas (km)	This indicator measures the length in km of the distribution lines constructed under the project. The baseline value for this indicator is expected to be zero.	Annual	CI-ENERGIES progress	CI-ENERGIES
Distribution LV cables rehabilitated	This indicator measures the length in km of the	Annual	CI-ENERGIES progress	CI-ENERGIES

under the project in urban areas (km)	distribution lines constructed under the project. The baseline value for this indicator is expected to be zero.			
Average time of outages in Abidjan (hours)	This indicator measures the average power outage duration in hours in Abidjan.	Annual	CIE	CI-ENERGIES
Average time of outages in 10 capital cities affected by the project (hours)	This indicator measures the average power outage duration in hours in 10 capital cities affected by the project.	Annual	CIE	CI-ENERGIES
Component 3: Rural Electrification and Support to Electricity for All Program				
Villages electrified under the project (number)	This indicator measures the number of villages electrified under the project	Annual	CI-ENERGIES report	CI-ENERGIES
Households provided with an electricity connection in rural areas under the project (number)	This indicator measures the number of household connections completed in rural areas under the project	Annual	CIE	CI-ENERGIES
of which female-headed households (%)	This indicator measures the percentage of connections provided to female-headed households in rural areas under the project	Annual	CIE	CI-ENERGIES
Distribution MV lines constructed under the project in rural areas (km)	This indicator measures the length in km of the distribution lines constructed under the project in rural areas. The baseline value for this indicator is expected to be zero.	Annual	CI-ENERGIES	CI-ENERGIES
Distribution LV lines constructed under the project in rural areas (km)	This indicator measures the length in km of the distribution lines constructed under the project in rural areas. The baseline value for this indicator is expected to be zero.	Annual	CI-ENERGIES	CI-ENERGIES
Beneficiary Satisfaction Survey Completed	This indicator will measure the completion of the Beneficiary Satisfaction Survey	Annual	CI-ENERGIES	CI-ENERGIES

Component 4: Strengthening Institutional Capacity of the Electricity Sector and Project Management				
Staff trained under the project (number)	This indicator measures the number of staff of the various sector agencies trained in the project	Annual	CI-ENERGIES	CI-ENERGIES
Project-related grievances registered under the project grievance redress mechanism and addressed (%)	This indicator measures as a percentage the number of addressed grievances over the number of registered grievances	Annual	Project progress report	CI-ENERGIES

Annex 2: Detailed Project Description
CÔTE D'IVOIRE: Electricity Transmission and Access Project

Project Development Objective and Components

1. The project development objectives are to contribute to the improvement of the efficiency and reliability of electricity supply and increased access to electricity in Côte d'Ivoire. The proposed project's four components are: (i) Reinforcement of Transmission Systems; (ii) Rehabilitation, Reinforcement, and Extension of Distribution Systems in Abidjan and 10 Regional Capital Cities; (iii) Rural Electrification and Support to Electricity for All Program; and (iv) Strengthening of the Institutional Capacity of the Electricity Sector and Project Management.

2. The project components are based on the priorities identified in the recently adopted Generation and Transmission, Distribution, and Rural Electrification Master Plans. Using the Master Plans as a guide, the GoCDI decided on the particular investments and geographical areas to be covered by each of the GoCDI's donor partners in the sector. As such, the World Bank's interventions are located in the South Western part of Côte d'Ivoire, including the capital city of Abidjan. All investment components under the project complement each other, i.e., investments under Component 1 will help to address key transmission system bottlenecks that in turn allow the expansion of the grid considered under Components 2 and 3.

3. All activities identified in the investment components (Components 1, 2, and 3.1) will be developed through supply and install contracts. The table below provides the overall cost estimation by component.

Table 2.1: Project Costs²¹ and Financing by Component

	Component	Project cost (FCFA billion)	Project Cost (US\$ million)	IDA SUF financing (US\$ million)
1	Reinforcement of Transmission Systems	67.0	115.6	115.6
2	Rehabilitation, Reinforcement, and Extension of Distribution Systems in Abidjan and 10 Regional Capital Cities	55.4	95.4	95.4
3	Rural Electrification and Support to Electricity for All Program	58.2	100.6	100.6
4	Strengthening Institutional Capacity of the Electricity Sector and Project Management	7.7	13.4	13.4
	Total	188.3	325.0	325.0

²¹ Costs of Components 1, 2, and 3 include the equipment and installation with contingencies.

Component 1: Reinforcement of Transmission Systems (US\$115.6 million equivalent)

4. The GTMP identified overloaded transmission lines and transformers without (n-1) reliability in selected substations as causing a deterioration of quality of electricity supply and high energy loss levels. Component 1 would finance selected investments highlighted by energy sector stakeholders as keys priorities and identified as follows: (i) the construction of a new substation at Gagnoa and the related transmission lines; (ii) the upgrade of three 90kV substations to 225kV at Youpougou 1, Bia-Sud, and Treichville; (iii) the improvement of reliability of supply in 15 substations. The main rationale for this component is to improve the quality and reliability of power supply and to ensure that the transmission system will be able to absorb the new generation capacity.

- **Sub-Component 1.1: Construction of a New Substation at Gagnoa and the Related Transmission Lines (US\$14.1 million equivalent).** This sub-component will finance a Greenfield 225/90/33/15kV substation, and new 33kV and 15kV feeders. The transmission network around the town of Gagnoa (population 170,000) is characterized by high level of electrical demand. In the medium term, the total power demand of the regional network will reach 200 MW. The two existing 90kV single circuit lines cannot convey the power needs for the three substations (Hire, Divo, and Gagnoa) in this region. Therefore, this sub-component will finance a new 225/90/33kV substation and associated transmission network located in Gagnoa. This would imply the construction of about one km of 225kV transmission line and five km of 90kV transmission lines through Soubre-Taabo 225kV transmission line and Gagnoa- Divo 90kV Tline. The activities to be implemented under this sub-component are mainly:
 - 01 km of 225kV transmission line;
 - 05 km of 90kV transmission lines;
 - 2x 225 kV line bays;
 - 2x225/90 kV 100 MVA transformers bays;
 - 2x225 kV bus bars;
 - 225 kV coupling bars bay;
 - 2 x100 MVA 225/90 kV transformers;
 - 2x 90 kV lines bays-;
 - 90/33 kV/ 24 MVA transformer bay
 - 90/15 kV /24 MVA transformer bay;
 - 2x90 kV bus bars;
 - 90 kV coupling bar, bay;
 - 1x90/33 kV 24 MVA transformer;
 - 1x90/15 kV 24 MVA transformer;
 - 3 x15kV switchgears;
 - 3x 33 kV, 2.4 MVA capacitor bank;
 - 3x15 kV, 2.4 MVA capacitor bank;
 - One 33 kV MV substation consisting of 2 half-trains connected in double attachment to the transformer
 - One 16.5 kV MV substation consisting of 2 half-trains connected in double attachment to the transformer;
 - Substation control and monitoring system;
 - Control building; and
 - Other ancillary buildings.

Table 2.2: Indicative Cost Breakdown of Sub-component 1.1

Activities	Cost (FCFA billion)	Cost (\$US million)
225kV substation equipment	7.20	12.45
225 kV and 90kV lines	0.70	1.21
Total sub-component cost	7.90	13.66
Contingencies (3%)	0.24	0.41
Total w/contingencies	8.2	14.1

- **Sub-Component 1.2: Upgrade Three Existing 90kV Substations to 225kV (US\$44.3 million equivalent).** This sub-component will finance a subset of investments identified in the GTMP, notably the upgrading of three existing 90kV substations (Youpougon 1, Bia-Sud, and Treichville) to 225kV. Upgrading these three substations will improve the dynamic behavior of the electricity network in Abidjan. In 2013, Yopougon 1 and BiaSud substations were the most affected in term of number of interruptions at MV level with, respectively, 222 and 217 interruptions, which generated a total unserved energy of 3.5 GWh. Most of the 90/15kV transformers are overloaded. Load shedding carried out in 2015 due to overload transformers of these substations was about 4.15 GWh, which represented 49 percent of the unserved energy due to load shedding. The activities to be implemented under this sub-component are:

(a) Upgrade of Bia-Sud substation to 225kV:

- 2 x 225 kV lines Bays toward Vridi and Riviera substations;
- Two spare bays planned in anticipation to doubling 225 kV line around Abidjan;
- 2 x225/90 kV 100 MVA Transformers bays;
- 225 kV bus bars;
- 2 x90 kV bus bars;
- One 225 kV coupling bay;
- 2 x225/90 kV 100 MVA transformers;
- Protection and control panel MV;
- Protection and control panel HV;
- Civil works;
- New control building for both HV and MV;
- Digital control system and teletransmission for the HTB substation; and
- Extension of the existing RTU560 for the digital control of MV the substation.

(b) Upgrade of Treichville 90kV substation to 225kV level:

- 2x225kV line bays Gas insulated Substation (GIS) type toward Vridi1 and Vrid 2;
- 2x225kV line bays Gas insulated Substation (GIS) type toward Trechville from Vridi 2;
- 2x225/90 kV 100 MVA transformer bays GIS type;
- 2x225/90 kV 100 MVA transformers;
- 2X225kV bus bars GIS type;
- Protection and control panel;
- Substation control and monitoring system;
- Protection and control panel at Vridi for 2x225kv lines bays;
- Control and monitoring system for 2x225kV line bays; and
- Civil works and building.

(c) **Upgrade of Youpougou 1 90kV substation to 225kV level**

- 6x225 kV lines bays Gas insulated Substation (GIS) type toward Azito 1, Azito 2, Azito 3, Abobo 1, Abobo 2 and Yopougou 2;
- 2x225/90 kV 100 MVA transformers bays;
- 225 kV bus bars;
- extension of the existing 90kV bus bars;
- One 225 kV coupling bay;
- 2 x225/90 kV 100 MVA transformers;
- Protection and control panel equipment;
- Control and monitoring system equipment;
- Civil works and new HV Control building;
- Extension of the existing RTU560 for the digital control system of MV substation; and
- 03 new buildings to house substation staff.

Table 2.3: Indicative Cost Breakdown of Sub-component 1.2

	Total Cost (FCFA billion)	Total Cost (US\$ million)
Youpougou 1	8.8	15.1
Bia -Sud	5.8	10.1
Treichville	10.3	17.8
Total sub-component cost	24.9	43.0
Contingencies (3%)	0.75	1.3
Total w/contingencies	25.7	44.3

- **Sub-Component 1.3: Improvement of Quality and Reliability of Supply in Selected 225kV/90kV Substations and 10 HV/MV Substations in Selected towns (US\$57.2 million equivalent).** This sub-component will finance the supply and installation of HV/MV transformers in selected overloaded HV substations namely at Abobo, Taabo, Kossou, Man, and Ferke. The rationale of this sub-component is to improve the quality of power supply by maintaining the voltage level to comply with operating voltage standards in these substations. This sub-component will also finance transformers to improve reliability of supply (n-1), and reduce technical losses in the 10 following substations, Agboville, Attakro, Ayamé 2, Bongo, Bouake 1, Daloa, Danané, Dimbokro, Abengourou, and Dabou. It will also fund extension of MV feeders to cope with the growing demand in the aforementioned cities.

(a) Improvement of Quality of Supply in Five 225kV/90kV Substations (US\$23.8 million equivalent). This sub-component would support supply and implementation of HV/MV transformers in selected overloaded HV substations. The rationale of this sub-component is to improve the quality of power supply by maintaining the voltage level to comply with operating voltage standards. The sub-component will fund:

- 4x225/90 kV 100 MVA new transformers to replace existing 4x225 kV/90kV 70MVA at Abobo substation;
- 2x225/90kV-100MVA new transformers to replace existing 225 kV/90kV 70MVA at

- Taabo substation;
- a new 225kV /90 kV transformer bay equipped with a new 70 MVA transformer at Kossou substation;
- a new 225kV/90 kV transformer bay equipped with a new 70 MVA transformer at Man; and
- A new 225kV/90 kV transformer bay equipped with a 70 MVA transformer at Ferke.

(i) Abobo Substation: (US\$6.6million equivalent). Abobo’s substation is an important electrical node of Abidjan city. This substation includes: 225 kV interconnection nodes for 2x225 kV lines (Abobo-Taabo 1 and Abobo-Taabo 2); 3x225 kV lines (Abobo-Azito 1, Abobo -Azito2, Abobo-Azito; one 225 kV line (Abobo-Prestea), which interconnects Côte d’Ivoire to Ghana network; a 90 kV interconnection node with 4x225/90kV 70 MVA transformers; and a 90/16.5 kV substation with 4x36 MVA transformers mainly supplying the North zone of Abidjan. In 2015 it reached 108 MW peak demand. Two options were considered to secure the substation of Abobo: (i) creation of a newly equipped 225/90 kV 100 MVA transformer bay; or (ii) replacement of existing 70 MVA overloaded transformers by 100 MVA transformers. The least cost master plan recommended the second option. Thus, the main activities to be financed are:

- removing the existing four transformers 225/90kV, 70 MVA;
- supply of four 225/90 kV 100 MVA transformers;
- Commissioning of four 225/90 kV 100 MVA transformers and integration into the RTU560 via IEC 61850 links; and
- Replacement of existing protection system of the four transformers incorporating digital protection relays communicating in IEC 61850 protocol.

(ii) Taabo Substation: (US\$3.6 million equivalent). In order to realize the (n-1) reliability of Taabo’s substation, the least cost master plan recommended the replacement of existing 2x70 MVA transformers by 2x100 MVA new transformers. Therefore, the main activities to be financed are:

- supply of two 225/90 kV 100 MVA transformers at Taabo;
- removing the existing two transformers at 225 kV Taabo;
- civil engineering work to adapt or upgrade existing bays;
- installation and commissioning of two 225 kV/90 kV 100 MVA transformers; and
- Replacement of existing protection system of the two transformers incorporating digital protection relays communicating in IEC 61850 protocol.

(iii) Kossou Substation (US\$5.3 million equivalent). Kossou’s hydropower plant contributes to voltage regulation of the interconnected grid of the Eastern network (Yamoussoukro, Attakro, Abengourou, and Agnibilékrou). The loss the 225 kV /90 kV transformer connected to the first engine of the hydropower plant is one of the major incidents causing voltage collapse of the said Western electrical network. Extending the substation of Kossou by adding a second transformer of 70 MVA with associated bay should ensure the (n-1) reliability (flexibility of operation and maintenance) and therefore the availability of the substation. Furthermore, for operational reasons the existing 65 MVA transformer will be replaced. Then the two transformer bays will be equipped with two new 70 MVA. The activities to be implemented are:

- extension of the 90 kV bus bar;

- adaptation of the substation civil engineering;
- creation of a new 225/90 kV 70 MVA transformer bay with associated equipment; and
- supply and installation of two new transformers 225/90 kV, 70 MVA and integration in national remote control system.

(iv) Ferke Substation (US\$3.6 million equivalent). Ferke is the interconnection substation between Côte d'Ivoire, Burkina Faso, and Mali. The reinforcement of the capacity of transformation of this 225 kV substation by adding a new equipped 225/90 kV transformer bay must ensure the necessary (n-1) reliability needed (flexibility of operation and maintenance) to limit the total unavailability of this important substation. Furthermore, for operational reasons, the second 65 MVA transformer will be removed and the two transformer bays will be equipped with two 225/90 kV 70 MVA new transformers.

(v) Man Substation (US\$4.7 million equivalent). The reinforcement of the capacity of transformation of this 225 kV substation by adding a new equipped 225/90 kV transformer bay must ensure the necessary (n-1) reliability needed (flexibility of operation and maintenance) to limit the total unavailability of this important substation. Furthermore, for operational reasons, the second 65 MVA transformer will be removed and the two transformer bays will be equipped with two 225/90 kV 70 MVA new transformers. The main activities to be financed are:

- extension of the 90 kV bus bar;
- adaptation of the substation civil engineering;
- creation of a new 225/90 kV 70 MVA transformer bay with associated equipment; and
- installation, integration in national remote control system and commissioning of the two 225/90 kV 70 MVA transformers.

Table 2.4: Indicative Cost Breakdown of Sub-component 1.3 (a)

	Cost (FCFA billion)	Cost (US\$ million)
Abobo	3.8	6.6
Taabo	2.1	3.6
Kossou	3.1	5.3
Man	2.7	4.7
Ferke	2.1	3.6
Total Project	13.8	23.8

(b) Improvement of Reliability of Supply of ten 90/33kV HV/MV Substations in Selected towns (US\$31.7 million equivalent). This sub-component will finance transformers to improve reliability of supply (n-1) and reduce technical losses at 10 substations namely Agboville, Ayamé, Bongo, Bouaké 1, Daloa, Danané, Dimbokro, Boundiali, and Dabou.

(i) **Substation of Agboville (US\$3.2 million equivalent).** Agboville's 90kv substation has (i) 90/33 kV 10 MVA transformer; (ii) 90/15 kV- 20 MVA transformer; and (iii) 30/15 kV 7.5 MVA reversible transformer. To cope with the growing demand, ensuring continuity of service and (n-1) security, it is necessary to strengthen the substation by a new equipped

90/33 kV 24 MVA transformer bay. The scope of work consists of:

- creation of a new equipped 90/33 kV transformer bay;
- procurement, installation and commissioning of 90/33 kV 24 MVA transformer;
- creation of 33kV switchgears;
- restructuring MV voltage room; and
- renewal the remote control system.

(ii) Substation of Ayamé 2 (US\$3.1 million equivalent). The scope of work to secure supply and (n-1) reliability include at the substation of Ayame 2:

- creation of a new equipped 90/33 kV transformer bay;
- procurement, installation and commissioning of 90/33 kV 24 MVA transformer;-
- creation of 33kV switchgears;
- restructuring MV voltage room; and
- renewal of the remote control system and integration of the bay in national system of monitoring and control.

(iii) Substation of Bongo (US\$5.3 million equivalent). At Bongo, a new substation will be created in the same area of the existing substation. This is justified by the fact that the existing one has neither lines bay nor 90 kV bus bars and no control room. The switchgears are outdoor type. As such, the following will be funded:

- creation of 2x 90 kV lines bays;
- creation of 2x90 kV bus bars with a 90 kV coupling bar;
- creation of 2 equipped 90/33 kV transformer bays
- supply and installation of one 90/33 kV 24 MVA transformer;
- supply and installation of 2 auxiliary transformers 33kV / 400-230 V, 250 kVA;
- one control building and 33 kV MV rooms;
- installation of protection and digital control system;
- renewal of the remote control and telecommunication system; and
- one new building to house substation staff.

(iv) Substation of Bouaké 1 (US\$3.3 million equivalent). The peak demand observed at Bouake 1 in May 2016 was 25.71 MW. The load factor of the transformers 90/33kV 10 MVA is 76 percent, and as for the two transformers 90/15 kV 36 MVA load factors are 49 percent and 52 percent, respectively. To ensure the continuity of service and to guarantee the (n-1) reliability, the reinforcement of the station of Bouaké 1 will have to be made by the creation and the equipment of span transformer 90/33 Kv- 24 MVA. The activities to be implemented to ensure the reliability of supply at this substation include:

- creation of one equipped 90/33 kV transformer bay;
- supply and installation of one 90/33 kV 24 MVA transformer;
- the construction of an MV building for the 33 KV substation; and
- renewal of the telecontrol and telecommunication system.

(v) Substation of Daloa (US\$2.8 million equivalent). In 2016, the peak demand observed in 2016 at Daloa substation was 24.5 MW and the two existing transformers 90/33 kV/ 16 MVA and 90/15 kV 24 MVA are loaded at 76 percent and 57 percent, respectively. To meet the growing demand of the 33kV feeder and ensuring continuity of service and (n-1)

reliability, it is necessary to strengthen this substation by adding a 90/33 kV 24 MVA transformer bay. As such, activities to be implemented include:

- a new equipped 90/33 kV transformer bay;
- acquisition and installation of 2 x90/33 kV 24 MVA transformers; and
- renewal of the remote control system in line with Côte d'Ivoire substation setting guidelines.

(vi) **Substation of Danané (US\$2.6 million equivalent).** Starting 2016, the (n-1) reliability of supply of this substation is not realized in this substation. Indeed, in case of loss of the unique 90/33 kV 20 MVA transformer in this substation, the load cannot be transfer and this lead to load shedding. Hence, to cope with the growing demand, ensuring continuity of service and (n-1) reliability, a new equipped 90/33 kV 24 MVA transformer bay is needed. The scope of work consists of:

- a new equipped 90/33 kV transformer bay;
- acquisition and installation of 90/33 kV 24 MVA transformers;
- extension of the existing 90kV busbars; and
- renewal of the remote control system in line with Côte d'Ivoire substation setting guidelines.

(vii) **Substation of Dimbokro (US\$2.8 million equivalent).** The existing substation has two voltage level (15kV and 33kV) and equipped with three transformers 90/15 kV 7.5MVA /15 MVA and 90/33 kV 7.5 MVA, loaded at 83 percent, 26 percent, and 51 percent, respectively. In 2016, the (n-1) reliability is not assured. Indeed, in the event of loss of the 90/33 kV 7.5 MVA single transformer, the entire load connected in 33kV feeder could not be transferred. Moreover, by the end of 2016, the load connected in 33kV being 8.03MW, the transformer 90/33 kV / 7.5 MVA will be loaded at 108 percent. To cope with demand growth, to ensure the continuity of service and to guarantee the (n-1) reliability, the reinforcement of the station of Dimbokro will be equipped with a new transformer 90/33kV/24 MVA bay. The activities to be implemented under this sub-component are:

- a new equipped 90/33 kV transformer bay;
- acquisition and installation of 90/33 kV 24 MVA transformers;
- extension of the existing 90kV bus bars;
- supply and installation of a 90 kV circuit-breaker, with its chassis;
- supply and installation of a 90 kV bus bar disconnecter;
- supply and installation of three 90 kV surge arresters;
- renewal of the remote control system in line with Côte d'Ivoire substation setting guidelines.

(viii) **Substation of Dabou (US\$2.2 million equivalent).** The securisation of this substation involves:

- a new equipped 90/33 kV transformer bay;
- acquisition and installation of 2 x90/33 kV 24 MVA transformers;
- supply and installation of 2 auxiliary transformers 33kV / 400-230 V, 400 kVA
- renewal of the remote control system in accordance with CI-ENERGIES substation setting guidelines.

(ix) **Substation of Attakro (US\$1.90 million equivalent).** There is necessity to strengthen the substation of Attakro given the growing demand in order to ensuring continuity of service and (n-1) reliability. A 90/33 kV 20 MVA transformer and 90/33 kV 40 MVA transformer equipped this substation. The 20 MVA transformer will be replaced by 40 MVA. The scope of the work to reinforce this substation includes:

- purchase and installation of a 90/33 kV 40 MVA transformer;
- replacement of the circuit breaker of the existing transformer bay;
- supply of an auxiliary transformer 33 kV / 400 of 250 KVA;
- modernization of the remote control system of the substation;
- extension of the existing control building.

(x) **Substation of Abengourou (US\$4.5 million equivalent).** To cope with the growing demand, ensuring continuity of service and (n-1) security, it is necessary to strengthen the substation by a new equipped 90/33 kV 36 MVA transformer bay. The scope of work consists of:

- creation of a new equipped 90/33 kV transformer bay;
- procurement, installation and commissioning of 90/33 kV 36 MVA transformer;
- creation of 33kV switchgears;
- restructuring MV voltage room; and
- renewal of the remote control system.

Table 2.5: Indicative Cost Breakdown of Sub-Component 1.3(b)

Number	Substation	Cost (FCFA billion)	Cost (US\$ million)
1	Agboville	1.8	3.2
2	Attakro	1.1	1.9
3	Ayamé 2	1.8	3.1
4	Bongo	3.1	5.3
5	Bouaké 1	1.9	3.3
6	Dabou	1.3	2.2
7	Daloa	1.6	2.8
8	Danané	1.5	2.6
9	Dimbokro	1.6	2.8
10	Abengourou	2.6	4.5
	Total	18.4	31.7

	Cost (FCFA billion)	Cost (US\$ million)
Subcomponent 1.3 (a)	13.8	23.8
Subcomponent 1.3 (b)	18.4	31.7
Total Subcomponent 1.3	32.2	55.5
Contingencies (3%)	1.0	1.7
Total w/contingencies	33.2	57.2

Component 2: Rehabilitation, Reinforcement, and Extension of Distribution Systems in Abidjan and Selected Regional Capital Cities (US\$95.4 million equivalent)

5. This component will finance the rehabilitation, reinforcement, and extension of distribution networks in 10 regional capital cities, grounding of MV lines in specific areas in Abidjan, and replacement of MV CPI conductors by CIS conductors in Abidjan.

- **Sub-Component 2.1: Rehabilitation, Reinforcement, and Extension of Distribution Networks in selected Regional Capitals (US\$47.6 million equivalent).** This sub-component will finance rehabilitation and extension of distribution networks in the towns of Gagnoa, Man, Soubré, Duekoue, Guiglo, Seguela, Odienne, Katiola, Sassandra, and Touba. This sub-component will address the lack of regular maintenance by providing resources to rehabilitate and expand the distribution network in the said towns. The upgrading activities will consist of creating new substations and feeders and replacing equipment on the Abidjan MV and LV network to meet operation standards and reduce losses. Roughly 60,000 new household connections are expected to be made under this sub-component, which will also bring about a better quality of supply for around 73,000 existing customers, mainly by restoring a good voltage level during peak period. It is also expected that these investments will reduce the average interruption duration from 14.2 hours to 5 hours over the project period. The extension and rehabilitation of distribution networks in the 10 towns will require an additional capacity of 38 MW provided essentially by Component 1 of the project and other ongoing projects of CI-ENERGIES. The critical activities to be implemented under this sub-component to cope with the increase of demand and to improve quality of supply in these 10 cities are:
 - construction of six new MV feeders of which:
 - one feeder from the substation of Man to reinforce the supply of the town;
 - two feeders (33kV) from the substation of Man to reinforce and secure the supply of Duekoue and Guiglo;
 - one feeder from 90kv/33kv substation of SEGUELA to reinforce and secure supply of Seguela;
 - one feeder from the substation of SOUBRE to reinforce and secure the supply of the town of SOUBRE; and
 - one feeder from of the substation of Gagnoa to reinforce and secure the supply of the town of Gagnoa and 03 feeders from the new 225/90/33/15kVsubstation of Gagnoa.
 - Creation of 365 MV/LV public distribution substations;
 - 260 km of MV network; and
 - 876 km of LV network.

Table 2.6: Indicative Cost Breakdown of Sub-Component 2.1

	Town	Cost (FCFA billion)	Cost (US\$ million)
1	Man	5.6	9.66
2	Touba	1.5	2.59
3	Odienne	3.6	6.21
4	Seguela	2.1	3.62
5	Sansandra	0.9	1.55
6	Soubre	3.5	6.03
7	Duekoue	0.4	0.69
8	Katiola	4.2	7.24
9	Gagnoa	4.1	7.07
10	Guiglo	0.7	1.21
	Total	26.6	45.9
	Contingencies (3.7%)	1.0	1.7
	Total w/contingencies	27.6	47.6

- Sub-Component 2.2: Replacement of Overhead MV Lines with Underground MV Lines in Abidjan (US\$39.5 million equivalent).** A significant portion of Abidjan MV network is overloaded causing load shedding and operating difficulties at peak periods or in case of damage to equipment. In general, the (n-1) reliability is not guaranteed. The technical losses estimated at about eight percent are far from the three percent standard acceptable. The Abidjan network suffers over 200 incidents annually per 100 km of network, with an average outage duration of 23.3 hours. This subcomponent will then finance the replacement of 407 km of the existing overhead MV lines with underground ones in Abidjan. The replacement of overhead lines by underground ones in Abidjan is the solution recommended by the distribution master plan. This will reduce the number of incidents linked to supply interruption and will reduce interventions by network operators. A preliminary study of undergrounding of MV network in Abidjan carried out by CI-ENERGIES has shown the technical and economic viability of such an operation. From a technical and economical point of view, the replacement of overhead Almelec conductors of 34 to 148 mm² section by underground CIS ALU 240 mm² cable would reduce voltage drops by 14 percent for 34 mm² section and by 42 percent for 148 mm² section. Technical losses would drop by 12 percent for 34 mm² section and by 52 percent for 148 mm² section cables. This replacement of overhead almelec conductors by underground CIS cables would allow saving of around 1,523 GWh. The ratio of the relative voltage drops is the inverse ratio of the electrical moments to one percent of the lines. Since the electrical moment of the underground cables is greater than that of the overhead lines, undergrounding lines will lead to reducing the voltage drops for the same power transit. This sub-component will finance the replacement of about 407 km of overhead MV network in the district of Abidjan by CIS cables. The main activities will include:

 - supply of equipment and installation of 458 km of MV underground network;
 - removal of 431 km of existing overhead MV network;
 - construction of substations and restructuring of the HV/LV associated network; and
 - Supply of control and network commissioning tests equipment.

- **Subcomponent 2.3: Upgrade of MV Cables by replacing *Impregnated Paper Insulation (CPI) Cables with Synthetic Insulation Cables (CIS) in Abidjan (US\$8.3 million equivalent)*.** One of the reliable solutions to reduce load shedding and technical losses associated with CPI cables is to replace them with CIS ones. A study carried out by CI-ENERGIES on this subject shows that, the replacement of CPI of 95 mm² and 150 mm² cables by CIS ALU 240 mm² cables would result in 60 percent and 40 percent reduction of technical losses, respectively. Therefore, this sub-component will provide resources to replace existing overloaded and aged MV CPI cables on one hand and carry out grid restructuring and updating operations on the other hand. Restructuring and upgrading operations will aim at adapting the underground HTA network to the increase of demand density and replacing equipment on the associated substations to meet operation standards and reduce losses. The scope of work to be funded includes:
 - removal of 113 km of existing CPI MV network;
 - supply of equipment and installation of 113 km of MV CIS cable network;
 - rehabilitation of substations and restructuring of the HV/LV associated network; and
 - supply of control and network commissioning tests equipment replacing.

Component 3: Rural Electrification and Support to Electricity for All Program (US\$100.6 million equivalent).

6. This component will finance the electrification of 201 villages in rural areas and provide direct financing for the GoCDI E4All Program, which provides financing for household connections (including internal house wiring) to obtain grid supply. Direct financing to the E4All Revolving Fund will be earmarked to finance connection costs in the localities that are electrified under the project.

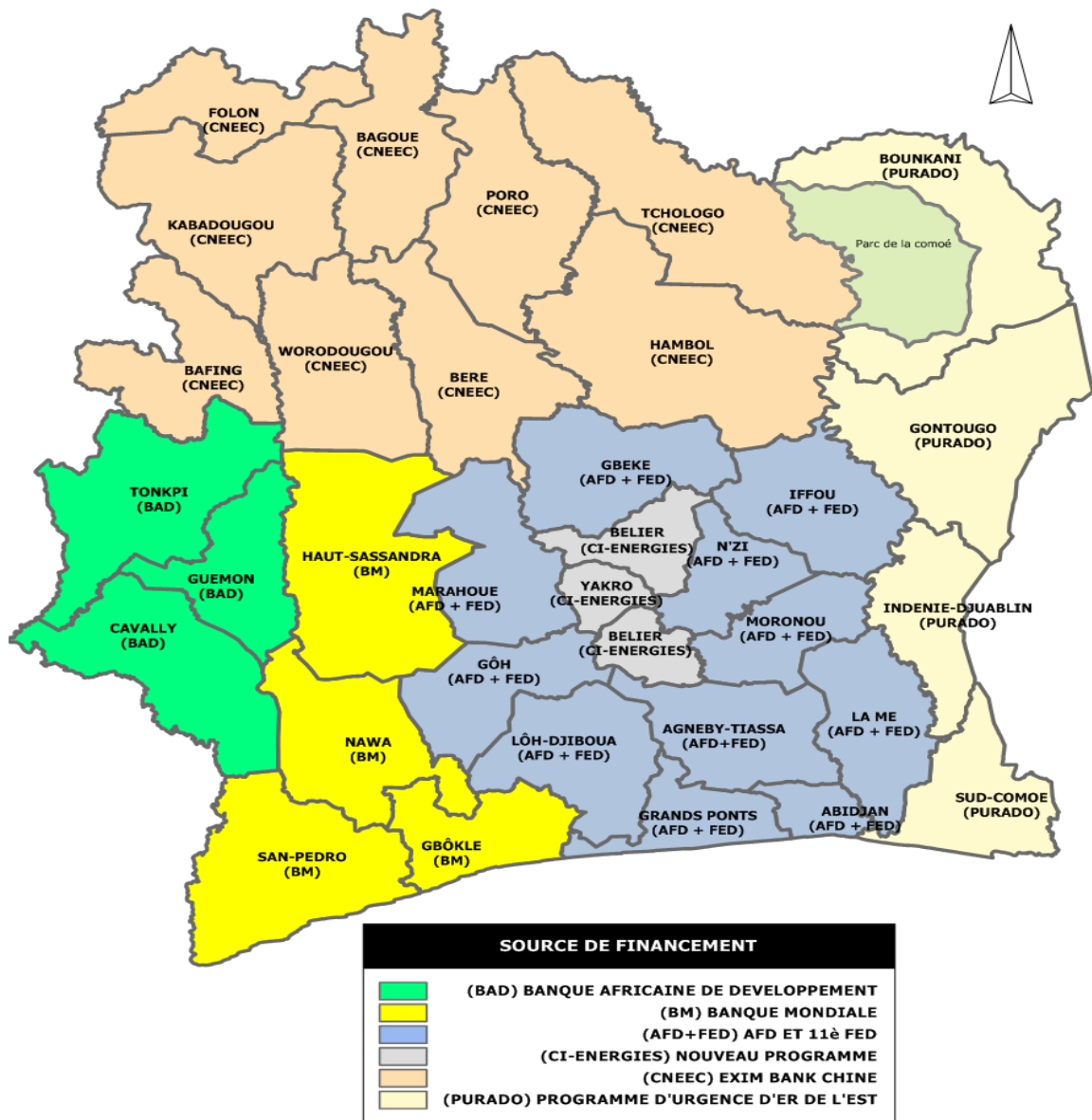
- **Sub-Component 3.1 Rural Electrification (US\$73.7 million equivalent).** This sub-component will support the roll out of The National Rural Electrification Program (“PRONER”) and the Master Plan for Rural Electrification, which identify priority actions and targets for rural electrification. The objective of the PRONER adopted by the GoCDI is to increase the penetration rate of electricity to 80 percent in 2020 and the coverage rate to 100 percent of the population. PRONER is an ambitious program of GoCDI to electrify all localities with over 500 inhabitants by 2018 by maintaining an annual rate of 500 localities electrified until 2020. The Rural Electrification Master Plan aims to develop the current HV/MV network in different parts of the territory to electrify new locations and develop 225/90/33kV and 90/33kV substations in many parts of the country. Specifically, the sub-component will fund the electrification of about 201 new localities in selected rural areas, including household connections. Rural electrification is supported by different donors mapped to different regions. The map below indicates that financing under this sub-component will be used to increase access in four regions in South West of the country.

The National electricity access scale up rollout program has been conceived to achieve the following objectives:

- Balance of access across the regions (departments) - the GoCDI’s targets to achieve an access rate of at least 30 percent in each department by 2018;
- All local administration offices and regional capitals (chefs-lieux) and villages of at least 500 households should be electrified by end 2018; all households living in the vicinity of an MV line (500 meters) should also be electrified; and
- Universal access program to electrify all Ivorian villages by 2020.

Commitments for the electrification of 1,249 villages (costing around FCFA 160 billion) have been made over the period of 2011-2015. The remaining 849 villages of over 500 households will be electrified over 2016-2018. The share of villages with access to electricity has increased from 34 percent to 49 percent between 2011 and 2015. The Master Plan for Rural Electrification indicates that all villages to be electrified in Côte d'Ivoire are located in less than 20 km from the grid and hence will be connected to the national grid. Only around 100 villages are isolated, with small populations, and these will be electrified with off-grid solutions.

Figure 2.1: Donor's areas of intervention in the rural electrification program and source of financing²²



The proposed investment under Component 3 will finance the electrification of 201 villages/communities, with a total population of 1,218,613 people, in the regions of Gboklé, San-Pedro, Nawa, and Haut Sassandra in the South West of Côte d'Ivoire, bordering Liberia. This area is the second economic hub of the country, rich in agriculture of coffee and cocoa, with the port of San

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(BAD) Banque Africaine de développement: African Development Bank
 (BM): Banque Mondiale: World Bank
 (AFD + FED) AFD et 11è FED: French Development Agency and European Union
 (CI-ENERGIES) Nouveau Programme: CI-ENERGIES New Program
 (CNEEC) Exim Bank Chine : China National Electric Engineering Company – Exim Bank China
 (PURADO) Programme d'urgence d'ér de l'est : Emergency Rural Electrification Program of the President

Pedro, which is the first terminal to export cocoa in the world. Given that the population is dispersed, at least 510, 918 people equivalent to 85,153 households, are expected to gain access to electricity through the project during the implementation of the project. The main activities included in this sub-component are:

- Construction of 1,522 km of MV lines;
- Construction of 1,763 km of LV lines;
- Erection of 352 substations/transformers constructed, including 60x50kVA, 123x100kVA and 169x160kVA; and
- Installation of 43,053 public lighting points of 150 W High Sodium Pressure.

In line with the 2015 SCD recommendations to foster income-generating opportunities for women, the component will support the development of gender-targeted interventions on productive and efficient use of electricity by women. First, a qualitative study to guide the proposed gender interventions will be conducted to investigate differences between women and men in energy access and use, affordability, coping mechanisms and interaction with service providers, among others. After the study, the sub-component will support the development of trainings to facilitate and build capacity among female beneficiaries on profitable uses of the electricity services provided. Based on the study's finding, a potential community center pilot could be set up in selected areas to support women using electricity for income-generating activities. During the preparation mission, some challenges were reported related to the beneficiaries' capability to read and recharge a prepaid meter. Consequently, the training will also focus on the use and benefits of electricity providing information and building male and female beneficiaries' skills to use the installed meters. The specific interventions are detailed in the Project Implementation Manual.

Sub-Component 3.2: Support to Electricity for All Program (US\$26.9 million equivalent). The "Electricity for All" Program was adopted by the Cabinet on May 27, 2014 with an objective to electrify all households within the villages that are already electrified and achieve at least 60 percent access rate by 2020. The experience shows that key constraints for access scale up in these areas are the ability of beneficiaries to pay the connection fee of around FCFA 150,000 (US\$250) at one time and heavy connection and security formalities. The program will connect around one million households in five years (200,000 connections per year) and will cost around US\$257 million. The GoCDI is preparing the documentation to set up a multi-donor revolving Fund for E4All Program (FE4All) by the end of 2017. Prior to the establishment of the FE4All, donor financed projects that are advanced will use a transitional Revolving Fund, similar the one set up by the World Bank in the previous IDA operation. Therefore, funds under this sub-component will be used to set up the transitional revolving fund to help finance household connection costs (including internal house wiring) to oLVin grid supply in the above mentioned 201 villages (sub-component 3.1) and in 10 regional capital cities (sub-component 2.1). The program will finance connection costs for low-income households, who cannot afford to pay the normal connection fee. Most such clients use electricity for domestic purposes and are on domestic tariff category (5A). For clients on pre-payment meters, mainly for low-income rural and semi-urban clients, reimbursements will be linked to the energy consumption. A fixed charge indexed to kWh will be collected to reimburse the pre-financed connection fees. For clients with relatively high income, mainly in urban areas, with post-payment meters, a fixed amount will be added to their bi-monthly bills for the reimbursement of the pre-financed connection fee over a period of two years. This fund will follow the principles and technical specifications of the E4All Electricity for All Program. The scheme is designed taking into

account three categories of income among the population in the project areas as identified in the rural electrification master plan studies where the low income category will pay only FCFA 1,000 and reimburse the connection fee over 10 years. An affordability assessment will be done to make sure that the conditions of repayment are adequate for the targeted population. Based on recommendations of analytical work and informed by results of the pilot phase of E4All program, part of the revolving fund would be used to finance E4All program in selected urban areas with low risks for reimbursement during the first two years of the project implementation. Reimbursements from such connections would be used to finance further connections in the project areas, without affecting the project implementation period. Once the Government E4All Fund has been fully operationalized, transfer of the resources of the revolving fund to the GoCDI' FE4All could take place.

Estimation of Connection Fees in 2015

Connection fees depend on the type of connection requested by the beneficiary at the time of subscription. The total fee includes connection cost and average financing cost, taking into account the risk factor. Beneficiaries of the E4All Program will include three categories. The table below shows the amount to be reimbursed per category of beneficiaries based on 2015 figures. The amount to be reimbursed is expected to be revised every year by the Fund management committee.

Table 2.7: Connection fees and reimbursable amounts per social categories

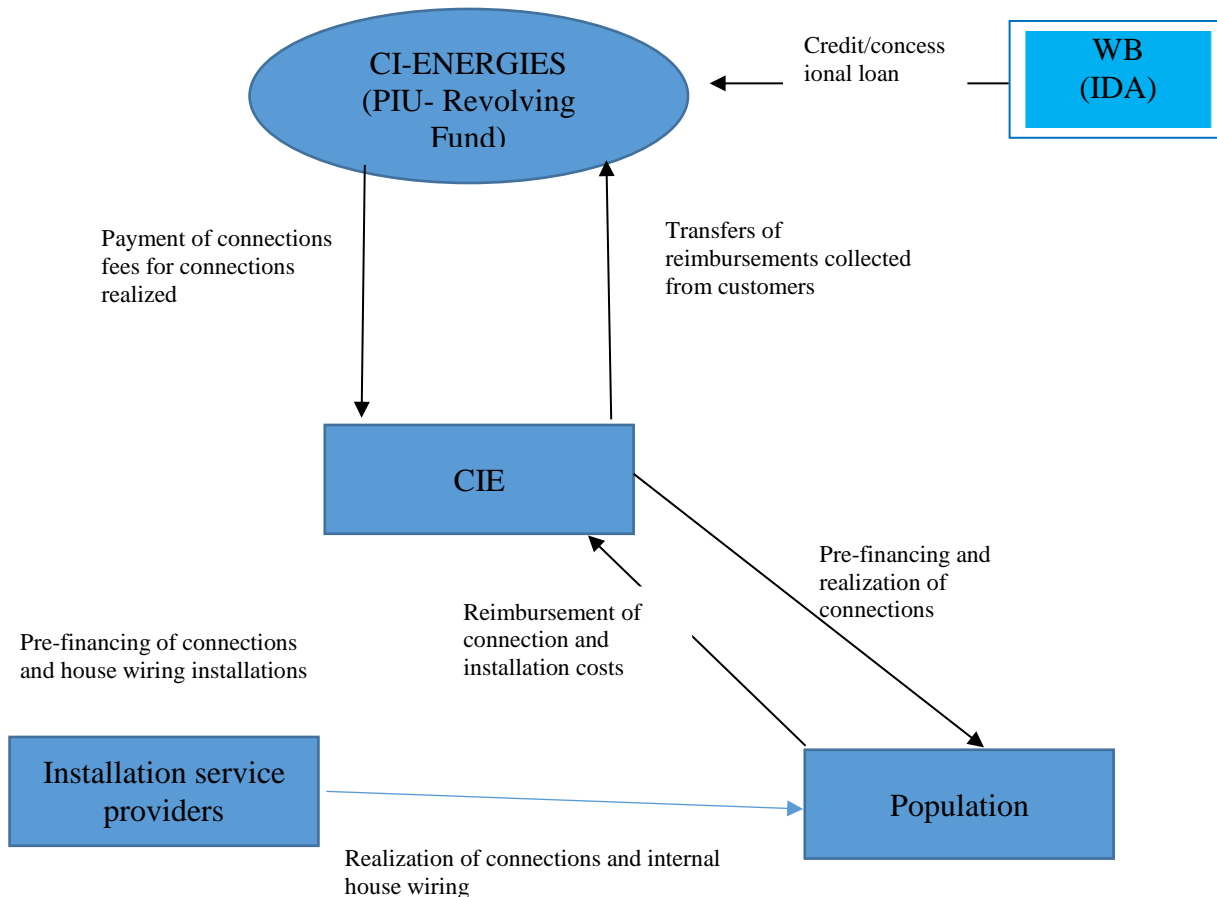
Type of Connection	Connection Cost (FCFA)	Upfront connection payment (FCFA)	Amount to be Reimbursed (FCFA)	Proportion of the clients	Location of the clients
Client category A (Social-low income < 5A)				90%	40% urban; 35% semi-urban and 25% rural)
• Type A0-close to the grid	103 000	(1000)	102,000	40%	
• Type A1 / 1 room	150,000	(1000)	149,000	5%	
• Type A2 / 2 room	180 000	(1000)	179,000	15%	
• Type A3 / 3 rooms	200,000	(1000)	199,000	40%	
Client category B (normal: medium consumption 5-10 A)	150,000	(1000)	149,000	5%	100% urban
Client category C (comfort: large consumption > 10A)	205,000	(5000)	200,000	5%	100% urban

Revolving Fund Framework

A revolving fund to finance connections fees will be managed by CI-ENERGIES. A special account to receive funds will be opened in a commercial bank. A procedures manual for the management of the Fund has been established by CI-ENERGIES. CIE will provide new connections. Modalities for the implementation including tariff structure for connections, procurement procedures, subcontractors to

be used, specifications of materials and security standards have been agreed upon in a protocol between CIE and CI-ENERGIES signed on February 23, 2017.

Fig.2.2: E4All Revolving Fund financing mechanism



The program will also finance the internal house wiring prior to connection.²³ For security reason, the house wiring will be certified with a relevant authority. In peri-urban and rural areas, where house wiring is not necessary, a standard ready board will be integrated in connection kit. CIE will supply standard certified kits to service providers.

Management of the fund will be entrusted to the PIU within CI-ENERGIES. CIE will register potential clients in the areas of the project, i.e., 201 villages under Component 3 and 10 regional capital cities. CIE will pre-finance the connections under the agreed connection costs, as established in the concession agreement. A technical committee of CI-ENERGIES and CIE will set unit costs for the internal wiring based on the recent market conditions.

CIE will be submitting monthly reports on works accomplished along with invoice for the connections realized, with sufficient details including the identification of the clients, GIS coordinates and contacts. CIE will also present monthly report on reimbursements collected from eligible customers and transfer

²³ Meters belong to CIE and are not included in the cost.

them to the revolving fund account. CIE's accounting system allows differentiating the payment for energy and the repayment of the connection cost.

Component 4: Strengthening Institutional Capacity of the Electricity Sector and Project Management (US\$13.4 million equivalent). This component will support capacity building and project management.

- **Sub-Component 4.1: Capacity building (US\$1.6 million equivalent).** The support provided under this sub-component will finance the capacity building or training plan of the staff of CI-ENERGIES involved in the project implementation. Training needs have been identified in different areas including project management, power distribution and rural electrification, electricity transmission, procurement, finance and accounting, and environmental and social safeguards. In addition, as part of the project's efforts to support an inclusive and equal approach to electricity services among men and women, gender and energy trainings will be conducted by the AFREA Gender and Energy Program among CI-ENERGIES personnel and CIE electricity agents in charge of connecting the households and installing the kits under the E4All Program. The trainings aim at sensitizing those actors involved in the electricity sector on the relevance of the gender aspects in the provision and management of electricity services. The trainings intend also to provide CI-ENERGIES personnel and CIE electricity agents with a more comprehensive understanding of their costumers increasing their knowledge on women and men's different needs related to electricity services and thus improving clients' services provision.
- **Sub-Component 4.2: Owner's Engineers for Project Supervision (US\$8.5 million equivalent).** This sub-component will finance services of two engineering firms to supervise and control the quality of the implementation of engineering works financed under the project. One engineering firm will be dedicated to the supervision of Components 1 and 2, and another to Component 3.
- **Sub-Component 4.3: Project Management (US\$3.3 million equivalent).** This will include the cost of managing the project, including remuneration of four keys experts to be hired under the project to support the project implementation unit. Key experts will include a project coordinator, the procurement specialist, the accountant, and a social safeguards specialist. Given the project's relevant social and gender implications, the social and gender specialist to be hired by the project will oversee the project's social and gender aspects and ensure that these elements are integrated, monitored, and evaluated during the project's implementation. Specific process indicators to monitor and evaluate the development of the proposed social and gender interventions are integrated in the Project Implementation Manual. The AFREA Gender and Energy Program will provide its technical assistance to support the social safeguards specialist in the development of the project's gender aspects and, if necessary, train the specialist on specific questions related to gender and energy. This sub-component will also finance a technical and financial audit of the project.

Table 2.8: Project Cost breakdown

Project Component and Cost Breakdown	Project Cost	Project Cost ²⁴
Component	(FCFA billion)	(US\$ million)
Component 1: Reinforcement of Transmission Systems	67.0	115.6
1.1. Construction of a New S/S at Gagnoa and Related Transmission Lines	7.9	13.7
1.2. Upgrade Three Existing 90kV Substations to 225kV	24.9	43.0
Bia-Sud	8.8	15.1
Treichville	10.3	17.8
Youpougon 1	5.8	10.1
1.3. Improvement of Quality and Reliability of Supply in 5 225kV/90kV S/S and 10 HV/MV S/S in 10 towns	32.2	55.5
5 225kV/90kV S/S	13.8	23.8
Kossou	3.1	5.3
Ferké	2.1	3.6
Man	2.7	4.7
Abobo	3.8	6.6
Taabo	2.1	3.6
10 HV/MV S/S in 10 towns	18.4	31.7
Agboville	1.8	3.2
Attakro	1.1	1.9
Ayamé 2	1.8	3.1
Bongo	3.1	5.3
Bouaké 1	1.9	3.3
Abengourou	2.6	4.5
Dabou	1.3	2.2
Daloa	1.6	2.8
Danané	1.5	2.6
Dimbokro	1.6	2.8
Contingencies Component 1 (3%)	2.0	3.4
Component 2: Rehabilitation, Reinforcement, and Extension of Distribution Systems in Abidjan and Selected Regional Capital Cities	55.4	95.4
2.1. Rehabilitation, Reinforcement, and Extension of Distribution Networks in 10 Regional Capitals	26.0	45.9
2.2. Replacement of Overhead MV Lines with Underground Lines in Abidjan	22.1	38.1
2.3. Replacement of MV Cables with Impregnated Paper Insulation (CPI) by Synthetic Insulation Cables (CIS) in Abidjan	4.7	8.0
Contingencies Component 2 (3.7%)	2.6	3.4
Component 3: Rural Electrification and Support to Electricity for All Program	58.2	100.6
3.1. Rural Electrification	39.8	68.6
3.2. Support to Electricity for All Program	14.4	25
Contingencies Component 3 (7.5%)	4.1	7.0
Component 4: Strengthening Institutional Capacity of the Electricity Sector and Project Management	7.7	13.4
4.1. Capacity building	0.9	1.5
4.2. Owner's Engineers for Project Supervision	4.8	8.3
4.3. Project Management	1.9	3.2
Contingencies Component 4	0.2	0.4
TOTAL	188.3	325.0

²⁴ The numbers are different from the main text for the subcomponents as the contingency is separated out

Annex 3: Implementation Arrangements
CÔTE D'IVOIRE: Electricity Transmission and Access Project

Project Institutional and Implementation Arrangements

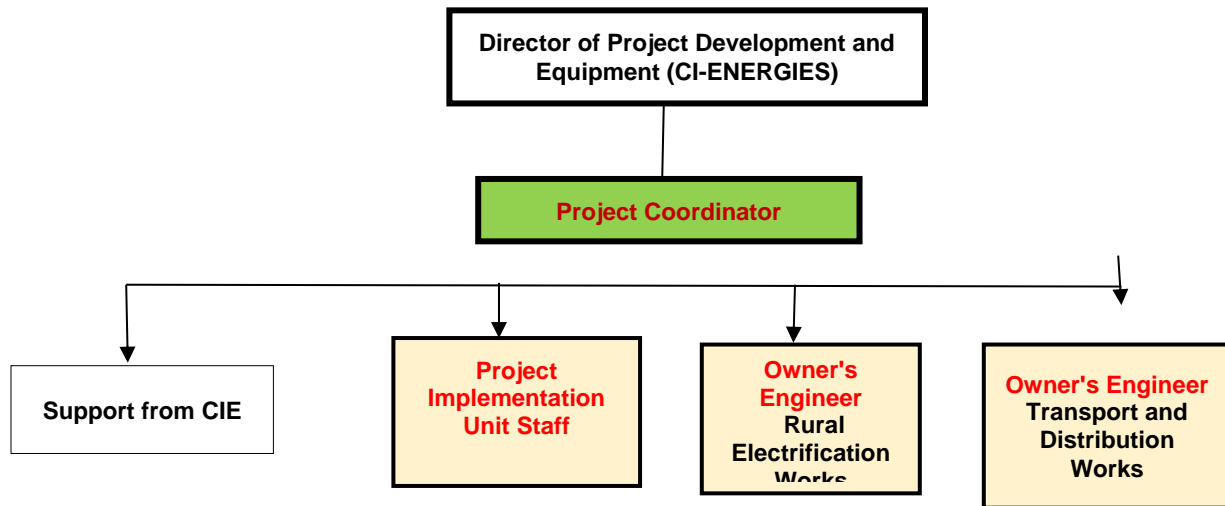
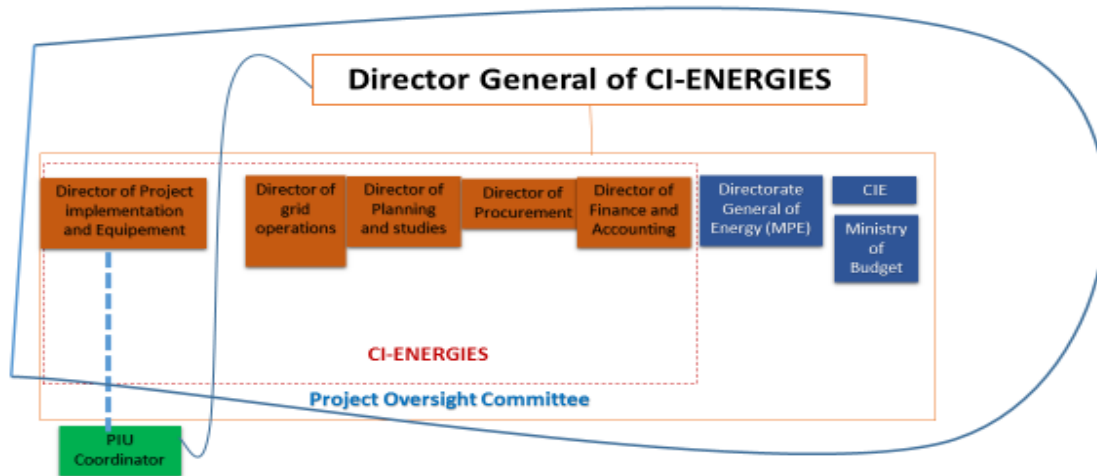
1. **CI-ENERGIES will be the implementing agency for the project.** CI-ENERGIES has recent experience with the previous World Bank-funded project and thus has staff who are familiar with World Bank procedures. Taking into account lessons from implementation of the previous project, CI-ENERGIES will set up a new dedicated Project Implementation Unit (PIU), led by a full-time Project Coordinator, who will report directly to the Director of Project Implementation and Equipment. The Project Coordinator and key project specialists (procurement specialist, accountant, and social and gender specialist) will be hired under the project as consultants responsible for project implementation, complementing CI-ENERGIES staff, who will also be involved in project implementation. The roles and responsibilities of CI-ENERGIES and PIU staff are detailed in the Project Implementation Manual, adopted on February 24, 2017.

2. **The decisions and guidance on the implementation of the project lie with the Director General of CI-ENERGIES.** A Project Oversight Committee composed of Directors of CI-ENERGIES and delegates from the Directorate General of Energy in the Ministry of Oil, Energy and Development of Renewable Energies, CIE, and the Ministry in charge of Budget and Government Portfolio will be put in place to facilitate the timely implementation of the project. The Project Oversight Committee will be meeting quarterly to assess the project performance and challenges, assist in finding solutions to challenges, and review the action plan for the following quarter to determine where the assistance to the PIU might be required. The representative of the Ministry of Budget and Government Portfolio will assist in solving issues related to customs clearances and import taxes. The decision and overall guidance on the project implementation lie with the Director General of CI-ENERGIES.

3. **CIE being the future operator of the infrastructure will be closely involved in project implementation.** This includes providing inputs in planning, technical specifications, and supervision of the implementation and commissioning of the infrastructure. An agreement has been signed on January 31, 2017 between the implementing agency, CI-ENERGIES, and CIE to define respective roles and responsibilities. CIE will appoint engineers dedicated to providing inputs to CI-ENERGIES on the supervision of the project implementation working with the PIU and the owner's engineers. The role of CIE for the execution of Components 1, 2, and 3.1 will be limited to technical inputs and commissioning of completed works to ensure compliance with grid standards and proper synchronization with the grid. Commissioned infrastructure will be handed over the CIE for operation and management.

4. **Special arrangements will be put in place for implementation of the revolving fund to support the Electricity for All Program.** A revolving fund to finance connections fees will be set up and managed by CI-ENERGIES. A procedures manual for the management of the fund has been established by CI-ENERGIES. CIE will implement new connections. Modalities for the implementation including tariff structure for connections, procurement procedures, subcontractors to be used, specifications of materials and security standards have been agreed upon in a protocol between CIE and CI-ENERGIES approved by the World Bank and signed on February 23, 2017.

Figure 3.1: Project Implementation Arrangements



Financial Management, Disbursements and Procurement

Financial Management Arrangements

5. The FM arrangements for the project have been designed with consideration for the country's post-conflict situation while taking into account the OP/BP 10.00, which describes the overall FM World Bank policies and procedures. The FM system of the project must be capable of (i) correctly and completely recording all transactions related to the project; (ii) facilitating the preparation of regular, timely and reliable financial statements; (iii) safeguarding the project's assets; and (iv) can be subject to auditing diligences as required by the World Bank. The arrangements also aim to facilitate disbursements and ensure effective use of project resources while using the country's own systems to the extent possible.

6. An assessment of the CI-ENERGIES (*Société des Energies de Côte d'Ivoire*) was carried out in October 2016 and January 2017 to check whether this state-owned enterprise could manage the proposed project. The main findings arising from this assessment were as follows: (i) CI-ENERGIES Directorate of Finance and Accounting (DFA) is familiar with the World Bank-financed projects financial management procedures and requirements; and (ii) there is an acceptable governance structure comprising a board of directors, an audit and risks management committee and an investment and strategies committee. However, the audited financial statements of CI-ENERGIES that are audited by two statutory independent auditors "*Commissaires aux Comptes*" do not include the accounts of donors-funded operations nor the assets and liabilities of the electricity sector previously managed by SOGEPE and SOPIE and transferred to CI-ENERGIES by law. Furthermore, the overall FM performance of the previous World Bank-funded project "CI- Urgent Electricity Sector Rehabilitation (P112573)" managed by CI-ENERGIES was rated moderately satisfactory due to some internal control weaknesses and financial reporting challenges derived from the accounting software used to manage the project.

7. To address the issues faced during the implementation of the P112573 project, CI-ENERGIES requested to use a ring-fenced financing mechanism for the fiduciary aspects of the new project. A project implementation unit "PIU" has been established to manage the overall FM aspects of the World Bank and other donor-financed projects. A new accounting software having a dedicated module for project management is being configured and deployed/installed, and it is expected to be finalized by project effectiveness date.

8. On that basis, the financial management system of the project will run as follows:

- The FM arrangements of the World Bank-financed operations in Côte d'Ivoire are guided by the new Decree No 475 governing the implementation modalities of World Bank-financed projects in Côte d'Ivoire. These are considered acceptable to IDA, having been improved over time.
- The Division within the Directorate of Finance and Accounting (DFA) of CI-ENERGIES responsible for the monitoring and accounting of donors-financed projects is headed by a qualified and experienced Manager. This Division under the overall oversight of the Director for the DFA will be strengthened with the recruitment on a competitive basis of an experienced Project Accountant familiar with IDA FM procedures and requirements.
- The FM team of CI-ENERGIES will prepare a consolidated annual work plan and budget (AWPB) for implementing the project activities. The AWPB will be submitted to the board of directors or the project steering committee for approval, and thereafter to IDA for no objection not later than 30 November of the year proceeding the year the work plan should be implemented.
- The implementation of the IDA-financed project will translate into an increase of activity for the DFA of CI-ENERGIES – which in turn will require more sophisticated control systems and adequate staff, an effective internal audit function, an updated manual of procedures in place, an integrated information system and projects software. It was therefore discussed and agreed with CI-ENERGIES the following additional measures to mitigate the risks: (i) a new project implementation manual (PIM) including FM aspects has been drafted; (ii) configuration and installation/deployment of the newly acquired accounting software "MICROSOFT NAV 2016" which includes a project management module should be finalized by project effectiveness date; and (iii) the internal audit Unit of CI-ENERGIES will include the proposed World Bank-financed project in its annual audit program and the mission reports shared with the World Bank.
- Interim unaudited Financial Reports (IFR) reflecting on the World Bank project activities will be prepared every quarter in a format and content agreed with IDA and submitted to the World Bank 45 days after the end of the quarter.

- CI-ENERGIES annual financial statements which include IDA and other donor-financed project activities will be audited annually by qualified and experienced external auditors, “statutory auditors” as required by law, based on terms of reference agreed on by all parties. The auditors will issue two separate audit reports: (i) one report on the entire annual financial statements of CI-ENERGIES and (ii) one report on the annual accounts of the project. A management letter will be required for each report. Both reports together with the management letters should be submitted to IDA not later than six months after the end of each fiscal year.
- Upon credit effectiveness, transaction-based disbursements (replenishment and reimbursement) will be used during the first months of project implementation. Thereafter, the option to disburse against submission of Interim un-audited Financial Report (IFR, also known as the Report-based disbursement) will be considered subject to the quality and timeliness of IFR submitted to the World Bank and the overall financial management arrangement as assessed in due course. The other options of disbursing the funds (reimbursement, direct payments and special commitments) will be available.
- One (1) Designated Account A (DA-A) denominated in FCFA will be opened at the Central Bank of West African States (BCEAO) to receive funds for Components 1, 2, and 3 (sub-component 3.2 excluded). A second Designated Account B (DA-B) denominated in FCFA will be opened at the Central Bank of West African States (BCEAO) to receive funds for sub-component 3.2. Both will be managed by the Department of Public Debt (*Direction de la Dette Publique-DDP*) to receive advances for project expenditures eligible for project financing. The funds will then be transferred into two Project Accounts (PA-1 and PA-2) – PA-2 will be opened for the purpose of the revolving fund and the PA-1 for the rest. PA-1 and PA-2 will be opened in a commercial bank on terms and conditions acceptable to the World Bank. The PAs will be managed by the Director for the DFA of CI-ENERGIES. Interest incomes generated on idling funds on the PAs will be deposited into a specific account opened in a commercial bank and reflected in the project financial statements and IFRs. Payments to firms, contractors, government specialized entities, services providers/consultants and suppliers will be made in accordance with the payments modalities, as specified in the respective contracts and memoranda of understanding. The credit will finance 100 percent of eligible expenditures of the project inclusive of tax.
- The residual FM risk after mitigation measures has been rated substantial taking into account the country context and the nature of the project activities mainly the risks associated to the activities related to the revolving funds.
- The project will be supervised on a risk-based approach. Based on the current overall residual FM risk, which is substantial, the project will be supervised twice a year to ensure that project FM arrangements still operate well and funds are used for the intended purposes and in an efficient way. The supervision intensity will be adjusted over time taking into account the project FM performance and FM risk level.

Table 2.9: FM Action Plan

Actions	Responsible party	Deadline
Finalize the configuration and deployment of the accounting software MICROSOFT NAV 2016	CI-ENERGIES	By effectiveness
Appoint the project accountant	CI-ENERGIES	Two months after project effectiveness

Planning and Budgeting Arrangements

9. The budgeting system is operational. Annual budgets are prepared and submitted to the board of directors. For the purposes of this project, the FM team of the dedicated PIU will prepare a consolidated AWPB for implementing project activities taking into account the project's components. The work plan and budgets will identify the activities to be undertaken and the role of respective parties involved in the implementation including the PIU and other implementing entities.

10. The AWPB will provide detailed information on the amount allocated per activity showing unit costs and quantities. Annual work plans and budgets will be consolidated into a single document by the FM unit of the PIU with support from the other departments of CI-ENERGIES and under the overall responsibility of DFA. The AWPB will be submitted to the project committee for approval, and thereafter to IDA for no objection no later than 30 November of the year preceding the year the work plan should be implemented. The budgeting system under the PIU will build on lessons learned. The budgetary discussions will begin at least six months before the fiscal year of implementation and will consider the procurement plan as the starting point. Once the budget is approved, it will be integrated in the computerized accounting system to serve as a basis for a budget execution monthly follow-up, based on variance analysis

Key Accounting Policies and Accounting Software

11. The accounting division is under the responsibility of the DFA, which includes a dedicated FM team for the purpose of donor-financed projects. The prevailing accounting policies and procedures in line with the West African Francophone countries accounting standards – SYSCOHADA, currently in use in on-going World Bank-financed operations in Côte d'Ivoire, will apply. The accounting systems and policies and financial procedures used by the project will be documented in the project's administrative, accounting, and financial manual. For the purpose of the World Bank-financed operation, the configuration and installation of the new accounting software MICROSOFT NAV 2016 will be a condition of effectiveness.

Internal Control and Internal Auditing

12. Internal control system is aimed at ensuring (i) the effectiveness and efficiency of operations; (ii) the reliability of financial reporting; and (iii) the compliance with applicable laws and regulations. For the purpose of this project, the accounting, financial and administrative procedures manual of CI-ENERGIES (already adopted) document, explain and describe work processes, information flow, authorization and delegation of authority, timing, job segregations, auto and sequential controls, compliance with project objectives, micro and macro rules and regulations. Application of the procedures set up in the manual will be mandatory for all staff at all levels. In addition to the procedures manual, all rules of the DFA of CI-ENERGIES that will not conflict with the manual will also apply to the project.

13. There is a formal internal audit department at CI-ENERGIES composed of three staff and headed by a qualified auditor. The FM procedures manual contained a description of the roles and responsibilities of the Internal Audit Department and the arrangements that guarantee the necessary level of independence.

14. Finally, CI-ENERGIES has an acceptable governance structure comprising a board of directors, an audit and risks management committee and an investment and strategies committee. Additional capacity building will increase the effectiveness of these committees.

Funds Flow and Disbursement Arrangements

Designated Account and Project Accounts

15. One (1) Designated Account (DA-A) denominated in FCFA will be opened at the Central Bank of West African States (BCEAO) to received funds for Components 1, 2, and 3 (sub-component 3.2 excluded). A second Designated Account (DA-B) denominated in FCFA will be opened at the Central Bank of West African States (BCEAO) to received funds for sub-component 3.2. Both will be managed by the Department of Public Debt (*Direction de la Dette Publique-DDP*) to receive advances for project expenditures eligible for project financing. The funds will then be transferred into two Project Accounts (PAs) – one for the purpose of the revolving fund and the other for the rest - opened in a commercial bank on terms and conditions acceptable to the World Bank. The PAs will be managed by the Director for the DFA of CI-ENERGIES. Interest incomes generated on idling funds on the PAs will be deposited into a specific account opened in a commercial bank and reflected in the project financial statements and IFRs.

Disbursement methods

16. **Designated Account A (DA-A):** Upon project effectiveness, transaction-based disbursements will be used. An initial advance up to the ceiling of the DA A (FCFA 100 million) and representing three months forecasted project expenditures paid though the DA will be made into the designated account and subsequent disbursements will be made on a monthly basis against submission of Statements of Expenditures (SoE) or records as specified in the Disbursement Letter reporting on the use of the initial/previous advance. Thereafter, the option to disburse against submission of quarterly unaudited IFR (also known as the report-based disbursements) could be considered subject to the quality and timeliness of the IFRs submitted to the World Bank and the overall FM performance and arrangements as assessed in due course. In the case of the use of the report-based disbursement, the DA-A ceiling will be equal to the cash forecast for two quarters as provided in the quarterly unaudited IFR. If and when IFRs are used as the basis of disbursements, the contents and format will be revised to include disbursement-related information. In addition to the “advance” method, the option of disbursing the funds through direct payments to a third party, for contracts above a pre-determined threshold for eligible expenditures (e.g., 20 percent of the DAs ceiling), will also be available. Another acceptable method of withdrawing proceeds is the special commitment method whereby IDA may pay amounts to a third party for eligible expenditures to be paid by the Recipient under an irrevocable Letter of Credit (LC).

Designated Account B (DA-B): Upon project effectiveness, transaction-based disbursements will be used. An initial advance up to the ceiling of the DA B (FCFA 5 billion) and representing 12 months forecasted project expenditures paid though the DA -B will be made into the designated account once all conditions related to the “revolving funds” are met. Subsequent disbursements will be made on a semester basis against submission of Statements of Expenditures (SoE) or records as specified in the Disbursement Letter reporting on the use of the initial/previous advance.

Disbursement of Funds to Beneficiaries, Contractors, Suppliers and Implementing Partners

17. The dedicated PIU at CI-ENERGIES will make payments to Implementing agencies, contractors, suppliers and the contracting in regard to the specified activities in the components of the project. Payments will be made in accordance with the payment modalities, as specified in the respective contracts/conventions. The criteria for payment and reimbursement and evidences for services delivered are detailed in the project implementation manual. The PIU coordination unit may also consider the findings of the internal audit function while approving the payments. The internal audit and the FM team will reserve the right to verify the expenditures ex-post, and refunds might be requested for non-respect of contractual/convention clauses. Misappropriated activities could result in the suspension of financing for a given entity.

Table 2.10: Disbursement Table

Category	Amount of the Scale-Up Credit Allocated (expressed in EUR)	Percentage of Expenditures to be Financed (inclusive of Taxes)
(1) Goods, works, non-consulting services, consultants' services, Operating Costs and Training for Components 1, 2 and 4 and Sub-Component 3.1 of the Project	276,344,300	100%
(2) Goods, works, non-consulting services, and consultants' services for Sub-Component 3.2 of the Project	25,200,000	100%
(3) Front-end Fee	755,700	Amount payable pursuant to Section 2.03 of this Agreement in accordance with Section 3.01 (a) of the General Conditions
TOTAL AMOUNT	302,300,000	

Local Taxes

18. Funds will be disbursed in accordance with project categories of expenditures and components, as shown in the Financing Agreement. Financing of each category of expenditure/component will be authorized at 100 percent inclusive of taxes as per the current Country Financing Parameters approved for Côte d'Ivoire.

Financial Reports

19. Financial reports will be designed to provide quality and timely information on project performance to project management, IDA and other relevant stakeholders. Formats of the financial reports are deemed acceptable to IDA and will be used for the purpose of this project. The consolidated quarterly IFR for the project includes the following financial statements: (i) statement of sources of funds and project revenues and uses of funds; (ii) statement of expenditures classified by project components and or disbursement category (with additional information on expenditure types and

implementing agencies as appropriate), showing comparisons with budgets for the reporting quarter, the year and cumulatively for the project life; (iii) cash forecast; (iv) explanatory notes; (v) Designated Account activity statements. The quarterly IFR will be prepared and submitted to IDA within 45 days after the end of each calendar quarter and will reflect the activities implemented directly by the PIU.

20. In compliance with International Accounting Standards and IDA requirements, the project will produce annual financial statements. These include: (i) a Balance Sheet that shows Assets and Liabilities; (ii) a Statement of Sources and Uses of Funds showing all the sources of Project funds, expenditures analyzed by project component and or category; (iii) a Designated Account Activity Statement; (iv) a Summary of Withdrawals using SoE, listing individual withdrawal applications by reference number, date and amount; and (v) Notes related to significant accounting policies and accounting standards adopted by management and underlying the preparation of financial statements.

21. The DFA of CI-ENERGIES will also be required to prepare the company annual consolidated financial statements for audits by the independent and legal auditors.

Auditing Arrangements

22. There are two (2) appointed external auditors at CI-ENERGIES (called *Commissaires aux Comptes* and independent or external auditor). They are appointed by the board of directors. The current two auditing firms are acceptable to the World Bank. CI-ENERGIES annual financial statements which should include IDA and others donor-financed project activities will be audited by qualified and experienced external auditors, “statutory auditors” as required by law, based on terms of reference agreed on by all parties. The auditors will be required to issue two reports: (i) one audit report on CI-ENERGIES consolidated financial statements; and (ii) one report on the World Bank-financed project accounts. Management letters will also be issued and submitted together with the audit reports to IDA not later than six months after the end of each fiscal year. The audit will cover transactions related to the two DAs and two PAs. The report will also include specific controls such as the utilization of the revolving funds, compliance with procurement procedures and financial reporting requirements and consistency between financial statements and management reports and field visits (e.g., physical control). The audit report will thus refer to any incidence of non-compliance and ineligible expenditures and misuse identified during the audit mission. The project will comply with the World Bank disclosure policy of audit reports and place the information provided on the official website within one month of the report being accepted as final by the team.

Table 2.11: Audit arrangements

Audit Report	Due Date
CI-ENERGIES and the new World Bank-financed project audit reports (two audit reports and one management letter)	(i) Not later than June 30 (2000 + N) if effectiveness has occurred before June 30 (2000 + N-1). (ii) Not later than June 30 (2000 + N+1) if effectiveness has occurred after June 30, (2000 + N-1)

Governance and Anti-corruption

23. The risk of irregularities and corruption within the project activities is substantial given the country context and the nature and implementation arrangements of the project activities including revolving funds. Good service delivery is a key challenge in Côte d’Ivoire’s public sector and to some

extent in State Owned Enterprises and, more specifically, for a project involving large contracts with relatively diverse interests. In addition, the lack of appropriate or effective oversight mechanisms could jeopardize project implementation.

24. A strong fiduciary arrangement has been designed and put in place to mitigate these risks. The following measures are envisaged to mitigate the risk of misuses, irregularities and corruption: (i) an Audit committee and internal audit department will be created and technical assistance will be provided to operationalize them by end of 2017; and (ii) the CI-ENERGIES will implement some measures to improve transparency such as providing information on the project status (publication of the project and CI-ENERGIES audited financial statements on its website).

25. Specific measures are incorporated in the project design to ensure smooth implementation and mitigate related risks.

Procurement

Applicable Procurement Policies and Procedures

26. Following the 2004 Country Procurement Assessment Report and the Procurement Code (Decree N°2005-110 dated February 24, 2005, a new Procurement Code (Decree N°2009-259 dated August 6, 2009), in line with the WAEMU's procurement Directives and international good practices, and key implementing regulations and documentation have been adopted. This Procurement Code was amended and modified in July 2015 through the Decree N°2015-525 dated July 15, 2015 also with implementing regulations thereunder. A national procurement capacity building program exists and is being implemented at the central and deconcentrated entities level. An electronic system for collecting and disseminating procurement information and for monitoring procurement statistics has been set up and needs to be spread over all of the contracting authorities. An audit of single source awarded contracts from 2011 to 2013 has been done in May 2014 and findings were published. However, remaining issues that affect transparency and efficiency of the national procurement system include relatively weak procurement units in the ministries, with enforcement of the 2015 Procurement Code and regulations not yet robust. In addition, the legacy of the socio-political situation due to the civil war does not guarantee effective functioning of the system and has also considerably increased fraud and corrupt practices. The new Government is trying to fight against this scourge by implementing mechanisms such as a code of ethics at the level of ministers and officials, but the results are not yet evident.

27. **Guidelines:** Procurement for the proposed project will be carried out in accordance with: (a) the World Bank's "Guidelines: Procurement of Goods, Works, and Non-Consulting Services under IBRD Loans and IDA Credits and Grants" dated January 2011; revised July 2014, (b) "Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits and Grants by World Bank Borrowers" dated January 2011, revised July 2014, and (c) "Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants", revised July 1, 2016.

28. **Procurement Documents:** Procurement would be carried out using the World Bank's Standard Bidding Documents (SBD) for all International Competitive Bidding (ICB) for goods and works and for Standard Request for Proposal (RFP) for the selection of consultants through competitive procedures. The Recipient will develop standard documents based on the World Bank's SBDs for National Competitive Bidding (NCB) for goods and works and the World Bank's RFP for the selection of

consultants through methods other than Quality and Cost Based Selection (QCBS), with modifications that will be submitted to the IDA for prior approval.

29. The different procurement methods or consultant selection methods, the need for pre-qualification, estimated costs, prior review requirements, and time frame are agreed between the Recipient and the World Bank in the Procurement Plan. The Procurement Plan will be updated at least annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

Advertising Procedure

30. General Procurement Notice, Specific Procurement Notices, Requests for Expression of Interest and results of the evaluation and contracts award should be published in accordance with advertising provisions in the guidelines mentioned above.

31. For ICB and RFPs that involve international consultants, the contract awards shall be published in the United Nations Development Business online within two weeks of receiving IDA's "no objection" to the recommendation of contract award. For Goods, the information to publish shall specify: (a) name of each bidder who submitted a bid; (b) bid prices as read out at bid opening; (c) name and evaluated prices of each bid that was evaluated; (d) name of bidders whose bids were rejected and the reasons for their rejection; and (e) name of the winning bidder, and the price it offered, as well as the duration and summary scope of the contract awarded. For Consultants, the following information must be published: (a) names of all consultants who submitted proposals; (b) technical points assigned to each consultant; (c) evaluated prices of each consultant; (d) final point ranking of the consultants; and (e) name of the winning consultant and the price, duration, and summary scope of the contract. The same information will be sent to all consultants who submitted proposals. The other contracts should be published in national gazette periodically (at least, quarterly) and in the format of a summarized table covering the previous period with the following information: (a) name of the consultant to whom the contract was awarded; (b) the price; (c) duration; and (d) scope of the contract.

Procurement Methods

32. **Procurement of Works.** The works to be financed by IDA would include electricity infrastructure improvement and rehabilitation for electricity transportation, distribution, and furniture as well as urban and villager areas. Contracts of works estimated to cost US\$10,000,000 equivalent or more per contract shall be procured through ICB. Contracts estimated to cost less than US\$10,000,000 equivalent may be procured through NCB. Contract estimated to cost less than US\$200,000 equivalent per contract may be procured through shopping procedures. For shopping, contracts will be awarded following evaluation of bids received in writing on the basis of written solicitation issued to several qualified suppliers (at least three). The award would be made to the supplier with the lowest price, only after comparing a minimum of three quotations open at the same time, provided he has the experience and resources to execute the contract successfully. For shopping, the project procurement officer will keep a register of suppliers updated at least every six month.

33. **Procurement of Goods.** The Goods to be financed by IDA would include: office and furniture, and equipment, office supplies, etc. Similar Goods that could be provided by the same vendor would be grouped in bid packages estimated to cost at least US\$1,000,000 per contract and would be procured through ICB. Contracts estimated to cost less than US\$1,000,000 equivalent may be procured through

NCB. Goods estimated to cost less than US\$100,000 equivalent per contract may be procured through shopping procedures. For shopping, the project procurement officer will keep a register of suppliers updated at least every six months.

34. **Selection of Consultants.** The project will finance Consultant Services such as surveys, technical and financial audits, technical assistance, activities under the institutional strengthening component, engineering designs and supervision of works, trainers and workshops facilitators. Consultant firms will be selected through the following methods: (a) QCBS; (b) selection based on the Consultant's Qualification (CQS) for contracts which amounts are less than US\$300,000 equivalent and are related to exceptional studies and researches which require a rare and strong expertise; (c) Least Cost Selection (LCS) for standard tasks such as insurances and, financial and technical audits costing less than US\$300,000; (d) Single Source Selection, with prior agreement of IDA, for services in accordance with the paragraphs 3.8 to 3.11 of Consultant Guidelines. Individual Consultants (IC) will be hired in accordance with paragraph 5.1 to 5.6 of World Bank Guidelines; Sole source may be used only with prior approval of the World Bank. Irrespective of the cost, any terms of reference needed for consultant selection must obtain prior approval of the World Bank.

35. Short lists of consultants for services estimated to cost less than US\$300,000 equivalent per contract may be composed entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines, if a sufficient number of qualified individuals or firms are available. However, if foreign firms express interest, they would not be excluded from consideration.

36. **Procurement from United Nations Agencies:** There may be situations in which procurement directly from UN agencies may be the most appropriate method of procurement. In such circumstances, the project would make specific arrangement with the UN Agencies concerned through a single source selection and then they follow their own procurement procedures to purchase and deliver the goods and services needed.

37. **Procurement of consulting services other than consulting services covered by consultant Guidelines:** These might include designing, editing and printing project promotion supports; providing logistic support such as car rental for field visits, travel services and logistic support for workshop and the like. LCS or shopping will be used.

38. **Training, Workshops and Conferences.** The training (including training material and support), workshops and conference attendance, will be carried out on the basis of approved annual training and workshop/conference plans. A detailed plan giving the nature of training/workshop, number of trainees/participants, duration, staff months, timing and estimated cost will be submitted to IDA for review and approval prior to initiating the process. The appropriate methods of selection will be derived from the detailed schedule. After the training, the beneficiaries will be requested to submit a brief report indicating which skills have been acquired and how these skills will contribute to enhance his/her performance and contribute to the attainment of the project objective.

39. **Operational Costs.** Operating costs financed by the project are incremental expenses, including office supplies, vehicles operation and maintenance, maintenance of equipment, communication costs, supervision costs (i.e. transport, accommodation and per diem), and salaries of locally contracted staff. They will be procured using the procurement procedures specified in the Project Financial and Accounting Manual.

Assessment of the Capacity of the Agencies to Implement Procurement

40. The lead responsibility for project implementation will be vested with CI-ENERGIES. A PIU within the CI-ENERGIES will be named and act on behalf on CI-ENERGIES. Key staff of the PIU will come from CI-ENERGIES or be recruited by the project.

41. The PIU within CI-ENERGIES will have the responsibility of the project fiduciary management (procurement and financial management). The mission gauged the capacity and ability to perform procurement activities in accordance with World Bank procedures and guidelines.

42. The assessment conclusions are the following:

A. Status of CI-ENERGIES

43. CI-ENERGIES has implemented the IDA-funded Urgent Electricity Rehabilitation Project that ended in 2014 with a disbursement rate of 99 percent.

44. CI-ENERGIES has been entrusted with the fiduciary management (procurement and financial management) of current projects financed by the BOAD, AfDB, two other projects named ENERGOS and CNECK funded, respectively, by the EU and China.

Turnaround Times

45. The information available indicates that almost none of the works contracts in the past project have been executed within the deadline. These delays are due in particular to: (a) the socio-political crisis; (b) the low capacity of firms; and (c) the unavailability of the site and preparatory activities of works.

Mitigation measure:

46. To mitigate above listed turnaround times, the following provisions shall be taken:

- Set realistic timeframes;
- Ensure the existence of effective capacity of the awarded contractors;
- Revise the allotments so that tenders can be of interest to national and international companies that have the capabilities and qualifications to bid;
- Arrangements should be made to recruit qualified technical firms in order to have reliable technical studies and realistic costs estimates;
- Recruit consultants firms for the detailed technical studies of works sufficient time prior to the launch of bids; and
- Recruit consultants firms for the control of works sufficient time prior to the launch of works.

B. Procurement Capacity Assessment

Fiduciary Team

47. The fiduciary team has a Procurement Director, a Head of the procurement service, three procurement assistant specialists, and an assistant contract manager working on projects funded by donors other than the World Bank.

48. Regarding the past project (the Urgent Electricity Rehabilitation Project) financed by the World Bank, the current projects entrusted within CI-ENERGIES and financed by other donors, and the criteria of experience in procurement, the assessment concluded that: (i) CI-ENERGIES has not enough experience in World Bank's procurement procedures; and (ii) the manual of procedures used for the past project does not fit with World Bank requirements for the new project.

Mitigation measures:

- Resize the organization functioning of the procurement unit in order to take into account contract management best practices.
- No later than three months after the project effectiveness date, the PIU should have been strengthened with one procurement specialist.
- The PIU will be responsible for the coordination of all procurement activities, including the following: (a) preparation and update of the procurement plans; (b) preparation, finalization and launch of the requests for proposals and bidding documents; (c) drafting of minutes of bids opening /proposal and preparation of the evaluation reports; (d) submission of procurement documents (terms of references, RFP, bidding documents, evaluation reports, contracts, etc.) to the World Bank when prior review is required; (e) preparation of the contracts, and overseeing the payments to contractors; and (f) drafting of procurement progress report and coordination of the activities. Each beneficiary entity will be involved in the implementation.

Procurement Process

49. In the past, the average time for contracts approval and signing after the award decision was around 30 days due to: (a) the unavailability of the members of the opening and judgment Committee; and (b) delay in the transmission of the evaluation report. However, a new Decree n°2015-475 dated July 1, 2015 that replaced the Instruction 192, increases significantly contract signature and approbation threshold.

Mitigation measure:

- Regarding the new provisions of the Decree n°2015-475, and the updated World Bank procurement guidelines, the Project Implementation Manual has been updated and approved by the World Bank.
- To minimize the delay associated with the drafting of appraisal reports, competent firms or consultants should be hired to help evaluate the bids and proposals.

Frequency of Procurement Reviews and Supervision

50. The World Bank's prior and post reviews will be carried out on the basis of thresholds indicated in the following table. IDA will conduct six-monthly supervision missions and annual Post Procurement Reviews, with the ratio of post review at least one to five contracts. IDA may also conduct an Independent Procurement Review at any time until two years after the closing date of the project.

Country Overall Procurement Risk Assessment:

High	
Average	X
Low	

Table 3.1: Procurement and Selection Review Thresholds

Expenditure Category	Contract Value (Threshold)	Procurement Method	Contract Subject to Prior Review
	US\$		
1. Works	≥10,000,000	ICB	All
	<10,000,000	NCB	Two first contracts
	<200,000	Shopping	
	No threshold	Direct contracting	All
2. Goods	≥1 000,000	ICB	All
	<1 000,000	NCB	Two first contracts
	<100,000	Shopping	
	No threshold	Direct contracting	All
3. Consultants Firms	≥300,000	QCBS; QBS; LCS; FBS, CQ	All contracts
	<300,000	QCBS; QBS; LCS; FBS, CQ	Two first contracts
Individuals	≥100,000	EOI	All contracts
	<100,000	comparison of 3 CVs	Two first contracts
(Selection Firms & Individuals)	No threshold	Single Source	All
All Term of reference regardless of the value of the contract are subject to prior review			

Table 3.2 Procurement Packages with Methods and Time Schedule – Goods

R e f	Contract (Description)	Estimated Cost (US\$)	Procurement Method	Prequal (yes/no)	Domestic Preference (yes/no)	Review by World Bank (Prior / Post)	Expected bid- opening Date
1	Acquisition of vehicles	862,000	Shopping	NO	NO	A posteriori	June 2017
2	Acquisitions of IT consumption material	74,000	Shopping	NO	NO	A posteriori	August 2017
3	Acquisition of lab truck	400,000	Shopping	NO	NO	A posteriori	March 2018
4	Acquisition of measurement equipment	100,000	Shopping	NO	NO	A posteriori	March 2018
5	Acquisition of test equipment	200,000	Shopping	NO	NO	A posteriori	March 2018
6	Fuel acquisition	566,000	Shopping	NO	NO	A posteriori	June 2017
7	Acquisition of material bureautique	10,000	Shopping	NO	NO	A posteriori	June 2017
8	Acquisition of furniture	26,000	Shopping	NO	NO	A posteriori	March 2018
9	Vehicles insurance	85,000	Shopping	NO	NO	A posteriori	March 2018
	Total	2,320,000	/	/	/	/	/

Table 3.3: Procurement Packages with Methods and Time Schedule – Works

Ref.	Contract (Description)	Estimated Cost (Million US\$)	Procurement Method	Prequal (yes/no)	Domestic Preference (yes/no)	Review by World Bank (Prior / Post)	Expected bid-opening Date
Component 1: Reinforcement of Transmission systems							
1	Construction of a New Substation at Gagnoa	16.6	ICB	NO	NO	A priori	June 2017
2	Upgrading of three existing 90kV Substations to 225kV	43.0	ICB	NO	NO	A priori	June 2017
3	Improving Quality of Supply in 15 Substations:	55.5	ICB	NO	NO	A priori	July 2017
Component 2: Rehabilitation, Reinforcement, and Extension of Distribution networks in Abidjan and 10 Capital Cities							
4	Rehabilitation, Reinforcement, and Extension of Distribution Networks in 10 Regional capitals	41.9	ICB	NO	NO	A posteriori	September 2017
5	Replacement of Overhead MV Lines with Underground Lines, and of MV CPI cables by CIS in Abidjan	40	ICB	NO	NO	A posteriori	October 2017
Component 3: Rural Electrification and Support to Electricity for All Program							
6	Rural electrification in the region GBOKLE	15.7	ICB	NO	NO	A posteriori	October 2017
7	Rural electrification	19.1	ICB	NO	NO	A posteriori	November 2017

	in the region Haut-Sassandra						
8	Rural electrification in the region NAWA	15.0	ICB	NO	NO	A posteriori	December 2017
9	Rural electrification in the region San Pedro	18.6	ICB	NO	NO	A posteriori	January 2018
10	Revolving Fund	25	Single Source				
	Total	290.2	/	/	/	/	/

Environmental and Social Safeguards (including Gender issues)

51. The planned project will finance physical infrastructure investments and triggers OP/BP4.01 on Environmental Assessment; OP/BP4.04 on Natural Habitats; OP/BP4.36 on Forests, OP/BP 4.11 on Physical Cultural Resources, and OP 4.12 Involuntary Resettlement. It will likely entail site-specific and largely reversible environmental impacts. For this reason, the project is rated as Environment Category B.

52. To be in compliance with OP/BP 4.01, an Environmental and Social Management Framework (ESMF) was developed by the borrower. The ESMF contains specific chapters to address all issues related to Natural Habitats, Forests and Physical Cultural Resources. The ESMF was consulted and disclosed within Republic of Côte d'Ivoire on February 1, 2017 and by the World Bank on January 31, 2017. The ESMF outlines an environmental and social screening process, including institutional responsibilities for screening, review and clearance, and implementation of mitigation measures and monitoring, for future investments. This screening process consists of (i) an environmental and social screening form to determine potential adverse environmental and social impacts and record the outcome of consultations; (ii) an environmental and social checklist with generic mitigation measures to be adapted to the specific investment; (iii) a summary of the World Bank's safeguard policies; (iv) an Environmental and Social Management Plan (ESMP), including environmental monitoring indicators and capacity building activities; (v) Environmental Guidelines for Contractors; and (vi) generic environmental impact assessment terms of reference. It is also designed to serve as a guide for developing ESIA's including ESMPs as needed.

53. In addition to the ESMF, ESIA of the known investment location of Gagnoa 2 substation was also prepared. To make sure that all potential adverse impacts associated with activities for Yopougon1, Treichville and Bia-Sud sub-stations are under control, an Environmental Audit was undertaken. As with the ESMF, all these safeguard instruments have been reviewed, consulted upon and disclosed both in Côte d'Ivoire on January 31, 2017 and by the World Bank on January 25, 2017.

54. To be in compliance with OP 4.12, an RPF was prepared, consulted, and disclosed in-country on January 26, 2017 and by the World Bank on January 26, 2017. Resettlement Action Plans (RAPs) will be developed during implementation of the project in case resettlement or land acquisition will be required for the construction of distribution lines in the rural electrification component. A social specialist will be recruited to complement the PIU capacity and will closely supervise and guide the resettlement

preparation and implement of RAPs. This specialist will work under overall supervision of the environmental safeguards coordinator in the PIU. Terms of reference will be developed for a social expert with resettlement and social inclusion experience, including gender.

55. The Financing Agreement will require the GoCDI to prepare and submit to the World Bank for prior approval and disclosure any required ESIA's including ESMPs in accordance with the ESMF, for the activities proposed to be carried out under the ongoing operation. Prior to commencing any works, the GoCDI will take all actions required by the ESMP and obtain the World Bank's confirmation that the works may commence. Finally, the GoCDI, through the PIU, will report quarterly to the World Bank on the environmental safeguard measures taken through a specific Safeguard Monitoring Report; and (ii) a summary of this specific report is to be included in the periodic project progress reports.

56. Specific gender interventions will be developed both on the supply and demand sides to promote equal access to and use of energy among women and men, including: (i) a qualitative study on women and men's electricity needs; (ii) capacity building activities for women on productive use of electricity and for women and men on the use of pre-paid meters; (iii) a possible pilot on productive use of electricity among women; and (iv) training on gender and energy for the CI-ENERGIES and CIE employees. The AFREA Gender and Energy Program will finance the qualitative study and the training for CI-ENERGIES and CIE employees. The capacity building activities for female and male project's beneficiaries and the potential pilot will be covered under IDA funds.

Monitoring and Evaluation

57. CI-ENERGIES, as the implementing agency, is responsible for the M&E of the project execution. It has a well-established M&E system that tracks progress on the implementation of all energy projects.

58. The project-level M&E framework will track progress during implementation, measure intermediate outcomes, and evaluate project impacts. The results framework in Annex 1 outlines key performance indicators, data collection methods, a timetable for collection, and responsible agencies. This framework will be used to supervise and monitor project implementation.

59. Specific attention will be devoted to monitor and evaluate the project's gender and social aspects. Activities, targets and indicators to assess the gender interventions are integrated in the Project Implementation Manual. During the first year of the project's implementation, an energy module will be included in an LSMS study to provide a baseline for the project. The target proportion of connections provided to female- and male-headed households in rural and urban areas will be decided based on the results of the LSMS study. Data from the LSMS and the qualitative study on women and men's energy needs will also help identify the gender outcome indicator to evaluate how the project facilitated women's access to and use of electricity.

60. The PIU will prepare project reports that are in form, content, and substance satisfactory to the World Bank. Reports will be prepared for each semester during project implementation, and will be submitted to the World Bank no later than 45 days after the end of the period covered by the reports. Monitoring of results and outcomes will be reported in the PIU's project implementation reports. Furthermore, the World Bank will supervise the project over its lifetime and its results and outcomes on a regular basis to evaluate the project's achievement of the PDO. If necessary, corrective actions will be discussed and agreed upon with the GoCDI.

Annex 4: Implementation Support Plan

CÔTE D'IVOIRE: Electricity Transmission and Access Project (P157055)

Strategy and Approach for Implementation Support

1. The strategy for implementation support has been developed on the basis of the nature of the project and its risk profile. Implementation Support has been designed so as to guarantee efficient and flexible support to the client and facilitate implementation of the risk mitigation measures. The objective is to ensure the implementing agency implement the project successfully to achieve the PDO. It also ensures that the World Bank's resources and staff are sufficient to supervise and support project implementation. The World Bank team members will be based both at headquarters and in the field in the Abidjan Country Office to ensure timely and continued coordination with the Borrower, perform close project implementation support and provide advice on implementation issues as they arise.

Implementation Support Plan

2. *First phase.* Technical implementation support will focus on ensuring timely establishment of the PIU at CI-ENERGIES, and that appropriate technical design of the project components is carried out. Additionally, the World Bank support under this phase will focus on the procurement process for concluding the tendering of the major infrastructure packages. In this regard, terms of reference for the additional staff required for the PIU positions at CI-ENERGIES have been prepared by the client and reviewed by the World Bank to ensure that tasks are appropriately defined and the required qualifications and experience are adequate to perform the key functions required for project implementation. The World Bank team will include staff and consultants, complemented with specialized expertise as required.

3. *Second phase.* After completion of the first phase, the World Bank team's support will focus on monitoring of the construction process, contracts management, disbursements, and effectiveness of capacity building and technical assistance activities. The World Bank team will include staff and consultants, complemented with specialized expertise as required.

Procurement and Technical Aspects

4. The World Bank Procurement Specialists will regularly participate in implementation support missions to assist in monitoring procurement procedures and plans. The procurement plan indicates contracts, which are subject to World Bank's prior review. All other contracts will be subject to post-review. The World Bank team will include World Bank staff engineers, complemented with specialized expertise, depending on the nature and scope of each component, to review project technical designs, specifications and proposals. Field visits will be carried out to the construction sites to monitor progress including environmental and social safeguard implementation. During the regular implementation support missions, the procurement plans will be updated at least once each year (or more often as required to reflect the actual project implementation needs) and post-procurement reviews will be carried out at a minimum once annually.

Monitoring and Evaluation Aspects

5. In addition to monitoring the impact of the project on the ground, the World Bank team will be regularly reviewing the overall sector performance as a result of all the investments to the sector.

Financial Management Aspects

6. Financial management supervision will start by assessing the progress of the project management unit staffing and reviewing the plan in place in order to execute disbursements following financial management guidance. This supervision will take place before contracts are awarded in case improvement measures need to take place before disbursement. The financial management supervision will also review quarterly progress and financial audits. A field based Senior Financial Management Specialist will dedicate at least eight weeks per year to the project implementation support.

Environmental, Social and Gender Aspects

7. Environmental safeguards support will include regular visits to project areas and the monitoring of mitigation measures. During construction, monitoring is necessary to ensure compliance with environmental and social safeguards related to the infrastructure projects. Field based Senior Environmental and Social Safeguard Specialists will supervise and support the implementation of the project and contribute to building the capacity of the client. The AFREA Gender and Energy Program will provide technical and advisory assistance to support the development of the gender-targeted interventions.

Audit

8. The World Bank's project team will closely monitor financial management activities to identify in advance potential delays in the preparation of the financial and audit reports and undertake corrective measures. Project financial statements will be audited by an external auditor hired under the project under terms of reference acceptable to the World Bank.

Overall Support Implementation Needs

9. The World Bank team should be composed of a mix of skills and experience for successful project implementation. The table below outlines the expected staff weeks and travel required to make sure the actions and schedule are appropriately resourced.

Table 3.4: World Bank implementation support

Time	Focus	Skills Needed	Resource Estimate (US\$ '000)
First 12 months	Preparation of procurement documents Implementation of ESIA and RAP	Engineering; procurement; financial management; environmental; and social	200
12-48 months	Review of progress in construction and capacity building; review of sector technical and financial performance; procurement; monitoring and evaluation; safeguards; and financial management.	Engineering; sector regulatory and planning; M&E specialist; financial analyst; environmental and social.	300

Table 3.5: Skills Mix Required

<i>Skills Needed</i>	<i>Number of Staff Weeks</i>	<i>Number of Trips per year</i>	<i>Comments</i>
Team leader	8	0	Field staff
Transmission and substation engineer	8	2	From the region
Distribution and access engineer	8	0	Field staff
Procurement specialist	6	0	Field staff
Environmental specialist	6	0	Field staff
Social specialist	6	0	Field staff
Specialized technical experts	2	As required	
Financial analyst	2	1	From the region or headquarters
Administrative support	3	0	From the field
Financial management specialist	5	0	Field staff
Monitoring and evaluation expert	2	1	From headquarters

Annex 5: Economic and Financial Analysis

CÔTE D'IVOIRE: Electricity Transmission and Access Project (P157055)

Economic and Financial Analysis of the Project

1. This section presents the economic and financial analysis prepared for this project. The evaluation of the components is restricted to the activities that generate benefits for which an economic value can be clearly identified and measured, notably benefits associated with investments under Components 1, 2, and 3 (sub-component 3.1). Sub-component 3.2 and Component 4 are excluded because of the difficulty in valuing the outcomes of revolving fund at this stage and technical assistance, respectively.

Economic Analysis

2. The economic analysis for the project follows a standard cost benefit framework. Comparing the present value of incurred costs to the stream of attributable benefits, the EIRR and NPV will inform the project's viability over its economic life time. The economic analysis has been based on the estimations presented in the prefeasibility studies (*Etude de préféabilité et d'Avant-Projet Sommaire*) prepared by CI-ENERGIES for each of the investment components in this project, as well as on the Power Sector Master Plan (*Plan Directeur des Ouvrages de Production et de Transport d'Énergie Électrique de la Côte d'Ivoire pour la Période 2014-2030*).

3. The development of the network according to the Master Plan, to which the project will contribute, will allow the country to achieve a transmission network that complies with international standards for network planning and security, while guaranteeing significant exchange capacities with neighboring countries. In addition, if the transmission is reinforced according to the transmission projects in the pipeline, the Master Plan shows that a clear improvement of the security of the network in the region of Abidjan can be achieved by 2017, including the N-1 criterion. Furthermore, the master plan estimates that the implementation of the transmission investment plan will result in a 35 percent reduction in the transmission losses, which will decrease to 3.05 percent in 2020 (from 4.75 percent in 2013).

4. The analysis was performed in real USD, assuming an exchange rate of US\$1 = 600 FCFA and the lifetime of the entire project has been conservatively estimated in 20 years.

Description of project benefits

5. The proposed project intends to upgrade and rehabilitate some specific sections of the transmission and distribution network as well as to provide electricity services in new rural areas. This will help to increase the transmission and distribution capacity of the grid while providing electricity access in 201 villages.

6. Broadly, the economic benefits from the proposed project may be classified into three categories:

- (i) the increased efficiency in electricity supply (reduction in losses, outages and voltage fluctuations);
- (ii) the increased supply of electricity to meet the existing suppressed demand and expected growth in demand; and

(iii) the supply of electricity to new customers in rural areas.

7. The network of existing transmission and distribution lines lacks reliability and experience high levels of technical losses. The upgrade and reinforcement of substations, transmission and distribution lines in key sections of the network will contribute to improve the reliability of electricity supply, reduce energy losses and increase access in Côte d'Ivoire. The benefits derived from the project are two fold, on one hand, for the existing end consumers – both residential and non-residential – is the value of the additional electricity from the consumption of the otherwise wasted electricity (reduced distribution losses); on the other hand, for rural consumers is the avoided cost of having to replace a more expensive energy source.

8. Rural households surveyed by CI-ENERGIES currently use a number of appliances running on dry-cell or rechargeable batteries, including radios, lanterns and small televisions. Lighting is also provided by kerosene lamps. The Master Plan for Rural Electrification conducted in 2015, estimated a willingness to pay for rural households at 200 FCFA / kWh which has been adopted for this analysis.

9. Additional benefits would also accrue from the project during its economic lifespan but are difficult to value, predict and quantify. They are discussed here, but not included in the quantification of benefits. The economic analysis thus represents a conservative estimate of the economic viability of the proposed project.

10. Reinforcing electricity grid will improve the quality of electricity supply. Currently, electricity supply suffers from low voltage and outages. The proposed project will improve the voltage conditions of electricity supply and reduce the incidence of outage in the existing lines.

11. Increased grid reliability due to the “n-1” resilience built into the design of the proposed project will reduce the risk of outage in some section of the network considerably. This benefit is not quantified in the economic analysis as the valuation of the risk reduction is difficult with the data available, representing a conservative estimation of the economic benefits of the project.

12. The table below presents the assumptions for the project benefits:

Table 5.1: Key Assumptions on Project Benefits

Benefit	Value	Comment
Willingness to Pay	200 FCFA/kWh (0.33 US\$/kWh)	Applies to demand derived from rural electrification.
Avoided cost	150 FCFA/kWh (0.25 US\$/kWh)	Applies to additional demand from the grid reinforcement components.
Average generation costs	48 FCFA/kWh (0.08 US\$/kWh)	Applies to the savings derived from the reduction in electricity losses.

13. The incremental electricity demand as well as the reduction in electricity losses expected from the project implementation have been estimated in the prefeasibility studies prepared by CI-ENERGIES. For the purposes of this analysis, we have only considered the first 10 years on those estimations and

kept constant the values of year 10 for the remaining lifetime of the project. The table below presents a summary of the estimation per project component.

Table 5.2: Estimated Project Impact on Electricity Distribution (in GWh)

		Year	1	2	3	4	5	6	7	8	9	10
Component 1	Losses reduction	GWh	28.3	26.9	24.7	23.3	22.9	22.4	22.1	22.3	24.5	23.8
	Non-Dist Energy reduction	GWh	11.9	12.5	12.8	12.9	13.2	13.5	13.6	13.7	13.5	13.5
	Indirect demand	GWh	12.4	18.2	25.9	19.8	26.3	35.8	51.1	67.3	91.2	127.5
Component 2	Losses reduction	GWh	29.8	57.8	85.9	114.0	142.1	171.1	198.4	226.6	254.9	283.2
	Non-Dist Energy reduction	GWh	0.9	1.0	1.1	1.1	1.0	0.9	0.7	0.5	0.6	0.6
	Indirect demand	GWh	0.0	0.0	0.0	0.0	2.4	5.3	8.4	32.7	37.1	42.8
Component 3	Rural demand	GWh	7.5	23.6	49.4	51.7	54.1	56.6	59.2	62.0	64.9	67.9

Description of Costs

14. The main costs associated with the project are:
- (i) capital costs of the substations, transmissions and distribution line expenditures, as well as the connection costs for new customers;
 - (ii) Operations and Maintenance costs associated to the transmission and distribution lines; and
 - (iii) average generation cost of additional electricity.

The table below summarizes the project costs by component:

Table 5.3: Breakdown of Costs by Component

Cost Component	Value	Comment
Comp. 1 CAPEX	65.0 MdCFA (108.4 MUS\$)	Excludes duties, taxes and contingencies
Comp. 2 CAPEX	58.2 MdCFA (87.9 MUS\$)	Excludes duties, taxes and contingencies
Comp. 3 CAPEX	39.7 MdCFA (66.2 MUS\$)	Excludes duties, taxes and contingencies
OPEX	5%	Over capex (incl. contingencies) per year
Avg. generation cost	48 FCFA/kWh (0.08 US\$/kWh)	

Results

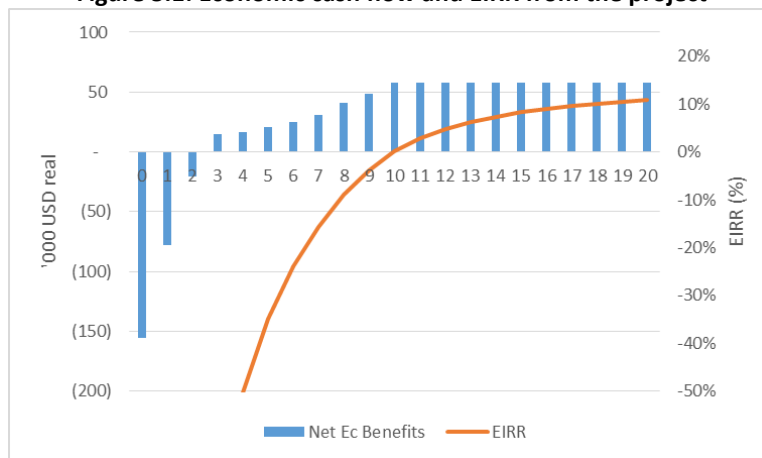
15. To assess the economic viability of the project, the stream of benefits from increased supply of electricity and reduced distribution losses are evaluated against the project capital costs, the operations and maintenance cost and the average generation cost of supplied electricity. The cost benefit analysis, assuming a discount rate of six percent (excluding taxes and duties from capital expenditure), estimates a net present value of US\$145.9 million and an EIRR of 10.8 percent.

Table 5.4: Estimated Economic Viability

	Unit	Value
Discount rate	%	6%
Economic Internal Rate of Return		
EIRR	%	10.8%
Composition of NPV		

Costs		
CAPEX	000 USD	(240,588)
OPEX	000 USD	(183,281)
Total costs	000 USD	(423,869)
Benefits		
Comp 1	000 USD	176,206
Comp 2	000 USD	197,103
Comp 3	000 USD	196,407
Total benefits	000 USD	569,716
Net Present Value	000 USD	145,848

Figure 5.1: Economic cash flow and EIRR from the project



Sensitivity

16. A switching value analysis was performed to test the robustness of the economic viability of the project to changes in the CAPEX and OPEX estimations. The results show that under the base case, the project remains viable until an increase in capital expenditure of 60 percent or an 80 percent increase in the operation costs.

Table 5.5: Sensitivity Analysis (switching values)

Parameter	Base Case	Sensitivity
CAPEX (MUS\$)	262.5	421.3
OPEX (%)	5%	9%

17. The results show that the project is economically viable and robust to variations in key underlying parameter within reasonable limits.

Figure 5.2: Cash Flow Analysis by Project Component

		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Benefits																						
Comp1	000 USD	\$ -	\$ 6,400	\$ 7,063	\$ 8,246	\$ 7,174	\$ 8,279	\$ 9,894	\$ 12,466	\$ 15,237	\$ 19,457	\$ 25,560	\$ 25,560	\$ 25,560	\$ 25,560	\$ 25,560	\$ 25,560	\$ 25,560	\$ 25,560	\$ 25,560	\$ 25,560	\$ 25,560
Comp2	000 USD	\$ -	\$ 2,531	\$ 4,846	\$ 7,166	\$ 9,451	\$ 11,733	\$ 14,082	\$ 16,285	\$ 22,865	\$ 25,336	\$ 27,818	\$ 27,818	\$ 27,818	\$ 27,818	\$ 27,818	\$ 27,818	\$ 27,818	\$ 27,818	\$ 27,818	\$ 27,818	\$ 27,818
Comp3	000 USD	\$ -	\$ 2,506	\$ 7,867	\$ 16,465	\$ 17,231	\$ 18,033	\$ 18,872	\$ 19,750	\$ 20,668	\$ 21,630	\$ 22,636	\$ 22,636	\$ 22,636	\$ 22,636	\$ 22,636	\$ 22,636	\$ 22,636	\$ 22,636	\$ 22,636	\$ 22,636	\$ 22,636
Subtotal	000 USD	\$ -	\$ 11,436	\$ 19,775	\$ 31,877	\$ 33,856	\$ 38,045	\$ 42,848	\$ 48,500	\$ 58,770	\$ 66,424	\$ 76,014	\$ 76,014	\$ 76,014	\$ 76,014	\$ 76,014	\$ 76,014	\$ 76,014	\$ 76,014	\$ 76,014	\$ 76,014	\$ 76,014
CAPEX																						
Comp1	000 USD	\$ (54,192)	\$ (54,192)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Comp2	000 USD	\$ (87,950)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Comp3	000 USD	\$ (13,233)	\$ (26,467)	\$ (26,467)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Subtotal	000 USD	\$ (155,375)	\$ (80,658)	\$ (26,467)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
OPEX																						
Comp1	000 USD	\$ -	\$ (2,710)	\$ (5,419)	\$ (5,419)	\$ (5,419)	\$ (5,419)	\$ (5,419)	\$ (5,419)	\$ (5,419)	\$ (5,419)	\$ (5,419)	\$ (5,419)	\$ (5,419)	\$ (5,419)	\$ (5,419)	\$ (5,419)	\$ (5,419)	\$ (5,419)	\$ (5,419)	\$ (5,419)	\$ (5,419)
Comp2	000 USD	\$ -	\$ (4,398)	\$ (4,398)	\$ (4,398)	\$ (4,398)	\$ (4,398)	\$ (4,398)	\$ (4,398)	\$ (4,398)	\$ (4,398)	\$ (4,398)	\$ (4,398)	\$ (4,398)	\$ (4,398)	\$ (4,398)	\$ (4,398)	\$ (4,398)	\$ (4,398)	\$ (4,398)	\$ (4,398)	\$ (4,398)
Comp3	000 USD	\$ -	\$ (1,263)	\$ (3,873)	\$ (7,260)	\$ (7,444)	\$ (7,636)	\$ (7,838)	\$ (8,048)	\$ (8,269)	\$ (8,499)	\$ (8,741)	\$ (8,741)	\$ (8,741)	\$ (8,741)	\$ (8,741)	\$ (8,741)	\$ (8,741)	\$ (8,741)	\$ (8,741)	\$ (8,741)	\$ (8,741)
Subtotal	000 USD	\$ -	\$ (8,370)	\$ (13,690)	\$ (17,077)	\$ (17,260)	\$ (17,453)	\$ (17,654)	\$ (17,865)	\$ (18,085)	\$ (18,316)	\$ (18,558)	\$ (18,558)	\$ (18,558)	\$ (18,558)	\$ (18,558)	\$ (18,558)	\$ (18,558)	\$ (18,558)	\$ (18,558)	\$ (18,558)	\$ (18,558)
Net Ec. Benefits																						
Total	000 USD	(155,375)	(77,592)	(20,381)	14,800	16,596	20,592	25,194	30,635	40,684	48,107	57,456	57,456	57,456	57,456	57,456	57,456	57,456	57,456	57,456	57,456	57,456

Financial Analysis of the Electricity Sector in Côte d'Ivoire

Key messages

18. Since the approval of the partial risk guarantee operation for the Foxtrot gas field expansion in May 2013,²⁵ the sector has made significant strides in terms of financial sustainability. While in 2011 and 2012, the sector was running at a deficit of more than FCFA 100 billion (US\$167 million), the comprehensive Power Sector Recovery Plan that was supported by IDA put the sector on a sustainable path, although still fraught with challenges.

19. These challenges encompassed (i) availability of gas supply, which became a bottleneck for new, efficient IPPs to reach financial closure; (ii) depreciation of the euro-pegged FCFA vis-a-vis the dollar; (iii) increased reliance on liquid fuel (HVO) particularly in 2015 as a result of a 30 percent drop in hydro-generation; and (iv) absence of a tariff adjustment. As a result, the sector deficit²⁶ grew again to FCFA 69 billion (US\$115 million) in 2015 from FCFA 22 billion (US\$37 million) deficit in 2013.

Table 5.6: Historical Net Sector Financial Balance Excluding Depreciation

<i>Billion FCFA</i>	2010	2011	2012	2013	2014	2015	2016
Sector Balance prior to Subsidy	(81.5)	(107.9)	(107.0)	(21.9)	(41.9)	(68.7)	3.3
Subsidy ²⁷	-	-	62.8	22.8	50.7	28.8	-
Net Sector Balance	(81.5)	(107.9)	(44.2)	0.9	8.8	(39.9)	3.3

20. Recurrent financial issues have prompted the GoCDI to take bold measures, particularly a landmark 10 percent tariff adjustment in July 2015, followed by another five percent in January 2016. However, it turned out to be a highly unpopular measure and the GoCDI had to backtrack partially on this measure under social and industry pressure. A 10 percent capped increase replaced these two consecutive increases and the GoCDI has committed to implement a 5 percent increase in 2017 and 2018 with a 3 percent increase for 2019 and 2020. Despite the partial tariff reversal, 2016 ended with a positive balance of FCFA 3.3 billion marking a significant improvement from 2015.

21. Going forward, fuel cost per kWh produced is dropping with the replacement of inefficient gas turbines (Vridi, Aggreko) by more efficient combined cycle plants (Azito 4 and Ciprel 5) and the increased hydro output from Soubré plant by mid-2017. The financial surplus is expected to range between FCFA 16 and 66 billion annually for the period stretching to 2020 under a conservative World Bank scenario. While the addition of 55 mmscfd of competitively priced domestic gas from the Foxtrot field is beneficial to the power sector in 2019, the team's financial analysis has highlighted that there is a risk of a significant gas surplus that would be borne by the sector and not initially utilized, due to the nature of its take-or-pay contract for gas. This surplus would be reabsorbed post-2020, as electricity demand continues to grow robustly, both domestically and in the sub region.

²⁵ Report No. 76301-CI.

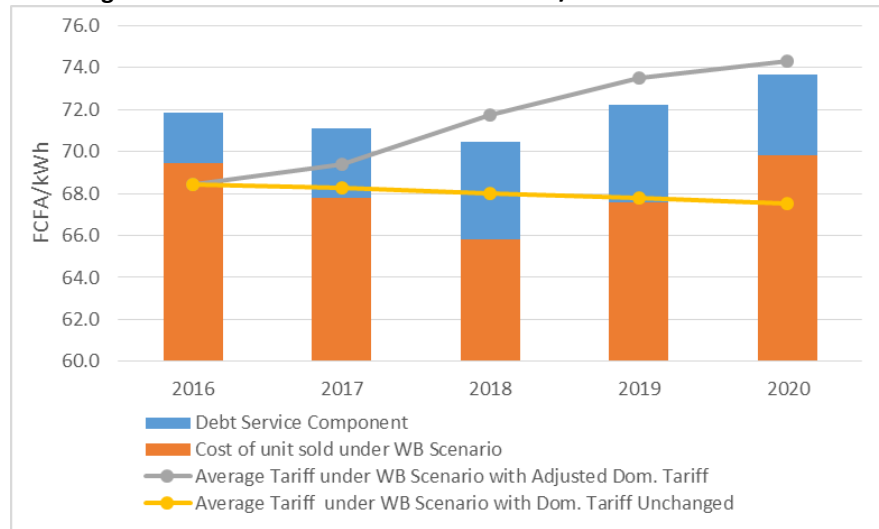
²⁶ Sector balance is akin to net income found in an income statement. However, since 2010, given the difficulty for the sector to cover its operating expenses, net income was not being netted by asset depreciation. Going forward, as the sector balance consolidates, it is expected to include it.

Table 5.7: Outlook Net Sector Financial Balance Excluding Depreciation and Subsidy

Billion FCFA	2016	2017	2018	2019	2020
CI-ENERGIES Scenario	3.3	44.2	87.6	71.0	147.7
World Bank Scenario	3.3	16.0	58.5	66.5	63.7

22. For the period 2017-2020, if anticipated tariff adjustments go as planned with an average tariff converging to 74 FCFA/kWh (12.8 US cents/kWh) by end of the decade, the sector would have the capacity to service its debt as highlighted by graph below. In parallel, an unchanged domestic tariff is only enough to cover operating expenses. This is contingent, particularly in 2019/20, upon CI-ENERGIES maintaining an adequate optimization of gas supply and demand and that generation capacity is added to the grid at the same pace of electricity demand.

Figure 5.3: Tariff versus cost of unit in FCFA/kWh



Cash waterfall system

23. Financial flows of the electricity sector are governed by Decree No. 2010-200 of July 15, 2010. Financial flows are divided into two major classifications: financial resources and sector expenditures.

24. The electricity sector financial resources²⁸ consist of:

- Collection proceeds received by the CIE* in its capacity as concessionaire, under the generation, transmission, distribution, and export of electricity;
- Fees collected for Rural Electrification* and Electricity Sector Development;²⁹
- Reduced Value Added Tax (VAT):* sector retaining 11.1 percent out of the 18 percent VAT;
- Capped Government's share of sector's gas bills* after they have exceeded the 50 billion FCFA threshold as per decree 2012-1122;
- HVO subsidy:* Government's financial support (i.e., subsidy) for purchase of expensive HVO particularly during period 2010-2015;
- Other small operating revenues* such as transformer leasing fee;

²⁹ Fee for Electricity Sector Development is yet to be implemented.

- g) Funds borrowed by the State and its agents on behalf of the electricity sector; and
- h) Sums mobilized on behalf of the Electricity Sector Stabilization Fund.

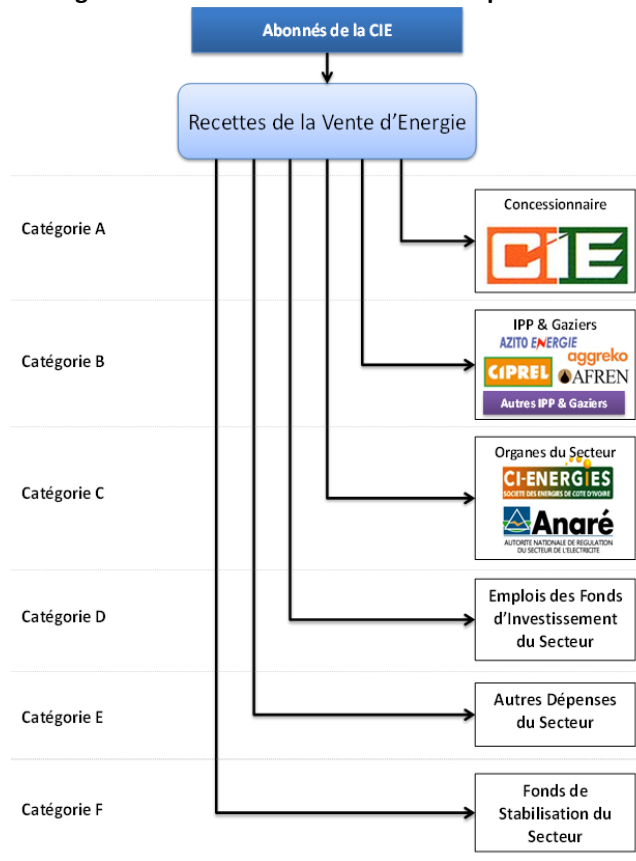
25. All financial resources are assigned to cover the electricity sector expenditures that are grouped into the following categories:

- a) *Category A*: Remuneration of the CIE, in its capacity as concessionaire, for the services it provides; CIE's annual remuneration is based on amounts of energy kWh sold and collected in the year;³⁰
- b) *Category B*: Purchasing fuel and electricity;
- c) *Category C*: Operating expenses of the structures and organs of management and control of the electricity sector (CI-ENERGIES and Anare);
- d) *Category D*: Uses of Electricity Sector Investment Funds, excluding debt service;
- e) *Category E*: Debt service; and
- f) *Category F*: Supply or reconstitution of the Electricity Sector Stabilization Fund.

26. Execution of Sector Expenditures is in the order of priority alphabetical categories (Category A having the highest priority level, and category F the lowest priority level). This cash waterfall system, in place since 1998 and managed by CIE, has been a key strength for the sector and has shielded private players even during political turmoil. It is represented in the figure below:

³⁰ Annual remuneration scheme of CIE is as follows: 22.6 FCFA/kWh up to 4,000 GWh, 11 FCFA/kWh from 4,001 GWh to 5,400 GWh, 3 FCFA/kWh above 5,401 GWh and 2 FCFA/kWh of exported energy.

Figure 5.4: Cash Waterfall for Sector Expenditures



Financial performance 2010-2016

27. The subsequent political upheavals, beginning with the coup d'état in 1999 and the political crises thereafter have taken a toll on the power sector; the sector's commercial performance declined sharply and investors' perception of risk was adversely affected. Between 2000 and 2010, only 110 MW of new generation capacity was added, while electricity demand continued to grow at over 5 percent per year on average, despite the political crisis. In early 2010, the country experienced severe load shedding for the first time since 1984. One hundred MW of emergency units had to be rented as a stop-gap measure in July 2012 and an additional 100 MW in March 2013.

28. This resulted in large losses for the power sector with 2010 ending with a deficit of FCFA 82 billion and ballooning to FCFA 108 billion in 2011 and FCFA 107 billion in 2012, amounting to about 30 percent of total sector revenues and mainly due to:

- Insufficient revenues following limited tariff increase in 2000s (domestic and exports) despite the higher reliance on gas;
- Large increases in costs in particular of the cost of gas supply following a decision in 2007 to remove a price cap from the existing gas supply contracts;
- Expensive emergency power needed because of lack of decision to expand gas supply and generation; and
- Increased resort to expensive liquid fuel to compensate for the lack of gas.

29. This severe fiscal situation prompted GoCDI to adopt a comprehensive power sector financial recovery plan in November 2012 with a strong involvement from IDA, the International Finance Corporation (IFC), and IMF. Key measures included:

- a. Renegotiation of the price of gas from Foxtrot, provider of about 65 percent of the gas for the power sector in 2012, from about US\$9/mmbtu to US\$5.5/mmbtu with an indexation formula no longer indexed on oil price³¹. This became effective as of January 1, 2012, providing about FCFA 80 billion relief for 2012.
- b. Renegotiation of Canadian National Resources (CNR) gas price that provides FCFA 27 billion relief per year.
- c. GoCDI structural subsidy for expensive HVO that is used to compensate for the lack of gas.
- d. Annual FCFA 50 billion ceiling to GoCDI share in gas revenues while the balance is reinjected in the sector for transmission and distribution investments.
- e. Ten percent increase in tariff for industrials in May 2012 (FCFA 5 billion in extra revenues).
- f. Export tariff increase of 10 percent in 2013 and an additional 10 percent in 2014.
- g. Reclassification of over 230,000 LV customers from the lifeline to the normal residential category.
- h. Renegotiation of CIE remuneration formula providing FCFA 8 billion in savings.
- i. Enactment of sector development levy.³²

30. In 2013, the aforementioned measures took full effect; the year ended with a deficit of FCFA 22 billion down from a FCFA 107 billion deficit in 2012. Unfortunately, this improvement stalled as deficit could not be contained during the period 2013-2015 reaching FCFA 69 billion by end-2015. 2015 was particularly difficult with two unexpected events: (i) the increased reliance on expensive HVO to compensate for a 30 percent drop in hydro generation; and (ii) 20 percent strengthening of the dollar vis-a-vis the euro-pegged FCFA currency.

Table 5.7: Electricity Sector Financial Balance

<i>Billion FCFA</i>	2010	2011	2012	2013	2014	2015	2016
Sector Balance prior to Subsidy	(81.5)	(107.9)	(107.0)	(21.9)	(41.9)	(68.7)	3.3
Subsidy ³³	-	-	62.8	22.8	50.7	28.8	-
Net Sector Balance	(81.5)	(107.9)	(44.2)	0.9	8.8	(39.9)	3.3

31. In response to the yawning sector deficit, GoCDI announced in July 2015 significant tariff increases spread over the next 18 months: a 10 percent increase on July 1, 2015 followed by a 5 percent increase on January 1, 2016. While the social tariff was unaffected, the repercussion on other categories was variable in magnitude with the largest increase affecting HV consumers and resulting in strong opposition from industries and the population.

³¹ Until 2012, the gas price for Foxtrot was indexed to the West Texas Intermediate index. This indexation formula, linked to the price of crude oil, exposed the sector to unpredictable gas prices, often as high as US\$9/mmbtu. This agreement was amended in 2012 with a new framework to calculate the gas price. The revised 2012 GSPA reduces the GoCDI exposure to future gas price shocks, by setting a new base price of US\$5.5/mmbtu and partial indexation to local exploration and production costs, with a clause enabling renegotiation if the price increases or decreases by more than 10 percent.

³² Sector development has not yet been implemented to date.

³³ Subsidy is structured to cover incremental cost for the use of HVO vis-à-vis gas.

32. Under social pressure and strong lobbying from industries, a presidential decision to nullify the proposed increase was announced on Labor Day, May 1, 2016. A revised inter-ministerial order for tariff adjustment was gazetted on June 20, 2016: a 10 percent capped tariff increase replaced the 10 percent average increase of July 1, 2015 and the subsequent 5 percent increase was postponed to July 1, 2017.

Figure 5.5: Historical Evolution of Tariffs by Client Type



33. **As a result of tariff adjustment, liquidity has come under pressure.** The delay in emitting March-April 2016 bills, while waiting for a GoCDI decision to be made on the tariffs, combined with the reimbursement of clients in the form of electricity credit have resulted in a significant liquidity crunch for the sector. In order to continue to meet its current obligations towards IPPs and gas suppliers, the sector had to expand its use of credit lines from commercial banks that have a financial cost.

Financial outlook 2016-2020

34. Upon request from the World Bank team, CI-ENERGIES has shared the power sector’s financial projections for the period 2016-2020. After carefully reviewing the underlying assumptions, the team has come to the conclusion that some of these assumptions were bullish, particularly for demand growth, volumes of electricity exports to the sub-region, commissioning dates of new generation assets and loss reduction profile. In light of that, CI-ENERGIES was asked to run a more conservative World Bank scenario with revised assumptions that the team considered to be more realistic. The two sets of assumptions are summarized in the matrix below:

Table 5.8: Financial Outlook, Key Assumptions

Key assumptions	CI-ENERGIES Scenario	World Bank Scenario
Net Domestic Demand growth	<ul style="list-style-type: none"> - 14.0% in 2017 - 15.2% in 2018 - 11.4% in 2019 - 11.1% in 2020 	<ul style="list-style-type: none"> - 10% in 2017 - 10% in 2018 - 10% in 2019 - 10% in 2020
Exports	<ul style="list-style-type: none"> - 2,005 GWh in 2017 - 2,210 GWh in 2018 - 3,110 GWh in 2019 - 3,810 GWh in 2020 	<ul style="list-style-type: none"> - 1,826 GWh in 2017 - 1,931 GWh in 2018 - 1,931 GWh in 2019 - 2,281 GWh in 2020
Domestic Tariff Assumptions	<ul style="list-style-type: none"> - 70.1 FCFA/kWh in 2017 - 73.0 FCFA/kWh in 2018 - 75.5 FCFA/kWh in 2019 - 77.3 FCFA/kWh in 2020 	<ul style="list-style-type: none"> - Similar tariff profile to CI-ENERGIES Scenario - Sensitivity: Domestic Tariff unchanged
Gas supply	<ul style="list-style-type: none"> - LNG @ 7\$/mmBtu as early as mid-2018; - Additional domestic gas production of 55 mmscfd as early as January 2019; 	<ul style="list-style-type: none"> - No LNG for 2016-2020; - Additional domestic gas production of 55 mmscfd as early as October 2019;
Commissioning	<ul style="list-style-type: none"> - Soubré by July 2017 - Songon: Open cycle phase by Jan. 2019 - Azito 4: Open cycle phase by July 2018 - Ciprel 5: Open cycle phase by Oct. 2019 	<ul style="list-style-type: none"> - Soubré by Oct. 2017 - Songon is not included - Azito 4: Open cycle phase by Jan. 2019 - Ciprel 5: Open cycle phase by Apr 2020
Grid Efficiency Rate (GT&D)	<ul style="list-style-type: none"> - 82.4% in 2017 - 84.9% in 2018 - 86.3% in 2019 - 87.5% in 2020 	<ul style="list-style-type: none"> - 82.0% in 2017 - 83.5% in 2018 - 84.5% in 2019 - 85.5% in 2020

Income Statement

35. **Despite the partial tariff reversal, 2016 ended up with a positive balance of FCFA 3.3 billion highlighting an improvement from 2015 where deficit reached about FCFA 69 billion.** Had the June 2016 tariff adjustment not occurred, the sector would have benefited from an estimated FCFA 20 billion of additional revenues that would have allowed the sector to post its first significant surplus since the beginning of this decade.

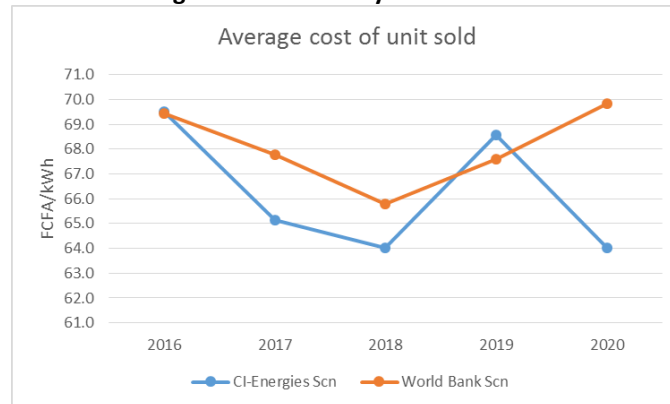
Table 5.9: Sector Financial Balance Excluding Depreciation and Subsidy

	2016	2017	2018	2019	2020
CI-ENERGIES Scenario	3.3	44.2	87.6	71.0	147.7
World Bank Scenario	3.3	16.0	58.5	66.5	63.7
World Bank Scenario with tariff unchanged	3.3	5.8	22.5	3.3	(26.3)

36. **Subsequent to the projected commission date of the hydropower plant Soubré in mid-2017,³⁴ CI-ENERGIES expects that the sector would achieve a financial surplus of FCFA 44 billion in 2017.** In contrast, World Bank scenario is more conservative with a forecasted FCFA 16 billion surplus as a result of delayed commissioning of Soubré combined with lower electricity demand at national and regional level. Should there be no appetite for tariff adjustment in 2017, surplus can grow up to FCFA 6 billion.

37. **In 2018, differences between World Bank and CI-ENERGIES scenarios widens.** Under CI-ENERGIES scenario, electricity sales are growing at a much faster pace supported by higher demand growth, a domestic tariff surplus of 4 FCFA/kWh and a higher efficiency rate. On the supply side, LNG starts contributing to the generation mix while Azito 4 starts operating its open cycle phase. Provided that LNG is priced at only US\$7/mmBtu and the FSRU is not underutilized – both optimistic assumptions – CI-ENERGIES projects the sector balance to double in volume inching up to FCFA 88 billion. In contrast, the World Bank team anticipates a more realistic balance of FCFA 58 billion for 2018. It is also noteworthy that 2018 is the year where cost of unit sold reached its lowest level over the five-year forecast period under both scenarios.

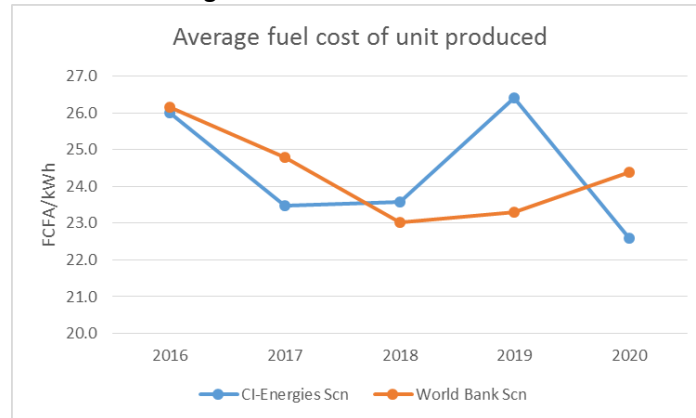
Figure 5.6: Electricity Cost Forecast



38. **In 2019, CI-ENERGIES scenario points to a marked deterioration of average fuel cost which is the result of an additional 55 mmscfd coming online,** billed to the sector under a take or pay contract but not consumed entirely. Under the World Bank scenario, additional gas from Foxtrot is pushed back toward 2020 owing to a lower pace in demand growth, hence the stabilized fuel cost per unit. This testifies to the importance for the sector in optimizing its gas portfolio; CI-ENERGIES will need to make sure that gas supply and demand are balanced at all-time horizons to avoid burdensome take-or-pay penalties that would have negative repercussions on the sector financial health. What is reassuring is that minimal tariff adjustments can compensate for the additional expenses and keep the sector financially whole.

³⁴Soubre has a capacity charge of 35 FCFA/kWh that is billed to CI-ENERGIES to repay its debt to Exim Bank. In other terms, Soubre is treated as an IPP in financial projections.

Figure 5.7: Fuel Cost Forecast

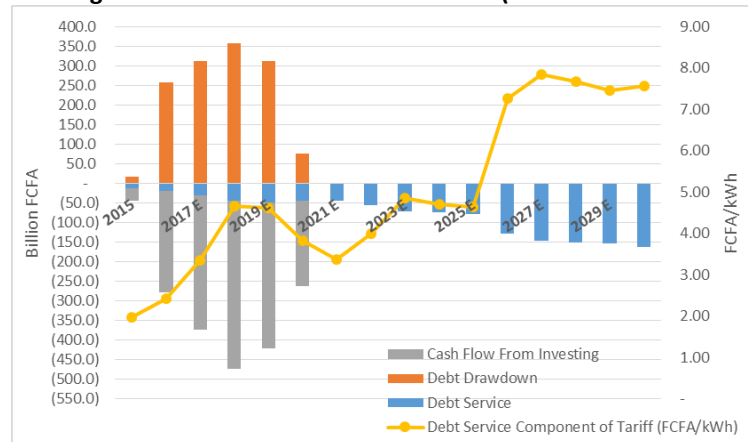


39. **By 2020, as sector demand for gas grows, CI-ENERGIES foresees a convergence in average fuel cost back to its previous level, resulting in a sector financial surplus of 148 billion FCFA.** Exports around 4,000 GWh with a domestic tariff of 77 FCFA/kWh are evidently supporting the sector’s finances. In contrast, World Bank scenario is penalized in 2020 owing to take-or-pay “penalties” relative to under-utilization of Foxtrot gas field and Ciprel power plant.

Investment Plan and Financing Plan

40. CI-ENERGIES is embarking on an ambitious investment program aimed at rehabilitating and expanding transmission and distribution network to accommodate growing electricity demand as well as expanding the grid to consumers that are yet to be connected in urban, peri-urban and rural areas. Total investment amounts to FCFA 1,600 billion over the period 2016-2020, of which FCFA 1,330 billion is debt financed.³⁵ Among debt financiers, EximBank China is ranked first with almost FCFA 500 billion of financing provided. The second largest financier is EU with FCFA 228 billion, followed by the World Bank with FCFA 147 billion.

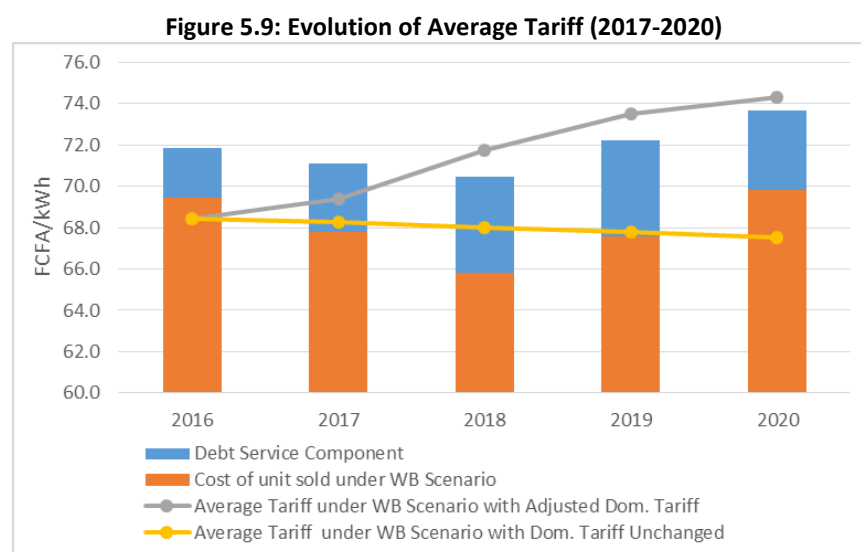
Figure 5.8: Financing Plan of 2016-2020 Investment Plan (Same under both scenarios)



³⁵ The underlying assumptions is that the FCFA 270 billion balance is expected to be filled by cash flow from operations.

41. **Until 2025, annual debt service per unit of electricity sold represents less than 5 FCFA/kWh under the World Bank scenario.**³⁶ In other words, if average tariff is 5 FCFA/kWh above cost of supply per unit sold, the sector would be expected to meet its debt service. 2026 marks the end of the grace period of the EximBank China loan whereby associated debt service swells from FCFA 7.3 billion in 2025 to FCFA 37.1 billion, hence the ratio of debt service to energy sold bumps up above 7 FCFA/kWh.

42. **For the period 2017-2020, if anticipated tariff adjustments go as planned with an average tariff converging to 74 FCFA/kWh by end of the decade,** the sector would have the capacity to service its debt. An unchanged domestic tariff is enough to cover operating expenses but not enough to service debt for investments provided that take-or-pay contracts are well managed (particularly in 2020).



Post-2020

43. However, the uncertainty on the generation mix post 2020 makes it difficult to predict with high confidence how the unit cost would evolve. Three scenarios can be envisaged:

- a. **Scenario 1:** Additional domestic gas is discovered enabling the sector to continue to rely on competitive gas pricing post 2020 (6 US\$/mmBtu) as power demand continues to grow at a high pace. LNG option is no longer required and hence there is no material change in the unit cost.
- b. **Scenario 2:** Gas production available for the power sector is capped at 300 mmscfd and LNG is imported into the country via a FSRU. Gas price coming from LNG (post re-gasification) is higher than domestic gas by at least US\$2/mmBtu and makes the sector exposed to market price volatility. As the share of LNG grows within total gas supply, average weighted average gas price would increase thereby putting a pressure on sector's financial resources in the event electricity tariff is not adjusted.
- c. **Scenario 3:** Gas production is constrained as scenario 2, however coal option moves forward allowing the sector to rely on cheaper means of generation than LNG fueled

³⁶ Debt service tariff component is even lower under CI-ENERGIES scenario as a result of higher demand.

power generation. Cost of generation mix under this scenario would remain competitive.

Key risks

This financial analysis has identified the following risks:

44. **The sector is expected to increase its reliance on one gas supplier Foxtrot International**, which accounts for 70 percent of gas supply today and is expected to represent more than 80 percent of gas supply by the end of the decade. While this does not have immediate financial implications, it puts Foxtrot in a monopoly position that could be used to the disadvantage to the sector.

Table 5.10: Gas production 2010-2015 (Realized) and Forecast 2016-2020 under World Bank Scenario

Gas Supply in mmscfd	2010	2011	2012	2013	2014	2015	2016 E	2017 E	2018 E	2019 E	2020 E
CI - 40	10	6	3	2	1	3	9	15	15	14	13
CI - 26	16	27	31	38	35	48	54	45	45	42	35
CI - 11	22	13	24	16	14	5	3	12	11	11	10
CI - 27	95	99	102	141	154	143	153	160	160	160	160
CI-27 Nouveau	-	-	-	-	-	-	-	-	-	18	55
Total Production	143	146	160	197	204	198	219	232	231	245	273
For Industrials	(13)	(13)	(13)	(13)	(13)	(13)	(13)	(13)	(13)	(13)	(13)
Available for the Sector	130	133	147	184	191	185	206	219	218	232	260

45. **The sector is increasingly relying on two IPPs, namely Azito and Ciprel.** Similar to gas supply, this creates a strong dependence vis-a-vis two producers that can potentially be to the sector's disadvantage.

46. **The sector ought to manage its take-or-pay under its power purchase and gas supply agreements in an optimal fashion** that minimizes financial burden on the sector while continuing to provide reliable electricity to consumers. For instance, under the World Bank scenario, FCFA 58.5 billion are at stake in 2020 alone.

Table 5.11: Impact of Take or Pay (ToP) Penalties under World Bank Scenario with Unchanged Tariff

Billion FCFA	2017	2018	2019	2020
Ciprel ToP penalty				14.4
Foxtrot ToP penalty				44.1
Sector balance for WB scenario with ToP penalties	5.8	22.5	3.3	(26.3)
Sector balance for WB scenario without ToP penalties	5.8	22.5	3.3	32.3

47. **LNG integration within the generation mix, if it occurs during the period 2017-2020, will need to be managed carefully by CI-ENERGIES** making sure that the low utilization rate of FSRU in early years does not result in prohibitive charges for the sector.

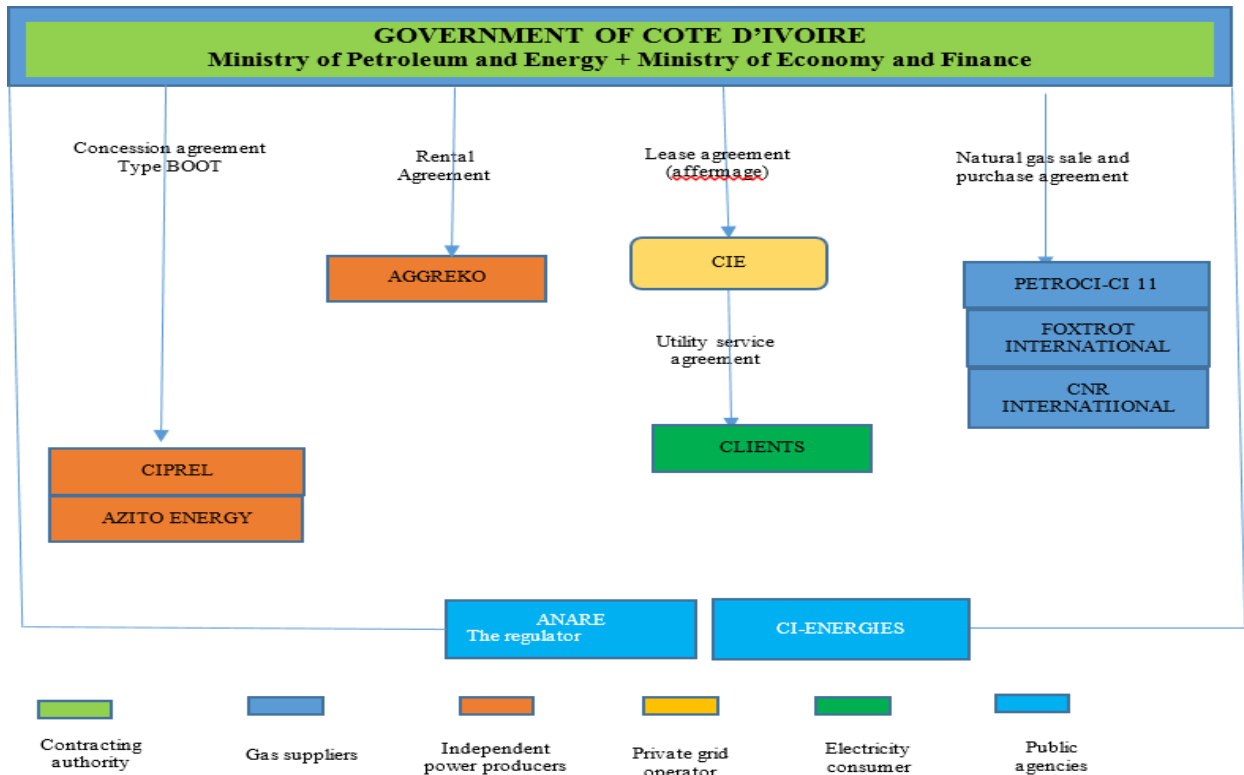
Annex 6: Energy Sector Background

CÔTE D'IVOIRE: Electricity Transmission and Access Project (P157055)

Policy, legal and institutional context

- 1. A revised national energy policy adopted in 2013 set as an objective for Côte d'Ivoire to become an energy hub in West Africa.** The adopted energy policy has three main axes: (i) restore financial viability of the energy sector – tariff adjustments and losses reduction; (ii) generation of sufficient electricity and demand side management; and (iii) improvement of the institutional framework. In the country's efforts to become an emerging country by 2020, the energy requirement, with an increasing demand of around 10 percent per year, is translated into 150 MW of additional capacity per year. Under the policy, the country has set an objective to become an energy hub in West Africa by providing abundant and quality energy at least cost to meet domestic and regional socioeconomic growth needs. Long-term objectives include increase of renewable energy share in the national energy mix from one percent in 2015 to 16 percent in 2030; diversification of energy production sources from 80 percent fossil fuel and 20 percent renewables in 2015 to 66 percent fossil fuel and 34 percent renewable in 2020, and 58 percent fossil fuel and 42 percent renewable energy in 2030.
- 2. Electricity sector activities in Côte d'Ivoire are governed by the 2014 Electricity Code,** replacing the outdated Electricity Law of July 29, 1985, and which governs generation, transmission, and distribution of electricity. While under the 1985 law transmission and distribution were a state monopoly that could be conceded to an operator, the 2014 law introduces further liberalization within the sector keeping only the dispatching activity under state monopoly and providing third party access to the transmission grid. The GoCDI has drafted regulations including 11 decrees and 10 ministerial orders to fully enforce the electricity law. These regulations are expected to be adopted before the end of 2016.
- 3. The Ivorian power sector institutions:** The current government institutions include *la Société des Energies de Côte d'Ivoire* (CI-ENERGIES), responsible for managing assets in the electricity sector and planning and contracting investments. The regulatory agency, *Autorité Nationale de Régulation du Secteur d'Electricité* (ANARE). The *Compagnie Ivoirienne d'Electricité* (CIE), the electricity sector operator, which is a private company, as are the independent power producers CIPREL, Azito, Aggreko, and the natural gas producers AFREN, Foxtrot, and Canadian Natural Resources. The Ministry of Petroleum and Energy and the Ministry of Economy and Finance oversee the sector.

Figure 6.1: Power Sector Institutional Arrangement in Côte d'Ivoire



Power Sector Reform History in Côte d'Ivoire

4. **Côte d'Ivoire was the first Sub-Saharan African nation to turn to the private sector to improve its power sector performance.** The oil crises of 1973 and 1979 reaffirmed Côte d'Ivoire's decision to prioritize hydroelectric power generation. The power plants of Kossou (174 MW), Taabo (210 MW), and Buyo (165) become operational in 1972, 1979 and 1980, respectively. The drought of 1983-1984 forced the country to rebalance its energy mix instead of relying on hydropower and introduce thermal power plants. *Energie Electrique de Côte d'Ivoire* (EECI)³⁷ urgently commissioned a 100 MW gas turbine power plant at Vridi, but the increase in production costs from this plant led to a financial deficit that dogged EECI until 1990. That same year, the GoCDI decided to privatize the power sector. It established a private company,³⁸ *Compagnie Ivoirienne d'Electricité* (CIE) in 1990 and granted it a 15 year concession contract ("affermage") to: (i) operate and maintain power plants owned by the government, the national transmission grid, and electricity distribution networks; (ii) provide retail services, including the development of commercial activities related to electricity supply and customer service; and (iii) implement projects for the expansion and replacement of network infrastructure required for service provision, with financial resources provided by GoCDI. The contract was signed for 15 years in 1990 and was extended in 2005 to 2020. CIE receives a management fee per unit of electricity sold and collected. EECI remained in charge of planning and contracting investments.

³⁷ EECI, established in 1952, has historically been responsible for implementing government policy relating to electricity and water as it was in charge of investment and operations of the sector.

³⁸ GoCDI currently owns 15 percent of CIE's shares, while the remaining 85 percent is owned by private shareholders. The main shareholder (ERANOVE) controls a 54 percent stake.

5. **Côte d’Ivoire introduced IPPs in 1994 to respond rapidly to the sharp increase in electricity demand.** By 1994, the electricity demand had increased significantly due to the economic recovery that followed the devaluation of FCFA. Thus, GoCDI decided to introduce IPPs to increase rapidly the generation capacity. On July 29, 1994, an agreement was signed with the CIPREL for the construction, operation, and eventual transfer of ownership of a 200 MW thermal power plant. In September 1997, a contract was concluded with Azito Energie for the development of a 300 MW natural gas fired power plant in Azito. The installed capacity of these IPPs has been increased and the agreements have been extended several times, including in 1997, 2010, and 2011 for CIPREL, and in 1999, 2000, and 2013 for Azito. Private production has enabled the country to respond rapidly to the domestic demand and export to neighboring countries Benin, Burkina Faso, Ghana, Mali, and Togo.

6. **A second reform process started in 1998 to make the sector more profitable.** EECI was liquidated and three sector institutions were created in its place: (i) the regulatory body ANARE; (ii) the *Societe de Gestion du Patrimoine du Secteur de l’Electricité* (SOGEPE) in charge of management of public assets and sector financial management; and (iii) the *Societe d’Operation Ivoirienne d’Electricité* (SOPIE), in charge of monitoring of the electricity flows and implementation of investments in transmission and distribution.

7. **A last reform was launched in 2011, when the state owned Company-Société des Energies de Côte d’Ivoire (CI-ENERGIES) was created.** Created by Decree No. 2011-472 of 21 December 2011, CI-ENERGIES manages the assets of the sector owned by the government. It is responsible for sector investment planning and implementation, including electrification programs. CI-ENERGIES is also responsible for provide financing for medium- and long-term infrastructure investments in the power sector owned by the GoCDI (from generation to grid investment to connection of new electricity users). It took over the responsibilities of former SOGEPE and SOPIE.

8. **The historical involvement of private players in the sector has in part shielded it from political instability.** Since 1998, the power sector cash flows are managed through a “cash waterfall” mechanism as shown below, which gives priority of payment to private investors. The affermage contract with CIE and the formalized cash flow distribution mechanism in the sector (“cash waterfall”), whereby CIE gets its contractual remuneration first, followed by the IPPs and gas field operators on a pari passu basis, have helped Côte d’Ivoire attract further private investments in generation, despite the civil and political turmoil in the 2000s. Both supply contracts with Azito and CIPREL have withstood the crisis and continued to supply power effectively and have expanded their power plants.³⁹ The institutional framework of the power sector in Côte d’Ivoire and financial flows of tariff revenues are presented in the figure below.

³⁹ Azito 3 combined cycle (+140 MW) was commissioned in April 2015 while CIPREL 4 combined cycle (+111 MW) was commissioned in December 2015; IFC was involved in financing of both expansions.

9. **A proposed new decree is aiming to provide more independence to the existing regulator.** The proposed new regulatory body, *Autorité Nationale de Regulation du Secteur de l'Electricité de Côte d'Ivoire* (ANARE-CI), per the draft decree establishing the body, will have a full independence in terms of management and decision making. Currently, ANER plays more of an advisory role.

Current situation of power sector

10. **With an installed generation capacity of 1,775 megawatts (MW), Côte d'Ivoire's electrical system is the third largest in West Africa, following Nigeria and Ghana.** Electricity domestic consumption in 2014 was 5,563 gigawatt hours (GWh) and peak demand reached 1,148 MW. Electricity domestic consumption increased by 6.5 percent in 2015 reaching 5,928 GWh and it is expected that, fueled by economic growth, will continue to grow around 10 percent per annum, reaching around 9,500 GWh by 2020. Installed capacity is expected to reach around 2,500 MW by 2020.

11. **Côte d'Ivoire is the only significant regional electricity exporter at present, despite the tight supply-demand balance in the country.** In 2016, it exported 1,650 GWh to five clients: *Énergie du Mali*, Volta River Authority in Ghana, *Communauté Electrique du Bénin* for Benin-Togo, the *Société Nationale d'électricité* in Burkina Faso, and the Liberia Electricity Company. Going forward, Côte d'Ivoire is well positioned to be the main hub of electricity trading in the sub-region as the West Africa Power Pool (WAPP) transmission line interconnections to Ghana, Burkina and Mali are in service and those with Liberia, Sierra Leone, and Guinea and beyond are built.

Table 6.1: Key Sector Figures

	2014	2015	Variation
Electricity Supply			
Installed Capacity (MW)	1,632	1,775	9%
Hydro capacity	604	604	0%
Thermal capacity	1,028	1,171	14%
Grid Generation (GWh)	8,202	8,618	5%
Hydro Generation	1,914	1,352	-31%
Thermal generation	6,288	7,255	15%
Electricity Demand			
Peak Demand (MW)	1,148	1,193	4%
National Gross Consumption (GWh)	7,319	7,729	6%
National Domestic Sales (GWh)	5,563	5,928	6.5%
Exports (GWh)	897	873	-3%
Ghana (VRA)	46	128	178%
Benin/Togo (CEB)	118	28	-76%
Burkina Faso (SONABEL)	435	370	-15%
Mali (EDM)	296	343	16%
Liberia (LEC)	2	4	122%
Imports (GWh)	14	13	-6%
Number of clients	1,315,837	1,432,779	9%
Quality of Product			
Average Interruption Duration	40h02	43h04	8%
Energy non distributed (GWh)	30.8	34.8	13%

12. **Virtually all thermal power generation is in the hands of IPPs, while the hydropower plants are state-owned.** Following the award of the concession to CIE, the country also awarded the first IPP contract in Africa to CIPREL in 1994, and in 1998 it awarded the then largest IPP in Africa to Azito Energie, a project that was supported by the first IDA Partial Risk Guarantee. Today, the Ivorian electricity generation is dominated by private sector (63 percent of total installed capacity and 81 percent of energy generation in 2015).

13. **Côte d'Ivoire has substantial, untapped hydroelectric potential, but still relies on limited natural gas to fuel its generation capacity.** With an estimated capacity of over 1,900 MW, which can theoretically generate about 10,000 GWh per year, Côte d'Ivoire has good potential for hydropower development. The current installed capacity from hydroelectric power is 604 MW, or less than 40 percent of the current total installed capacity. Hydroelectricity generated per year is around 1,500 GWh, equivalent to 19 percent of total energy consumption per year. Despite this significant untapped hydroelectric potential, only the 275 MW site on the Sassandra River (Soubré) with financing from EximBank China is under construction, the first hydro plant to be built in the past 30 years. It is due to be commissioned in July 2017 and will be transferred to CI-ENERGIES once completed. Other potentially attractive hydro sites are not yet at sufficiently advanced stages of technical preparation to be commissioned before 2020. Hydropower projects in pipeline for the next 10 years include Singrobo, Gribo Popoli, Bouloubré, and Louanga. GoCDI has signed a number of Memoranda of Understanding with private developers.

14. **The power sector is heavily reliant on domestic gas production.** The production of natural gas in Côte d'Ivoire is estimated at 220 million cubic feet per day and proven reserves are estimated at 1,095 billions of cubic feet. Principal consumers of the natural gas are the power plants in Abidjan. In 2015,

gas supply for power sector reached 185 mmscf per day, all coming from domestic sources and accounting for about 79 percent of the power generation mix. Hydropower contributed to 16 percent of the generation mix while the 5 percent remaining are HVO based. While there has been uncertainty from where additional gas would come from to meet rapidly growing electricity demand delaying development of new IPPs, the major gas supplier Foxtrot has recently increased its output by an additional 20 mmscf per day and is appraising a new field that would bring an additional 54 mmscf per day in 2018/19. With these new gas discoveries, CI-ENERGIES does not expect a fuel shortage for the period 2016-2020. HVO would only be used as back up and for few peak hours. Beyond 2020, coal and LNG are being pursued by the Government.

Table 6.2: Gas Supply to the Electricity Sector

<i>Mmscfd</i>	2015	2016	2017	2018	2019	2020
CI - 40 (CNR)	3	6	5	5	5	5
CI - 26 (CNR)	48	48	46	55	55	55
CI - 11 (PETROCI)	5	6	12	13	12	11
CI - 27 (FOXTROT)	143	162	174	194	194	194
New Gas Field (FOXTROT)				54	54	54
Total Gas Supply Forecast	198	221	237	321	320	319
Available for Power Sector	185	208	224	308	307	306

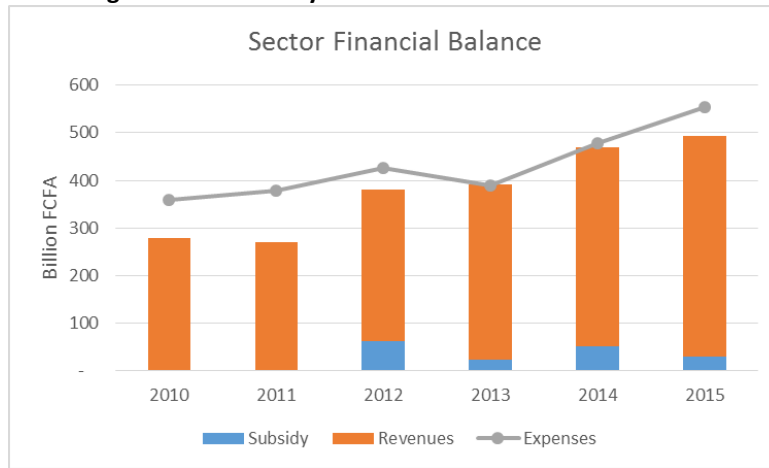
Challenges of the power sector

15. **The Ivorian electricity sector faces several challenges and constraints.** The transmission and distribution networks are old and overloaded and there has been little funding for rehabilitation and reinforcement over the past decade. Transmission losses on the HV grid are estimated at 6 percent while distribution technical and non-technical losses are in the range of 17 percent. These are considered high in industry standards, but are among the lowest in the sub-region. Distribution losses are down from 22 percent in 2010 as a result of efforts achieved in limiting fraud.

16. **Household access to electricity in Côte d'Ivoire is low.** At about 28 percent, the electricity access rate is relatively low compared to per capita income. The electricity penetration rate is around 40 percent (number of electrified villages out of the total number of villages in Côte d'Ivoire), indicating that a significant part of the population in electrified areas is unable to get a grid connection, despite available supply.

17. **Tariffs remain a politically charged topic despite the improvement in quality of service.** Since 2012, tariffs have not kept up with inflation and furthermore were based upon a predominantly hydro supply cost structure, while thermal power grew increasingly dominant in the generation mix. In July 2015 the GoCDI announced significant tariff increases spread over the next 18 months: a 10 percent increase on July 1, 2015 followed by a five percent increase on January 1, 2016. While the social tariff was unaffected, the repercussion on other categories was variable in magnitude with the largest increase affecting HV consumers and resulting in opposition from industries and the population. As a result, a presidential decision to nullify the proposed increase was announced on Labor Day, May 1, 2016. A revised inter-ministerial order for tariff adjustment was gazetted on June 20, 2016: a 10 percent capped tariff increase replaced the 10 percent average increase of July 1, 2015 and the subsequent 5 percent increase was postponed to July 1, 2017.

Figure 6.3: Electricity Sector Historical Financial Balance



18. **The country is mobilizing financial resources to invest in major upgrade and expansion of the medium and high voltage transmission lines and substations.** Total energy losses are about 22 percent and cannot be addressed without substantial investment in the network. The utility has recently completed long-term power master plans (2016-2030) to guide future investments in the sector. The plans include generation and transmission master plan, urban distribution master plan, rural electrification master plan, system automation master and electricity for all program that includes a new financed connection scheme. The master plans estimated that investments of about US\$2 billion are required over the next decade in transmission rehabilitation and extension, a further US\$680 million in urban distribution (greater Abidjan), and US\$675 million is required for rural electrification. The GoCDI has so far mobilized financing from the Exim Bank of China (US\$819 million), the AfDB (US\$150 million), the EU (Euro 190 million), and AFD (US\$130 million). However, the financing gap is still significant given the needs to refurbish and upgrade the network.

19. **Planned medium term (2016-2020) generation investments to meet the increasing demand are mainly led by the private sector and the country has limited natural gas.** Apart from Soubré 275 MW hydropower plant that is expected to be commissioned by end 2017 through the financing from the Exim Bank of China, most of planned generation projects are developed by independent power producers. Most of the additional capacity will be fueled by natural gas. The planned projects are listed in the table below. There is limited commercial natural gas to fuel the power plants and there are no new confirmed discoveries in Côte d'Ivoire. The GoCDI has recently launched a tender to select a private operator to develop and operate a LNG terminal in Abidjan. It is important to note that 95 percent of domestic natural gas is consumed to produce electricity.

Table 6. 3: Planned Generation Projects 2016-2020

Power Plants	Capacity	Technology	Commissioning
Soubre	275 MW	Hydro	July 2017
Azito 4 TAG (Globeleq Group)	200 MW	CCGT	July 2018
AZITO 4 TAV	80 MW	CCGT	July 2019
Songon - 1er Tranche TAG 1	123 MW	CCGT	June 2019
Songon - 2eme Tranche TAG 2	123 M	CCGT	October 2019
Songon - 3eme Tranche TAV	123 MW	CCGT	June 2020
Ciprel V - 1er Tranche TAG 1	120 MW	CCGT	October 2019
Ciprel V - 2eme Tranche TAG 2	120 MW	CCGT	February 2020
Ciprel V - 3eme Tranche TAV	110 MW	CCGT	June 2020
Centrale solaire 1	20 MW	Solar PV	November 2017
Centrale solaire 2	50 MW	Solar PV	December 2017
BIOKALA 1.1	23 MW	Biomass	July 2020
BIOKALA 1.2	23 MW	Biomass	October 2020
SINGROBO	44 MW	Hydro	July 2020
GRIBOPOPOLI	112 MW	Hydro	December 2020
TAYABOUI	80 MW	Hydro	December 2020
GAO	80 MW	Hydro	December 2020

20. **The National Program for Rural Electrification (PRONER)**, launched in 2014, has as its objective to increase the penetration rate of electricity to 80 percent in 2020 and the coverage rate to about 100 percent of the population. PRONER is a strong commitment of GoCDI to electrify all localities with over 500 inhabitants in the coming years and maintain an annual rate of electrification of 500 new localities until 2020.

21. **The national electricity access scale up rollout program derived from the recently adopted Rural Electrification Master Plan 2016-2030 has set ambitious objectives.** These objectives are to achieve (i) a balance of access rate of at least 30 percent across regions by end 2017; (ii) all local administration offices and regional capitals (chefs-lieux) and villages of at least 500 households should be electrified by end 2017; (iii) all households living in the vicinity of an MV line (500 meters) should also be electrified; and (iv) all Ivorian villages or communities should be electrified by 2020. So far commitments for the electrification of 1,249 villages (costing around FCFA 160 billion) have been made over the period of 2011-2015 by different donors and the GoCDI.

22. **All villages in Côte d'Ivoire except 100 are in less than 20 kms of the grid and will be electrified through grid extension.** The Master Plan for rural electrification indicates that all electrified villages in Côte d'Ivoire are located less than 20 km from the grid and hence will be connected to the national grid. Only around 100 villages are isolated with small population and these will be electrified with off-grid solutions. In total, there are 849 villages of over 500 households remaining to be electrified in the next two years.

23. **Electricity for All Program (E4All).** To accelerate access to electricity for the population, in May 2014 the GoCDI adopted the "Electricity for All" Program, with a target of 200,000 new customer connections per year through a dedicated funding vehicle (FE4All), which would eliminate the current barrier to access that the present high upfront connection charge represents. It would pre-finance (for low-income households) the cost of both a grid connection and a standardized internal house-wiring kit. Beneficiaries would only pay a symbolic fee of less than US\$2 dollars to participate and would be able to repay the cost of the connection over a time period as long as 10 years. As currently designed, the FE4All

would be funded by the Government, development partners, and commercial loans from the capital market. This initiative is expected to bring access to electricity to around one million households over five years.

Annex 7: Map

CÔTE D'IVOIRE: Electricity Transmission and Access Project (P157055)

