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IDA/R2016-0184/1

July 11, 2016

Closing Date: Thursday, July 28, 2016 at 6 p.m.

FROM: Vice President and Corporate Secretary

Senegal - Electricity Sector Support Project

Additional Financing

Project Paper

Attached is the Project Paper regarding a proposed additional credit to Senegal for the Electricity Sector Support Project (IDA/R2016-0184), which is being processed on an absence-of-objection basis.

Distribution:
Executive Directors and Alternates
President
Bank Group Senior Management
Vice Presidents, Bank, IFC and MIGA
Directors and Department Heads, Bank, IFC and MIGA

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Report No: PAD1815

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT PAPER

ON A

PROPOSED ADDITIONAL CREDIT

IN THE AMOUNT OF EURO 62.8 MILLION
(US$70 MILLION EQUIVALENT)

TO THE

REPUBLIC OF SENEGAL

FOR THE

ELECTRICITY SECTOR SUPPORT PROJECT

July 7, 2016

Energy and Extractives Global Practice
Africa Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective May 31, 2016)

Currency Unit	=	CFAF
CFAF 589	=	US$1
US$1	=	Euro 0.89670014

FISCAL YEAR

January 1 – December 31

ABBREVIATIONS AND ACRONYMS

AF	Additional Financing
ASER	*Agence Sénégalaise d'Electrification Rurale* (Rural Electrification Agency)
CPM	*Cellule de Passation de Marchés* (Procurement unit)
CPS	Country Partnership Strategy
DA	Designated Account
EBITDA	Earnings before interest, tax, depreciation, and amortization
EIB	European Investment Bank
EIRR	Economic Internal Rate of Return
EU	European Union
FIRR	Financial Internal Rate of Return
FM	Financial Management
FSE	*Fonds Spécial de l'Energie* (Energy Support Fund)
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GoSN	Government of Senegal
GRS	Grievance Redress Service
HFO	Heavy Fuel Oil
HV	High Voltage
IPP	Independent Power Producer
LESDP	Letter of Energy Sector Development Policy
LV	Low Voltage
MV	Medium Voltage
NPV	Net Present Value
OMVG	*Organisation pour la Mise en Valeur du fleuve Gambie* (The Gambia River Basin Development Organisation)
OMVS	*Organisation pour la Mise en Valeur du fleuve Sénégal* (Senegal River Basin Development Organisation)
PAP	Priority Action Plan
PDO	Project Development Objective
PIU	Project Implementation Unit
PSE	*Plan Sénégal Emergent* (Emerging Senegal Plan) 2014
SENELEC	*Société Nationale d'Electricité du Sénégal* (National Electricity Utility of Senegal)

STS	Standard Transfer Specification
T&D	Transmission and Distribution
WBG	World Bank Group

Regional Vice President:	Makhtar Diop
Country Director:	Louise J. Cord
Senior Global Practice Director:	Anna Bjerde (Acting)
Practice Manager:	Charles Joseph Cormier
Task Team Leaders:	Manuel Berlengiero and Chris Trimble

SENEGAL
ADDITIONAL FINANCING TO THE ELECTRICITY SECTOR SUPPORT PROJECT

CONTENTS

ADDITIONAL FINANCING DATA SHEET

Senegal

Additional Financing to the Senegal Electricity Sector Support Project (P158655)

AFRICA

ENERGY AND EXTRACTIVES

Basic Information - Parent			
Parent Project ID:	P125565	Original EA Category:	B - Partial Assessment
Current Closing Date:	30-Sep-2016		

Basic Information - Additional Financing (AF)			
Project ID:	P158655	Additional Financing Type (from AUS):	Scale Up
Regional Vice President:	Makhtar Diop	Proposed EA Category:	B – Partial Assessment
Country Director:	Louise J. Cord	Expected Effectiveness Date:	31-Oct-2016
Senior Global Practice Director:	Anna Bjerde (Acting)	Expected Closing Date:	31-Oct-2020
Practice Manager/Manager:	Sameer Shukla (Acting)	Report No:	PAD1815
Team Leader(s):	Manuel Berlengiero and Chris Trimble		

Borrower				
Organization Name	Contact	Title	Telephone	Email
Ministry of Energy and Renewable Energy	Mrs. Oumy Khairy Diao Diop	Director of Strategy and Regulation	221-774501653	okdiao@hotmail.com

Project Financing Data - Parent (Electricity Sector Support Project-P125565) (in US$, millions)							
Key Dates							
Project	Ln/Cr/TF	Status	Approval Date	Signing Date	Effectiveness Date	Original Closing Date	Revised Closing Date
P125565	IDA-51450	Effective	26-Jul-2012	03-Aug-2012	01-Jan-2013	30-Sep-2016	30-Sep-2016

Disbursements									
Project	Ln/Cr/ TF	Status	Currency	Original	Revised	Cancelled	Disbursed	Un-disbursed	Disbursed
P125565	IDA-51450	Effective	XDR	56.30	56.30	0.00	31.74	24.56	56.37

Project Financing Data - Additional Financing (Additional Financing to the Senegal Electricity Sector Support Project P158655) (in US$, millions)

[ ]	Loan	[ ]	Grant	[ ]	IDA Grant
[X]	Credit	[ ]	Guarantee	[ ]	Other

Total Project Cost (Additional Financing):	168.00	Total Bank Additional Financing:	70.00
Financing Gap:	0.00		

Financing Source - Additional Financing (AF)	**Amount**
BORROWER/RECIPIENT	4.00
International Development Association (IDA)	70.00
European Investment Bank	94.00
Financing Gap	0.00
Total Additional Financing	168.00

Policy Waivers	
Does the project depart from the CAS in content or in other significant respects?	No
Explanation	
Does the project require any policy waiver(s)?	No
Explanation	

Team Composition

Bank Staff

Name	Role	Title	Specialization	Unit
Manuel Berlengiero	Team Leader (ADM Responsible)	Senior Energy Specialist	Team Leader	GEE07
Chris Trimble	Team Leader	Energy Specialist	Team Leader	GEE07
Mamata Tiendrebeogo	Procurement Specialist (ADM Responsible)	Senior Procurement Specialist	Procurement	GGO01
Fatou Fall Samba	Financial Management Specialist	Financial Management Specialist	Financial Management	GGO25

Amadou Mamadou Watt	Team Member	Energy Specialist	Economic and Financial Analysis	GEE07
Cheikh A. T. Sagna	Safeguards Specialist	Senior Social Development Specialist	Social Safeguards	GSU01
Ruma Tavorath	Environmental Specialist	Environmental Specialist	Environmental Safeguards	GENDR
Xavier Remi Daudey	Team Member	Energy Specialist	Engineer	GEEES
Maya Abi Karam	Counsel	Senior Counsel	Legal Counsel	LEGEN
Vanessa Lopes Janik	Team Member	Operations Officer	Gender	GEEES
Mariame Maiga	Team Member	Consultant	Gender Specialist	GEE08
Rahmoune Essalhi	Team Member	Procurement Assistant	Procurement	GGO01
Seynabou Thiaw Seye	Team Member	Program Assistant	Team support	AFCF1
Thanh Lu Ha	Team Member	Senior Program Assistant	Team support	GEE07

Extended Team

Name	Title	Location

Locations

Country	First Administrative Division	Location	Planned	Actual	Comments
Senegal		Tobène	X		
Senegal		Thiès Nones	X		
Senegal	Thies	Region de Thies		X	
Senegal		Rufisque	X		
Senegal		Mbour	X		
Senegal	Matam	Matam		X	
Senegal		Kounoun		X	
Senegal		Hann		X	
Senegal		Mbaw	X		
Senegal		Grand Dakar		X	
Senegal	Dakar	Dakar		X	
Senegal		Cap des Biches		X	
Senegal		Casamance	X		
Senegal	Kedougou	Region de Kedougou	X		

Senegal	Kolda	Kolda		X	
Senegal	Kaolack	Kaolack		X	

Institutional Data

Parent (Electricity Sector Support Project-P125565)

Practice Area (Lead)

Energy & Extractives

Contributing Practice Areas

Cross Cutting Topics

[ ] Climate Change

[ ] Fragile, Conflict & Violence

[ ] Gender

[ ] Jobs

[ ] Public Private Partnership

Sectors / Climate Change

Sector (Maximum 5 and total percent must equal 100)

Major Sector	Sector	Percent	Adaptation Co-benefits percent	Mitigation Co-benefits percent
Energy and mining	Transmission and distribution of electricity	85		80
Public Administration, Law, and Justice	Public administration - Energy and mining	15		52
Total		100		

Themes

Theme (Maximum 5 and total percent must equal 100)

Major theme	Theme	Percent
Urban development	City-wide infrastructure and service delivery	46
Financial and private sector development	Infrastructure services for private sector development	46
Rural development	Rural services and infrastructure	8
Total		100

Additional Financing (Additional Financing to the Senegal Electricity Sector Support Project - P158655)

Practice Area (Lead)

Energy & Extractives

Contributing Practice Areas

Cross Cutting Topics

[ ] Climate Change

[ ] Fragile, Conflict & Violence

[X] Gender

[ ] Jobs

[ ] Public Private Partnership

Sectors / Climate Change

Sector (Maximum 5 and total percent must equal 100)

Major Sector	Sector	Percent	Adaptation Co-benefits percent	Mitigation Co-benefits percent
Energy and mining	Transmission and distribution of electricity	85		10
Public Administration, Law, and Justice	Public administration- Energy and mining	15		
Total		100		

☐I certify that there is no Adaptation and Mitigation Climate Change Co-benefits information applicable to this project.

Greenhouse Gas Accounting

Baseline Emissions	5,219 tCO_2	Project Emissions	4,566 tCO_2	**Net reduction**	652 tCO_2

Themes

Theme (Maximum 5 and total percent must equal 100)

Major theme	Theme	Percent
Urban development	City-wide infrastructure and service delivery	46
Financial and private sector development	Infrastructure services for private sector development	46
Rural development	Rural services and infrastructure	8
Total		100

Consultants (Will be disclosed in the Monthly Operational Summary)

Consultants Required? Consultants will be required

I. Introduction

1. This Project Paper seeks the approval of the Executive Directors to provide an additional IDA Scale Up Facility Credit, for which Senegal has been deemed eligible, in the amount of US$70 million to the Republic of Senegal for the Electricity Sector Support Project (P158655). The proposed Additional Financing (AF) will scale up and finance new activities under a well-performing parent project. The AF also leverages parallel co-financing in the amount of US$94 million from the European Investment Bank (EIB). The project development objectives (PDOs) are to contribute to (a) reducing SENELEC's technical and commercial losses; and (b) improving the reliability of electricity services in selected areas focusing primarily on Greater Dakar.

2. The PDOs will remain unchanged, and the proposed AF will make additional investments in the transmission and distribution (T&D) network of SENELEC (*Société Nationale d'Électricité du Sénégal*), the national power utility, as well as scale up measures to address losses to improve SENELEC's commercial performance and in turn improve service quality to customers. As part of the AF, it is proposed to extend the project closing date by four years, to October 31, 2020. This is the first AF and first extension of the project.

II. Background and Rationale for Additional Financing in the amount of US$70 million

Country Context

3. **Senegal aspires to become a middle-income country by 2035**. However, it has been trapped in a low-growth equilibrium since 2006. Over the last decade, Senegal has been outperformed by other countries in Sub-Saharan Africa, which grew at an average rate of 6 percent whereas growth in Senegal averaged only 3.3 percent. Moreover, while output per capita grew slowly, the volatility of growth was greater than that of other West African Economic and Monetary Union countries.

4. **In 2015, gross domestic product (GDP) grew by 5.4 percent, the highest rate since 2008**. Real GDP growth is projected at around 6 percent for 2016–2017, with the economy driven mainly by a rebound in agriculture, lower oil prices, reduced production costs, and lower electricity subsidies, as well as growth in the services sector, particularly telecommunications and financial services.[1] Nevertheless, Senegal's economy and the challenge of poverty reduction remain exposed to external shocks and natural disasters.

5. **Poverty remains high at 46.7 percent according to the 2011 Poverty Household Survey using the national poverty line, and the number of poor people has risen during 2006–2011**. Inequality is slightly lower than the Sub-Saharan Africa average. However, geographic disparities are pronounced, with almost two out of three residents in rural areas being poor, especially in the south, as against one in four in Dakar. Given an estimated annual population growth rate of 2.5 percent, GDP growth remains well below the rate necessary for significant poverty reduction. More broadly, a majority of the Millennium Development Goals were not achieved. Senegal

[1] *Situation Economique et Financière en 2015 et Perspectives en 2016*, Ministère de l'Economie, des Finances et du Plan, Direction de la Prévision et des Etudes Economiques, 2015.

ranked 170 out 188 countries on the United Nations Development Programme's Human Development Index in 2015.

6. **Senegal has made advances in gender equality despite constraints related to women's rights and social and economic empowerment.** Women in Senegal are still confronted with hardship in their daily life, especially in rural areas, where they represent approximately 70 percent of the labor force. Women have high rates of illiteracy (60 percent compared to 34 percent of men) and maternal mortality and morbidity rates are high. Gender disparities and discriminatory practices persist in many domains, disadvantaging women (for example, men are legally considered heads of households, limiting women's agency). The new constitution of 2001 reaffirms the principle of equity and gender equality and prohibits all forms of discrimination based on gender. In 2010, the Gender Parity Law was adopted, raising the proportion of seats held by women in National Parliament to 43 percent in 2014 (up from 23 percent in 2012). In 2014, the Global Gender Gap Report ranked the country 77 out of 142, up from 102 out of 134 five years earlier (World Economic Forum).

7. **To reverse these current socioeconomic trends, the Government of Senegal (GoSN) has developed an ambitious program that prioritizes economic diversification and exports**. The 2014 Emerging Senegal Plan (*Plan Sénégal Emergent 2014*, PSE) is the authorities' blueprint to help Senegal exit the trap of low growth and high poverty. It intends to make Senegal a hub for West Africa by achieving high rates of equitably shared economic growth. The plan is articulated around three pillars: (a) higher and sustainable growth through structural transformation; (b) human development and social protection; and (c) improved governance, peace, and security. As the energy sector affects almost every facet of the Senegalese economy, a key part of the PSE is to improve the quality of electricity service. This AF will contribute directly to the PSE's first pillar on higher and sustainable growth by increasing the quality of electricity supply. Unreliable electricity supply is one of the key constraints to private sector growth in Senegal.

Sector and Institutional Context

8. **Senegal's energy sector is overseen by the Ministry of Energy and Development of Renewable Energies.** SENELEC is a state-owned enterprise that has a monopoly for T&D. SENELEC also owns about half of the generation capacity, with the remainder being owned by independent power producers (IPPs) that generate electricity and sell it exclusively to the utility. An independent Electricity Regulatory Commission (*Commission de Régulation du Secteur de d'Electricité,* CRSE) was established in 1998 with the responsibility of approving revenue requirements for the sector and overall regulation, including licensing and leading IPP tender processes. The sector also includes the rural electrification agency (*Agence Sénégalaise d'Electrification Rurale,* ASER).

9. **The high cost of electricity in Senegal impedes the competitiveness of industry and affordability of energy for households**. The average electricity tariff is US$0.24 per kWh compared to global average of approximately US$0.10 per kWh. The average electricity tariff is well above that of other key markets in the sub-region, such as Nigeria at US$0.09 per kWh, Ghana at US$0.11 per kWh, and Côte d'Ivoire at US$0.13 per kWh. The high tariff level makes electricity expensive for households with access to electricity. Current levels of access are 57 percent on average, with 88 percent access in urban areas, and 27 percent access in rural areas.

10. **Electricity supply has grown substantially, but has still not been sufficient to keep pace with peak demand or meet latent demand.** The available installed capacity increased from 540 MW in 2010 to 605 MW in 2016,[2] an increase of 12 percent. The situation has improved recently with new power plants coming online, such as the Taiba Ndiaye IPP Project in March 2016. However, the increase in installed capacity compares to an increase in peak demand from 429 MW in 2010 to an estimated 564 MW in 2016, an increase of 32 percent. The main reasons why supply increases have not kept pace are the sector financial challenges and the limited success in planning and implementing new generation projects.

11. **Senegal's energy mix today is highly dependent on imported oil products, with thermal capacity accounting for 90 percent of electricity dispatched to the grid. Hydropower** imports from the *Organisation pour la Mise en Valeur du fleuve Sénégal* (OMVS) account for only 10 percent of electricity dispatched to the grid. Overall losses and unserved energy (a proxy for blackouts) are still high at about 20 percent and 37.3 GWh per year in December 2015 compared to SENELEC and GoSN targets of 17 percent and 10 GWh per year. Network losses are compounded by low bill payment rates by municipalities, which has forced SENELEC to accumulate over US$200 million in debt to cover operating costs.

12. **The financial performance of the sector has improved but remains exposed to oil price shocks.** Operating costs are highly dependent on global oil prices because over 90 percent of electricity generated in Senegal uses heavy fuel oil (HFO) and diesel. An automatic fuel price adjustment mechanism built into the tariff structure allows SENELEC to be compensated for revenue shortcomings according to the concession agreement. This has translated into a high dependency of SENELEC on direct subsidy transfers from the GoSN, channeled since 2011 through the special fund for electricity. Lower global oil prices in 2015 helped reduce costs, reduce the burden of the electricity sector on the national budget, and restore financial viability in the short term. Direct transfers to the sector through the Energy Support Fund (*Fonds Spécial de l'Energie,* FSE) have been reduced from 2.4 percent of GDP in 2012 to 0.4 percent of GDP in 2015 and are expected to be zero in 2016. However, the sector remains highly vulnerable to global price shocks, underlining the importance of developing a more diversified power mix.

13. **The GoSN launched a sector reform process in 2011 as a consequence of the energy crisis and developed a Letter of Energy Sector Development Policy (LESDP) outlining ambitious objectives to improve the sector's performance in the medium to long term**. The objective of the policy program is to improve reliability and affordability of access to modern electricity services in a sustainable manner by (a) ensuring energy security and increasing the energy access for all; (b) developing an energy mix combining thermal generation, bioenergy, and renewables and seizing the opportunities of regional interconnections; (c) continuing and accelerating the liberalization of the energy sector by encouraging independent production and sector institutional reform; (d) improving the competitiveness of the sector to lower the cost of energy and reduce sector subsidies; and (e) strengthening sector regulation. A number of important governance changes have been implemented in recent years but progress in implementing the LESDP has been slow.

[2] These values exclude units that have been taken out of operation for maintenance and include some operational rental units.

14. **The GoSN is in the process of relaunching the program along three policy pillars:** (a) management and commercial performance of SENELEC; (b) the institutional framework and options for unbundling; and (c) grid extension and rural electrification.

- **Management and commercial performance of SENELEC.** A performance contract between the GoSN and SENELEC has been in place since 2012. This includes agreement on a system of bonuses and sanctions to improve the management and commercial performance of SENELEC and to improve the reliability of services to ensure that consumers benefit from improved quality of electricity delivered. This has resulted in (a) improved transparency and better monitoring of the results achieved and the resources available to SENELEC (tariffs, subsidies); and (b) performance incentives for staff through the establishment of a link between the results of the company and remuneration. An extension of the performance contract for 2016 has been signed. A new performance contract for 2017–2019 is currently under negotiation (expected to be signed in September 2016). This will include a more focused and reduced number of indicators and a strengthened performance incentive system. The GoSN is also looking into measures to strengthen the SENELEC board and increase its independence.

- **Options for unbundling and institutional structure.** The GoSN is exploring various options for unbundling to improve the sector's governance and long-term sustainability. In preparation, governance changes have been supported by the parent project. SENELEC has started the process of separating accounts for generation, transmission, and distribution activities and has carried out an inventory of physical assets. This will allow for a performance assessment of each activity. SENELEC's ownership model will also be reassessed.

- **Grid extension and rural electrification.** This pillar promotes universal access by ensuring affordability of modern electricity services in large areas of the country that are presently only partially served. The rural concession model has been introduced in Senegal with limited success. By the end of 2015, only 7,321 rural households were connected against a target of 106,600 (this refers to connections made by the six concessions under the ASER; it does not include the 8,829 rural connections added by SENELEC in 2015). Affordability issues, especially in rural areas, have been hampering the achievement of the GoSN's objectives of universal access to modern energy services. An important action is the harmonization of urban and rural tariffs. A study is currently under way with European Union (EU) funding that will inform reforms in this area, incorporating best practice recommendations. In addition, there is a need to subsidize connection costs. A World Bank-supported carbon finance project is under preparation for this purpose.

15. **In parallel, while progress has been made in improving the performance of SENELEC, substantial investments are still needed to ensure a medium-term plan for generation and to improve T&D.** SENELEC has developed a Priority Action Plan (PAP) for 2016–18. The PAP identifies specific investments needed in the electricity system to improve quality of service standards. The total investment program over three years is valued at US$170 million. The GoSN has committed CFAF 20 billion (about US$34 million) to the first year of the PAP, with additional support likely in the second and third years. In addition to the PAP, SENELEC has prepared a Strategic Plan that provides a longer-term aspirational vision for sector growth. The PAP is intended to lay the foundation for the Strategic Plan.

16. **The proposed AF comes at a critical time to support the GoSN in implementing its energy sector reform package.** The AF will support key policy actions and invest in measures to scale up infrastructure to improve overall system efficiency, reduce technical and nontechnical losses, and improve bill collection. Implementation of the AF activities is expected to bring in revenue of more than CFAF 3.5 billion (about US$6 million) per year to SENELEC through reduced losses and increased bill collection. The GoSN's policy focuses in the first instance on decreasing losses and improving collections as this is a less politically sensitive solution than increasing tariffs (which, as described earlier, are already among the highest on the African continent). Key project activities include the installation of prepaid meters for residential customers and intelligent meters for large customers, which even under the current tariffs could improve allocation and targeting of the subsidies; this, in turn, will help improve SENELEC's commercial performance and cash position. In addition to increasing revenues, the project will support the GoSN's policy to improve SENELEC's operational and financial turnaround, focusing on decreasing operational costs (for example, maintenance and fuel); improving access to working capital; and reducing administrative costs. Building on the activities financed under the parent project, the AF will also support the GoSN in assessing the best option to revise utility ownership while in parallel reinforcing the role of the regulator to ensure appropriate sector institutional oversight.

17. **Activities to be scaled up under the AF are essential to ensuring that consumers are able to reap the benefits arising from new generation.** With the Bank's support, SENELEC is finalizing a credible generation plan, which outlines the path to a diversified energy mix and boosting generation capacity to meet growing demand while reducing the cost of supply. The plan will help limit exposure to global oil price shocks. The least-cost generation plan will likely incorporate recent offshore gas discoveries through gas to power, as well as various solar projects, including those supported through the World Bank Group's Scaling Solar Program, which is currently under preparation.

Status of the Parent Project

18. **The Electricity Sector Support Project (P125565), a US$85 million equivalent IDA credit, was approved on July 26, 2012 and became effective on January 1, 2013.** The PDOs are to contribute to (a) reducing SENELEC's technical and commercial losses and (b) improving the reliability of electricity services in selected areas focusing primarily on Greater Dakar. SENELEC is the project implementing entity. The parent project consists of the following four components:

- **Component 1: Upgrading and Modernization of the Transmission and Distribution Network.** This component includes (a) the upgrading, rehabilitation, or replacement of existing transmission lines and substations in the interconnected network; (b) the upgrading of the distribution network from 6.6 kV to 30 kV in Greater Dakar; (c) the installation of at least 15 remotely controlled medium voltage/low voltage (MV/LV) distribution substations in Greater Dakar; (d) the extension and densification of the distribution network in Greater Dakar; and (e) the extension of the interconnected network to reach isolated secondary consumption centers.

- **Component 2: Improve SENELEC's Commercial Performance.** This component aims at improving SENELEC's commercial performance by reducing the cost of billing, increasing bill collection, and reducing nontechnical losses through fraud reduction. This component includes (a) the installation of 150,000 standard transfer specification-compliant split prepaid meters; (b) the installation of about 10,000 electronic smart meters and a remote meter reading system;[3] and (c) the installation of a new electricity customer management system for SENELEC.

- **Component 3: Long-term Strategic Outlook.** This component aims at carrying out studies designed to assist Senegal in developing a long-term strategy for its energy sector, regarding (a) energy diversification; (b) private sector participation in the energy sector; (c) strengthening of the energy sector's governance, efficiency, transparency, and accountability; and (d) SENELEC's financial restructuring and electricity tariff review. This component has also supported an audit of the performance contract between the GoSN and SENELEC, which has substantially improved the ability to track key performance indicators across the sector.

- **Component 4: Project Implementation, Communication, and Monitoring and Evaluation.** This component provides financing for project coordination, supervision, financial management (FM), communication and outreach, procurement, supervision of implementation of the safeguard instruments, and monitoring and evaluation, including through the provision of technical assistance, training, goods, and audit services

19. **The project is rated satisfactory for progress toward the development objective and overall implementation progress in the most recent Implementation Status and Results Report.** The project has been rated moderately satisfactory or above on both of these indicators in the previous 12 months. The mid-term review of the project took place in January 2015. Main recommendations included: (i) strengthening of financial management control mechanisms (including quality and timing of reporting, internal control, and availability of counterpart financing); and (ii) speeding up procurement processes and disbursements to accelerate implementation. Since the mid-term review, the quality and timing of financial reporting have improved as has the availability of counterpart financing, and the implementing agency is in the process of recruiting an internal auditor for the project (dated covenant under the proposed AF). Disbursements have also picked up, reaching 56.37 percent in early July 2016 and forecasted to reach 60 percent by the end of July 2016. Commitment of project funds is about 90 percent of available financing (with a projection of 100 percent to be reached by September 2016). The overall performance of the parent project on procurement and FM are assessed as moderately satisfactory. A series of measures to strengthen the project fiduciary performance will be implemented in tandem with the AF. The recipient is currently in compliance with all but one recurrent legal covenant under the project. The table below provides an update on each of the recurrent covenants as of June 30, 2016.

[3] In addition, given the success of the project, this activity leveraged financing from the French Development Agency for an additional 15,000 smart meters.

Table 1. Status of Recurrent Legal Covenants – Parent Project

Covenant	Status
The Recipient shall ensure that (1) SENELEC's electricity tariffs are reviewed not later than January 1, April 1, July 1 and October 1 in each Fiscal Year… to ensure that SENELEC receives the maximum allowed revenue as specified in Schedule 2.Section V. A of the Financing Agreement	Met
The Recipient shall ensure that SENELEC maintains a level of Accounts Receivables from electricity sales not exceeding 95 days in each Fiscal Year throughout Project implementation (Schedule 2.Section V. B of the Financing Agreement)	As of June 30, 2016, Accounts Receivables stands at 125 days. This is mainly due to arrears of municipalities and semi-public entities.
The Recipient shall (i) ensure that no later than November 30 of each year during implementation, SENELEC informs the Recipient and the Association of a forecast of SENELEC's EBITDA over debt service ratio…; (ii) cause SENELEC to maintain such ratio at a level equal to or greater than 1.2 through the end of 2018 and 1.4 thereafter. (Schedule 2.Section V. C of the Financing Agreement)	Met

20. **Project implementation is progressing steadily.** Under Component 1, Upgrading and Modernization of the Transmission and Distribution Network, all contracts are advancing well despite a few implementation issues. These issues include the rehabilitation of the Hann-Cap de Biche transmission line and the rehabilitation of the high-tension substation at Cap de Biche, which are delayed mainly due to unforeseen technical reasons. At the same time, other activities under Component 1 have already been completed, including the network extensions and densifications in Koumpentoum, Koungheul, Nganda, Ourossogui, and Orefonde, which are contributing to achieving the PDOs. These activities have allowed people to have electricity 24 hours per day, compared to seven hours per day previously, with a positive impact on education, health, and economic activities.

21. **Component 2 is advancing satisfactorily.** SENELEC mainstreamed the installation of prepayment meters for all new connections while in parallel scaling up efforts to combat nontechnical losses. Due to the large uptake of prepaid meters, SENELEC is currently facing issues with its reserve stock. The only activity still under procurement under Component 2 is the installation of SENELEC's new commercial and information system.

22. **Under Component 3, most of the studies supported are either completed or under way.** The component has successfully financed several advisory activities that have provided inputs to the GoSN's sector reforms and identified measures to improve SENELEC's performance. These include the integration of renewable energies in SENELEC's energy mix and network, regular audit of the performance contract and preparation of the new contract for 2017–2019 (ongoing), feasibility of liquefied natural gas introduction in the country's energy mix, SENELEC's overall risks analysis, and SENELEC's management and organizational audit and tariff study. Key ongoing studies include the sector institutional and organizational audit as well as SENELEC's accounting separations (both scheduled to be completed by March 2017).

23. **Activities under Component 4 are focused on supporting project implementation.** These are being implemented to ensure smooth and timely implementation. In particular, the component financed studies and capacity reinforcement in several areas, such as social and environmental aspects, fiduciary, and project monitoring and evaluation.

Rationale for AF

24. **In line with OP/BP 10.00, Investment Project Financing, the proposed AF will provide support to scale up and maximize the development impact of the Electricity Sector Support Project.** The proposed AF will contribute to achieving the key medium-term results of the PAP, namely a reduction of total losses to 17 percent and at least 60 percent of SENELEC clients on prepaid meters. The AF will focus on investments to reinforce the T&D system (Component 1) and improve the commercial performance of SENELEC (Component 2) during the initial years of the PAP, as well as strategic analytical and advisory support in the form of studies and technical assistance to support the implementation of the GoSN reforms and credible generation options (Component 3). Additional support for project implementation (Component 4) will also be provided.

25. **The activities proposed under the AF are consistent with the PDOs of the Electricity Sector Support Project, and the AF will retain the same implementation arrangements.** Although the IDA envelope for the AF is limited to US$70 million, a larger volume of investments has been identified by the GoSN and SENELEC, in particular regarding the upgrading, rehabilitation, and replacement of existing transmission lines and substations. The final choice of investments to be financed under the project will be made based on several criteria, particularly advancement of procurement documents and safeguards studies, as well as urgency for continuity of services.

26. **The proposed AF is strategically aligned with the World Bank Group's twin goals of reducing extreme poverty and promoting shared prosperity, Senegal's Second Poverty Reduction Strategy Paper, the GoSN's priorities as outlined in the PSE and LESDP, and the World Bank's FY13–17 Country Partnership Strategy (CPS) for Senegal (Report No. 73478-SN).** Electricity is a critical engine of economic growth, which is the most effective means of reducing poverty and boosting shared prosperity. Most economic activities will be impossible without electricity. Reliable, competitively priced electricity is essential for competitiveness, business development, job creation, and income generation. Electricity access is also a vital catalyst for wider social development, including the delivery of social services, such as health and education, which help lift populations out of poverty and enable economic growth. Lighting, refrigeration, and effective sterilization procedures enabled by electricity supply make health care far more effective, while electricity improves education by enabling superior lighting and powering of computers.

27. **The FY13–17 CPS supported Senegal's National Social and Economic Development Strategy priorities (today reflected into the PSE) and Senegal's efforts to engage in a recovery and a higher-growth and shared prosperity path over the medium term.** This CPS is built upon the foundation of strengthening the governance framework and building resilience. CPS Pillar 1 focuses on accelerating growth and creating employment, including an outcome related to improving access to energy. The proposed AF is also aligned with the guiding principles

included in the World Bank Group's energy sector directions paper, *Toward a Sustainable Energy Future for All: Directions for the World Bank Group's Energy Sector*, in particular in seeking market solutions to leverage financial resources and help governments foster private sector participation and investments.

28. **The timing of the proposed operation is critical to support the GoSN reform process and leverage financing from other donors.** The GoSN's and SENELEC's ownership of the Electricity Sector Support Project is strong and has improved over time. The continuous and increased IDA engagement in the sector will allow to leverage project funds to attract parallel co-financing from the EIB in the amount of US$94 million, expected to be approved in late 2016 (US$14 million of which will be in the form of a grant from the EU Commission to the EIB for on-granting to Senegal) to complement the project activities. Table 1 summarizes the financing plan for the project. Furthermore, the German Development Bank (*Kreditanstalt für Wiederaufbau*, KfW) is also preparing a separate investment project with activities modelled on the project.

Table 2. Electricity Sector Support Project Financing Plan (US$, millions)

Component	IDA Original Credit	IDA AF Credit*	EIB *	GoSN Original Contribution	GoSN AF Contribution	Total
Component 1: Upgrading and modernization of the T&D Network	41.5	35.0	74.5	4.8	0.0	**155.7**
Component 2: Improve SENELEC's Commercial Performance	32.3	23.0	19.4	3.2	0.0	**77.9**
Component 3: Long-term Strategic Outlook	8.3	8.0	0.0	0.0	0.0	**16.3**
Component 4: Project Implementation, Communication, and Monitoring and Evaluation	3.0	4.0	0.0	0.5	4.0	**11.5**
Total	**85.0**	**70.0**	**93.9**	**8.5**	**4.0**	**261.4**

Note: Each of the IDA and EIB financing will fund 100 percent of their respective activities under a parallel financing arrangement with separate financing agreements. *All amounts include price contingencies.

29. **The proposed AF is a key element of a suite of World Bank Group (WBG) instruments supporting the power sector value chain in Senegal, including generation, transmission, distribution, and improvement of SENELEC's performance.** The WBG program is anchored in strong sector dialogue with the authorities, focusing on lowering the cost of energy through cheaper and more mixed generation, better governance and management of the power sector, and ensuring reasonably priced energy access in rural areas. The proposed AF will also complement the first objective of the energy-related objectives within the intended nationally determined contributions made by the GoSN as part of the 21st annual Conference of the Parties process in Paris 2015.

30. **Policy support is provided through, among others, a series of IDA-financed programmatic budget support operations concluded in 2015.** These have led to the Letter of Development Policy for the Energy Sector, the performance contract with SENELEC, and an addendum to the performance contract to include a performance-based mechanism for SENELEC staff. Going forward, WBG support (in particular the next phase of budget support operations

under preparation) will focus on achieving key actions identified in the GoSN energy sector reform program.

31. **The proposed AF complements other WBG operations to bridge supply and reduce the cost of generation by addressing key T&D bottlenecks.** The WBG-supported dual fuel private power investment at Taiba Ndiaye, which came online in mid-March 2016, will alleviate the need for emergency rentals and thus meet expanding demand at lower cost. In addition, the Bank-supported *Organisation pour la Mise en Valeur du fleuve Gambie* (OMVG - The Gambia River Basin Development Organisation) Interconnection Project (P146830) will link Senegal to Guinea, providing access to its extensive hydropower potential at lower cost, while also connecting the Casamance and Senegal Oriental regions to the national grid. A project to extend the OMVS system is also under preparation with the World Bank support, which will enable the enhanced hydro capacity (from the Manantali hydropower plant as well as from the forthcoming Gouina hydropower plant) to be evacuated efficiently by interconnecting the OMVS and OMVG at Tambacounda. The World Bank is supporting the access agenda in Senegal through The Sustainable Energy for All Technical Assistance Program (P145845) that is helping to develop an investment prospectus to reach the GoSN access goals and the Sustainable and Participatory Energy Management Project for Senegal that contributes to increasing the availability of diversified household fuels. Senegal is also due to benefit from the Banda Gas to Power Guarantee Project (P145664), for which IDA is providing guarantees to Mali, Mauritania, and Senegal. The WBG is also working with the GoSN to prepare a support package for a quick, transparent tender process for the development of 50 MW to 200 MW of solar IPP projects in the context of the Bank Group Scaling Solar Program, supported jointly by IDA, International Finance Corporation, and Multilateral Investment Guarantee Agency.

III. Proposed Changes

Summary of Proposed Changes	
The proposed AF will support SENELEC to scale up investments under the Electricity Sector Support Project. The activities under the AF are aligned with the existing PDO and will be incorporated under existing project components. A closing date extension of four years and one month, to October 31, 2020, is proposed to allow for completion of activities under the project, particularly the AF, and to align with the timeline of investments receiving parallel co-financing from the EIB. The disbursement estimates and implementation schedule are revised in line with the proposed new activities and closing date. The project results framework has also been updated.	
Change in Implementing Agency	Yes [ ] No [X]
Change in Project's Development Objectives	Yes [ ] No [X]
Change in Results Framework	Yes [X] No [ ]
Change in Safeguard Policies Triggered	Yes [ ] No [X]
Change of EA category	Yes [ ] No [X]
Other Changes to Safeguards	Yes [ ] No [X]
Change in Legal Covenants	Yes [ ] No [X]
Change in Loan Closing Date(s)	Yes [X] No [ ]

Cancellations Proposed	Yes [ ] No [X]
Change in Disbursement Arrangements	Yes [ ] No [X]
Reallocation between Disbursement Categories	Yes [ ] No [X]
Change in Disbursement Estimates	Yes [X] No [ ]
Change to Components and Cost	Yes [X] No [ ]
Change in Institutional Arrangements	Yes [ ] No [X]
Change in Financial Management	Yes [ ] No [X]
Change in Procurement	Yes [ ] No [X]
Change in Implementation Schedule	Yes [X] No [ ]
Other Change(s)	Yes [ ] No [X]

Development Objective/Results

Project's Development Objectives

Original PDO

The project development objectives are to contribute to: (i) reducing SENELEC's technical and commercial losses; and (ii) improving the reliability of electricity services in selected areas focusing primarily on Greater Dakar.

Change in Results Framework

Explanation:

The results framework has been updated. In particular, the PDO indicators have been revised to align with the system-wide indicators included in SENELEC's performance contract and reflect the results of the additional activities. These indicators are monitored on a quarterly basis by an external auditor and are aligned with the key metrics to assess sector performance. End target dates have been updated to reflect the proposed new project closing date. A PDO-level indicator related to beneficiary feedback ("average response time to customer complaints") has been added.

Compliance

Covenants - Additional Financing to the Senegal Electricity Sector Support Project - P158655

Source of Funds	Finance Agreement Reference	Description of Covenants	Date Due	Recurrent	Frequency	Action
IDA	Front-end Fee	The Front-end Fee payable by the Recipient shall be equal to one quarter of one percent (¼ of 1%) of the Credit amount. The Recipient shall pay the Front-end Fee not later than sixty days after the Effective Date. Article II, 2.03 of the Financing Agreement.	31-Dec-2016	☐		New

IDA	Internal auditor	The Project Implementing Entity shall, not later than one (1) month after the Effective Date, employ and thereafter maintain at all times during project implementation, an internal auditor whose qualifications, experience and terms of reference shall be acceptable to the Association. Section I, A of the Project Agreement (2).	30-Nov-2016	☐		New
IDA	Project Implementation Manual	The Project Implementing Entity shall, not later than one (1) month after the Effective Date (a) update under terms of reference acceptable to the Association, and furnish to the Recipient and the Association, an implementation manual for the Project containing detailed arrangements and procedures, specified in Section I, C, 1 of the Project Agreement and thereafter adopt such PIM as shall have been approved by the Association.	30-Nov-2016	☐		New
IDA	Project accounting software	The Project Implementing Entity shall, not later than three (3) months after the Effective Date update its accounting software to include the Project. Section II, B, 3.	31-Jan-2017	☐		New

Conditions

Source Of Fund	Name	Type
IDA	Execution of Subsidiary Agreement, Article V, 5.01	Effectiveness

Description of Condition

The Additional Condition of Effectiveness consists of the following, namely that the Subsidiary Agreement has been executed on behalf of the Recipient and the Project Implementing Entity.

Source Of Fund	Name	Type
IDA	Execution of Subsidiary Agreement, Article V, 5.02	Effectiveness

Description of Condition

The Subsidiary Agreement has been duly authorized or ratified by the Recipient and the Project Implementing Entity and is legally binding upon the Recipient and the Project Implementing Entity in accordance with its terms.

Source Of Fund	Name	Type
IDA	Withdrawal Conditions; Withdrawal Period	Disbursement

Description of Condition
Notwithstanding the provisions of Part A of Section IV of the Financing Agreement, no withdrawal shall be made (a) from the Credit Account until the Association has received payment in full of the Front-end Fee; or (b) for payments made prior to the date of this Agreement.

Risk

Risk Category	Rating (H, S, M, L)
1. Political and Governance	Moderate
2. Macroeconomic	Moderate
3. Sector Strategies and Policies	Substantial
4. Technical Design of Project or Program	Moderate
5. Institutional Capacity for Implementation and Sustainability	Substantial
6. Fiduciary	Moderate
7. Environment and Social	Low
8. Stakeholders	Moderate
9. Other	
OVERALL	Substantial

Finance

Loan Closing Date - Additional Financing (Additional Financing to the Senegal Electricity Sector Support Project - P158655)

Source of Funds	Proposed Additional Financing Loan Closing Date
International Development Association (IDA)	31-Oct-2020

Loan Closing Date(s) - Parent (Electricity Sector Support Project - P125565)

Explanation:

A closing date extension of four years and one month is proposed to allow for completion of some of the remaining activities under the parent project and completion of the activities to be supported by the AF.

Ln/Cr/TF	Status	Original Closing Date	Current Closing Date	Proposed Closing Date	Previous Closing Date(s)
IDA-51450	Effective	30-Sep-2016	30-Sep-2016	31-Oct-2020	

Change in Disbursement Estimates (including all Sources of Financing)

Explanation:

Disbursement estimates are updated to reflect the proposed AF and the undisbursed balance under the original project, taking into account the proposed new closing date.

Expected Disbursements (in USD Million)(IDA Financing)

Fiscal Year	2017	2018	2019	2020	2021
Annual	10.00	35.00	30.00	20.00	9.00
Cumulative	61.00	96.00	126.00	146.00	155.00

Allocations - Additional Financing to the Senegal Electricity Sector Support Project - P158655

Source of Fund	Currency	Category of Expenditure	Allocation	Disbursement % (Type Total)
			Proposed	Proposed
IDA	EUR	(1) Goods, works, non-consulting services, Training, Operating Costs, and consultants' services for the Project (except Parts A.2, A.3, B.1, B.2, and B.3)	62,800,000	100
		Total:	62,800,000	100

Components

Change to Components and Cost

Explanation:

The proposed AF will finance additional activities under the existing Electricity Sector Support Project components as described below.

- ***Component 1: Upgrading and Modernization of the Transmission and Distribution Network (US$110 million, of which IDA US$35 million and EIB US$74.5 million [of which EU US$14 million grant]).*** The AF will finance selected activities of the PAP to strengthen SENELEC's T&D network and increase capacity to manage the network to reduce losses and improve network availability, reliability, and network safety. IDA-supported activities will include investments along the following lines:

  - Upgrading, rehabilitation, or replacement of existing transmission lines and substations in the interconnected network, including rehabilitation of 13 existing MV/LV substations; updating and standardization of SENELEC's electrical protection systems; rehabilitation of the radio system and telecommunications of SENELEC's network; and network expansion with a third bay transformer of 40 MVA/30 KV in Touba's substation

  - Installation of at least 15 remotely controlled MV/LV distribution substations in Greater Dakar, including installation of remote control for switching (circuit breaker and disconnector) devices in 90 MV substations.

  - Extension and densification of the distribution network in Greater Dakar, including creation of 61 MV/LV substations; installation of 100 km of MV lines; and installation of 34 km of LV lines.

  - Extension of the interconnected network to reach isolated secondary consumption centers, including creation of 40 MV/LV substations, installation of 464 km of MV lines, and installation of 93 km of

LV lines.

EIB investments include grid extension such as the following:

- Upgrading, rehabilitation, or replacement of existing transmission lines and substations in the interconnected network area of the recipient's territory, including rehabilitation of two existing MV/LV substations and updating and standardization of SENELEC's electrical protection systems.
- Extension and densification of the distribution network in the Greater Dakar, Dabo, and Velingara regions.
- Extension of the interconnected network to reach isolated secondary consumption centers of the recipient's territory, including in the areas of Tangori, Baila, Kounkane, and Medina Gounass.

- ***Component 2: Improve SENELEC's Commercial Performance (US$42 million, of which IDA US$23 million and EIB US$19.4 million).*** IDA-supported activities will include investments that improve SENELEC's commercial performance by increasing bill collection and reducing nontechnical losses through fraud reduction, such as the following:
  - Additional prepayment meters. This will include the supply of an additional 260,000 standard transfer specification-compliant split prepaid meters (in addition to the 150,000 under the parent project), of which 40,000 will be supplied to vendors at farmers markets.
  - Internal wiring for selected LV customers. This activity will include the installation of internal wiring for 12,500 low-income households to enable access and rehabilitation of internal wiring at the farmers markets receiving prepayment meters to improve safety and reduce electricity theft.
  - Develop communication and marketing on SENELEC's prepayment system. This will include gender-sensitive communications such as outreach activities through women's groups to sensitize the population to the hazards of illegal connection, the benefits of bill payment, and the benefits of having safe and legal connections.
  - Support to improve the quality of services provided by SENELEC's customer call center, including expansion of call center facilities and the purchase of associated equipment. This activity is expected to improve SENELEC's ability to engage with customers and gather beneficiary feedback.

  EIB funding would support procurement and installation of an additional 300,000 prepaid meters.

- C***omponent 3: Long-term Strategic Outlook (IDA US$8 million).*** The AF will continue to support SENELEC and the GoSN in developing a medium- to long-term strategy for the energy sector, including technical assistance to conduct strategic studies and support to implement recommendations from strategic studies conducted under the parent project. Activities will include the following:
  - Support for improvement of SENELEC internal governance, focusing on the implementation of the recommendations identified during the first phase of analytical studies under the parent project on risk analysis, monitoring and evaluation tool, administrative, accounting, and financial procedures, accounts separation, and financial restructuring including, where feasible, consideration of gender dimensions.

- Support for sector reform, through technical assistance on topics such as options for private sector participation in the energy sector, a tariff study, an audit of SENELEC's performance contract for 2017-2019, and a regulatory study.

- Support for sector and project planning, such as assistance on natural gas sector development in Senegal; assistance on development and implementation of the Strategic Plan; generation planning software; and updates to the generation, transmission, and distribution planning.

- ***Component 4: Project Implementation, Communication, and Monitoring and Evaluation (US$8 million, of which IDA US$4 million and SENELEC US$4 million).*** The AF will continue to support supervision-related activities. This includes the following:

  - Similar to the parent project, this component will provide support to the Project Implementation Unit (PIU) through the provision of technical assistance, training, operational costs, and support for project coordination, supervision, FM, communication and outreach, procurement, and audit services. In particular, the AF will support any reinforcement capacity needed within the PIU to manage the additional funds, such as the recruitment of supervisory engineering consultants ("owner's engineers") as well as support for fiduciary functions.

  - In terms of monitoring and evaluation, the AF will support a beneficiary survey, including baseline and end-of-project surveys to understand the project's impact, including gender-related impacts. As part of the monitoring of Component 2, the project will track, with the support of the World Bank Gender and Energy Team, the number of women vendors at farmers markets and female household heads who receive a new meter. The survey will also contribute to the project's citizen engagement aspects.

  - The AF will finance studies, communication activities, and technical assistance to ensure that project safeguard measures are systematically carried out throughout the life of the project. Similar to the original project, adequate financial provision to face any potential resettlement arising out of involuntary resettlement will be made available by the Government/SENELEC included in the confirmed US$4 million counterpart funds for the project. The costs associated with the preparation of the project-related safeguard instruments, population information and awareness raising, and monitoring and evaluation will be financed through IDA funds.

The current and revised component costs (all sources of financing) are shown in the following table. With the resources of the AF (including IDA, EIB, and GoSN counterpart funding), total resources under the project will amount to just over US$261 million.

Current Component Name	**Proposed Component Name**	**Current Cost (US$M)**	**Proposed Cost (US$M)**	**Action**
Component 1: Upgrading and modernization of the Transmission and Distribution Network	Component 1: Upgrading and modernization of the Transmission and Distribution Network	46.25	155.7	Revised
Component 2. Improve SENELEC's commercial performance	Component 2. Improve SENELEC's commercial performance	35.5	77.9	Revised
Component 3. Long term strategic outlook	Component 3. Long term strategic outlook	8.25	16.3	Revised

Component 4. Project implementation, communication and monitoring and evaluation	Component 4. Project implementation, communication and monitoring and evaluation	3.5	11.5	Revised
	Total:	**93.5**	**261.4**	

Other Change(s)

Change in Implementation Schedule

Explanation:

SENELEC remains the implementing agency. The implementation schedule is updated to reflect the AF activities and the proposed extension of the project closing date to October 31, 2020.

While EIB will be providing parallel co-financing through a separate financing agreement, the Bank task team is exploring the possibility of using World Bank procurement guidelines for EIB financing. Joint supervision by the World Bank and EIB teams is planned.

IV. Appraisal Summary

Economic and Financial Analysis

Explanation:

The proposed AF is economically viable with an economic internal rate of return (EIRR) of 23 percent for Component 1 and 44 percent for Component 2.

The proposed AF is financially viable with a combined financial internal rate of return (FIRR) of 16 percent for Component 1 and 30 percent for Component 2.

The project economic and financial analyses are limited to Bank investments and do not consider EIB investments due to data limitations. The economic and financial analyses were prepared for the two main investment components: T&D (Component 1) and prepaid meters (Component 2). Alternatives were considered to analyze the impacts of the activities. SENELEC has several planning and load flow models for optimization of the T&D system associated with schemes for expanding the generation. The investment mixes were analyzed by models to come up with the investment program that has the lowest present value of costs and meets the capacity requirements over time. Details of the economic and financial analyses are included in Annex 4.

Justification of public financing. The investment component of the project consists of construction of electricity T&D assets that will remain state owned. Hence, public sector financing is the most efficient and least costly financing mechanism under the existing institutional framework.

Value added of Bank support. The GESP leverages the Bank's experience in neighboring countries and lessons learned from previous and ongoing projects in similar settings.

Component 1

The primary benefits from improving the T&D network come from increased consumption by existing and new customers, from transformer and lines loss reduction, and from outages reduction.

The T&D component of the project will connect new customers to the grid for whom the service of the utility would not be available without the project. The benefits of the electricity delivered to these customers are valued at what they would be willing to pay for the incremental energy supplied by the project.

The economic benefits of loss reduction are calculated using the 'with-without' project approach and evaluated at the willingness to pay since it is assumed that this reduction in losses would translate into an increase in sales. The economic benefits from the reduction of outages are valued at the costs of electricity to the end users (that is, the average opportunity cost of the energy when outages occur).

The economic net present value (NPV) of the project is US$114 million and the EIRR 23 percent (discount rate of 6 percent). The switching values indicate that the project could sustain substantial variations in critical variables before the NPV becomes zero.

The financial benefits are based on average tariff data and increased sales that derive from reduced T&D losses. The financial NPV will be US$56 million and the FIRR 16 percent (discount rate of 6 percent). The switching values indicate that the project could sustain substantial variations in critical variables before the NPV becomes zero.

Component 2

The component is economically viable with an NPV of US$50 million and an EIRR of 44 percent. The component is financially viable with an NPV of US$18 million and an FIRR of 30 percent. The switching values of both the economic and financial analyses of Component 2 indicate that the component is not sensitive to an increase in investments costs or to a reduction of energy saved by the deployment of prepayment meters. The project is however sensitive either to an increase in the cost of the energy sold or to a decrease in sales.

Financial Analysis of SENELEC

Since 2013, SENELEC has reduced unserved demand aided by lower international oil prices and investments that expanded HFO power plants and rehabilitated power generation after a period of severe disruptions. Generation upgrades have resulted in lower production costs, with the amount of emergency rental power in the interconnected system decreasing from 150 MW to 100 MW. Shifting from expensive diesel to cheaper HFO allowed for further savings. SENELEC's tariff compensation (a direct government subsidy provided to the utility to maintain affordable tariffs) has been reduced from about CFAF 120 billion in 2012 to about CFAF 88 billion in 2013 and about CFAF 78 billion in 2014. Annex 3 includes details on the evolution of SENELEC's financial situation from 2006 to 2014 with generation information and information on the number of clients.

Financial projections show a significant improvement of SENELEC's financial position. SENELEC is likely to break even as early as 2016 (see Annex 4 for details, including margins per sale from 2015 to 2020 and profit or loss from 2014 to 2017), and therefore the GoSN is not expected to provide tariff compensation subsidies for the foreseeable future if oil prices remain low. Improvements in the financial sustainability of the sector depend on the coming online of various generation assets, including power imports from neighboring countries, commissioning of Sendou 1 IPP power plant and extra generating capacity at Cap de Biche through the Contour Global IPP, and loss reduction and increased cash collections though the increased use of prepayment meters. Financial projections are highly sensitive to external oil price shocks, potential delays with private sector generation projects, and unforeseen disruptions caused by equipment failure.

SENELEC's activities will generate margins covering the needs of short-term financing. The situation will strongly improve with the commissioning of new, cheaper production units and the regional interconnection in the context of a low crude oil price.

Greenhouse Gas Accounting Analysis

The proposed AF covers T&D infrastructure investments, which are expected to reduce T&D losses. Because the appraisal of the original project did not cover greenhouse gas (GHG) accounting, the impact of both the original and AF on GHG emissions is assessed here. According to the information received from SENELEC, T&D losses are expected to be reduced by at least 1 percentage point as a result of the upgrades. The expected lifetime of these investments is 30 years. These data are used as the basis to estimate net GHG emissions.

The baseline losses are estimated at 285 GWh per year. The emission factor for Senegal based on HFO and diesel generation is assumed as 0.614 tCO_2/MWh (according to the Bank's GHG accounting manual). With 30 years of economic life, the baseline emissions from T&D losses is 5,219 tCO_2.

The T&D losses will be reduced to 249 GWh per year as a result of the project. Using the same emissions factor, emissions with support of the project are estimated to be 4,566 tCO_2 over the economic life of the project. In total, the project reduces GHG emissions by 652 tCO_2 in the 30 years of economic life.

Technical Analysis

Explanation:

The technologies supported by the AF have been successfully implemented by SENELEC and other utilities in Sub-Saharan Africa to strengthen and increase capacity of the network and improve commercial performance.

The project uses well-established technologies to improve network availability, reliability, safety, and reduction of T&D losses. The project presents no unusual construction or operational challenges. The equipment and the technologies used in construction and operation of distribution networks are well-known and proven, including in Senegal. The project will observe conventional electricity utility standards for these works and equipment specification will be based on European/international standards to ensure that proper quality standards are maintained.

Project costs are based on recent prefeasibility studies and inputs from SENELEC. Considering the possibility of relative cost increases during the implementation, a contingency amount has been included in the estimated prices for investment activities under the AF.

Environmental Analysis

A review of the current instrument has been completed, and an action plan is being prepared to ensure that any shortcomings are addressed during the implementation of the AF. The proposed activities under the AF involve construction or civil works with minor environmental impacts. The environmental safeguard documentation of the parent project, including the Environmental and Social Management Framework and Resettlement Policy Framework, has been updated to reflect the revised project scope and was published in the World Bank InfoShop and in-country on May 26, 2016. The Integrated Safeguards Data Sheet has also been updated and disclosed on May 26, 2016. Preparation of the Environmental and Social Management Plan and Resettlement Action Plan will be financed through Component 4. Environmental safeguards implementation is assessed as satisfactory in the most recent Implementation Status and Results Report of the parent project (February 2016).

Social Analysis

A review of the current safeguard instruments has been completed, and an action plan is being prepared to ensure that any shortcomings are addressed during the implementation of the AF. The proposed activities under the AF involve construction or civil works with minor social impacts. The social safeguard documentation of the parent project, including the Environmental and Social Management Framework and Resettlement Policy Framework have been updated to reflect the revised project scope and were published in the World Bank InfoShop and in-country on May 26, 2016. The Integrated Safeguards Data Sheet has also been updated and disclosed. Preparation of the Environmental and Social Management Plan and Resettlement Action Plan will be financed through Component 4. Involuntary resettlement implementation is assessed as satisfactory in the most recent Implementation Status and Results Report of the parent project (February 2016).

Citizen Engagement/Beneficiary Feedback

A beneficiary survey will be conducted in sample villages to gather baseline data to understand key issues around electricity connections, consumer satisfaction, communication with the utility, gender, and social issues. This survey will be done using a mixed methods approach of data collection, focus group discussions, and analysis and will be carried out in two stages: to gather baseline data and to gather impact-level data at project completion. The data collection and focus group discussions will provide a feedback mechanism and help donor and government counterparts develop a more robust monitoring and evaluation system with regard to female and male consumers and reasonable indicators and targets to be considered under the project's results framework.

The project will also provide support to improve the quality of services provides by SENELEC's customer call center including expansion of call center facilities and the purchase of associated equipment. An indicator to this effect has been added to the project results framework.

Gender

Through the support of the World Bank-implemented Energy Sector Management Assistance Program's Africa Gender and Energy Program (P149119), resources have been dedicated to develop knowledge and pilot activities within the energy sector, specifically with the ASER and under the Senegal Second Sustainable and Participatory Energy Management Project (P120629). This has resulted in better development outcomes, increased female participation in decision making, increases in women's incomes, and overall improvement of women's status in the community. With training supported by the Senegal Second Sustainable and Participatory Energy Management Project (P120629), over 1,000 women have emerged as charcoal producers, while the share of total community income going to women has risen from 3 percent in 2009 to 12 percent in 2013 with additional increases expected in the years to come.

On the knowledge front, as part of a larger Bank/Energy Sector Management Assistance Program study on gender and electricity infrastructure, a gender-disaggregated impact analysis of planning and construction phases of T&D investments, as well as the deployment of meters supported by the parent project was carried out to assess project impacts. The analysis focused on land and labor markets and the extent to which T&D investments can promote socioeconomic development in affected areas.

The qualitative research was undertaken from May 25 to June 5, 2015, and focused on five locations: three locations in the Greater Dakar area and two locations in Central Senegal. The study highlighted several gender-related constraints, such as strengthening in project design the means of gender-targeted information sharing (such as written/visual, audio, and video communication) and ensuring that recruitment processes are transparent and reach both men and women equally. Job positions in nontraditional sectors, such as procurement, logistics, auditing, and support activities, may also be targeted to women, through positive discrimination actions and customized training.

The Africa Gender and Energy Program will extend its support to the AF based on the lessons and experienced learned from integrating gender within Senegal's rural energy programs and initial studies on the T&D sector.

SENELEC already has a strong foundation on gender issues through an identified gender focal point and a women's network within the utility. The team will help strengthen the capacity of the gender focal point and work with SENELEC to carry out a basic gender assessment, develop a gender action plan, and provide training for the utility and partners. Further, the team will help integrate gender and social considerations within the project components where feasible, such as supporting the communications campaign on nontechnical losses (under Component 2) and improving the monitoring and reporting on gender where possible.

Financial Management

The FM arrangements for the AF will be the same as those under the parent project. The overall performance of the parent project on FM was assessed as moderately satisfactory during the last FM supervision undertaken in December 2015. Staffing is adequate to handle additional activities; the interim unaudited financial reports for the ongoing project have also been submitted on time and the quality of the reports was satisfactory. However, improvements related to the accounting system and internal control strengthening were identified. There are no internal control activities due to lack of an internal auditor designated for the project. In addition, the software does not generate automatically required financial information, and data are manually restated. Thus, a plan has been agreed with SENELEC to ensure that (a) an internal auditor will be recruited within one month of project effectiveness and conduct audits on a regular basis (approximately once per quarter) for the implementation period to strengthen the internal control of the project; and (b) the accounting software will be updated within three months of project effectiveness to allow automatic generation of financial information.

Procurement

The procurement arrangements for the AF will also be the same as those under the parent project. The procurement risk is assessed as substantial. The following mitigation measures have been agreed: (a) revision of the procurement manual to make clear the decision-making mechanism with thresholds for contract approval and delegation; (b) the training of new staff of the technical departments and the country procurement manager on Bank procurement procedures and on bids evaluation; (c) better definition of the role of procurement staff recruited under the parent project; and (d) improvement of the procurement tracking system.

Risk

The overall risk rating for the project is substantial. Key risks include the following:

- **Sector strategies and policies (Substantial).** Risks in this area are assessed as substantial. The energy sector is in the process of transition with several options being considered for reform. In addition, while SENELEC performance has been strengthened, room for improvement in several keys areas remains. The parent project and AF provide support to SENELEC for further improvements in its operations and overall sector reform, both through strategic studies and technical assistance as well as targeted investments. Through the project and its AF, the Bank team, in collaboration with other donors, will maintain a close sector dialogue with the GoSN/SENELEC counterparts to mitigate risks in this area to the extent possible.

- **Institutional Capacity for Implementation and Sustainability (Substantial).** Project performance has been improving substantially over the past year. The project has therefore been rated moderately satisfactory on procurement and FM aspects in the most recent Implementation Status and Results Report (February 2016). However, some concerns remain regarding the fiduciary capacity of the implementation agency. With regard to FM, an action plan has been agreed to address a few shortcomings highlighted by recent supervision missions, in particular the recruitment of the internal auditor and the proper establishment of the dedicated software to generate automatic financial reporting. Both activities have faced delays and are currently being addressed by the PIU. Similarly, with regard to procurement, the risks

are assessed as substantial and capacity will be strengthened to ensure smooth implementation of the proposed activities.

- **Stakeholders (Moderate).** Bank financing is expected to be approved at the end of July 2016 and is therefore on a faster preparation track than the parallel co-financing from the EIB, which is expected to be approved in late 2016. Although the risk is considered moderate at this stage, there is a risk to the overall project that this parallel co-financing is not approved, which will require a project restructuring. IDA financing will not be affected because no contracts will be jointly financed. The Bank team is closely monitoring the approval of EIB parallel co-financing.

- **Climate and disaster risks.** The AF has been screened for risks related to climate change and disaster risk management. The potential impacts are expected to be negligible. There is a moderate potential impact of climate-related disasters on the network upgrade activities. Dakar is subject to strong winds, particularly in the rainy season (approximately June–September each year), which could delay construction or affect the operations of the network upgrades. These aspects will be monitored during project implementation and works planned accordingly.

V. World Bank Grievance Redress

32. 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.

VI. Beneficiary Feedback

33. In addition to the beneficiary feedback that will be recorded and monitored for all project components through the beneficiary survey proposed under Component 2, feedback will also be gathered through the grievance redress mechanism. The PIU will gather information about activities where complaints have been brought forward. This will include information on how complaints were resolved or relevant follow-up was made, and this information will be included in an annual progress report and taken into account under the project, as relevant, during project implementation.

Annex 1: Revised Results Framework

Project Name:	Additional Financing to the Senegal Electricity Sector Support Project (P158655)			Project Stage: Additional Financing	Status: FINAL
Team Leader(s): Manuel Berlengiero and Chris Trimble		Requesting Unit:	AFCF1	Created by: Thanh Lu Ha on 16-Feb-2016	
Product Line:	IBRD/IDA	Responsible Unit:	GEE07	Modified by: Allison Berg on 6-Jul-2016	
Country:	Senegal	Approval FY:	2017		
Region:	AFRICA	Lending Instrument:	Investment Project Financing		
Parent Project ID:	P125565	Parent Project Name:	Electricity Sector Support Project (P125565)		

Project Development Objectives

Original Project Development Objective - Parent:
The PDOs are to contribute to (a) reducing SENELEC's technical and commercial losses and (b) improving the reliability of electricity services in selected areas focusing primarily on Greater Dakar.

Proposed Project Development Objective - Additional Financing (AF):
No change to the PDO.

Results

Core sector indicators are considered: Yes — Results reporting level: Project Level

Project Development Objective Indicators

Status	Indicator Name	Core	Unit of Measure		Baseline	Actual (Current)	End Target
Revised	Un-served energy (total) per year on the interconnected system	☐	GWh	Value	40.00	37.30	15.00
				Date	31-Dec-2013	31-Dec-2015	31-Oct-2020
				Comment	Revised indicator from "unserved demand due to T&D networks unreliability per year" to align with the SENELEC performance contract and new project timeline.		

Revised	Overall SENELEC recovery rate (total energy billed divided by total energy dispatched)	☐	Percentage	Value	79.00	80.00	84.00
				Date	01-Jan-2013	31-Dec-2015	31-Oct-2020
				Comment	Revised indicator from “Electricity losses per year in the Project area” aligned with the SENELEC performance contract and new project timeline.		
New	Bill collection rate (residential, commercial, industrial, and municipalities)	☐	Percentage	Value	n.a.	92.00	97.00
				Date	01-Jan-2013	31-Dec-2015	31-Oct-2020
				Comment	Replaces “Accounts receivables (residential, commercial and industrial)” indicator. Aligned with the SENELEC performance contract and new project timeline.		
Marked for Deletion	Accounts receivables (in days) (residential, commercial and industrial)	☐	Days	Value	110.00	99.00	95.00
				Date	31-Dec-2012	31-Dec-2015	30-Sep-2016
				Comment			
Marked for Deletion	Un-served demand (total) per year	☐	Gigawatt-hour (GWh) Sub Type Supplemental	Value	40.00	34.20	10.00
New	Average response time to customer complaints related to blackouts and malfunctions (LV)	☐	Hours	Value	8.00	8.00	6.00
				Date	31-Dec-2015	31-Dec-2015	31-Oct-2020
				Comment	New indicator to measure citizen engagement. Tracked through SENELEC’s performance contract.		
Revised	Direct project beneficiaries, of which female	☒	Number	Value	6,024,300.00	6,641,506.00	9,035,696.00
				Date	1-Jul-2012	31-Dec-2015	31-Oct-2020
				Comment	Change in end target to reflect the proposed revision in project end date.		

Revised	Female beneficiaries	☒	Percentage	Value	50.14	50.14	50.14
Marked for Deletion	Electricity losses per year in the project area	☒	Percentage	Value	21.00	19.60	16.90
				Date	04-Nov-2013	31-Dec-2015	30-Sep-2016
				Comment	No mechanism to track - replaced with recovery rate which is tracked through the SENELEC performance contract.		
Marked for Deletion	Electricity losses per year in the project area- Technical	☒	Percentage Sub Type Supplemental	Value	10.00	10.00	8.00
Marked for Deletion	Electricity losses per year in the project area- Non-Technical	☒	Percentage Sub Type Supplemental	Value	11.00	9.50	6.00
Marked for Deletion	Total net injected generation	☒	Megawatt hour(MWh) Sub Type Supplemental	Value	2,787,581.00	2,900,000.00	3,100,000.00

Intermediate Results Indicators

Status	Indicator Name	Core	Unit of Measure		Baseline	Actual (Current)	End Target
Revised	T&D lines constructed or rehabilitated under the project	☐	km	Value	0.00	383.00	1,961.00
				Date	01-Jan-2013	31-Dec-2015	31-Oct-2020
				Comment	Targets established. End target date updated.		
Revised	Households provided with access to electricity under the project (by household connections)	☐	Number	Value	0.00	85,000.00	235,000.00
				Date	01-Jan-2013	31-Dec-2015	31-Oct-2020
				Comment	End target revised from 12,400 to 235,000. End target date updated.		
Revised	Residential customers served with prepayment meters under the project	☐	Percentage	Value	0.00	7.00	60.00
				Date	01-Jan-2013	31-Dec-2015	31-Oct-2020

				Comment	End target revised from 20% to 60%. End target date updated.		
Revised	Medium and high power customers (above 17 kV) with smart meters	☐	Percentage	Value	0.00	0.00	100.00
				Date	01-Jan-2013	31-Dec-2015	31-Oct-2020
				Comment	End target revised from 30% to 100%. End target date updated.		
Revised	Latest SENELEC generation master plan updated and adopted	☐	Yes/No	Value	No	No	Yes
				Date	01-Jan-2013	31-Dec-2015	31-Oct-2020
				Comment	Indicator clarified. A first version of the SENELEC's generation plan was updated and adopted by the Council of Ministers. However, delays in generation projects have required a second update which is ongoing. End target date updated.		
Marked for Deletion	Strategy adopted on medium and long term energy supply diversification into coal, gas, renewable energy and regional integration	☐	Yes/No Sub Type Breakdown	Value	No	No	Yes
				Date	01-Jan-2013	31-Dec-2015	30-Sep-2016
				Comment			
Revised	Strategy adopted on private sector participation and sector governance	☐	Yes/No	Value	No	No	Yes
				Date	01-Jan-2013	31-Dec-2015	31-Oct-2020
				Comment	Indicator clarified. End target date updated.		
New	Recommendations from SENELEC's accounting separation implemented, including institutional and organization audit and physical assets audit	☐	Yes/No	Value	No	No	Yes
					01-Jan-2013	31-Dec-2015	31-Oct-2020
					Result added to capture SENELEC's financial restructuring activity.		

Note: The revised Results Framework targets are limited to IDA investments.

Annex 2: Procurement Arrangements

General

1. Procurement under the proposed project will be carried out in accordance with the World Bank guidelines: 'Guidelines: Procurement of Goods, Works, and Non-Consulting Services under IBRD Loans and IDA Credits and Grants by World Bank Borrowers', dated January 2011 and revised in July 2014; 'Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits and Grants by World Bank Borrowers', dated January 2011 and revised in July 2014; the '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; and other provisions stipulated in the Financing Agreement.

2. The procuring entity as well as bidders and service providers, that is, suppliers, contractors, and consultants, shall observe the highest standard of ethics during the procurement and execution of contracts financed under the project in accordance with paragraph 1.16 of the Procurement Guidelines and paragraph 1.23 of the Consultant Guidelines.

3. A General Procurement Notice will be prepared and published in United Nations Development Business online, on the Bank's external website, and in at least one national newspaper after the project is approved by the Bank's Board and before project effectiveness. Specific Procurement Notices for all goods and works to be procured under International Competitive Bidding and Requests for Expressions of Interest for all consulting services to cost the equivalent of US$300,000 and above will also be published in the United Nations Development Business online, the Bank's external website, and the national press. For works and goods using National Competitive Bidding procedures, the Specific Procurement Notice will only be published nationally.

Assessment of the Agency's Capacity to Implement Procurement

4. **The institutional arrangement for this AF will be based on the existing arrangements used for the implementation of the parent project.** SENELEC will have the overall responsibility to conduct the following activities: (a) manage the overall procurement activities and ensure compliance with the procurement process described in the relevant manuals; (b) prepare and update the Procurement Plan annually; (c) prepare bidding documents and draft Request For Proposals, evaluation reports, and contracts in compliance with Bank procedures; and (d) seek and obtain approval of national entities and of IDA on procurement documents as required.

5. The procurement department called '*Cellule de Passation de Marchés*' (CPM) of SENELEC is responsible for supervising all procurement activities in SENELEC. For the parent project, a PIU has been created to support the project implementation. Two procurement staff have been recruited: one to support the CPM and another to support SENELEC *Direction de l'Approvisionement de l'Administration, du Patrimoine et l'Approvisionment* (Directorate of Procurement and Assets Administration). The last assessment conducted by the Bank team found that the procurement system in place has been weakened by the departure of one of the procurement specialists and many technical staff who strongly supported the project implementation.

6. **The following weaknesses have been identified**: (a) the procurement manual does not provide a clear description of mechanism for procurement and has no mention of the system for filing procurement documents; (b) existing procurement staff are overloaded and have limited capacity in procurement, and their roles are not clearly described in the procurement manual; (c) the new technical staff recruited to support the project implementation have very limited experience in Bank procedures; (d) the existing file recording system needs to be improved; and (e) the agency uses an inefficient manual to follow up procurement activities.

7. **All these weaknesses increase the risk of** (a) tentative or incorrect application of procurement processes resulting in delays; (b) implementation delays and poor quality of contract deliverables; (c) increase in the number of complaints and high cost for resolution; (d) a poor filing system that increases cost/time of supervision and decrease in effectiveness of supervision; and (e) difficulty in identifying bottlenecks and proposing solutions for improvement.

8. **The following mitigation measures have been agreed**: (a) the revision of the procurement manual to make very clear the decision-making mechanism with thresholds for contract approval and delegation; (b) the training of new staff of the technical department and the CPM on the World Bank's procurement procedures and on bids evaluation; (c) a better definition of the role of procurement staff recruited under the parent project; and (d) the improvement of the procurement tracking system.

9. **Procurement risk rating.** Based on the abovementioned factors, the overall procurement risk is assessed as substantial.

Procurement Arrangements

10. **Procurement Plan**: The borrower and the implementing agency have prepared a detailed 18-month Procurement Plan. This plan has been concluded and agreed on by the GoSN and the Bank during negotiations. The Procurement Plan will be updated in agreement with the Bank team annually or as required to reflect the actual project implementation needs and improvements in institutional capacity. Preparation of procurement packages for the AF activities is already ongoing and their finalization is expected to take less time than the original project, mainly due to the fact that most of the activities under the AF are scale-up of activities already under implementation in the parent project.

Annex 3: Financial Management and Auditing Arrangements

1. **External audit.** The Financial Agreement will require the submission of audited financial statements for the project to IDA within six months after year-end. The terms of reference of the external auditor of the original project will be extended to include the additional activities. An opinion on the audited project financial statements in compliance with the International Federation of Accountants and a specific opinion on additional activities will be required.

2. The external auditors will prepare a Management Letter giving observations and comments and providing recommendations for improvements in accounting records, systems, controls, and compliance with financial covenants in the Financial Agreement.

3. **Budgeting arrangements.** The budgeting process and monitoring are clearly defined in the existing administrative and accounting manual of procedures. Periodic reports of budget monitoring and variance analysis should be prepared by the FM team on a quarterly basis.

4. **Reporting and monitoring.** The unaudited interim financial report format of the ongoing project will be updated to include the AF. It will comprise sources and uses of funds according to project expenditures classification and a comparison of budgeted and actual project expenditures (commitments and disbursements) to date and for the quarter. SENELEC will submit the financial reports to the Bank within 45 days after the end of each calendar quarter.

5. SENELEC will produce the project's annual financial statements, which will include the AF and will comply with International Federation of Accountants and Bank requirements. These financial statements[4] will include (a) a balance sheet and a statement of sources and uses of funds; (b) a statement of commitments; (c) accounting policies adopted and explanatory notes; and (d) a management assertion that project funds have been expended for the intended purposes as specified in the relevant financing agreements.

6. **Accounting arrangements.** The current accounting standards used for the ongoing project will be applicable. The accounting software used will be updated to take into account this project. This accounting software will be updated to allow automatic generation of financial information.

7. **Internal control arrangements.** The existing manual of administrative financial and accounting procedures is adequate to be used for this AF. It clearly defines FM procedures and operations documentation. There are no internal control activities due to the lack of an internal auditor for the project. An internal auditor with qualification satisfactory to the Bank will be recruited for the implementation period to strengthen the internal control of the project.

8. **Disbursement arrangements and flow of funds.** Disbursement for the AF will largely follow the existing disbursement arrangements for the original financing. Under the Additional Financing, disbursements will continue to be made using the Advance, Reimbursement, Direct payment and Special Commitment methods. A new segregated designated account (DA) will be

[4] The project financial statements will be all inclusive and cover all sources and uses of funds and not only those provided through IDA funding. It thus reflects all project activities, financing, and expenditures, including funds from other development partners.

opened at a commercial bank acceptable to IDA to facilitate payment for eligible project expenditures. The DA will be managed by Directorate of investment of the Ministry of Economy and Finance, which is the entity in charge of managing the DAs in Senegal, in coordination with SENELEC. The Ceiling of the DA has been set at CFA Franc 2 billion. Upon effectiveness of the AF and receipt of a withdrawal application, an initial advance up to the ceiling amount will be disbursed to the DA and subsequent advances will be made upon receipt Statements of Expenditures reporting on the use of the advance for eligible project expenditures.

9. **Eligible expenditures and co-financing**. A single withdrawal category is used for the AF and the percentage of expenditures to be financed is 100 percent inclusive of taxes for all project parts with the exception of Parts A2, A3, B1, B2 and B3 which will continue to be exclusively financed from the proceeds of the original credit. Counterpart funds in the estimated amount of US$4 million will be provided by the GoSN for the financing of expenditures related to the resettlement and compensation of population affected by the project. Parallel co-financing (US$94 million) provided by EIB will be used for separate activities and contracts not financed by IDA.

Table 3.1. Eligible Expenditures

Category	Amount of the Credit Allocated (expressed in EUR)	Percentage of Expenditures to be Financed (inclusive of Taxes)
(1) Goods, works, non-consulting services, Training, Operating Costs, and consultants' services for the Project (except Parts A.2, A.3, B.1, B.2, and B.3)	62,800,000	100%
TOTAL AMOUNT	62,800,000	

10. **FM covenants.** The Project Implementing Entity shall, not later than one (1) month after the Effective Date, employ and thereafter maintain at all times during project implementation, an internal auditor whose qualifications, experience and terms of reference shall be acceptable to the Association. Section I, A of the Project Agreement. The Project Implementing Entity shall, not later than three (3) months after the Effective Date update its accounting software to include the Project. Section II, B, 3

11. **FM action plan.** Based on the outcome of the FM risk assessment, the following FM plan is proposed. The objective of the plan is to ensure the project maintains a satisfactory FM system throughout the project's life. Table 3.2 summarizes the FM action plan agreed with SENELEC.

Table 3.2. FM Action Plan

FM Activity	Frequency
Desk reviews	
Interim financial reports review	Quarterly
Audit report review of the program	Annually
Review of other relevant information such as interim internal control systems reports	Continuous as they become available
On-site visits	
Review of overall operation of the FM system	Annual for SENELEC (Implementation Support Mission)
Monitoring of actions taken on issues highlighted in audit reports, auditors' management letters, internal audit, and other reports	As needed
Transaction reviews (if needed)	As needed
Capacity-building support	
FM training sessions	During implementation and when needed

Annex 4: Economic and Financial Analysis

Economic and Financial Analysis

1. The economic and financial analysis focuses on the main investment components of the project: T&D (Component 1) and prepaid meters (Component 2). The analyses look at the IDA financing proposed under the AF.

2. Alternative investments are considered to analyze the impacts of the AF. SENELEC has several planning and load flow models for optimization of the T&D system associated with schemes for expanding the generation. The investment mixes were analyzed by models to come up with the investments program that has the lowest present value of costs and meets the capacity requirements over time.

3. The following assumptions are used in the economic and financial analysis:

- **Base case discount rate**: 6 percent;
- **Exchange rate** (CFAF/US$): 600;
- **Customer willingness to pay**: US$0.42 per kWh (based on weighted average of LV tariffs and current cost of self-generation).

Parent Project Impacts

4. A series of activities have been completed under the parent project that have resulted in an improvement of electricity supply services along the Ourossogui-Orefonde distribution area. Similarly, the extension of the MV line from Mbaye Mbaye to Koumpentoum connected the isolated centers of Koungheul, Nganda, and Koumpentoum to the national network, improving overall access to electricity and quality of services. A number of additional network modernizations and substantial installation of prepaid meters supported under the parent project contributed to reducing SENELEC's losses and further improving services in the Greater Dakar areas. While SENELEC does not have data available on loss reduction and cost of production savings, table 4.1 shows data on the access increase in these areas.

Table 4.1. Access and Consumption Rates in Various Project Areas

Elements	Before Project		After Project	
	% Customers	% Sales	% Customers	% Sales
Nganda	6	7	20	55
Kounghel	10	5	12	17
Koumpentoum	6	0,4	11	6

Source: SENELEC PIU.
Note: % of sales is used as proxy to measure quality of service by means of increased consumption and therefore improved access.

AF Component 1: Upgrading and Modernization of the Transmission and Distribution Network

5. The objective of the AF activities under this component is to secure and increase the load delivery capability of the T&D system. The project consists of replacing old transformers or installing new transformers and new connection lines to supply the demand. The incremental

benefits of this project include the reduction of transformer losses and the improvement in reliability. Because Senegal is operating in a supply-constrained environment where latent demand is not met, loss reduction is assumed to translate into increased consumption by existing and new customers.

6. Component 1 will connect new customers to the grid, for whom the service would not be available without the AF. The benefits of the electricity delivered to these customers are valued at what they would be willing to pay for the incremental energy supplied by the project. The economic benefits from increased consumption are therefore valued using the approach of customer willingness to pay.

Table 4.2. Incremental Consumption for 2015–2045

	2015	2016	2017	2018	2045
Net incremental demand (MW)	40	38	35	44	44
Cumulative net demand (MW)	40	78	113	157	157
Load Factor % (1)	60	60	60	60	60
Net energy sold (2) (GWh)	210.24	409.97	593.93	825.19	825.19
Average willingness to pay (US$/MWh)	42.56	42.56	42.56	42.56	42.56
Fuel Cost (3) (US$/MWh)	18.46	18.46	18.46	18.46	18.46
Operating cost (4) (US$/MWh)	8.54	8.54	8.54	8.54	8.54
Value of transmission service (5) (US$/MWh)	2.77	2.77	2.77	2.77	5.83
Revenues (US$, millions)	0.58	1.14	1.65	2.29	4.81

Note:
(1) Load factor = projected energy demanded/(8,760 * projected system capacity)
(2) Energy sold (GWh) = 8.76 * incremental demand (MW) * load factor
(3) The fuel cost in 2015 was CFAF 80.6 per MWh.
(4) The operating cost in 2016 was CFAF 41 per MWh.
(5) Value of transmission service = [a − (b + c) / (1− 0.18)] * 0.2877. The sum (b + c) is divided by (1 − 0.18) to take into account the additional fuel and operating costs induced by 18 percent of system losses.

Table 4.3. Reduction of Technical Losses for 2015–2045

	2010–2014	2015	2016	2017	2045
Demand (GWh)	1,959.0	2706.3	2930.2	3078.9	3273.8
Technical losses (8%)	170.35	235.33	254.80	267.73	284.68
Required generation (GWh)	2,129.40	2941.68	3185.02	3346.68	3558.47
Tech losses with the project %	8	7	7	7	7
Technical losses with project (GWh)	170.35	205.92	222.95	234.27	249.09
Net reduction of losses (GWh)	0.00	29.42	31.85	33.47	35.58
Net reduction of losses (US$, millions) (valued at the consumers' willingness to pay)	–	12.52	13.56	14.24	15.14
Net reduction of losses attributable to the project (US$, millions)	–	3.76	4.07	4.27	4.54

7. The results of the base case indicate that if AF is implemented successfully, using a discount rate of 6 percent, the economic NPV will be US$114 million with 23 percent EIRR and the financial NPV will be US$56 million with 16 percent of FIRR.

Analysis by Major Activity under Component 1

8. Each major activity under Component 1 is analyzed individually to identify economic benefits of expanded supply (evaluated based on the willingness to pay), increased reliability (reduction of non-distributed energy), or cost reduction (for the connection to the grid of isolated centers).

9. The tables present analyses of key activities drawn from SENELEC's investment program. The benefits of upgrading substations and rehabilitation of transmission lines consist primarily of increased reliability of supply. Table 4.4 presents the economic and financial analysis, with an EIRR of 25 percent and an FIRR of 14.6 percent.

Table 4.4. Analysis of Economic and Financial Benefits of Substations and Line Upgrades

Analysis of Economic Benefits: Subcomponents Sub-station and HV line upgrade											
Discount rate	%	6%									
	year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Project costs											
Initial investments lines	MFCFA	(700)	(300)								
Initial investments sub-station	MFCFA	(14,369)	(6,158)								
Avoided Supply disruption	GWh			23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.5
Avoided Supply disruption	FCFA/kWh			395	395	395	395	395	395	395	395
Extra Generation costs	FCFA/kWh			83	83	73	66	66	66	66	66
Net Avoided cost of supply disruption	MFCFA			7,326	7,324	7,568	7,725	7,725	7,725	7,725	7,725
Net Economic Benefits/(costs)	MFCFA	(15,069)	(6,458)	7,409	7,407	7,641	7,791	7,791	7,791	7,791	7,791
Net Economic Present Value	**MFCFA**	**22,358**									
EIRR	**%**	**25.0%**									
Sources for technical parameters: feasibility study and Senelec-Sample of studied investments in the category											
Analysis of Financial Benefits: Subcomponents Sub-station and HV line upgrade											
Discount rate	%	6%									
	year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Project costs											
Initial investments lines	MFCFA	(700)	(300)								
Initial investments sub-station	MFCFA	(14,369)	(6,158)								
Increased Energy Delivery	GWh			53.5	53.5	53.5	53.5	53.5	53.5	53.5	53.5
Collection rate	%			21	18	16	15	15	15	15	15
Increase revenue collected	MFCFA			4,945	5,133	5,258	5,321	5,321	5,321	5,321	5,321
Net Financial Benefits/(costs)	MFCFA	-15,068.900	-6,458.100	4,945.005	5,132.790	5,257.980	5,320.575	5,320.575	5,320.575	5,320.575	5,320.575
Net Financial Present Value	**MFCFA**	**8,931**									
FIRR	**%**	**14.6%**									
Sources for technical parameters: feasibility study and Senelec-Sample of studied investments in the category											

10. Network densification in Dakar will bring economic benefits to consumers who gain access to electricity. These benefits are valued based on the willingness to pay approach outlined earlier.

Table 4.5 presents the economic and financial analysis of densification, with an EIRR of 99 percent and an FIRR of 46 percent.

Table 4.5. Analysis of Economic and Financial Benefits of Densification

Analysis of Economic Benefits: Densification												
Discount rate			6%									
	year	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Project costs												
Initial investments	MFCFA		(1,606)	(6,424)								
New connections	000				18.8	18.8	25.0	25.0	25.0	25.0	25.0	25.0
Consumption per connection	kWh/an				813	830	846	863	880	898	916	934
Additional consumption	GWH/an				15.2	15.6	21.2	21.6	22.0	22.4	22.9	23.4
Willingness to Pay	FCFA/kWh				480.0	480.0	480.0	480.0	480.0	480.0	480.0	480.0
Value of additional Supply	MFCFA				7,320	7,466	10,154	10,357	10,564	10,775	10,991	11,211
Cost of additional supply	FCFA/kWh				83	83	73	66	66	66	66	66
Technical losses	%				8%	8%	8%	8%	8%	8%	8%	8%
Cost of additional Generation	MFCFA				(1,270)	(1,409)	(1,678)	(1,554)	(1,586)	(1,617)	(1,650)	(1,683)
Net Economic Benefits/(costs)	MFCFA		(1,606)	(6,424)	8,590	8,875	11,832	11,911	12,150	12,393	12,641	12,893
Net Economic Present Value	MFCFA		122,662									
EIRR	%		99.0%									
Analysis of Financial Benefits: Densification												
Discount rate			6%									
	year	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Project costs and benefits												
Investissement (millions)	MFCFA		(1,606)	(6,424)								
Annual turnover	GWH/an				62.7	96.4	164.5	168.8	172.8	176.7	180.6	184.6
Turnover per customer	MFCFA				7,337.7	11,163.5	18,859.0	19,166.0	19,415.5	19,658.8	19,895.8	20,126.3
O&M cost	MFCFA				(5,548.8)	(8,376.0)	(13,524.3)	(13,920.0)	(12,362.2)	(12,749.3)	(13,079.2)	(13,084.0)
Net Financial Benefits	MFCFA		(1,606.1)	(6,424.3)	1,788.9	2,787.5	5,334.7	5,246.1	7,053.3	6,909.5	6,816.6	7,042.3
Net Financial Present Value	MFCFA		51,976.9									
FIRR	%		45.7%									

11. The connection of isolated centers will mostly bring economic benefits through a reduction of generation costs. Table 4.6 presents the economic and financial analysis of connecting isolated centers, with an EIRR of 21 percent and an FIRR of 13 percent.

Table 4.6. Analysis of Economic and Financial Benefits of Connecting Isolated Centers

Connection of isolated centers : Saraya, Bandafassi, Salemata, Fongolemi												
	year	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Annual demand (GWH)			18.9	20.8	22.8	25.0	27.4	30.1	32.9	35.9	39.0	42.4
Project costs												
Initial investments	MFCFA		5,080									
Cost of generation from grid (incl incremental losses)	MFCFA			749	778	739	846	721	721	721	721	721
Additional O&M	MFCFA			15	15	15	15	15	15	15	15	15
Total Costs	MFCFA		5,080	764	793	754	861	736	736	736	736	736
Avoided costs through project												
Diesel Oil consumption avoided	Tons			1,182	1,164	1,181	1,175	1,299	1,299	1,299	1,299	1,299
Diesel Oil consumption avoided	MFCFA			727	716	726	722	798	798	798	798	685
Other O&M avoided	MFCFA			85	87	90	91	101	101	101	101	101
Total Avoided Costs	MFCFA		-	1,994	1,967	1,997	1,988	2,198	2,198	2,198	2,198	2,084
Net Economic Benefits/(costs)	MFCFA		(5,080)	1,230	1,174	1,243	1,127	1,462	1,462	1,462	1,462	1,348
Discount rate	%		6%									
Net Economic Present Value	MFCFA		3,652									
EIRR	%		21%									

Connection of isolated centers : Saraya, Bandafassi, Salemata, Fongolemi												
	year	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Annual demand (GWH)			18.9	20.8	22.8	25.0	27.4	30.1	32.9	35.9	39.0	42.4
Project costs												
Initial investments	MFCFA		4,200									
Cost of generation from grid	MFCFA			749	778	739	846	721	721	721	721	721
Additional O&M	MFCFA			15	15	15	15	15	15	15	15	15
Total Costs	MFCFA		4,200	764	793	754	861	736	736	736	736	736
Increased revenues	MFCFA			1,840	1,543	1,543	1,543	1,543	1,543	1,543	1,543	1,543
Net Financial Benefits/(costs)	MFCFA		(4,200)	1,076	750	789	682	807	807	807	807	807
Discount rate	%		6%									
Net Financial Present Value	MFCFA		1,300									
FIRR	%		13%									

Component 2: Improve SENELEC's Commercial Performance

12. Investments under this component are focused on prepaid meters. The other activities, such as communication, marketing, and installations for poor customers, are supporting activities to guarantee the success of the introduction of prepaid meters in the market for a targeted type of customers.

13. The main economic benefit is the reduction of commercial losses. The GoSN is the main beneficiary in so far as this assumes that the additional revenue to SENELEC results in a reduction of the subsidy received from the GoSN. If the subsidy was held constant, this would allow a reduction in tariff, which would accrue to paying consumers.

14. Table 4.7 shows cost-benefits analysis of the prepayment meters. The component is clearly economically viable with a positive NPV of US$61 million and an EIRR of 44 percent. In addition, the financial NPV is positive (around US$60 million) with an FIRR around 30 percent.

Table 4.7. Prepayment Meters

Assumptions		
Discount rate	Percent	6
Exchange Rate	CFAF/1US$ on 04/08/2016	600
Number of meters		260,000
Cost of a kW installed	$	1,500
Capital Recovery Factor	Percent	8.72
O&M	Percent of investment cost	1.50
Annual charge	US$ per kW/per year	153
Equipment life	years	20
Load factor	Percent	50
Capital cost	US$/kWh	0.035

Results		
Economic NPV	US$ million	**61**
EIRR	Percent	**44**

Financial NPV	US$ million	**60**
FIRR	Percent	**30**

Financial Analysis of SENELEC

Historical Performance

15. Since 2009, rather than implementing tariff increases, the GoSN has made a political decision to provide compensation to SENELEC based on the difference between revenue requirements reviewed by the regulator and actual tariffs. Despite compensation, SENELEC's repeated losses, low revenues, and cash constraints have seriously affected its financial situation, especially in 2009 and 2010, with a high debt level of both equity and repayment capacity. SENELEC's difficult cash flow position particularly affected its ability to make ordinary expenses (for example, to purchase fuel). At the end of 2011, the level of unserved demand reached a record of 250 GWh, of which half is due to lack of fuel. As a result, the country registered 270 days of load shedding. This led to growing customer dissatisfaction and lower levels of bill collection, creating the energy crisis of 2011. Without the GoSN compensation, SENELEC would have faced even additional cash constraints.

16. Since 2012, following the GoSN commitment to redress the sector and the creation of the FSE, SENELEC operational situation has improved. SENELEC was still however affected by a liquidity deficit. Repayment capacity improved in 2013 to some extent due to the financial restructuring and reduction of the cost per kWh. However, this improvement was not sufficient to enable the company to meet its short-term commitments. The sluggish performance was reflected in the turnover of the company, which has changed only by 3.82 percent between 2012 and 2013

despite the increase in demand of 4.5 percent, mainly due to an increase of 28 percent of undistributed energy, which increased from 32,000 MWh to 40,967 MWh, and lower sales levels.

17. Electricity generation in Senegal has then improved since 2013, aided by lower international oil prices and investments that expanded HFO power plants and rehabilitated power generation. Generation upgrades have resulted in lower production costs, with the amount of emergency rental power in the interconnected system decreasing from 150 MW to 100 MW. Shifting from expensive diesel to cheaper HFO allowed for further savings. SENELEC's tariff compensation from the GoSN has been reduced from about CFAF 120 billion in 2012 to about CFAF 88 billion in 2013 and about CFAF 78 billion in 2014. Following years of heavy financial losses, SENELEC reported a marginal profit for 2013 and 2014 after including subsidies.

18. Table 4.8 shows the evolution of SENELEC's financial situation from 2006 to 2014 with the generation and number of clients.

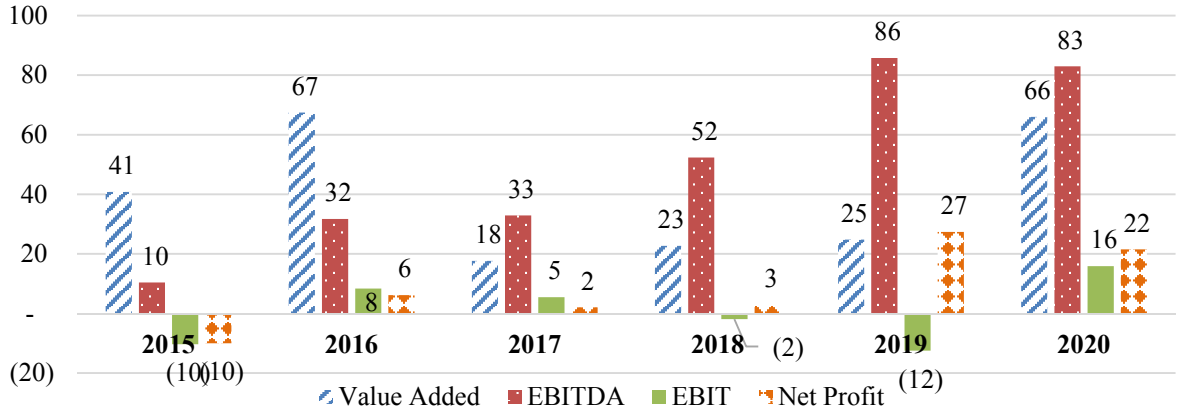
Table 4.8. Summary of SENELEC Situation 2006–2014

Income Statements (CFAF, millions)	**Actual (certified)**								
	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Revenues	157,183	180,526	209,744	221,459	243,465	250,362	282,708	291,744	314,233
Revenues variation		*15%*	*16%*	*6%*	*10%*	*3%*	*13%*	*3%*	*8%*
(−) Fuel and energy costs	(93,064)	(123,691)	(188,831)	(144,332)	(223,196)	(250,444)	(289,187)	(263,009)	(271,584)
Gross margin	**64,119**	**56,835**	**20,913**	**77,127**	**20,269**	**(82)**	**(6,480)**	**28,736**	**42,649**
Gross margin/turnover	*41%*	*31%*	*10%*	*35%*	*8%*	*0%*	*−2%*	*10%*	*14%*
(−) Others operating	(83,386)	(57,853)	(44,704)	(56,469)	(43,869)	(40,909)	(64,006)	(74,152)	(70,132)
(−) Staff expenses	(20,912)	(22,116)	(22,779)	(26,534)	(28,032)	(28,388)	(28,660)	(29,313)	(29,172)
EBITDA*	**(40,179)**	**(23,134)**	**(46,570)**	**(5,876)**	**(51,632)**	**(69,378)**	**(99,145)**	**(74,729)**	**(56,655)**
EBITDA/turnover	*−26%*	*−13%*	*−22%*	*−3%*	*−21%*	*−28%*	*−35%*	*−26%*	*−18%*
(−) Depreciation and amortization	(16,609)	(18,240)	(15,397)	(21,013)	(28,837)	(30,242)	(24,428)	(23,313)	(21,156)
(−) Financial charges/revenues	(10,220)	(2,311)	(4,974)	(6,739)	(2,919)	(9,251)	(8,827)	(7,151)	(5,882)
(−) Taxes	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Net income before tariff subsidies	(67,009)	(43,686)	(66,942)	(33,629)	(83,389)	(108,872)	(132,401)	(88,888)	(74,430)
(+) Tariff subsidies	32,881	37,339	60,000	39,535	28,070	103,371	123,328	88,666	77,601
Net income	**(34,128)**	**(6,347)**	**(6,942)**	**5,906**	**(55,319)**	**(5,502)**	**(9,073)**	**(222)**	**2,171**
Generation (MWh)	2,192,463	2,305,672	2,400,533	2,489,662	2,618,703	2,560,125	2,917,194	3,037,911	3,233,331
Variation		*5.2%*	*4.1%*	*3.7%*	*5.2%*	*−2.2%*	*13.9%*	*4.1%*	*6.4%*
Number of clients	651,920	711,578	766,353	827,266	880,082	899,451	944,801	988,605	1,046,807
Variation	–	*9.2%*	*7.7%*	*7.9%*	*6.4%*	*2.2%*	*5.0%*	*4.6%*	*5.9%*

**EBITDA: Earnings before interest, tax, depreciation, and amortization*

Financial Projections

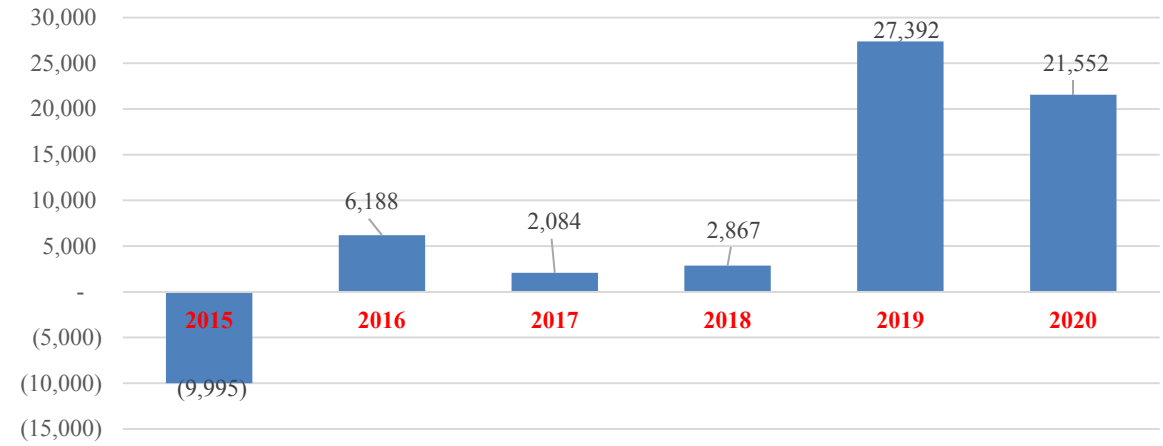
Figure 4.1. Margins per Sale from 2015 to 2020



Source: World Bank analysis

19. The GoSN has already laid out targets for diversification of supply. In turn, SENELEC prepared financial projections to assess the impact taking into account power imports from Mauritania, the commissioning of Sendou 1 (expected to come online by end of 2017, financed with assistance from the African Development Bank), the commissioning of extra generation at Cap de Biche by Contour Global, the commissioning of Tobene IPP (both online since mid-2016), and increased regional hydropower expected from 2019. In this context, the financial position of SENELEC improves significantly. The return to profitability is expected to occur in 2016 (see Figure 4.1).

Figure 4.2. Profit or Loss from 2015 to 2020



Source: World Bank analysis

20. SENELEC's activities will generate margins covering the needs of short-term financing (after tariff compensation – see Table 4.3 below). The situation will improve significantly with the commissioning of these units and the regional interconnection in the context of a low crude oil price. SENELEC is expected to surpass its target EBIDTA / debt service ratio of 1.4 in 2019. The commissioning of a new plant as well as construction of the OMVG interconnection line will

enable SENELEC to access reliable and low-cost generation capacity, reducing the diesel rental plant contracted with Aggreko and APR Energy. In addition, SENELEC's finances will continue to be monitored on a quarterly basis with the possibility of subsidies through the FSE as needed.

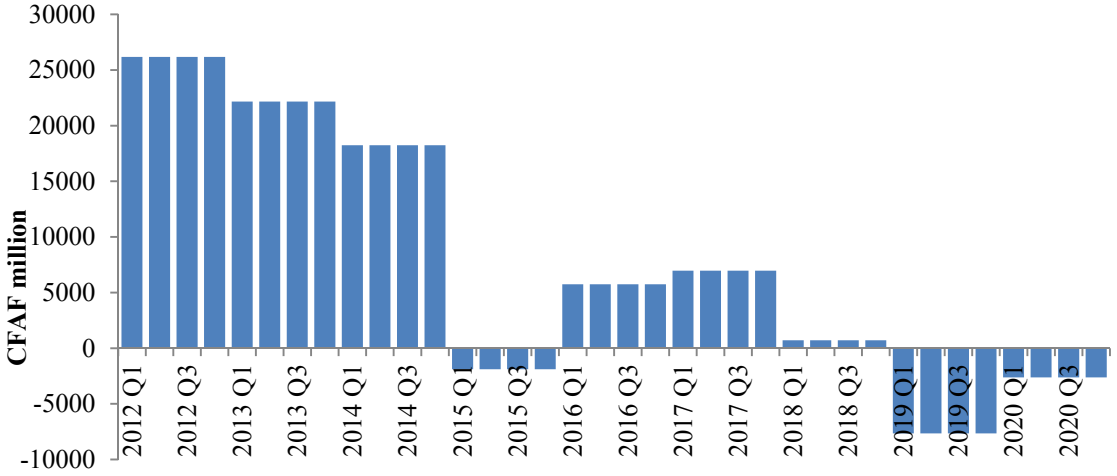
Table 4.9. Financial Ratios for 2015–2020 (excluding Subsidies)

Ratios	2015	2016	2017	2018	2019	2020
EBIDTA/debt service	0.18x	0.54x	0.56x	0.90x	1.47x	1.42x
Reimbursement capacity	34.60x	7.44x	15.46x	7.81x	3.97x	3.84x

21. However, in the short term, the sector remains extremely sensitive to external oil price shocks, potential delays with private sector generation projects, and any unforeseen disruptions caused by equipment failure. Since electricity supply in Senegal is currently fueled overwhelmingly by oil-based products, GoSN is also focusing on diversification of fuel sources over the medium-term. With the Bank support, the GoSN will likely incorporate recent gas discoveries through gas to power, as well as various solar projects, including those supported through the World Bank Group's Scaling Solar Program, currently under preparation.

22. The tariff formula is reviewed quarterly to reflect the reality of the energy sector and the technology mix. Taking oil price forecasts and expected generation capacity growth into account, the tariff formula suggests SENELECs tariffs could be reduced in 2019 and 2020. Table 4.3 shows the tariff subsidy level from 2012 to 2020.

Figure 4.3. Tariff Compensation Estimated from Electricity Regulatory Commission (*Commission de Régulation du Secteur de d'Electricité*) Formula Mechanism



Source: World Bank analysis

23. Given the sensitivity of the sector to external oil price shocks,, a sensitivity analysis of an increased oil price (around 25 percent) was done, and the results are presented below. Table 4.10 shows results in the base case, while Table 4.11 shows the results from the sensitivity analysis on oil prices to assess the impact on the financial viability of SENELEC. In comparison with the base scenario, a 25 percent increase in oil prices would mean that SENELEC would continue to have benefits but with a reduction of profits, which could cause a cash problem.

Table 4.10. SENELEC Financial Projections Base Case Scenario

Year ending December 31 (CFAF, millions)	2015	2016	2017	2018	2019	2020
Gross margin	79,757	113,637	170,278	211,254	253,337	341,654
Value added	40,817	67,446	65,984	86,427	119,799	118,053
Earnings before interest and taxes	10,385	31,708	32,916	52,368	85,739	82,971
EBITDA	−10,334	8,393	15,910	23,554	54,245	49,434
Other activity	−15,994	189	−3,915	−3,132	21,393	15,553
Net profit (loss)	−9,995	6,188	2,084	2,867	27,392	21,552
Sales	330,068	349,595	380,056	411,845	479,594	537,178
Assets						
Long-term assets	401,251	442,139	491,395	512,201	540,703	527,867
Receivables	147,510	90,712	95,384	106,024	121,258	137,122
Other receivables	130,540	80,276	84,411	47,237	52,160	45,613
Short-term cash	0	0	0	46,586	29,676	13,932
Total	**682,633**	**616,268**	**673,790**	**714,527**	**746,398**	**727,116**
Liabilities						
Equity	279,802	302,770	295,800	289,614	307,953	321,087
Long-term debt	163,556	174,764	202,302	200,436	209,937	188,680
Equity and debt	443,358	477,534	498,102	490,050	517,889	509,767
Short-term debt	189,429	107,568	100,043	224,478	228,508	217,349
Short-term cash	49,847	31,166	75,644	0	0	0
Total	**682,633**	**616,268**	**673,790**	**714,527**	**746,398**	**727,116**

Table 4.11. SENELEC Financial Projections with oil price increase of 25 percent

Year ending December 31 (CFAF, millions)	2015	2016	2017	2018	2019	2020
Gross margin	79,757	113,637	162,117	203,662	244,940	334,694
Value added	40,817	67,446	57,824	78,835	111,402	111,093
Earnings before interest and taxes	10,385	31,708	24,756	44,775	77,343	76,011
EBITDA	−10,334	8,393	7,750	15,962	45,848	42,474
Other activity	−15,994	189	−12,076	−10,724	12,996	8,593
Net profit (Loss)	−9,995	6,188	−6,077	−4,725	18,995	14,592
Sales	330,068	349,595	380,056	411,845	479,594	537,178
Assets						
Long-term assets	401,251	442,139	491,395	512,201	540,703	527,867
Receivables	147,510	90,712	95,384	106,024	121,258	137,122
Other receivables	130,540	80,276	84,411	49,034	54,103	47,246
Short-term cash	281,382	174,129	182,493	188,945	163,682	187,042
Total	**682,633**	**616,268**	**673,889**	**701,146**	**724,812**	**714,910**
Liabilities						
Equity	279,802	302,770	287,640	273,861	283,804	280,274
Long-term debt	163,556	174,764	202,302	200,436	209,937	188,680
Equity and debt	443,358	477,534	489,942	474,297	493,740	468,955
Short-term debt	189,429	107,568	101,978	226,849	231,072	219,503
Short-term cash	49,847	31,166	81,968	0	0	26,452
Total	**682,633**	**616,268**	**673,889**	**701,146**	**724,812**	**714,910**