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Report No: PAD1391

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED CREDIT

IN THE AMOUNT OF EUR 49.6 MILLION
(US$54.5 MILLION EQUIVALENT)

AND A PROPOSED GRANT

IN THE AMOUNT OF SDR 7.6 MILLION
(US$10.5 MILLION EQUIVALENT)

TO THE

GOVERNMENT OF THE REPUBLIC OF NIGER

FOR AN

ELECTRICITY ACCESS EXPANSION PROJECT

NOVEMBER 20, 2015

ENERGY AND EXTRACTIVES GLOBAL PRACTICE
AFRICA

CURRENCY EQUIVALENTS

(Exchange Rate Effective October 31, 2015)

Currency Unit	=	EUR
EUR0.90876	=	US$1
US$1.39687	=	SDR 1

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

AFD	*Agence Française du Développement* (French Development Agency)
ARMP	Agence de régulation des marchés publics au Niger (Regulatory Authority)
CGP	*Cellule des Grands Projets* (Large projects unit)
CPS	Country Partnership Strategy
CQS	Consultants' Qualification Selection
DA	Designated Account
DL	Disbursement Letter
DPO	Development Policy Operation
EIRR	Economic Internal Rate of Return
EOI	Expression of Interest
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
FBS	Fixed Budget Selection
FIRR	Financial Internal Rate of Return
FM	Financial Management
GDP	Gross Domestic Product
GIS	Geographic Information System
GNI	Gross National Income
GoN	Government of Niger
GRM	Grievance Redress Mechanism
GRS	Grievance Redress Service
HV	High Voltage
ICB	International Competitive Bidding
IFR	Interim Unaudited Financial Report
INS	*Institut National de la Statistique du Niger* (Niger National Institute of Statistics)
IPF	Investment Project Financing
LCS	Least Cost Selection
LV	Low Voltage
MEP	Ministry of Energy and Petroleum
MV	Medium Voltage
NCB	National Competitive Bidding
NELACEP	Niger Electricity Access Expansion Project

Nigelec	*Société Nigérienne d'Electricité* (Nigerian Electricity Company)
NPV	Net Present Value
OHADA	*Organisation pour l'Harmonisation en Afrique du Droit des Affaires* (Organisation for the Harmonisation of Business Law in Africa)
PDES	*Plan de Développement Economique et Social* (Plan for Social and Economic Development)
PIE	Project Implementation Entity
PIM	Project Implementation Manual
PIU	Project Implementation Unit
PP	Procurement Plan
PPP	Purchasing Power Parity
PS/PAS	Procurement Specialist/Procurement Assistant
QBS	Quality Based Selection
QCBS	Quality and Cost-Based Selection
RAP	Resettlement Action Plan
RFP	Request for Proposals
RPF	Resettlement Policy Framework
SBD	Standard Bidding Document
SCADA	Supervisory Control and Data Acquisition
SSS	Single Source Selection
ToR	Terms of Reference
TTL	Task Team Leader
VAT	Value Added Tax
WA	Withdrawal Application
WACC	Weighted Average Cost of Capital
WAPP	West African Power Pool
WTP	Willingness to Pay
XOF	West African CFA

Regional Vice President:	Makhtar Diop
Country Director:	Paul Noumba Um
Senior Global Practice Director:	Anita Marangoly George
Practice Manager:	Meike van Ginneken
Task Team Leader:	Manuel Luengo

NIGER
Electricity Access Expansion Project

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PAD DATA SHEET

Niger

Electricity Access Expansion Project (P153743)

PROJECT APPRAISAL DOCUMENT

AFRICA

Report No.: PAD1391

Basic Information			
Project ID	EA Category		Team Leader(s)
P153743	B - Partial Assessment		Manuel Luengo
Lending Instrument	Fragile and/or Capacity Constraints [ ]		
Investment Project Financing	Financial Intermediaries [ ]		
	Series of Projects [ ]		
Project Implementation Start Date	Project Implementation End Date		
15-Dec-2015	31-Dec-2021		
Expected Effectiveness Date	Expected Closing Date		
31-Mar-2016	31-Dec-2021		
Joint IFC			
No			
Practice Manager/Manager	Senior Global Practice Director	Country Director	Regional Vice President
Meike van Ginneken	Anita Marangoly George	Paul Noumba Um	Makhtar Diop

Borrower: Government of the Republic of Niger			
Responsible Agency: Ministry of Energy and Petrol			
Contact:	Alio Touné	Title:	Directeur du Cabinet
Telephone No.:	22790645556	Email:	as.toune@live.fr
Responsible Agency: Nigelec			
Contact:	Mahamadou Arzika	Title:	Secrétaire Général
Telephone No.:	22720722461	Email:	arzikam@yahoo.fr

Project Financing Data(in USD Million)					
[ ]	Loan	[X]	IDA Grant	[ ]	Guarantee
[X]	Credit	[ ]	Grant	[ ]	Other

Total Project Cost:	65.00	Total Bank Financing:	65.00
Financing Gap:	0.00		

Financing Source	**Amount**
BORROWER/RECIPIENT	0.00
International Development Association (IDA)	54.50
IDA Grant	10.50
Total	65.00

Expected Disbursements (in USD Million)

Fiscal Year	2016	2017	2018	2019	2020	2021	2022
Annual	0.00	10.00	12.50	12.50	12.50	12.50	5.00
Cumulative	0.00	10.00	22.50	35.00	47.50	60.00	65.00

Institutional Data

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 % must equal 100)

Major Sector	Sector	%	Adaptation Co-benefits %	Mitigation Co-benefits %
Energy and mining	Transmission and Distribution of Electricity	70		
Energy and mining	General energy sector	30		
Total		100		

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

Themes		
Theme (Maximum 5 and total % must equal 100)		
Major theme	Theme	%
Urban development	City-wide Infrastructure and Service Delivery	60
Financial and private sector development	Infrastructure services for private sector development	20
Financial and private sector development	State-owned enterprise restructuring and privatization	20
Total		100

Proposed Development Objective(s)
The Project Development Objective (PDO) is to increase access to electricity in Niger.

Components	
Component Name	**Cost (USD Millions)**
Extension and reinforcement of distribution systems	56.28
Strengthening institutional capacity in the electricity sector	8.72

Systematic Operations Risk- Rating Tool (SORT)	
Risk Category	**Rating**
1. Political and Governance	Moderate
2. Macroeconomic	Low
3. Sector Strategies and Policies	Substantial
4. Technical Design of Project or Program	Low
5. Institutional Capacity for Implementation and Sustainability	Substantial
6. Fiduciary	Substantial
7. Environment and Social	Moderate
8. Stakeholders	Low
9. Other	
OVERALL	Substantial

Compliance		
Policy		
Does the project depart from the CAS in content or in other significant respects?	Yes [ ]	No [X]
Does the project require any waivers of Bank policies?	Yes [ ]	No [X]
Have these been approved by Bank management?	Yes [ ]	No [ ]

Is approval for any policy waiver sought from the Board?	Yes [ ] No [X]
Does the project meet the Regional criteria for readiness for implementation?	Yes [X] No [ ]

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	X	
Natural Habitats OP/BP 4.04		X
Forests OP/BP 4.36		X
Pest Management OP 4.09		X
Physical Cultural Resources OP/BP 4.11	X	
Indigenous Peoples OP/BP 4.10		X
Involuntary Resettlement OP/BP 4.12	X	
Safety of Dams OP/BP 4.37		X
Projects on International Waterways OP/BP 7.50		X
Projects in Disputed Areas OP/BP 7.60		X

Legal Covenants

Name	Recurrent	Due Date	Frequency
Appointment of an independent auditor		Not later than 4 months after effectiveness	

Description of Covenant

The Recipient shall cause the Project Implementing Entity to appoint an independent auditor, with terms of reference and qualifications acceptable to the Association by not later than four (4) months as of the Effective Date

Name	Recurrent	Due Date	Frequency
Procurement and set an accounting software		Not later than 3 months after effectiveness	

Description of Covenant

The Recipient shall cause the Project Implementing Entity to procure and set an appropriate accounting software to ensure timely recording of financial information as well as timely production of quarterly and annual financial statements not later than three (3) months as of the Effective Date.

Conditions

Source Of Fund	Name	Type
IDA	Execution of the Subsidiary Agreement between the Recipient and Nigelec	Effectiveness

Description of Condition

The Subsidiary Agreement has been executed on behalf of the Recipient and the Project Implementing Entity.

Source Of Fund	Name	Type
IDA	Adoption of the Project Implementation Manual	Effectiveness

Description of Condition

The Recipient, through PIE, has adopted the Project Implementation Manual in a manner satisfactory to the Association.

Source Of Fund	Name	Type
IDA	Establishment of a Project Implementation Unit within Nigelec	Effectiveness

Description of Condition

The Recipient, through PIE, has recruited, on a temporary-basis, an accountant and a procurement specialist, in accordance with terms of reference and the qualifications acceptable to the Association.

Team Composition

Bank Staff

Name	Role	Title	Specialization	Unit
Manuel Luengo	Team Leader (ADM Responsible)	Senior Energy Specialist		GEEDR
Ibrah Rahamane Sanoussi	Procurement Specialist	Senior Procurement Specialist		GGODR
Josue Akre	Financial Management Specialist	Financial Management Specialist		GGODR
Clemencia Torres De Mastle	Team Member	Senior Energy Economist		GEEDR
Franklin Koffi S.W. Gbedey	Team Member	Senior Energy Specialist		GEEDR
Paivi Koskinen-Lewis	Social Safeguards Specialist	Social Development Specialist		GSURR
Pedro E. Sanchez	Team Member	Lead Energy Specialist		GEEDR
Ruxandra Costache	Counsel	Counsel		LEGAM
Marie Lolo Sow	Team Member	Program Assistant		GEEDR

Extended Team

Name	Title	Office Phone	Location
Lucia Fort	Consultant		Washington, DC
Medou Lo	Consultant		Washington, DC

Michel E. Layec	Consultant	473-32-31	Washington DC

Locations

Country	First Administrative Division	Location	Planned	Actual	Comments
Niger	Zinder	Zinder	**X**		
Niger	Tillaberi	Tillaberi	**X**		
Niger	Tahoua	Tahoua	**X**		
Niger	Niamey	Niamey	**X**		
Niger	Maradi	Maradi	**X**		
Niger	Dosso	Dosso	**X**		
Niger	Agadez	Agadez	**X**		

Consultants (Will be disclosed in the Monthly Operational Summary)

Consultants Required ? Consultants will be required

I. STRATEGIC CONTEXT

A. Country Context

1. **Niger is a large, landlocked country in the arid Sahel region with a population of about 17 million people growing rapidly at about 3.3 percent per year.** The country's total land area is 1.27 million square kilometers, out of which two-thirds is desert. More than 84 percent of the population is concentrated in rural areas along the Niger River in the southwestern part of the country and along its long southern border with Nigeria. The central and northeastern regions are arid and sparsely populated, with the exception of a few smaller cities along the northern route to Algeria. Though droughts are frequent, about 80 percent of the population derives its livelihood from agriculture and livestock. Uranium mining and, more recently, oil production play an increasingly important role in Niger's economy.

2. **Poverty incidence is declining, however Niger remains among the poorest countries in Africa (and in the world) with an average US$890 per capita GNI (PPP) in 2013,** well below the average GNI in constant prices of US$1,959 for low income countries. Niger is ranked the last out of 187 countries in the 2014 Human Development Index. In 2012 the poverty headcount rate (US$2.5 a day (PPP)) stood at 90 percent of the population, down from 95 percent in 1990. Over the last five years economic growth was about seven percent, with natural resources playing a key role in GDP growth. International aid finances about 40 percent of Niger's budget while much of the Government's revenues comes from trade (especially uranium and oil), investment (especially in the mining and hydrocarbon sectors), and remittances.

3. **Niger has an unprecedented opportunity to accelerate economic development, reduce poverty and boost shared prosperity.** Since 2000 only modest progress has been observed in social and economic indicators, due in large part to recurrent droughts, regional conflict, and political instability. The successful political stabilization in April 2011, however, provided the basis for a stronger policy focus on broad-based growth and poverty reduction as well as for strengthening the political institutions. The start of oil production in November 2011 and large-scale investments in the uranium sector promise to boost growth over the medium term while providing critical resources for the Government's development agenda. However, taking advantage of these opportunities will require other important changes to occur. As described in Niger's Economic and Social Development Plan (2012-2015), one critical element underpinning sustainable economic growth is the improvement and expansion of modern services, such as electricity and telecommunications, to develop a competitive and diversified economy. Attention will also be paid to the Plan's strategic pillar on the promotion of social development, which aims to build with all stakeholders a non-discriminatory society where men and women, boys and girls, have the same opportunities to participate in development and enjoy the benefits of growth. There is also the need to reinforce good governance and build institutional capacity to create an enabling environment for investment and economic growth.

B. Sectoral and Institutional Context

4. **Access to electricity services remains one of the lowest in the region at about 10 percent.** There are very large disparities in access between urban and rural areas, and between the capital Niamey and the other urban centers. Electricity access is below one percent in rural areas, access

varies in smaller cities between 20 and 40 percent, and stands at around 50 percent in Niamey. Furthermore, electricity consumption levels are relatively low. Nationwide aggregated peak electricity demand is only about 150 MW (excluding mining operations). The state-owned utility, Nigelec, serves about 218,000 customers. The Government of Niger (GoN) has defined an ambitious distribution investment program with the objective of increasing the overall national access to 60 percent of the population by 2027.

5. **Imports of cheap electricity from Nigeria, Niger's main supply source, have been critical for meeting a strong growth in electricity demand during the last decade.** Over the period 2001-2014 electricity consumption in Niger grew at an average 8.5 percent per year, much faster than the GDP growth of about four percent. Electricity imports from Nigeria under a preferential tariff (about US¢4/kWh) account for about three-fourths of consumption. Import is lagging behind the fast growing demand and is constrained by generation availability in Nigeria and transmission capacity between the two countries.

6. **The high dependence on energy imported from Nigeria, the fast growth in electricity demand, and the low access levels have led the GoN and Nigelec to embark on large investments in domestic power generation.** In its 2011 business plan, Nigelec assumed that electricity demand will increase by about 10 percent per year over the next 10 years. Nigelec has signed a two-year rental contract for 30 MW of small diesel units whose generation costs are close to US¢30/kWh to overcome transmission unreliability and frequent power cuts and meet its fast growing demand. The GoN is currently building an 80 MW diesel plant expected to become operational in early 2016 and developing the Kandadji multipurpose hydropower project on the Niger River, which is expected to enter into operation in 2020-2021. The Kandadji project will provide a maximum of 120 MW during five months of the year and 30 MW during the dry season. Other generation projects under consideration include a 20 MW grid connected solar PV generation plant, a 600 MW coal-based electricity generation plant fed by the Sakaldamna deposits, expected to be commissioned around 2022, as well as other fossil-fuel generating units to supply the urban centers of Agadez, Zinder, Maradi, and Tahoua. Significant transmission investments to build new lines and to improve existing infrastructure are also proposed in order to strengthen the transmission links with Nigeria, to interconnect with Benin and Burkina-Faso as part of the West Africa Power Pool (WAPP) program, and to interconnect Niger's five small power sub-systems. Niger imports electricity from Nigeria through two transmission lines: the Birnin Kebbi - Naimey 132kV line (capacity approximately 85-90 MW) and the Katsina-Maradi 132 kV line (capacity approximately 20-2 5MW). The 132kV line Birnin Kebbi - Niamey is at the limit of saturation and is subject to multiple disturbances. To increase capacity and stabilize imports from Nigeria, the construction of a double circuit North backbone linking Nigeria to Burkina Faso through Niger and Benin is planned. The capacity of the line is estimated at 480 MW. The bulk of the supply of electricity from this line will be provided by the Kaindji and Jebba hydropower plants that are managed by concession granted to *Mainstream*, a company in which Nigelec is a shareholder. The Kaindji hydropower plan is under rehabilitation with support from the Bank, and *Mainstream* is planning in the coming years other renovations to increase production capacity.

7. **Over the past years, Nigelec has had relatively good technical, commercial, and financial performance, but its financial health is challenged by increasing generation costs, which are not reflected in tariffs.** Total technical and commercial losses are about 20 percent and bill

collection stands at about 87 percent (including government and state-owned enterprises' accounts). In order to improve its liquidity, Nigelec has initiated the installation of prepaid and smart meters. Over the last 10 years, Nigelec has shown a positive net operating profit, albeit deteriorating as retail tariffs have not reflected cost increases and were reduced for irrigation and social tranche consumers. The good financial performance will however be difficult to sustain in the short and medium term as generation and import costs will likely increase substantially and as large investments enter Nigelec's balance sheet. The company's investment plan foresees the growth in the generation mix of relatively expensive thermal liquid fuel based generation, which will have an impact on the costs of service and on Nigelec's finances. Nigelec's 2011 business plan concluded that generation costs will increase substantially from about US¢5.9/kWh in 2011 to US¢7.2/kWh by 2015, maintaining that level until 2020. In the event that Nigeria's supply is curtailed or export tariffs are adjusted, or that domestic generation becomes more costly than envisaged by Nigelec, the cost increase would create significant financial stress on Niger's power sector.

8. **Urgent and significant investments in the distribution networks are also needed to improve access.** Nigelec has developed at a conceptual level a pipeline of distribution investments for urban and peri-urban areas and isolated systems, a subset of which are included in the proposed project. The Nigelec investment program to improve access to electricity services rests on two pillars. One pillar consists of the rehabilitation, strengthening, and expansion of the distribution networks in the main urban centers, in particular the seven urban centers included in the project. The second pillar consists of increasing access to electricity to communities that do not yet have electricity services through grid extension, new isolated grids, or off-grid solutions.

9. **The GoN is committed to carry out policy reforms and implement efficiency improvement measures in order to support the sustained development of the electricity sector.** As part of the three-year Public Investment Reform Support Program, supported by the World Bank in the context of a development policy operation (DPO) series, the GoN has agreed to implement policy reforms to enhance the institutional framework for the electricity sector. Those reforms include the adoption of a sound legal and regulatory framework for the sector and the strengthening of its operating framework, particularly with the creation of a regulatory authority for both the electricity and downstream petroleum sectors. A new Electricity Code and a law setting-up a new regulatory authority are currently being reviewed by the Parliament. The key objectives of the new regulatory framework include promoting private participation in energy generation, integrating Niger into the regional electricity market, creating an independent regulator, and ensuring the economic and financial sustainability of the power sector. In addition, the GoN intends to maintain the economic and financial equilibrium of the sector and the utility through the adoption of cost reflective tariffs over the medium term and other measures that are expected to improve Nigelec's operational and financial performance based on a comprehensive audit of Nigelec completed in 2014.

10. **Looking forward, the GoN is committed to put in place measures to expand electricity access in rural areas.** The Government has decided to develop a National Electrification Strategy, which will provide a road map to develop access in urban and peri-urban areas and in rural areas in an equitable manner. In addition, it will implement additional measures to develop access in the rural areas, which is an integral component of the Government's overall policy and program to

promote national economic and social development and integration. Both on-grid and off-grid solutions for increasing electricity access in rural areas will be considered.

C. Higher Level Objectives to which the Project Contributes

11. **The proposed project is fully aligned with the FY13-16 Niger Country Partnership Strategy (CPS), which focuses on three pillars: (1) achieving resilient growth, (2) reducing vulnerability, and (3) strengthening capacity for service delivery.** The World Bank Group's support to the electricity sector is a critical part of the CPS as it would increase delivery of energy services to residential, commercial, and productive uses in seven urban centers of Niger.

12. **The CPS is fully aligned with the 2012 Government Plan for Social and Economic Development (PDES) and the World Bank Group's twin goals.** In particular, the project is consistent with the PDES objective of creating a competitive and diversified economy for accelerated, inclusive growth. Sustainable expansion of basic services to the general population, including access to energy services, plays a key role in that national development strategy, which in turn is key to achieving the twin goals.

13. **The proposed project will be implemented in coordination with other donors engaged in the electricity sector.** In particular the proposed project complements an investment and technical assistance project financed by the *Agence Française de Développement* (AFD) aimed at improving equitable electricity access in the capital, Niamey, and at assessing the feasibility of solar power generation plants.

II. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

14. The Project Development Objective (PDO) is to increase access to electricity in Niger.

B. Project Beneficiaries

15. The project is expected to benefit around 330,000 people in seven urban areas, including households, small businesses, and public institutions (e.g., local government, elementary and high schools), which will be connected to the electricity grid. The project will also contribute to enhance capabilities at the Ministry of Energy and Petroleum (MEP) and Nigelec, thus laying a solid foundation for expanding electricity services to Niger's population and to commercial customers.

C. PDO Level Results Indicators

16. Progress toward achieving the PDO will be measured by the following project outcome indicators:

- People provided with access to electricity under the project by household connections (number);
- Non-household connections provided with access to electricity under the project (number); and
- Direct project beneficiaries (number), of which female (percentage).

III. PROJECT DESCRIPTION

17. The proposed Niger Electricity Access Expansion Project (NELACEP) will finance part of Nigelec's Investment Distribution Program, focusing on addressing existing distribution network bottlenecks and pending connection requests in seven major urban areas, including the capital Niamey.

18. In addition, the project will finance the development of a National Electrification Strategy, which will provide a road map to develop access in urban and peri-urban areas and in rural areas in an equitable manner. Also, it will implement additional measures to develop access in the rural areas.

19. The project will support capacity building activities for MEP in the context of the current sector reform program. It will provide financing to Nigelec to improve its performance and to cover project implementation costs. The project is described briefly below and further details are provided in Annex 2.

A. Project Components

Component 1. Extension and reinforcement of distribution systems (estimated cost US$52.6 million equivalent).

20. This component will support the expansion, reinforcement, densification, and rehabilitation of medium/low voltage (MV/LV) distribution systems to allow the connection of 60,000 new connections in seven major urban areas (Niamey, Dosso, Maradi, Zinder, Agadez, Tahaoua and Tillabéry). In addition, this component will support the reinforcement of the substations that feed the urban centers and its related MV backbone network, thus improving the service quality for existing customers and allowing new customers to connect to the grid. This will improve power system performance, leading to a reduction of system losses, blackouts, fluctuation of voltage conditions, and poor system power factors. One of the main objectives of the reinforcement is to accommodate the additional demand generated by people connected through the project. The investments will include adding, replacing, or upgrading distribution lines, substations, MV/LV equipment, meters, spare parts, and tools. The new customers will be connected by electronic meters with both prepayment and post payment functions. The payment of the connection charges will be subsidized at 50 percent. In addition, the initial payment will be limited to US$20 equivalent and the remaining payment will be spread over 12 months. This connection policy will be extended to all connections undertaken by Nigelec in the project areas. This component incorporates an owner's engineer for supervising the implementation of the investment component, including the supervision of the implementation of the safeguard instruments.

Component 2. Strengthening institutional capacity in the electricity sector (estimated cost US$8.72 million equivalent).

21. This component will finance capacity building activities for MEP as well as Nigelec. In addition, it will support Nigelec in project implementation. The component will be divided into three sub-components:

- ***Sub-component 2-A***: *Technical assistance to MEP (US$4.25 million equivalent).* Activities under this sub-component will include: (i) strengthening MEP capacity to develop sector policies and regulations and to articulate a strategic vision for the sector; (ii) supporting the establishment of the Energy Regulator once it has been created,[1] and the preparation of a tariff review; (iii) supporting GoN's efforts to increase electricity access in the country by financing a National Electrification Strategy and measures to expand access in the rural areas. The strategy will consider both on-grid and off-grid solutions. These activities support the policy reforms included under the Public Investment Reform Support Program agreed with the World Bank as part of the DPO series.
- ***Sub-component 2-B:*** *Technical assistance to Nigelec (US$2.47 million equivalent).* This sub-component will include: (i) capacity strengthening in distribution system planning (implementation of a geographic information system and acquisition of new distribution planning software); (ii) the acquisition of fault detection equipment for underground MV system to improve system operation and fault clearing; and (iii) consultancy services for the study of Supervisory Control and Data Acquisition (SCADA) systems for the high voltage (HV) and MV grid.
- ***Sub-component 2-C:*** *Project Management (US$2 million equivalent).* The component covers all activities related to project implementation, including the purchase of vehicles for site supervision, the acquisition of computers and office equipment, training, audits, and other operational costs.

B. Project Costs and Financing

22. The lending instrument for the proposed project is an Investment Project Financing (IPF). The total project cost is estimated at US$65 million. The Ministry of Finance will receive an IDA credit denominated in a Euro[2] amount equivalent to US$54.5 million and an IDA grant in the SDR amount equivalent to US$10.5 million and will on-lend the funds to Nigelec. Cost estimates have been prepared and reviewed in consultation with Nigelec as well as the MEP and are in line with similar projects in Sub-Saharan Africa. Cost estimates by component are detailed in Table 1.

Table 1: Project Cost and Financing by Component (US$ million)

Project Components	Project cost	IDA Financing	% Financing
1. Extension and reinforcement of the distribution system	52.60	52.60	100
2. Strengthening institutional capacity in the electricity sector	8.72	8.72	100
2a. Technical assistance to MEP	4.25	4.25	100
2b. Technical assistance to Nigelec	2.47	2.47	100
2c. Project Management	2.00	2.00	100

[1] Two laws are under review by the Parliament: a new Electricity Code and the creation of an Energy Regulatory Authority. The Bank is supporting these sector policy reforms through the DPO series.

[2] The Borrower elected to denominate the credit in Euro as permitted under the IDA Single Currency Lending pilot program approved by the Executive Directors.

Contingency	3.68	3.68	100
Total Project Cost (including contingency)	**65.00**	**65.00**	**100**

C. Lessons Learned and Reflected in the Project Design.

23. The project has been designed taking into account broad lessons from World Bank's experience in the energy sector across Sub-Saharan Africa, as well as the existing projects in Niger. The following lessons learned from the implementation of these projects and ensuing country dialogue have informed the design of this project, including its implementation arrangements.

24. **International best practice has been incorporated in the design of the electrification component.** As part of project preparation, a workshop was held in Niamey in April 2015 with the stakeholders of the electricity sector, in particular MEP, Nigelec, and the National Agency for Promotion of Rural Electrification. The objectives of the workshop were to: (i) present international experiences on access to grid electricity, in particular pilots on prepayment and electronic meters and also the funding mechanisms for the implementation of household connections; and (ii) discuss the challenges in implementation of access projects in the electricity network in Niger. The main conclusions of the workshop were the following: (i) there is a need to develop a policy and a strategic plan for electrification in Niger—the development of the National Electrification Strategy will be financed by the World Bank as part of the NELACEP; and (ii) strategies must be developed to remove the connection charge barriers to the poor by designing and implementing innovative financing mechanisms. Based on the experiences of some African countries presented at the workshop, it was agreed with the client to spread the payment of the connection charges over several months, so that the initial fee to be paid by the consumers remains affordable. The project will also finance the installation of the connection, and contractors will be recruited through a competitive bidding process to implement the connections. Nigelec will be responsible for the commercial aspects of the connections. The technical and commercial capacities of Nigelec will be reinforced to make sure that this activity is conducted successfully.

25. **Electricity connections should be made affordable for low-income households.** Currently, the electricity connection fees in Niger are around US$200 per connection, which represents an economic barrier for low-income households to be connected to the grid. In order to lower this barrier, the investments for access to electricity under the project, including the acquisition and installation of connection equipment, will be funded as a grant in the amount of US$10.5 million. This will serve to subsidize 50 percent of the connection fee for 120,000 subscribers. The number of connections that will benefit from this action takes into account the total of subscribers who are connected through the Bank project (target of 60,000), together with those that will be connected through the AFD project (target of 60,000) in the areas where the projects will be implemented since the connections financed through the AFD project will adopt the same level of subsidy as under the Bank project. In addition, the payment schedule will be modified so that at the time of requesting the electricity connection, the customer will pay about US$20 equivalent. The remainder of the payment will be part of the customer's energy bill spread over a 12 month period.

26. **Advance procurement and packaging for the investment component will avoid delays in implementation.** The procurement process for the investment component is progressing in parallel

to the preparation and approval process of the project, with the objective of awarding and signing the main contracts soon after effectiveness.

27. **The project design incorporates an owner's engineer for supervising the implementation of the investment component.** Based on previous experience under similar projects, technical support during the construction period will help to avoid bottlenecks in the commercial and technical interactions with the contractors. In addition, the owner's engineer will help in conducting the supervision of the implementation of the safeguard instruments. This is particularly relevant considering that the investments are spread over several locations.

IV. IMPLEMENTATION

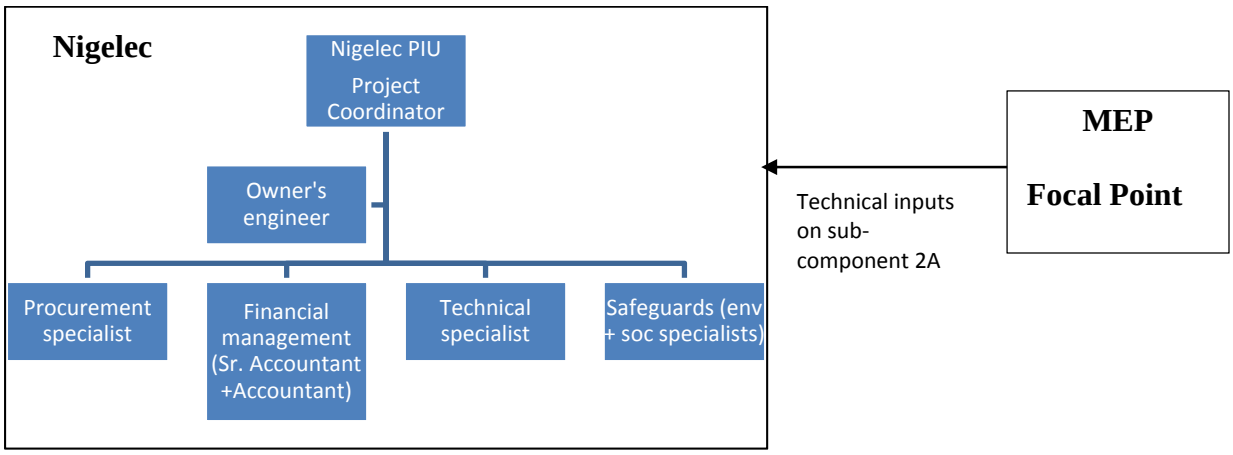
A. Institutional and Implementation Arrangements

28. **Implementing Agency.** Nigelec will be the sole implementing agency for the project. The MEP will nominate a focal point for its technical assistance subcomponent who will be responsible for providing the technical inputs and necessary technical clearances during the procurement process as well as for monitoring all activities included in the subcomponent. The role and responsibilities of both entities will be described in detail in the Project Implementation Manual (PIM), which will be prepared by Nigelec prior to effectiveness. In addition, Nigelec and MEP will sign a Memorandum of Understanding, which be an integral part of the PIM as an annex, to solidify their agreement on this arrangement.

29. Nigelec created a unit to manage its large projects (*Cellule des Grands Projets, CGP)*, including the NELACEP, and as such this will be the Project Implementation Unit (PIU). This will ensure a very close coordination with the implementation of the complementary project financed by AFD, as it will be supervised by the same unit. It is led by a project coordinator who reports to Nigelec's Deputy Chief Executive Officer (*Sécretaire Générale*). The PIU has been created at the same level of the other operational departments in Nigelec, thus ensuring adequate coordination through the management board. The PIU is headed by a project coordinator who is responsible for overall implementation. The project team includes specialists who are responsible for the following areas: procurement, financial management, technical, and environmental and social safeguards. The owner's engineer, who will be competitively recruited as part of the project, will report directly to the project coordinator.

30. Project implementation arrangements are summarized in Figure 1. A more detailed description of project implementation arrangements – including fiduciary responsibilities – is provided in Annex 3.

Figure 1: Project Implementation Arrangements



B. Results Monitoring and Evaluation

31. Annex 1 presents the project's results framework. Nigelec will be responsible for monitoring and reporting on all project activities, with inputs from MEP in regard to subcomponent 2A. In addition to regular monitoring and reporting on the agreed project indicators, activities to be monitored include the timely, efficient, and transparent supervision of procurement and contract management; monitoring of construction and commissioning of the distribution lines and substations; effective implementation of the Environmental and Social Management Plan and Resettlement Action Plan; and successful completion of studies and training activities. In addition, Nigelec's data system will generate sex-disaggregated data and include gender-relevant indicators about direct project household beneficiaries and non-household clients to adequately monitor and report on the outcome and impact of improved energy services on female and male beneficiaries.

C. Sustainability

32. The proposed infrastructure investments will provide substantial net economic benefits to Niger's society over a long period, as it will result in an additional 60,000 grid connections, equivalent to connecting about 330,000 people. The connections will improve the quality of the electricity services for existing households and productive users in seven main urban centers. From a technical perspective, Nigelec and the contractors to be selected have a long experience with the proposed technology and the operations and maintenance requirements. However, the project is part of a sector: (i) where a substantial investment program is to be implemented requiring coordination and implementation capacities; and (ii) that is likely to experience financial stress if the current tariffs are not adjusted to ensure Nigelec's financial and operational sustainability, particularly adequate maintenance. Power sector sustainability will hinge therefore on the ability of GoN and Nigelec to deliver on the investment program and on maintaining Nigelec's short- and long-term financial viability through improvements in operational performance, efficiency, and tariffs adjustments.

33. The World Bank's combined DPO and IPF support are designed to help the GoN and Nigelec achieve these goals. The role of supporting the creation of a regulator, the development of a

methodology to set cost reflective tariffs transparently, and a mechanism to implement gradually the new tariff schedule will be critical to ensure the financial sustainability of Nigelec and the sector as a whole. This, in turn, will help to ensure the sustainability of the energy access investments supported by this project.

V. KEY RISKS

A. Overall Risk Rating and Explanation of Key Risks

34. The overall risk of the project is rated as substantial. The main risks identified for the proposed project are summarized below.

35. ***Sector Risks.*** The financial equilibrium of the sub-sector and of Nigelec in particular are at risk. Current tariff levels are inadequate in view of the increasing role of costlier domestic thermal generation (including short-term rentals) and also due to Nigelec's self-financing and debt-service requirements. A detailed financial analysis will be initiated in parallel to the setting-up of the new regulatory entity, even on the basis of a preliminary investment program. Under the Public Investment Reform Support Program, agreed with the World Bank, the GoN has committed to establish clearer and more transparent tariff principles, tariff setting guidelines, and a cost-reflective tariff over the medium term. Delays on the implementation of generation and transmission projects, including in the implementation of the Nigerian generation program, would also delay the full benefits of distribution expansion investments in Niger.

36. ***Institutional Capacity for Implementation and Sustainability and Fiduciary Risks.*** These risks are rated substantial because Nigelec has low implementation capacity. Since no Bank financed projects have been implemented by Nigelec in the last decade, there will be a learning curve in regard to financial management, procurement, and contract management. The institutional assessment has identified the areas that need support through capacity building activities (see Annex 3 for more details).

37. ***Climate and Disaster-related Risks.*** A climate and disaster risk screening has been completed for the proposed project. As result of the screening, the team has confirmed that the technical specifications for equipment take into consideration a temperature increase of 1-1.6C by 2020-49. The team has also simulated the robustness of the investments in the distribution system with an expected increase in demand caused by the above mentioned temperature increase. As for the expected civil works on the sub-stations, the design of the drainage systems will account for expected increased flooding. Finally, there will be strengthening on the capacity to maintain the system with focused training on extreme events and how to do preventive maintenance (e.g., cleaning of drainage infrastructure before rainy season). These aspects will be monitored during project implementation.

VI. APPRAISAL SUMMARY

A. Economic and Financial Analysis

Economic Analysis

38. The rationale for public sector financing for investments under the proposed project rests primarily on the present characteristics of the sector: (i) low electricity access in the country requiring government intervention as a development priority to ensure energy supply and increase access to electricity; (ii) upgrading and expanding distribution networks are not normally conducive to public private arrangements, particularly if those investments are not linked to a private and bankable project; and (iii) the scale of investments required, and associated long payback periods. It is highly unlikely that a private investor will finance the proposed investments given the status of the sector.

39. In this context, the World Bank provides significant value added, as it is already a close partner of the GoN in the development of its electricity sector through the support to the development of the Kandadji hydropower project as well as through the DPO series, which includes support to the energy sector. The World Bank is well positioned to continue its commitment to the expansion and modernization of electricity supply in Niger, also building on its experience in similar programs in the region.

40. The economic viability of the project is analyzed by simulating the operations of the distribution networks for two scenarios: a 'Without-the-Project' scenario - where no such distribution investment is carried out; and a 'With-the-Project' scenario comprising project investment in network strengthening, rehabilitation, densification, and extension.

41. The project's net present value (NPV) is US$50.9 million at a 10 percent social discount rate, and the economic internal rate of return (EIRR) is 22.6 percent. The economic viability of the distribution investments (excluding the technical assistance not directly related to the investment and the price contingency) is robust under various assumptions of investment and generation costs. The project economic benefits include additional electricity sales and improved efficiency provided through upgrading, rehabilitation, and extension of the distribution networks in seven urban centers of Niger. The estimation of the economic benefits is based on estimates of customers' willingness to pay. Key sensitivity scenarios with base case results are provided in Table 2 and the results of the economic analysis carried out for each of the seven centers is provided in Annex 5.

Table 2: Summary of the Economic Analysis (Base Case and Key Sensitivity Scenarios)

Case	NPV, US$ million (at a 10% discount rate)	EIRR (%)
Base Case	50.9	22.6
Increase of 10% in generation costs	42.4	20.5
Increase in investment (all contingencies included)	45.4	20.3
Increase in benefits of 10% (higher willingness-to-pay or higher electricity consumption)	60.5	24.6

42. The project economic impact varies significantly between various urban centers as a result of variations in the initial physical condition of the distribution network, the amount of investment required, the expected increase in consumption of the urban center, and the cost of the generation sources for the center. Table 3 provides the EIRR for each center for the base case scenario.

Table 3: EIRR for Each Urban Center - Base Case

Urban Center	EIRR (%)
For the 7 urban centers	22.6
Niamey	29.4
Dosso	12.0
Tillaberi	5.8
Maradi	18.1
Tahoua	10.6
Zinder	9.4
Agadez	14.4

43. The EIRR for the project is 22.6 percent. As in the future as all systems become interconnected, this is the most important rate of return. The main cost in the economic and financial analysis is the cost of generation – this cost will converge between various cities over time as they are interconnected and will be served by common generation assets. In the short term, there are some cities whose EIRR is close to or just below the threshold (Zinder and Tillaberi). The government has made a strategic decision to invest in those cities as they are the capital cities of their respective departmental divisions. The investments financed by this project will lay the basis for grid integration and further expansion of the grid beyond the project period.

Financial Analysis

Nigelec Operational and Financial Performance

44. This section provides an overview of Nigelec's operational and financial performance as well as of its investment program. A detailed analysis is included in Annex 5.

45. Overall, over the last four years Nigelec's operational and financial performance has been relatively good in large part because of Niger’s continued access to low-cost electricity imports from Nigeria (at less than US¢4/kWh). This relatively healthy financial situation is however deteriorating as the retail tariff levels fixed by the government have not been adjusted for the last five years (and in fact were reduced for water pumping for agricultural production and for the Social Tranche).

46. Looking ahead, the following three main factors will likely impact Nigelec's future financial performance: (i) increase in supply costs as new domestic generation (such as the Gorou Banda 80 MW diesel units) will be dispatched to meet the fast increasing demand, or possibly through increases from Nigeria as Nigeria seeks to implement a private-sector based power sector reform; (ii) a large investment program in generation, transmission, and distribution (rehabilitation and

access extension), which would require adequate liquidities and debt service coverage ratio; and (iii) a tariff policy based on cost-reflective tariff setting principles, mechanisms for periodic reviews and adjustments as needed, and the participation of a new regulatory authority for the energy sector. In the context of the DPO support, discussions are ongoing regarding electricity tariffs to be cost-reflective by 2017. As noted in the project description above, the proposed project will support technical assistance to the new regulator and MEP to carry out a detailed review of the sector financial equilibrium and of both the level and structure of electricity tariffs.

Project Financial Analysis

47. Assuming that by 2017 retail tariffs are cost reflective (estimated increases of 15-25 percent have been assumed for tariffs to be cost-reflective) the project will yield a robust financial rate of return and a sound debt service coverage ratio. The financial internal rate of return (FIRR) and the debt service coverage ratio will be respectively 5.8 percent and 3.2 for a +15 percent average tariff adjustment in 2017 and 10.2 percent and 4.7 for a +25 percent average tariff adjustment. It should also be noted that there are substantial uncertainties regarding the future evolution of the generation costs as well as delays in the commissioning of least-cost investments, which could impact significantly on Nigelec's finances.

B. Technical

48. ***Technology***. All the technologies applied in the project, particularly as regards component 1, have been widely used in other countries with similar conditions and in the region; hence, the project does not raise any significant technical concerns. The access component of the project will continue to use the "appropriate engineering" approach to adapt the available and tested reticulation methods, including low-cost technologies, to the specific conditions in Niger.

49. ***Generation and Transmission Capacity.*** The availability of electricity generated and imported to supply Nigelec's consumers (old and new) after the project is implemented was checked as was the capacity of the transmission infrastructures to transit electricity.

50. Currently, Nigelec has 165,300 consumers in the region of Niamey, Tillabery, and Dosso, with a peak demand of 115 MW. This corresponds to an average demand of 0.7 kW per customer. The project envisages connecting 40,200 connections in those three cities and the AFD will finance the connection of 45,000 connections in the project zone. This additional demand resulting from these two operations is 60 MW at peak. The current maximum available generation of Nigele is 126 MW (including 30 MW Aggreko rental). The construction of the Gorou Banda power plant (80 MW) planned for 2016 will cover the additional demand of the project. In the following years, the increase of imports from Nigeria through a new transmission line Birni Kebbi – Niamey (330 kV) is essential to support the demand growth. This line is the first phase of the WAPP North Core interconnection Nigeria-Niger-Benin-Burkina Faso. In the cities of Agadez, Maradi, Tahoua, and Zinder, a total of 19,745 connections are provided under the project. The estimated additional maximum power demand is 2.7 MW for Agadez, 5.3 MW for Maradi, and 3.4 MW and 2.4 MW for Tahoua and Zinder, respectively. These demands will be met by increased imports from Nigeria and the additional local generation capacities.

51. The reinforcement of the MV backbone network and the upgrade of the transformation capacity of the substation, supported by both the World Bank and AFD, will help to accommodate the expansion to connect the new consumers.

C. Financial Management

52. The proposed financial management (FM) arrangements, including the mitigation measures for the project, are considered adequate to meet the Bank's fiduciary requirements under OP/BP 10.00. An assessment of the proposed FM arrangements and Nigelec found a substantial residual FM risk after mitigation measures. FM arrangements taking into account this risk are summarized below and described in detail in Annex 3.

53. The Nigelec PIU will include staff from Nigelec's existing FM Department and will be comprised of a dedicated qualified and experienced Senior Financial Management Specialist supported by one experienced accountant. Since Nigelec has no past, recent experience in the Bank-financed projects policies and procedures, it was agreed that Nigelec will recruit a short term consultant with FM experience in Bank-financed projects acceptable to IDA to support the FM Specialist. In addition, the Bank FM team will provide ad hoc training to the project FM team during the project implementation to ensure to keep adequate records and reporting of financial transactions and information. The FM team will report to the project's coordinator and will be responsible for: (i) the design and establishment of the project's computerized financial management system; (ii) maintaining up-to-date accounting records and ledgers; (iii) recording of financial transactions; (iv) financial reporting; (v) submission of audit reports; and (vi) ensuring that a proper internal control system is in place to achieve accountability at all levels.

54. The FM team will be supported by Nigelec's existing Internal Audit Department. The Internal Auditors will review the FM Reports submitted by the project's different stakeholders, and will carry out regular internal audit controls. This will include the verification of eligibility of expenditures ex-post as well as physical inspection of works and goods acquired by the project.

55. The project's internal control and appropriate segregation of duties and responsibilities will be defined in the administrative, accounting, and financial chapter of the project implementation manual. Accounting software with multi-projects, multi-sites, and multi-donors features will be procured.

56. Disbursements for this IPF operation will follow the *World Bank Disbursement Guidelines for World Bank Projects*, dated May 2006. Funds will be disbursed against eligible expenditures incurred from the signing date of the Financing Agreement to the Closing Date specified in the Financing Agreement. Funds will be disbursed for 100 percent of eligible expenditures inclusive of taxes. Additional disbursement procedures are detailed in Annex 3.

D. Procurement

57. Procurement for the proposed project will be carried out in accordance with the World Bank's "Guidelines: Procurement of Goods, Works and Non Consulting Services under IBRD Loans and IDA Credits and Grants by World Bank Borrowers" dated January 2011 and revised 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 July, 2014, and 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 the provisions stipulated in the Financing Agreement. National Competitive Bidding (NCB) shall be in accordance with procedures acceptable to the Bank.

58. Nigelec has the technical expertise to support procurement processes despite its limited procurement experience with World Bank procedures. Nigelec has its own procurement procedures, which have been recently aligned to National Procurement Code, which is overall judged acceptable by the World Bank despite some areas for improvement. The procurement process is fully conducted within Nigelec: preparation, evaluation, approval, and signature. An Internal Audit Directorate is in charge of procurement prior review control, and there are three existing manuals: (i) manual of administrative and accounting procedures, (ii) manual of procurement procedures, and (iii) manual on delegation of power at the central and regional level and for various thresholds. The PIM will take into account these manuals to include adequately the World Bank procurement procedures to be applied for this financing and to clarify the interactions between involved actors related to the procurement responsibility in line with the institutional arrangements agreed with the Borrower. Nigelec and MEP will sign a Memorandum of Understanding, which be an integral part of the PIM as an annex, to solidify their agreement on this arrangement. The procurement filing needs to be strengthened and aligned to the World Bank procurement filing requirements.

59. The key risks identified for procurement management and over signature powers are: (i) the risk of confusion on procedures to be applied; (ii) the lack of proficient procurement staff to implement procurement actions in line with Bank procurement procedures; (iii) the staff within Nigelec responsible for process control and approval are not familiar with Bank procurement procedures; (iv) the risk of exposure of the procurement staff to influence and pressure from their hierarchy; and (v) inadequate communication and interaction between the technical directorates, the Procurement Unit, and the PIU put in place, which may lead to delays in the drafting of terms of reference (ToRs) or technical specification and poor estimation of the costs; (vi) the procurement in a specialized market with few bidders can restrict competition and possibly increase prices and collusion risks; (vii) the corruption risks in procurement of big contracts taking into account the IFC enterprise survey; (viii) poor filing, which can lead to loss of documents. Overall, all these risks can cause mis-procurements, possible delays in evaluation of bids, and technical proposals leading to implementation delays, poor quality of contract deliverables and reputational risks to the World Bank and the project.

60. The overall procurement risk for the proposed project is considered high taking into account the lack of experience in World Bank procurement procedures, the size of contracts to be procured and the overall fiduciary risk in the country. An action plan has been agreed with Nigelec in order to mitigate the risks identified in the procurement assessment (see Annex 3). With the implementation of the proposed measures of the action plan and the support of World Bank team, the overall residual procurement risk is rated substantial.

E. Social and Environmental Safeguards

61. The project's environmental assessment is category B, partial assessment, as no adverse long-term impacts are anticipated. Three safeguard policies have been triggered: Environmental Assessment (OP 4.01), Involuntary Resettlement (OP 4.12), and Physical Cultural Resources (OP/BP 4.11).

62. The net social and environmental effect of the project is expected to be strongly positive, as greater access to electricity will significantly improve the beneficiaries' living conditions in these areas. New households will be connected through extension of the network; and the same would apply to businesses and institutional users (local government, schools, health centers, etc.).

63. Environmental Assessment (OP/PB 4.01). Activities under component 1 have the potential for some localized environmental adverse impacts. An Environmental and Social Impact Assessment (ESIA) and an Environmental and Social Framework (ESMF) have been prepared to address and mitigate potential environmental and social impacts of the proposed project. The ESIA and the ESMF have been approved by the Bank and disclosed in-country and in the Info Shop on October 16, 2015. The ESMF will contain provisions for chance find- procedures under OP 4.11.

64. Involuntary Resettlement (OP/BP 4.12) is triggered in the context of component 1 as new distribution lines might require some land acquisition and involve compensation, and potentially, limited relocation and displacement of households and assets. Some small-scale land acquisition and/or losses or assets may occur as a result of constructing new substations (Niamey and Maradi) and expanding the grid. A Resettlement Action Plan (RAP) for the known locations, which addresses such negative social impacts on women or men, and contains a compensation framework for the affected households, has been prepared, consulted upon, and was disclosed on October 16, 2015. Additionally, a Resettlement Policy Framework (RPF) was prepared for the locations which have not been identified yet to guide the future preparation of eventual RAPs, consulted upon, and disclosed in-country and the InfoShop on October 16, 2015. The cost of land acquisition and compensation will be covered by the borrower.

65. Coordination and implementation of the project's environmental and social safeguards will be carried out by Nigelec, which will reinforce its staffing by recruiting a social specialist to be responsible for ensuring project compliance with the social safeguards instruments in accordance with national and Bank policies and procedures; Nigelec already has an environmental specialist. They will be trained, together with their regional counterparts, in the implementation and monitoring of World Bank safeguard policies. Nigelec will ensure adherence to the safeguard documents of all agencies involved in the implementation of the project, including contractors. All contractor bidding documents will include specific environmental and social clauses. Consulting engineers' contracts will include provisions for overseeing the implementation by the contractors of the environmental and social clauses. In order to reinforce safeguards capacity in the regions, the Owner's engineer will be mandated to supervise these issues. Nigelec will produce on a quarterly basis, reports on the compliance with the safeguard documents.

Gender

66. The project team will collaborate with the Africa Renewable Energy Access Gender and Energy Program to look at relevant gender dimensions under the project, particularly as related to access. The focus will be on the payment and application procedure for the new electricity connections, information campaigns, consultation processes under the social safeguards, and the National Electrification Strategy. Actions to respond to gender differences will include a survey of potential new clients to identify their constraints to obtaining an electricity connection; designing information campaigns about the project and its benefits so they reach women and other groups with limited access to information to encourage their demand for a connection; and building the capacity of project staff managing the application process to ensure that female and male clients are treated equally and provided assistance to complete the application successfully. Mechanisms such as deferred charges and flexible eligibility criteria will be investigated to ensure that women, particularly low-income female household heads and small business owners, can have access to and benefit from the economic opportunities associated with having electricity. In addition, the project's monitoring and evaluation system will generate sex-disaggregated data on project activities and outcomes to adequately monitor and report on the impact of improved energy services on female and male beneficiaries.

F. World Bank Grievance Redress

67. 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.

G. Beneficiary Feedback

68. Beneficiary feedback will be recorded and monitored for component 1 through the grievance redress mechanism, which is further described in the RAP. The PIU will gather information about component 1 activities where complaints have been brought forward, including information on how they were resolved or relevant follow-up, and this information will be included in an annual progress report and taken into account during project implementation.

Annex 1: Results Framework and Monitoring

Country: Niger
Project Name: Electricity Access Expansion Project (P153743)
Results Framework

Project Development Objectives

PDO Statement: The Project Development Objective (PDO) is to increase access to electricity in Niger.

Project Development Objective Indicators							
		Cumulative Target Values					
Indicator Name	**Baseline**	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**	**End Target**
People provided with access to electricity under the project by household connections – Grid (Number) (Core)	0	0	48,640	179,200	307,200	326,400	326,400
Non-household connections provided with access to electricity under the project (Number)	0	0	1,000	4,500	8,500	9,000	9,000
Direct project beneficiaries (Number) (Core)	0	0	49,640	183,700	315,700	335,400	335,400
Female beneficiaries (Percentage) (Sub-type)	49.6	49.6	49.6	49.6	49.6	49.6	49.6
Intermediate Results Indicators							
Indicator Name	**Baseline**	**Cumulative Target Value**					
		YR1	**YR2**	**YR3**	**YR4**	**YR5**	**End Target**
Household connections provided with access to electricity under the project (Number)	0	0	7,600	28,000	48,000	51,000	51,000

Number of total electricity connections completed in urban areas under the project (Number)	0	0	8,600	32,500	56,500	60,000	60,000
Distribution lines constructed or rehabilitated under the project (km) (Core)	0	0	105	420	695	695	695
Distribution lines constructed under the project (km) (Sub-type)	0	0	70	280	460	460	460
Distribution lines rehabilitated under the project (km) (Sub-type)	0	0	35	140	235	235	235
Number of times MV feeders affected by the project are cut off (Number)	85	85	80	65	45	40	40
Substation supply capacity (MW)	270	270	270	350	390	415	415
Cities with completed georeferenced electricity systems (Number)	1	1	2	4	6	7	7
National Electrification Strategy adopted by the Government (Text)	No	No	No	Yes	Yes	Yes	Yes
Project-related grievances registered under the project GRM and addressed (Percentage)	0	100	100	100	100	100	100

Indicator Description				
Project Development Objective Indicators				
Indicator Name	Description (indicator definition etc.)	Frequency	Data Source / Methodology	Responsibility for Data Collection
People provided with access to electricity under the project by household connections – Grid	Unit: Number This indicator measures the number of people that have received an electricity connection under the project via new connections aimed at connecting households. It will be calculated using the number of household connections times the average household size in urban areas in Niger (6.4 people/household).	Semi-annual	Nigelec data system	Nigelec
Non-household connections provided with access to electricity under the project	Unit: Number This indicator measures the number of non-households connections (public institutions, commercial, small industries) completed under the project.	Semi-annual	Nigelec data system	Nigelec
Direct project beneficiaries	Unit: Number Direct beneficiary are people or groups who directly derive benefits from the interventions of the project. It will be estimated by adding the people provided with access to electricity to the number of non-household connections.	Semi-annual	Nigelec data system and census data from the *Institut National de la Statistique du Niger* (INS)	Nigelec
Female beneficiaries	Unit: Percentage Based on the assessment and definition of direct project beneficiaries, specify what percentage of the beneficiaries are female. This is based on data coming from the census.	Semi-annual	INS	INS

Intermediate Results Indicators				
Indicator Name	Description (indicator definition etc.)	Frequency	Data Source / Methodology	Responsibility for Data Collection
Household connections provided with access to electricity under the project	Unit: Number This indicator measures the number of households connections completed under the project.	Semi-annual	Nigelec data system	Nigelec
Number of total electricity connections completed in urban areas under the project	Unit: Number This indicator measures the number of total connections (household and non-household) completed in urban areas under the project.	Semi-annual	Nigelec data system	Nigelec
Distribution lines constructed or rehabilitated under the project	Unit: Km This indicator measures the number of km of distribution lines (LV and MV) constructed or rehabilitated under the project	Semi-annual	Project progress report	Nigelec
Distribution lines constructed under the project	Unit: Km This indicator measures the number of km of distribution lines (LV and MV) constructed under the project	Semi-annual	Project progress report	Nigelec
Distribution lines rehabilitated under the project	Unit: Km This indicator measures the number of km of distribution lines (LV and MV) rehabilitated under the project	Semi-annual	Project progress report	Nigelec
Number of times MV feeders affected by the project are cut off	Unit: Number This indicator measures the number of times MV feeders affected by the project (rehabilitated or reinforced) are cut off during a year.	Annual	Nigelec data system	Nigelec
Substation supply capacity	Unit: MW	Annual	Nigelec data system	Nigelec

	This indicator measures the capacity of the MV/LV substations that feed electricity to the cities included in the projects.			
Cities with completed georeferenced electricity systems	Unit: Number This indicator measures the number of cities that have completed the georeference for their electricity systems.	Semi-annual	Project progress report	Nigelec
National Electrification Strategy adopted by the Parliament	Unit: Yes/No This indicator checks whether the National Electrification Strategy has been completed and adopted by the Parliament.	Annual	Completion report	MEP
Project-related grievances registered under the project GRM and addressed	Unit: Percentage This indicator measures as a percentage the number of addressed grievances over the number of registered grievances.	Annual	Project progress report	Nigelec

Annex 2: Detailed Project Description

NIGER: Electricity Access Expansion Project

1. The proposed Niger Electricity Access Expansion Project (NELACEP) will finance a strategic portion of Nigelec's investment program to improve access to electricity services, focusing on the priority to address existing network bottlenecks and pending connection requests in seven major urban areas, including the capital Niamey. The project will also finance capacity building activities to the MEP in the context of the current sector reform program. In addition, it will provide financing to Nigelec to improve its performance and to cover project implementation costs.

2. The project has two components: (i) extension and reinforcement of distribution systems; and (ii) strengthening institutional capacity in the electricity sector.

Component 1: Extension and reinforcement of distribution systems *(estimated cost: US$52.6 million equivalent).*

3. The investment component consists of investments in distribution systems in seven cities in Niger: Niamey, Dosso, Maradi, Zinder, Tahoua, Tillabery, and Agadez. The investments concern (i) extension, reinforcement, densification, and rehabilitation of LV and MV distribution networks (ii) reinforcement of the MV backbone network and rehabilitation / reinforcement of substations feeders; (iii) electricity connections; and (iv) construction supervision throughout the country.

(i) Extension, reinforcement, densification and rehabilitation of MV and LV networks

4. The extension relates to the construction of new LV and MV lines to serve new customers in order to increase the access rate, while the reinforcement is to replace equipment whose service capacity has become saturated by equipment of higher capacity. The densification concerns investments in areas where the existing network has become saturated because of the increase in the load density. Finally, the rehabilitation is the replacement of obsolete equipment defective or saturated by new reliable and secure equipment.

5. *For the city of Niamey*, the extension concerns the Koira Tegui neighborhood with the construction of 18 new MV/LV substations equipped with a 400 kVA transformer each. The MV/LV distribution lines to supply customers from these stations will also be built. In total it is planned to construct 12.2 km of MV lines and 110 km of LV lines. In regard to rehabilitation, seven old substations with obsolete and dangerous equipment will be replaced by new masonry enclosure substations. Transformers approaching their load limit will also be replaced. 12 MV/LV substations equipped with old cubicle breaker units (Vercors 500), will be renewed with metal clad MV switchgears. The obsolete 3x150 mm2 aluminum MV cables will be replaced with single-core 3x (1x150mm2) cables to improve the reliability of the MV network. The total length of these sections amounts to 12.2 km. Regarding reinforcement, 28 transformers that have reached 75 percent of capacity will be replaced with those with higher capacity. Twenty-three pole mounted transformer stations operating at more than 75 percent of their capacity will be converted to masonry enclosure stations equipped with higher capacity transformers. Under this activity, 157 km of low voltage cable will be laid to reach the existing and new customers. Regarding

strengthening, 12 areas were identified, resulting in 67 transformer stations for which the capacity of their transformers will be increased. The activity will also cover the construction of one new station, MV links between the stations, and LV network to reach existing and possibly new customers. Ultimately, 3 km of underground MV networks and 188 km of LV networks will be built.

6. *For the city of Dosso,* three districts were selected as part of the expansion of the network, with the construction of three new transformer stations (two masonry enclosure cabin stations and a pole mounted pole station). The construction of 3 km of MV networks and 38 km of LV networks are also planned. Reinforcement and the strengthening activities concern the upgrade of two existing pole mounted transformer stations to masonry cabin stations with higher capacities.

7. *For the city of Zinder,* nine districts are affected by the expansion activity. The construction of 19 substations with 8 km of MV lines and 138 km of LV lines, is planned. For the reinforcement, one pole mounted transformer station will be upgraded to masonry cabin stations with higher capacity. For the strengthening of the network the capacity of five transformer stations will be increased and four new stations will be built. At the network level, 3 km of MV lines and 25 km of LV lines will be built.

8. *For the town of Tahoua*, 10 districts will benefit from the construction of 11 new MV/LV substations, 300 m of MV lines and 3.5 km LV lines, as part of the expansion. For the rehabilitation, 3 km LV lines will be laid, and seven pole mounted switches will be replaced. 2 km of 3x150 mm2 obsolete underground MV aluminum cables will be replaced by the 3x (1x150 mm2) underground aluminum cables. As part of the reinforcement, a new pole mounted transformer station will be built and five old pole mounted stations will be upgraded to masonry cabin stations of higher capacity. 600 m of MV lines and 1 km of LV lines will be laid.

9. *For the town of Maradi,* nine districts will benefit from expansion with the construction of five new masonry cabin stations and the upgrade of 13 pole mounted stations to masonry cabin stations with higher capacity power transformers. The construction of 7 km of MV lines and 134 km of LV lines is also planned. The reinforcement consists of the construction of masonry cabin stations and the upgrade of two pole mounted stations into higher capacity masonry cabin stations. One hundred m of MV lines and 22 km of LV lines will be built. For the strengthening, a new pole mounted station will be built and eight pole mounted stations will be upgraded to masonry cabin stations. Two hundred m of MV lines and 56 km of LV lines will be built.

10. *For the city of Agadez*, network expansion will concern nine neighborhoods. In these districts, 18 new pole mounted transformers and two new masonry cabin stations will be built. Four km of MV lines and 21 km of LV lines will be installed. As part of the reinforcement of the network, four pole mounted stations will be upgraded into higher capacity masonry cabin stations, and the transformer capacity of an existing masonry cabin station will be increased. For the rehabilitation, two normal switches and four obsolete pole mounted switches will be replaced. The strengthening will consist in the construction of a new pole mounted station and a new masonry cabin stations. Five pole mounted stations will be upgraded into masonry cabin stations with higher capacity power transformers. One point six km of MV lines and 8.5 km of LV lines will be constructed.

11. *For the city of Tillabery*, five areas will be affected by network expansion. As part of this expansion, 3 new pole mounted stations will be built, and one pole mounted station will be upgraded into masonry enclosed cabin station of higher capacity. Nine hundred m MV lines and 17 km of LV lines will be built. For the rehabilitation, 7 pole mounted switches will be replaced. For the strengthening, 3 pole mounted stations posts will be upgraded into cabin stations of higher capacity, and the transformer of a cabin station will be replaced with a higher capacity transformer. Forty three m of MV lines and 1.4 km of LV lines will be built.

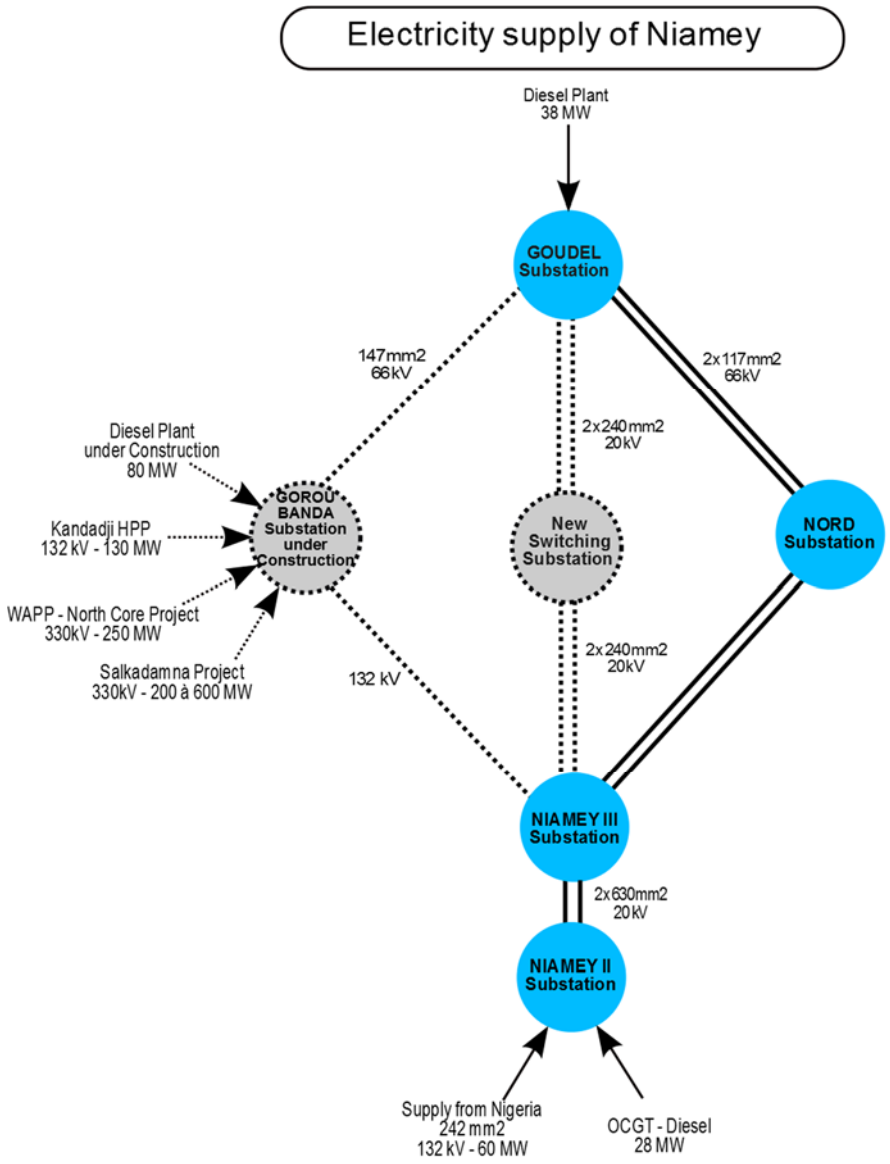
(ii) Reinforcement of the MV network and rehabilitation / reinforcement of substations

12. The objective of the reinforcement and rehabilitation activities is to allow the MV distribution network to carry the loads resulting from investments in distribution. To achieve this goal, new sections of overhead and underground MV lines will be built, some substations will be rehabilitated with the creation of new MV feeders, overloaded HV/MV transformers will be upgraded, and switching substations will be built.

13. *For the city of Niamey*, as shown in Figure 1, the project includes the construction of an underground two MV (240 mm2 Alu) line between Goudel substation and Niamey 3. One of the two feed cables will connect, in normal operation, Goudel to the new switching substation to be financed under this project. This substation will relieve the overloaded feeders of Niamey Nord substation. The second cable will connect directly the Goudel substation and Niamey 3. The new substation will be supplied with 20 kV and will be equipped with cubical switch units for two incoming lines, one intermediate connection, and six new outgoing feeders. Two outgoing feeders will be used to relieve the existing feeders of Madina, North and Hamdallaye Fleuve. In anticipation of the proposed SCADA/Emergency Management System for HV and MV systems, the MV switching equipment financed under this project will be motorized.

- At the Goudel Substation. Two new 20 kV bays and two 30 MVA transformers will be installed as part of the Gorou Banda project. To allow the transfer of the energy of Gorou Banda to new feeders, ten 24 kV breaker units will be installed in this substation. Some of these units will be used to replace existing aging units. New civil works are also planned.
- At the Niamey 3 Substation. The project will finance the acquisition and installation of a dozen breaker units for the rehabilitation of obsolete breakers and to create new supply feeders to relieve the existing ones. The rehabilitation of the battery room and the expansion of the building are also planned.
- At Niamey Nord Substation. The 10 MVA and 20 MVA transformers currently in service will be saturated in 2019. To avoid this situation, the rehabilitation of the old 66 kV bay and installation a new 66 kV bay will be financed. Two 30 MVA transformers will be installed as part of the project on both 66 kV bays with the associated civil works. Ten MV cubical units including one transformer protection unit, one intermediate connection unit, and eight feeder breakers will be installed. Civil works in the switchyard and the building are also included.

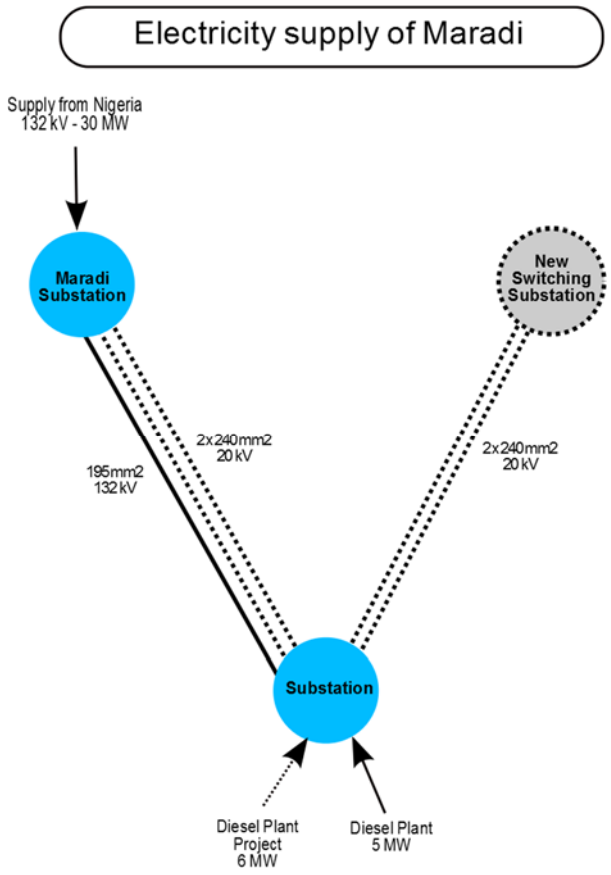
Figure 1: Scheme of Niamey's Power Supply



14. *For the city of Dosso*, a new 20 kV feeder will be created to relieve the existing feeders in order to allow more expansion and quality of service in the city.

15. *For the city of Maradi*, the creation of a new switching substation is planned with the acquisition of 15 cubical MV units (feeder breaker from the existing substation, incoming feeders to the new substation, measurement units, one tie breaker, new feeder beakers, one grounding switch and one auxiliary transformer switch). Four breaker units will be installed to connect the new switching substation to the existing 132/132 kV switching substation will be converted to a supply substation. Two underground 240 mm² MV lines of 8 km will be built to connect the substations. The associated civil works will also be part of the investment. For the existing substation, breaker units will be procured to replace the obsolete VM6 units.

Figure 2: Scheme of Maradi's Power Supply



16. *For the city of Zinder*, construction of a new overhead MV link to achieve the closure of feeder D1. This line will be built between the "CEG 8" substation and the new substation Jaguindi.

17. *For the town of Tahoua,* the project will provide two 33 kV cubical breaker units for the expansion and the acquisition of 18 24kV breaker units to replace the obsolete ones, transformers units, generator units, feeder breaker units, tie breaker unit, measurement unit and grounding and auxiliary transformer units. The associated civil work is also planned.

18. *For the city of Agadez,* the acquisition of 11 24 kV breaker units is planned to replace the existing ones (incoming feeder breaker, generation breakers, outgoing feeders breakers, measurement unit, switch for grounding and auxiliary transformer, TSA / BPN and bar lift). Two new outgoing feeders will be created.

19. *For the city of Tillabery*. Eight new 24 kV feeder units will be acquired to replace the obsolete low oil volume units.

(iii) Electricity connections

20. In total, the supply and installation of 60,000 connections (meters and connection equipment included) is planned under the project, with 36,120 of these connections planned in Niamey (Table

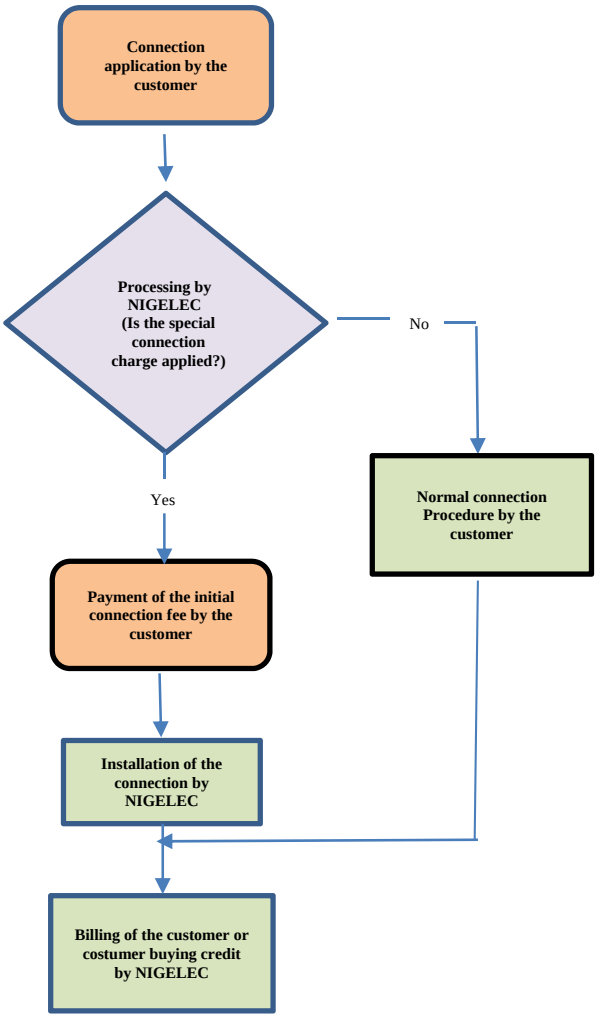
1 below shows the breakdown of planned connections under the project by city). The meters will be electronic with both post payment and prepayment functions. The objective of Nigelec is to allow the customer to choose between the two functions based on his or her needs. Arrangements will be made to facilitate access to these connections and better organization will be in place to allow the installation of connections within the timeframe of the project. The contractors will be recruited through a competitive process to implement the connections. Nigelec will be responsible for the commercial aspects of the connections. The technical and commercial capacities of Nigelec will be reinforced to make sure that this activity is conducted successfully.

Table 1. Number of Connections Planned under the Project by City

City	Number of connections
Niamey	36,120
DOSSO	3,025
ZINDER	3,450
TAHOUA	4,830
MARADI	7,595
AGADEZ	3,870
TILLABERY	1,110
TOTAL GENERAL	**60,000**

21. Currently, the electricity connection fees are around US$200, which represents an economic barrier for the low-income households to be connected to the grid. In order to lower this barrier, the investments for access to electricity under the project, including the acquisition and installation of connection equipment, will be funded as a grant in the amount of US$10.5 million. This will serve to subsidize 50 percent of the connection fee for 120,000 subscribers. The number of connections that will benefit from this action takes into account the total of subscribers who are connected through the Bank project (target 60,000) together with those connected through the AFD project (target 60,000) in the areas where the projects will be implemented since the connections financed through the AFD project will adopt the same level of subsidy as under the Bank project. In addition, the payment schedule will be modified so that at the time of requesting the electricity connection, the customer will pay about US$20. The remainder of the payment will be part of the customer's energy bill spread over a 12 month period. Figure 3 illustrates the planned connections process taking these decisions into account.

Figure 3. Connection Processing Chart



(iv) Owner's engineer for construction supervision

22. The supervision of the MV works (rehabilitation and strengthening of the substations) and the LV works (strengthening, rehabilitation, densification, and extension of the network) will be done by an owner's engineer, to be recruited on a competitive basis under the project. The owner's engineer will also monitor compliance with safeguard instruments (environmental and social) related to construction.

Component 2: Strengthening institutional capacity in the electricity sector *(estimated cost US$8.72 million equivalent).*

23. This component will finance capacity building activities for Nigelec as well as MEP. In addition, it will support Nigelec in project implementation. The component is divided into three sub-components:

- ***Sub-component 2-A***: *Technical assistance to MEP (US$4.25 million equivalent).* Activities under this component will include: (i) Strengthening MEP capacity to develop sector policies, regulations, and ability to articulate a strategic vision for the sector. The project will finance the provision of experts, who will work with GoN officials on the development of such documents; (ii) supporting the implementation of the Energy Regulator once it has been created, and the preparation of a tariff review. It is envisaged that experts financed under the project will help GoN to develop the various policy and regulatory documents, and will train newly recruited officials in the Energy Regulator; (iii) Supporting Government's efforts to increase electricity access in the country by financing a National Electrification Strategy and measures to expand access in rural areas. An international consultant with experience in developing such instruments will be recruited to develop the strategy and other measures, which will be used as the road map for future investments to expand access to electricity. The strategy will consider both on-grid and off-grid solutions.

- ***Sub-component 2-B:*** *Technical assistance to Nigelec (US$2.47 million equivalent).* This sub-component will support: (i) Capacity strengthening in distribution system planning through the acquisition of new distribution planning software and the implementation of a geographic information system (GIS); Network planning software licenses will be acquired as part of this project and on-site training will be organized for Nigelec technical staff on the use of the software. The software will be used for electrical design and planning electric systems both for transmission and distribution. The GIS concerns the network of cities of Dosso, Maradi, Zinder, Tahoua, Agadez and Tillabery. The digitization of the Niamey network is ongoing and thus is not part of this project; (ii) Acquisition of fault detection equipment on underground MV system to improve system operation and fault clearing. This activity concerns the acquisition of a van equipped with fault detection equipment on board for the underground MV network. On-site training will also be organized for the Nigelec's personnel for the mastery of the equipment; (iii) Consultancy services for the study of SCADA systems for HV and MV grid. This activity relates to the selection of a consultancy service for the study of two SCADA systems (one for HV and MV systems). The SCADA will allow a better operation of the system and to improve system reliability. The study will analyze the feasibility of the SCADA systems and develop the specifications and bidding documents. The consultant will also provide assistance during bid evaluation

- ***Sub-component 2-C:*** *Project Management (US$2 million equivalent).* The component covers all activities related to project implementation, including the purchase of vehicles for site supervision, the acquisition of computers and office equipment, training, audits, and other operational costs.

Table 2: Estimate of Project Costs

Project Components	Project Cost (US$ millions)
1- Extension and reinforcement of distribution systems	
1.A- Reinforcement and Expansion of the Distribution System	30.5
Lot 1 : Part of Niamey, Maradi, Zinder	*11*
Lot 2: Part of Niamey, Agadez, Tahoua	*11*
Lot 3: Part of Niamey, Dosso, Tillabery	*8.5*
1.B - Rehabilitation and Reinforcement of Substations and MV system(lot 4)	10.1
- Niamey	*5.0*
- Tahoua	*0.9*
- Maradi	*3.5*
- Agadez	*0.4*
- Tillabery	*0.3*
1.C – Electricity Connections	10.5
Lot 1: Procurement of meters	*4.0*
Lot 2: Procurement of connection equipment	*6.0*
Lot 3: Installation of meters	*0.5*
1.D - Construction Supervision of 1.1 and 1.3	1.5
Subtotal Component 1	**52.60**
2- Strengthening institutional capacity in the electricity sector	
2.A – Technical assistance to the Ministry of Energy (Sector Reform)	4.25
2.A.1- Policymaking and Regulatory framework	*0.65*
2.A.2 - Energy regulator	*0.6*
2.A.3 - National electrification Strategy	*3.0*
2.B – Technical assistance to Nigelec	2.47
2.B.1 - GIS for the distribution network and Network planning software and training	*0.57*
2.B.2- Underground Fault Detection System	*0.4*
2.B.3 - Study of SCADA system for HV and MV system	*1.5*
2.C.- Project management	2.0
Subtotal Component 2	**8.72**
Contingency	3.68
Total	**65.00**

Annex 3: Implementation Arrangements

NIGER: Electricity Access Expansion Project

Project Institutional and Implementation Arrangements

1. Nigelec will be the sole implementing agency for the project. MEP will nominate a focal point for technical assistance subcomponent 2A, who will be responsible for providing the technical inputs into all ToR and bidding documents for all contracts to be executed under subcomponent 2A, and necessary clearances during the procurement process as well as for monitoring all activities included in the subcomponent. The role and responsibilities of both entities will be described in detail in the Project Implementation Manual (PIM), which will be prepared by Nigelec prior to effectiveness. In addition, Nigelec and MEP will sign a Memorandum of Understanding, which will be an integral part of the PIM as an annex, to solidify their agreement on this arrangement.

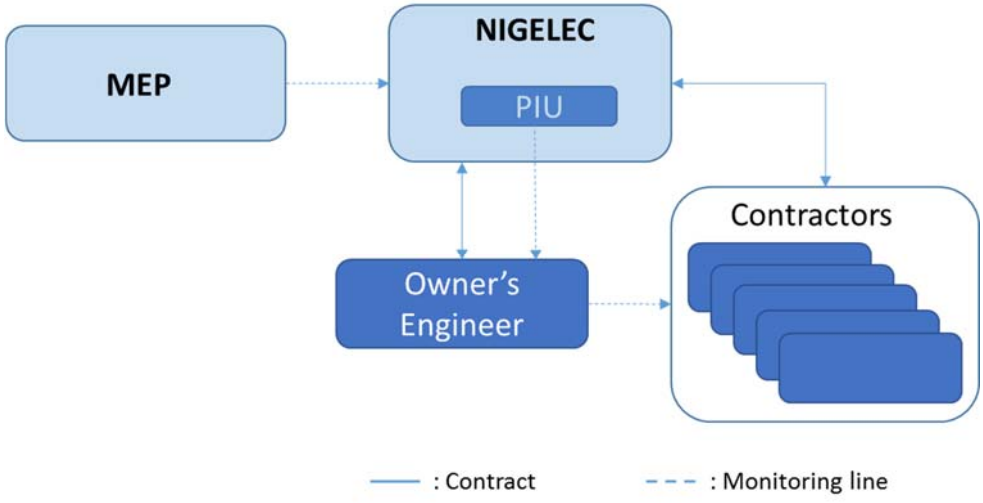
2. Nigelec created a unit to manage its large projects (*Cellule des grands projets-CGP)*, including the NELACEP, and as such this will be the Project Implementation Unit (PIU). This will ensure a very close coordination with the implementation of the complementary project financed by AFD, as it will be supervised by the same unit. It is led by a project coordinator who reports to Nigelec's Deputy Chief Executive Officer (*Sécretaire Générale*). The PIU has been created at the same level of the other operational departments in Nigelec, thus ensuring adequate coordination through the management board.

3. The project coordinator is responsible for overall implementation, including the coordination with the focal point in the MEP and AFD. The project team includes specialists who are responsible for the following areas: procurement, financial management, technical, and safeguards. In addition, the owner's engineer, who will be recruited as part of the project, will report directly to the project coordinator. The members of the team have been nominated within Nigelec with the support of external consultants for specific tasks according to implementation needs to ensure that the monitoring and reporting obligations to the Bank are met.

4. Components of the project will be implemented by contractors selected by the PIU under competitive procurement. A consulting firm will be engaged to assist the PIU as an owner's engineer to supervise the execution of the works and services by the contractors (see Figure 1).

5. Given the fact that the project will be implemented in seven cities, the PIU will get technical and commercial support from Nigelec's regional offices, which have presence in all cities affected by the project. A focal point will be nominated to coordinate with the PIU project coordinator. As for the environmental and social aspects, the ToRs of the owner's engineer will include monitoring of compliance with safeguard documents (environmental and social) to further support the PIU in this regard.

Figure 1: NELACEP Institutional Arrangements



6. The project will be implemented in accordance with the PIM, which will be prepared by Nigelec prior to effectiveness.

Financial Management, Disbursements and Procurement

Financial Management Arrangements

7. The Bank's financial management team conducted a financial management assessment of Nigelec, the entity implementing the project. The assessment noticed that Nigelec does not have any recent experience with the implementation of the Bank-financed projects but it is implementing the US$160 million Gorou Banda central 100 MW project financed by the West African Development Bank and the Islamic Development Bank. Nigelec will also implement an investment and technical assistance project from the AFD to improve electricity access by expanding Nigelec's grid. As part of the PIU, Nigelec designated an FM specialist and an accountant to work under the project. Moreover, Nigelec will hire experienced procurement and FM consultants to provide the required guidance to the newly-deployed project staff.

8. The objective of the financial management assessment was to determine whether the financial management arrangements: (i) are capable of correctly and completely recording all transactions and balances relating to the project; (ii) facilitate the preparation of regular, accurate, reliable and timely financial statements; (iii) safeguard the project's assets; and (iv) are subject to auditing arrangements acceptable to IDA. The assessment complied with the Financial Management Manual for World Bank-Financed Investment Operations that became effective on March 1, 2010.

9. The following measures should be taken to reinforce the internal control environment at the PIU, which have been agreed to include: (i) an FM consultant will be recruited to support the newly-deployed FM staff for a period of at least 12 months; (ii) the Nigelec Administrative, Financial Management and Accounting Manual will be updated to reflect the project operations; (iii) related guidelines and FM/disbursement training will be provided to the PIU and the project

Financial Management Specialist (FMS) will also look to provide ad hoc training to the PIU during project implementation; (iv) procure and install a dedicated accounting software for the project activities under a multi-donors, multi-projects version; and (v) recruit an external auditor or consider extending the ToR of Nigelec's current external auditor to the project activities.

10. **Planning and Budgeting**. Nigelec's PIU will prepare an annual work plan and budget for implementing project activities taking into account its objectives. The work plan and budget will identify the activities to be undertaken and the role of respective parties in implementation. The annual work plan and the budget will be consolidated into a single document with the support of the Nigelec PIU's FM team, which will be submitted to Nigelec's Board of Directors for approval, and thereafter to IDA for no objection no later than November 30 of each year preceding the year the work plan should be implemented.

Accounting Arrangements

11. ***Staffing and Training.*** Nigelec PIU staffing will be adequate and commensurate with the extent of the activities under NELACEP, including maintaining accounting records relating to the project financed transactions and preparation of the project's financial reports. For Nigelec's PIU, the FM function is carried out by a team that comprises staff deployed from Nigelec and is composed of: (i) a qualified and experienced Senior Financial Specialist, in charge of the supervision of the overall FM activities of the project; (ii) an experienced Accountant; and (iii) an FM consultant to support the project FM team for at least twelve months. The team has the overall FM responsibility over, budgeting, accounting, reporting, disbursement, internal control and auditing. Nigelec PIU's FM and Accounting staff will have their capacity reinforced over the project implementation by the rolling out of the training plan, which includes among others, training on IDA disbursement procedures, training on OHADA (*Organisation pour l'Harmonisation en Afrique du Droit des Affaires*) accounting principles and its implication for a donor-financed operation, and training on IDA financial reporting arrangements.

12. ***Accounting Records and Information Accounting System***. Project accounts will be maintained and supported with appropriate records and procedures to track commitments and to safeguard assets. Annual financial statements will be prepared by the FM team of Nigelec's PIU by using appropriate accounting software to generate automatically acceptable interim unaudited financial reports (IFRs) and financial statements. Nigelec is using the SIGAL Accounting Software that will be replaced by a new integrated software, including FM, Payroll and Commercial Management. However, it was agreed that, within three months of the project effectiveness date, a dedicated accounting software under a multi-donors, multi-projects version will be procured and installed for the proposed project. The accounting policies and procedures will be documented in the manual of administrative, financial and accounting procedures. The project through its administrative and financial management units will apply the OHADA accounting principles.

13. **Financial Reporting Arrangements.** The IFRs will be designed to provide quality and timely information on Project performance to Project management, and relevant stakeholders. Formats of the various periodic IFRs to be generated from the financial management system will be developed using the World Bank's Guidelines for Borrowers on Financial Monitoring Reports.

The quarterly IFRs include financial statements (e.g., sources of funds and uses of funds; statement of expenditures classified by project component, disbursement category, expenditure types, showing comparisons with budgets; cash forecast; physical progress report; notes to the IFRs; Designated Account activity statements). In compliance with International Accounting Standards and IDA requirements, the project will produce annual financial statements. These include: (i) a balance sheet that shows assets and liabilities; (ii) a Statement of Sources and Uses of Funds showing all the sources of project funds, expenditures analyzed by Project component and Credit category; (iii) a Statement of C ash Receipts and Payments which recognizes all cash receipts, cash payments and cash balances controlled by the project; (iv) a Designated Account Activity Statement; (v) an implementation report containing a narrative summary of the implementation progress of the project; (vi) a summary of withdrawals using IFRs, listing individual withdrawal applications by reference number, date and amount; and (vii) notes related to significant accounting policies and accounting standards adopted by management and underlying the preparation of financial statements. The format of IFRs was agreed during project negotiations. Annual financial statements and IFRs will be submitted for audit at the end of each fiscal year (ending December 31) or other periods to be stated.

Internal Control and Internal Auditing Arrangements

14. ***Internal Control Systems.*** To facilitate adequate internal control practices, an FM section of the Project Implementation Manual that lays out procedures related to proper authorization for payment requests, segregation of duties, and other internal control procedures and practices relating to financial management of the project will be prepared. The procedures identified in the FM section of the PIM will have to be closely followed by all the parties involved in the project implementation. In addition, regular oversight by Nigelec's Board, periodic supervision missions by the Bank's task team, and annual financial audits by independent external auditor will serve as mechanisms for ensuring the project financial management systems function effectively.

15. ***Internal Auditing***. Nigelec has an internal audit and management control department comprised of qualified and experienced staff. The department is divided into two units which include Internal Audit, and management control. The audit department activities are not automated. Nigelec internal audit departments will incorporate the audit of NELACEP in its annual work plan. Annual internal audit plans prepared by Nigelec, are subsequently reviewed by Nigelec's Board of Directors, are agreed by the Association and are thereafter implemented with diligence and efficiency.

16. **External Auditing Arrangements.** Nigelec is majority owned by the Nigerien State, but it is run like a private company. Under its articles of association, Nigelec is subject to a statutory audit at the end of the fiscal year. In addition to the statutory audit, Nigelec is also subject to a contractual audit. The statutory auditor issued an unqualified opinion on the 2013 accounts, with emphasis on matters, including:

(i) Delay in the approval of Nigelec's accounts by its Board of Directors;
(ii) No physical inventory of the fixed assets as of December 31, 2013;
(iii) Nigelec was the defendant in a lawsuit against a supplier who was claiming FCFA 570 million; the matter was appealed to the Court of Appeal. No provision for any liability has been made in the 2013 financial statements.

17. The Bank requires the project financial statements to be audited in accordance with auditing standards acceptable to the Bank. Accordingly as with other Bank-financed projects in Nigelec, the Nigelec PIU will recruit an independent external auditor or consider extending the scope of the ToR of Nigelec's current external auditor to the project activities. The annual project audits will be financed from the credit proceeds.

18. The external auditor will: (i) express an opinion on the project financial statements; (ii) determine whether the Designated Account (DA) has: (a) been correctly accounted for, and (b) been used in accordance with the legal agreement; and (iii) determine adequacy of the supporting documents and controls surrounding the use of Statement of Expenditures as the basis for disbursement. The external auditor will also furnish a separate Management Letter, which will: (i) identify significant weaknesses in accounting and internal control as well as asset management; (ii) report on the degree of compliance with financial covenants of the Financial Agreement, and (iii) communicate matters that have come to the attention of the auditors which might have a significant impact on the implementation of the project.

19. The annual audit report on the project financial statements will be due to the Bank within six (6) months after the end of the reporting date. This requirement will be stipulated in the Financing Agreement. In line with the new access to information policy, the project will comply with the disclosure policy of the Bank of audit reports (for instance making available to the public without delay after receipt of all final financial audit reports, including qualified audit reports) and place the information on its official website within one month after acceptance of final report by IDA.

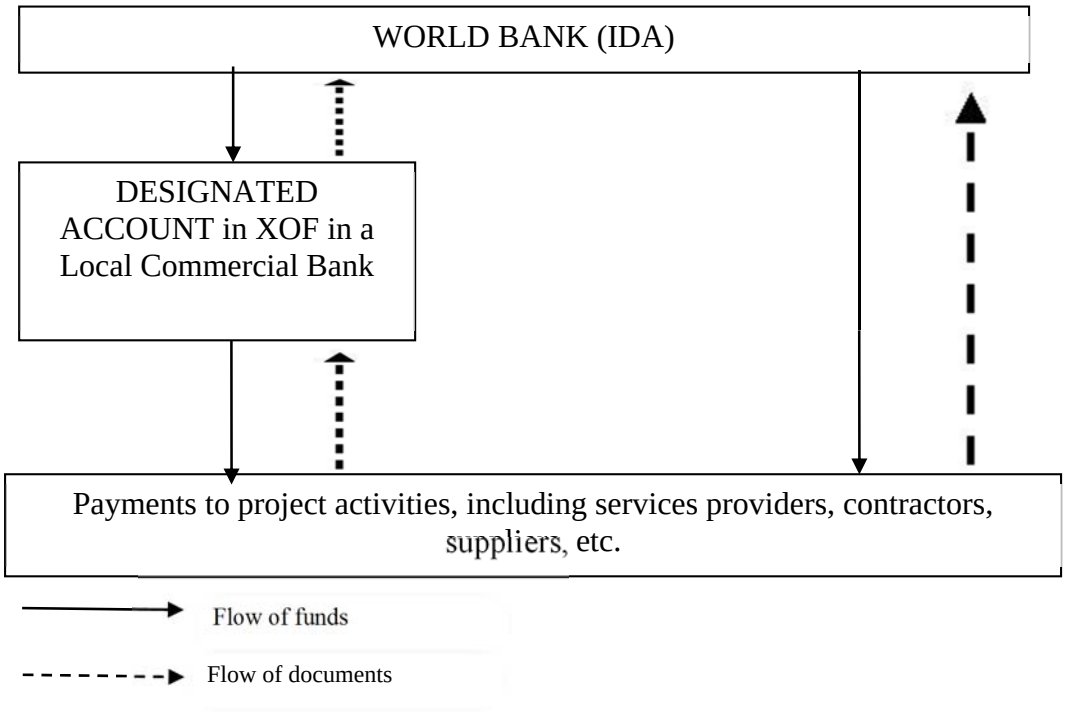
20. Nigelec's PIU shall recruit an external auditor or consider extending the ToR of Nigelec's current external auditor to the project activities, not later than four months (4) after the Effective Date, the independent auditors referred to in Section 4.09 (b) (i) of the General Conditions, selected with terms of reference satisfactory to the Association and in accordance with the provisions of Section III of Schedule 2 to the Financing Agreement.

Funds Flow and Disbursement Arrangements

21. Disbursements for this Investment Project Financing operation will follow the World Bank Disbursement Guidelines for World Bank Projects, dated May 2006. Funds will be disbursed against eligible expenditures incurred from the signing date of the Financing Agreement to the Closing Date specified in the Financing Agreement. Funds will be disbursed for 100 percent of eligible expenditures inclusive of taxes.

22. ***Banking Arrangements***. Nigelec's PIU will open a Designated Account (DA) denominated in West African CFA Franc (XOF) in a local Commercial Bank acceptable to IDA. Funds will flow from the World Bank to the DA where payments of the various project activities can be made in XOF. The Bank recommends that the Designated and Project Accounts be opened within one month after effectiveness and details of the said account communicated to the Bank with the signatories. The Funds Flow diagram for each of the four implementing agencies will be as follows:

Figure 2: Flow of Funds



23. ***Disbursement Methods.*** The following disbursement methods will be used:

a) **Report- based Disbursements**: Initial disbursement to the project by IDA will be made after receiving a withdrawal application with a six (6) months cash flow forecasts. This withdrawal application should be prepared within one month after project effectiveness. Thereafter, IDA disbursements will be made into the Designated Account based on quarterly IFRs which would provide actual expenditure for the preceding quarter (3 months) and cash flow projections for the next 2 quarters (6 months). The IFRs together with the Withdrawal Application (WA) will be reviewed by the Bank's Financial Management Specialist (FMS) and approved by the Task Team Leader (TTL) before the request for disbursement is processed by the Bank's Loan Department.

b) **Other Methods**: In addition, whenever needed the direct payment method of disbursement, involving direct payments to suppliers for works, goods and services upon the borrower's request, may also be used. Payments may also be made to a commercial bank for expenditures against pre-agreed special commitments. Reimbursements can also be made to the borrower for eligible expenditures refinanced from its own resources. These payments will also be reported in quarterly IFRs. The IDA Disbursement Letter (DL) will stipulate the minimum application value for direct payment and special commitment procedures as well as detailed procedures to be complied with under these disbursement arrangements.

24. **Financial Covenants.** The Borrower shall establish and maintain a financial management system including records, accounts and preparation of related financial statements in accordance with accounting standards acceptable to the Bank. The Financial Statements will be audited in

accordance with international auditing standards. The Audited Financial Statements for each period shall be furnished to the Association not later than six (6) months after the end of the project fiscal year. The Borrower shall prepare and furnish to the Association not later than 45 days after the end of each calendar quarter, interim un-audited financial reports for the Project, in form and substance satisfactory to the Association. The Borrower will be compliant with all the rules and procedures required for withdrawals from the Designated Accounts of the project.

25. **Conclusion of the FM assessment.** Based on the Bank's assessment, the FM residual risk for the Project is found Substantial. The proposed FM arrangements are considered satisfactory in fulfillment of the requirements under Bank OP/BP 10.00 once the mitigation measures are implemented. The implementing entity will ensure that the Bank's Guidelines: Preventing and Combating Fraud and Corruption in Projects financed by IBRD Loans and IDA Credits and Grants (revised January 2011) are followed under the project.

Procurement

26. **Procurement Arrangements**. Procurement of the proposed project will be carried out in accordance with the World Bank's "Guidelines: Procurement under IBRD Loans and IDA Credits" dated January 2011 revised July 2014, and "Guidelines: Selection and Employment of Consultants by World Bank borrowers "dated January 2011 revised July 2014, and the provisions stipulated in the Financing and the Project Agreements.

27. **Procurement of Works, Goods.** The procurement will be done using the Bank's Standard Bidding Document (SBD) for all ICB and National SBD agreed with or satisfactory to the Bank. Procurement may be done under NCB and Shopping depending on the thresholds.

28. **Procurement of non-consulting services.** Procurement of non-consulting services will follow procurement procedures similar to those stipulated for the procurement of goods, depending on their nature.

29. **Improvement of bidding procedures under national competitive bidding.** The Niger Procurement reform has led to the adoption of a new procurement law in October 2011 and the implementing decree on procurement Code in December 2011. Implementing texts are adopted in 2012 and 2013. The Niger legal framework is now better aligned to the West African Economic Monetary Union Directives and international standards. Nigelec procurement procedures have been recently harmonized to the National Procurement Code.

30. Although the legal framework seems acceptable, the Recipient shall ensure that the following additional requirements are met under National Competitive Bidding:

a) invitation to bid shall be advertised in at least one national newspaper with wide circulation, at least 30 days prior to the deadline for the submission of bids;
b) foreign bidders shall not be precluded from bidding and no preference of any kind shall be given to national bidders in the bidding process;
c) bidding shall not be restricted to pre-registered firms;
d) qualification criteria shall only concern a bidder's overall capability and financial capacity

to perform the contract, taking into account objective and measurable factors. All qualification criteria shall be clearly specified in the bidding documents;

e) bids shall be opened in public, immediately after the deadline for submission of bids;
f) bids shall not be rejected merely on the basis of a comparison with an official estimate without the prior concurrence of the Bank;
g) before rejecting all bids and soliciting new bids, the Bank's prior concurrence shall be obtained;
h) contracts shall be awarded to the lowest evaluated and qualified bidder;
i) no domestic preference shall be given for domestic bidders;
j) fees charged for the bidding documents shall be reasonable and reflect only the cost of their printing and delivery to prospective bidders, and shall not be so high as to discourage qualified bidders;
k) any firm declared ineligible by the Bank, based on a determination by the Bank that the firm has engaged in corrupt, fraudulent, collusive, coercive or obstructive practices in competing for or in executing a Bank-financed contract, shall be ineligible to be awarded a Bank-financed contract during the period of time determined by the Bank; and
l) each contract financed from the proceeds of the Credit shall provide that the suppliers, contractors and subcontractors shall permit the Bank, at its request, to inspect their accounts and records relating to the performance of the contract and to have said accounts and records audited by auditors appointed by the Bank. The deliberate and material violation by the supplier, contractor or subcontractor of such provision may amount to obstructive practice.

31. **Selection of Consultants.** Consultancy services will be done using the Bank's standard Request for Proposals when required. Assignments estimated to cost the equivalent of US$300,000 or more would be advertised for expressions of interest (EOI) in Development Business (UNDB), and in at least one newspaper of wide national circulation. In addition, EOI for specialized assignments may be advertised in an international newspaper or magazine. Foreign consultants who wish to participate in national selection should not be excluded from consideration. Shortlists of consultants for services estimated to cost less than US$200,000 equivalent per contract for supervising engineers and US$100,000 equivalent per contract for other consulting services, may be composed entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines.

32. **Capacity Building and Training Programs, Seminars, Conferences, Workshops, etc.** All training and workshops will be carried out on the basis of the project's Annual Work Plans and Budget which will have been approved by the Bank on a yearly basis, and which will inter-alia, identify: (i) the envisaged training and workshops; (ii) the personnel to be trained; (iii) the institutions which will conduct the training and selection methods of institutions or individuals conducting such training; (iv) the justification for the training, how it would lead to effective performance and implementation of the project and or sector; (v) the duration of the proposed training; and (vi) the cost estimate of the training. Report by the trainee upon completion of training would be required.

33. **Operating Costs.** Project operating costs would be procured using the implementing agency's administrative procedures, which have been reviewed and found acceptable to the Bank.

34. **Fraud and corruption**. All procuring entities, as well as bidders, suppliers, and contractors shall observe the highest standard of ethics during the procurement and execution of contracts financed under the project in accordance with paragraph 1.15 and 1.16 of the Procurement of the Procurement Guidelines and paragraphs 1.25 and 1.26 of the Consultant Guidelines. 'Guidelines on Preventing and Combatting Fraud and Corruption in Projects financed by IBRD loans and IDA Credits and Grants "dated October 15, 2006 and revised in January 2011, shall also apply to the project.

35. **Procurement responsibilities and accountabilities**. Procurement activities will be carried out by Nigelec through the PIU. The procurement activities will be supported by the Procurement Unit and the Technical directorates in their respective area of competency.

36. The PIU will be responsible for all procurement related to the project and will carry out the following activities in close collaboration with the procurement unit and the technical directorates: (i) preparation and updating of the procurement plan; (ii) preparation of the bidding documents, draft requests for proposals (RFP), evaluation reports, contracts in compliance with World Bank procedures; (iii) monitoring the implementation of procurement activities; (iv) development of procurement reports; and (v) seeking and obtaining approval of national entities and then IDA on procurement documents as required.

37. **Capacity Assessment and Remedial Actions**. A preliminary assessment of the capacity of Nigelec to implement procurement activities of the project was carried out in March 2015. The assessment reviewed the organizational structure for Nigelec, the procurement capacities of the agency (past procurement experience, staff in charge of procurement, tools including manuals, procurement reporting, filing, use of software, etc.) and the interactions between the different units involved in the Project.

38. The assessment found that Nigelec has the technical expertise to support procurement processes despite its limited procurement experience with World Bank procedures, as no record shows past recent experience in implementing a World Bank financed project. Nigelec launched the process to recruit a qualified procurement specialist experienced in World Bank procurement procedures to support the PIU in all procurement activities.

39. Nigelec has its own procurement procedures, which have been recently better aligned to National Procurement Code overall judged acceptable by the World Bank despite some need for improvement. The procurement processes is fully conducted within Nigelec: preparation, evaluation, approval and signature. An Internal Audit Directorate is in charge of procurement prior review control and there are three existing manuals: (i) manual of administrative and accounting procedures, (ii) manual of procurement procedures, and (iii) manual on delegation of power at the central and regional level and for various thresholds. There is a need to update these manuals to take into account the World Bank procurement procedures to be applied for this financing and to clarify the interactions between involved actors related to the procurement responsibility in line with the institutional arrangements agreed with the Borrower. Nigelec and MEP will sign a Memorandum of Understanding, which will be an integral part of the PIM as an annex, to solidify

their agreement on this arrangement. The procurement filing also needs to be strengthened and aligned to the World Bank procurement filing requirements.

40. The key risks identified for procurement management and over signature powers are: (i) the risk of confusion on procedures to be applied; (ii) the lack of proficient procurement staff to implement procurement actions in line with Bank procurement procedures; (iii) the staff within Nigelec responsible for process control and approval are not familiar with Bank procurement procedures; (iv) the risk of exposure of the procurement staff to influence and pressure from their hierarchy; and (v) inadequate communication and interaction between the technical directorates, the Procurement Unit and the PIU, which may lead to delays in the drafting of terms of reference (ToRs) or technical specification and poor estimation of the costs; (vi) the procurement in a specialized market with few bidders can restrict competition and possibly increase prices and collusion risks; (vii) the corruption risks in procurement of big contracts taking into account the IFC enterprise survey; (viii) the poor filing which can lead to loss of documents. Overall, all these risks can cause mis-procurements, possible delays in evaluation of bids and technical proposals leading to implementation delays, poor quality of contract deliverables and reputational risks to the World Bank and the project.

41. The overall procurement risk for the proposed project is considered High taking into account the lack of experience in World Bank procurement procedures, the size of contracts to be procured and the overall fiduciary risk in the country. In order to mitigate the risks identified in the procurement assessment, the following action plan is proposed. With the implementation of the proposed measures of the action plan and the support of World Bank team, the overall residual procurement risk will be rated Substantial. A key element of this action plan is the recruitment of a high level procurement specialist to provide support to the PIU on procurement matters.

Table 1: Action Plan for Strengthening Procurement Capacity		
Risk	**Action**	**Responsibility**
1-Risk of confusion on interactions and procedures to be applied	Preparation of a Project Implementation Manual with section on procurement detailing out all applicable procedures, instructions and guidance for handling procurement, the SBDs and other standard procurement documents to be used and the interactions between the staff involved in the procurement process.	Nigelec's Deputy Chief Executive Officer (*Sécretaire Générale- SG*)
2- Lack of proficient procurement staff to implement procurement actions in line with Bank procurement procedures	Recruit a qualified procurement specialist to support the PIU	SG
3- Staff within Nigelec responsible for process control and approval are not familiar with Bank procurement procedures	Organize a workshop to update staff on current changes in Bank procurement procedures Hands-on training of identified high level staff within Nigelec on Bank procurement procedures will be done During the life of the project, capacity building for the all project staff involved in the procurement decision-making process and tender committee members, customized and hands-on training for the procurement staff on procurement focusing on: procurement planning, preparation of bidding documents, evaluation of bids or proposals, and procurement documents filing	PIU/IDA Procurement Specialist PIU/IDA- Procurement Specialist – PIU/IDA
4- Risk of exposure of the staff involved in the procurement decision to the influence and pressure from their hierarchy	The internal audit direction in Nigelec and the Regulation Authority (ARMP) will have to play its role to ensure good governance and limit the opportunities for undue influence by anyone	Internal Audit Direction/ARMP
5- Inadequate communication and interaction between the technical directorates and the procurement unit which may lead to delays in the drafting of terms of reference (ToRs) or technical specification and poor estimation of the costs	Update manuals to take into account the specificity of the project and all interactions between involved actors related to the procurement responsibility in line with the institutional arrangements agreed with the Borrower Closely monitor procurement plans and exercise quality control on all aspects of the procurement process, including evaluation, selection and award on a monthly basis.	SG/Internal Audit/Tech Directorate/PIU/ Procurement Unit PIU/
6- Procurement in a specialized market with few bidders can restrict competition and possibly increase prices and collusion risks Corruption risks in procurement of large contracts taking into account the IFC enterprise survey	All procurement of large contracts will be supervised by high level technical consultant and thoroughly reviewed by the Bank The Borrower will regularly update its market survey and cost estimates	SG/PIU/IDA

7- Poor filing which can lead to loss of documents	An adequate filing system will be set for the project records at Nigelec. The project will finance appropriate equipment and the Procurement Specialist will ensure compliance with Bank procurement filing manual	Procurement unit /Procurement Specialist

42. **Procurement methods**. For Niger, International Competitive Bidding (ICB) thresholds have been set at US$5 million for works and US$500,000 for goods. The table below summarizes the procurement and selection thresholds applicable to this project.

Table 2: Procurement Methods Thresholds

NO	Expenditure Category	Contract Value Threshold**(US$)	Procurement Method
	Works	C>=5, 000,000	ICB
		100,000= <C < 5, 000,000	NCB
		C<100,000	Shopping
		All values	DC
1	Goods and Non Consulting Services	C>=500,000	ICB
		50,000= <C < 500,000	NCB
		C<50,000	Shopping
		All values	DC
2	Consulting Services Firms	C>= 200,000 firms	QCBS, QBS
		< 200,000 firms	QCBS, FBS, CQS, LCS
		All Values	SSS
	Individual Consultant	All values	Based on comparison of CVs
		All Values	SSS
3	Training, Workshops, Study Tours	All Values	With the approval of the TTL
All TORs, regardless of the value of the contract and the selection method, are subject to prior review.			

ICB – International Competitive Bidding

NCB – National Competitive Bidding

DC – Direct Contracting

QCBS – Quality and Cost-Based Selection method

SSS – Single Source Selection

QBS – Quality Based Selection

FBS – Fixed Budget Selection

LCS – Least Cost Selection

CQS – Selection based on Consultants' Qualification (for Contracts below 100 000 USD)

43. **Procurement prior review thresholds**. The procurement prior review thresholds are tied to the High procurement risk as shown in the table below and reflected in the procurement plan.

No	Expenditure Category		Amount in USD
1	Works		>=5 000 000
2	Goods and Non Consulting Services		>=500 000
3	Consulting Services		>=200 000
4	All Direct contracting and Single Source contracts with consultant (firms)	*Works*	>=100 000
		Goods	
		Consultants services	
5	Individual Consultants (*Single Source contracts)*		>= 100 000
	Individual consultants (*based on comparison of CVs*)		>=200 000

44. Contracts estimated to cost above these thresholds for works and goods, consulting services will be subject to prior review by IDA. Further, it was agreed on the following additional mitigation measures:

a) All ToRs for consulting services will be subject to prior review by Bank irrespective of the cost estimate.

b) At least once a year, the Bank and the Government will agree on a procurement plan which will detail the procurement methods to be used and specific contracts to be reviewed by the Bank;

45. **Revision**. The prior review thresholds and other measures to be taken to mitigate the procurement risk should be re-evaluated once a year with a view of adjusting them to reflect changes in the procurement risk that may have taken place in the meantime and to adapt them to specific situations. In case of failure to comply with the agreed mitigation measures or Bank guidelines, a re-evaluation measure of both types of thresholds, ICB and prior review, may be required by IDA.

46. **Additional Notes**:

a) The threshold for shopping is defined under para. 3.5 of the Guidelines and should normally not exceed US$50,000 equivalent for off-the-shelf goods and commodities, and US$100 000 for simple civil works.

b) Operating expenditures are neither subject to the Procurement and Consultant Guidelines nor prior or post reviews. Operating expenditures are normally verified by TTLs and FM Specialists.

c) Irrespective of the thresholds and category of risk, the selection of all consultants (firms or individuals) hired for legal work or for procurement activities are respectively cleared by the Legal Vice President Unit with the relevant expertise and the designated Procurement

Specialist (PS)/Procurement Assistant (PAS), or Regional Procurement Manager as required.

d) Prior Review Contracts for the Hiring of Individual Consultants: Apart from legal work and procurement assignments, review of the selection process for all other individual consultants (Technical Experts) shall be solely reviewed by the TTL and the relevant technical specialist within the Bank team.

e) Contracts below the threshold but falling within an exception as defined in clause 5.4 of the Guidelines: Selection and Employment of Consultants are also subject to prior review or require the Bank's prior no objection.

f) Special cases beyond the defined thresholds are allowed based on applicable market conditions.

47. A procurement plan (PP) for the first 18 months of program implementation has been prepared (see below). The final version of this PP has been discussed and approved during project negotiations. During implementation the PP will be updated - at least annually - to reflect actual program implementation needs and improvements in institutional capacity.

48. For component 1, all technical studies have been completed and the preparation of the bidding documents is expected to be finished to launch the tender process in 2015.

Procurement Packages with Methods and Time Schedule – Goods and Works

Ref.	Contract (Description)	Estimated Cost (Million US$)	Procurement Method	Prequalification (yes/no)	Domestic Preference (yes/no)	Review by Bank (Prior / Post)	Expected bid-opening Date	Expected contract signature Date
1	Reinforcement and Expansion of the Distribution Systems & Rehabilitation and Reinforcement of Substations and MV systems	40.6	ICB	NO	NO	Prior	02/08//2016	04/29/2016
2-1	Procurement of connection equipment	6	ICB	NO	NO	Prior	04/12/2016	07/04/2016
2-2	Procurement of meters	4	ICB	NO	NO	Prior	04/12/2016	07/04/2016
2-3	Installation of meters	0.5	NCB	NO	NO	Post	04/12/2016	07/04/2016
3	Procurement of Network planning software	0.085	Shopping	NO	NO	Post	04/12/2016	06/13/2016
4	Procurement of Underground Fault Detection System	0.4	NCB	NO	NO	Post	04/12/2016	06/13/2016
	Total	51.585	/	/	/	/	/	/

Procurement Packages with Methods and Time Schedule - Consulting Services

Ref.	Description of Assignment	Estimated Cost	Selection Method	Review by Bank (Prior / Post)	Expected Proposals Submission Date	Expected contract signature Date
1	Construction supervision	1.5	QCBS	Prior	02/16/2016	05/11/2016
2	GIS for the distribution network of Maradi, Zinder, Tillabery, Dosso, Tahoua and Agadez	0.485	QCBS	Prior	02/16/2016	05/11/2016
3	Study of SCADA system for HV and MV system in Niamey	1.5	QCBS	Prior	04/26/2016	07/20/2016
4	National electrification Strategy	3	QCBS	Prior	02/16/2016	05/11/2016
	Total	6.485	/	/	/	/

49. **Procurement information and documentation – filing and database**. Procurement information will be recorded and reported as follows:

a) Complete procurement documentation for each contract, including bidding documents, advertisements, bids received, bid evaluations, letters of acceptance, contract agreements, securities, related correspondence, etc., will be maintained at the level of respective ministries in an orderly manner, readily available for audit.

b) Contract award information will be promptly recorded and contract rosters as agreed will be maintained.

c) Comprehensive quarterly reports indicating: (i) revised cost estimates, where applicable, for each contract; (ii) status of on-going procurement, including a comparison of originally planned and actual dates of the procurement actions, preparation of bidding documents, advertising, bidding, evaluation, contract award, and completion time for each contract; and (iii) updated procurement plans, including revised dates, where applicable, for all procurement actions.

Environmental and Social (including safeguards)

50. The net social and environmental effect of the project is expected to be highly positive, as greater access to electricity will significantly improve the beneficiaries' living conditions in these areas. New households will be connected through extension of the network; and the same would apply to businesses and institutional users (local government, schools, health centers, etc.).

51. The project is rated as environmental category B, partial assessment, as no adverse long-term impacts are anticipated. It triggers 3 safeguard policies: Environmental Assessment (OP 4.01), Involuntary Resettlement (OP 4.12), and Physical Cultural Resources (OP/BP 4.11).

52. Environmental Assessment (OP/PB 4.01). Activities under component 1 have the potential for some localized environmental adverse impacts. An Environmental and Social Impact Assessment (ESIA) and an Environmental and Social Framework (ESMF) (for unknown locations) were prepared to address and mitigate potential environmental and social impacts of the proposed project. The ESIA and the ESMF were approved by the Bank and disclosed in-country and in the Info Shop on October 16, 2015.

53. OP/BP 4.12 is triggered in the context of component 1 to cover clearance of land/Rights of Way (RoW) for new distribution networks, which might require some land acquisition leading to compensation, and potential, but very limited relocation and displacement of some households and assets. In case any land acquisition or compensation becomes necessary, the cost will be covered by the borrower. Some small-scale land acquisition and/or losses or assets may occur as a result of constructing new substations (Niamey and Maradi) and expanding the grid. For the known locations, a Resettlement Action Plan, which will address such negative social impacts, which may be different for women and men, and contains a compensation framework for the affected households, was prepared, consulted upon and disclosed on October 16, 2015, both in-country and in the Infoshop. The RAP contains socio-economic studies, (i.e., the results of the census survey, legal framework applicable in-country as well as the provisions of the World Bank safeguard policy, the applicable valuation and compensation methodology for determining replacement cost, definition of eligibility for compensation and other resettlement assistance, and description of resettlement assistance/ compensation measures); lays out the methodology for community participation and consultations process that has been used in preparing the RAP and that will continue through project implementation; describes the grievance redress mechanism and its different levels, institutional framework and organizational responsibilities for implementing the RAP, implementation schedule, costs and overall budget, and a monitoring and evaluation plan. The grievance redress mechanism aims at friendly settlement of complaints at the source of the complaint, but in case this is not possible, other more formal channels may be used. The first and preferred instance is settlement at the level of the community, through informal means. Complaints will be registered by the agency in charge of community relations and information flow. Additionally, a Resettlement Policy Framework (RPF) for the unknown locations was prepared to guide the preparation of eventual RAPs. The RPF includes the guidelines and procedures for compensation and/or resettlement in the event that future activities under the sub-projects should require land acquisition, involuntary resettlement or cause restriction of access to livelihoods or assets and resources. It contains: (i) an assessment of the country regulatory and institutional framework for land acquisition and compensation; (ii) likely categories of affected assets and parties, as well as the scope of impacts; (iii) a gap analysis and a compensation framework consistent with OP 4.12 and the national legislation; (iv) measures to assist vulnerable groups; (v) a consultation framework to enable the participation of affected populations in the preparation of specific resettlement plans; (vi) an institutional framework to implement the resettlement policy framework; (vii) a grievance redress mechanism; and (viii) a monitoring and evaluation framework and budget. It was consulted upon and disclosed in-country and at the InfoShop on October 16, 2015.

54. Coordination and implementation of the project‘s environmental and social safeguards related to component 1 will be carried out by Nigelec, which will reinforce its staffing by recruiting a social specialist to be responsible for overseeing Project compliance with the environmental and social safeguards instruments in accordance with national and Bank policies and procedures. They will be trained, together with their regional counterparts, in the implementation and monitoring of World Bank safeguard policies. Nigelec will ensure adherence to the safeguard documents of all agencies involved in the implementation of the project, including contractors. All contractor bidding documents will include specific environmental and social clauses to be strictly implemented. Consulting Engineers' contracts will include provisions for overseeing the implementation by the contractors of the environmental and social clauses. To ensure adequate safeguards coverage in the regions, the Owner's engineer will be mandated to oversee the safeguards aspects. Nigelec will produce on a quarterly basis, reports on the compliance with the safeguard documents. World Bank supervision teams will also include environmental and social safeguard experts.

Monitoring and Evaluation

55. Overall monitoring and coordination of project activities will be performed by Nigelec. This will be a key responsibility of the project coordinator in the project management team. Activities to be monitored include: the timely, efficient and transparent supervision of procurement and contract management; monitoring of the construction and commissioning of the distribution lines and substations; effective implementation of the ESMP and RAP; successful completion of studies and training activities; and project implementation monitoring, including regular monitoring and reporting on the agreed project indicators and different results and impacts for women and men. In addition, Nigelec's data system will generate sex-disaggregated data and include gender-relevant indicators about direct project household beneficiaries and non-household clients to adequately monitor and report on the outcome and impact of improved energy services on female and male beneficiaries. Annex 1 presents the project's results framework, which defines specific outcomes and results to be monitored under this project.

56. In addition, the World Bank will carry out the normal review procedures for procurement, regular supervision missions, the Financial Monitoring Reports, and the quarterly reports provided by Nigelec, including updated monitoring tables, independent annual financial audits of the project and of the financial statements of Nigelec. The Bank will also carry out a mid-term review after about 30 months from effectiveness of the project and prepare an Implementation Completion and Results Report at the end of the project.

Annex 4: Implementation Support Plan

NIGER: Electricity Access Expansion Project

Strategy and Approach for Implementation Support

1. The strategy for implementation support has been developed on the basis of the nature of the project and responds to complexities of the project given the capacity for implementation. The implementation support's objective is to ensure that government agencies involved properly implement the project. It also ensures that the World Bank's resources and staff are sufficient to supervise and support this implementation.

Implementation Support Plan

2. Technical implementation support will first focus on ensuring timely establishment of the project management team at Nigelec, and appropriate technical design of the project components carried out. It will ensure proper coordination with the MEP for the implementation of MEP's technical assistance. The Bank team will include headquarters (HQ) and country office-based staff and consultants.

3. Given that the tendering process for the major infrastructure packages has been conducted during the preparation of the project, the Bank team support will also focus on monitoring the construction process and contract management, since the beginning of the implementation of the project. Also, the Bank team support will focus on the effectiveness of capacity building and technical assistance activities.

Main areas of Supervision

Procurement and technical aspects

4. World Bank procurement specialists will regularly participate in implementation support missions to assist in monitoring procurement procedures and plans. The procurement plan indicates those contracts which are subject to prior review. All other contracts will be subject to post-review. During the early phase of the project implementation, more frequent supervision is envisaged in order to ensure that procurement guidelines are followed by the project management team at Nigelec being supported by the Owner's Engineer. The Bank team will include a Bank staff engineer, in order to review technical specifications and proposals. It is expected to do field supervision of the construction sites. During the regular implementation support missions, the procurement plans will be updated at least once each year (or more often as required to reflect the actual project implementation needs) and post-procurement reviews will be carried out at a minimum once annually.

5. IDA will carry out sample post review of contracts that are below the prior review threshold for contracts implemented to ascertain compliance with the procurement procedures as defined in the legal documents. The procurement post-reviews should cover at least 15 percent of contracts subject to post-review, as the risk rating is Substantial.

Financial management aspects

6. Financial management supervision will start by assessing the progress of the project management unit staffing and reviewing the plan in place in order to execute disbursements following financial management guidance. This supervision will take place before contracts are awarded in case improvement measures need to take place before disbursement. The financial management supervision will also review quarterly progress and financial audits. In terms of resources, a country-office-based staff for eight weeks is expected to be required.

7. Based on the outcome of the FM risk assessment, the following implementation support plan is proposed. The objective of the implementation support plan is to ensure the project maintains a satisfactory financial management system throughout the project's life.

FM Activity	**Frequency**
Desk reviews	
Interim financial reports review	Quarterly
Internal audit report review of the Project	On a risk based approach
External Audit report review of the project	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	Semi-annual (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 as and when needed.

Environmental and social aspects

8. Environmental safeguards support will include visits to project areas and the monitoring of mitigation measures. During construction, monitoring is necessary to ensure compliance with environmental and social safeguards related to the infrastructure projects, including attention to gender differences and impacts.

Overall Support Implementation Needs

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

Time	Focus	Skills Needed	Resource Estimate (Staff Weeks)
First twelve months	Establishment of the project management team at Nigelec. Review construction progress of infrastructure Implementation of environmental and social safeguard studies – EIA, and RAP as required. Development and improvement of FM/Procurement systems	Task Management Technical Safeguards Financial Management and Procurement	US$ 150,000
12-72 months	Technical implementation support Social and environmental safeguard implementation support Gender mainstreaming activities support M&E implementation support Financial management & procurement implementation support	Senior Energy Specialist and Power Engineer Social Safeguard Specialist & Environmental Specialist Gender and Energy Specialist M&E Specialist FM Specialist & Procurement Specialist	US$ 615,000

10. The staff skill mix and focus in terms of implementation support is summarized in the table below.

Skills Mix Required

Skills Needed	Number of Staff Weeks/year	Number of Trips	Comments
Senior Energy Specialist (TTL)	7	2 per annum	HQ based
Power Engineer	5	2 per annum	Region based
Procurement Specialist	3	0	Country office based
Financial Management Specialist	2	0	Country office based
Social Safeguard Specialist	3	1 per annum	HQ based
Environmental Specialist	3	1 per annum	HQ based
Gender and Energy Specialist	2	1 per annum	HQ based

Annex 5: Economic and Financial Analysis

NIGER: Electricity Access Expansion Project

I. Introduction

1. ***Rationale for Public Financing***. The rationale for public sector financing for investments under the proposed project rests primarily on the present characteristics of the sector: (i) low electricity access in the country requiring government intervention as a development priority to ensure energy supply and increase access to electricity; (ii) upgrading and expanding distribution networks are not normally conducive to public private arrangements, particularly if those investments are not linked to a private and bankable project; and (iii) the scale of investments required, and associated long payback periods. It is highly unlikely that a private investor will finance the proposed investments given the status of the sector.

2. The scope of overall investments in generation, transmission and distribution is well beyond the available financial resources of the GoN. Several multilateral and bilateral partners and various lending institutions are supporting the GoN's energy sector development program. However, the combined financial support from these partners is still inadequate to meet the sector investment needs. As part of the ongoing reforms, legal and regulatory changes are being made to promote private investments on segments of the sector that are more conducive for private participation, such as generation.

3. ***World Bank's added value.*** The World Bank Group is already a close partner of the GoN in the development of its electricity sector through the support to the development of the Kandadji hydropower project as well as through the DPO series that includes support to the energy sector. The World Bank is well positioned to continue its commitment to the expansion and modernization of electricity supply in Niger, also building on its experience in similar programs in the region.

4. Drawing on expertise and experience from work in different regions, the World Bank engagement will enable adoption of best practices in design and execution of network expansion, thus ensuring technically and socially efficient delivery. Further, World Bank financing will enable the GoN to source loans at rates that would ensure the financial viability of the distribution extension that is critical for increasing access to electricity and support inclusive economic growth.

Methodology

5. The project economic analysis seeks to assess the net economic benefits to Niger's society of the proposed investment, and the financial analysis assesses the investment impacts on the power utility's (Nigelec) finances.

6. Development impacts expected from the proposed investment. The PDO is to increase access to electricity. This will be done by financing the implementation of grid-based distribution investment for households, small businesses, and public institutions, and capacity building. The distribution investment will be carried out in seven of the main urban centers of Niger: Niamey, Tillaberi, Dosso, Maradi, Tahoua, Zinder, and Agadez over the 2016-2019 period. In each urban center, the project impacts will be felt at three levels: (1) improvements in the quantity and quality of the electricity services available in the urban center due to upgrading and strengthening of some

key substations delivering electricity to the center, and a reduction in distribution losses; (2) increased consumption and improved quality of electricity services in selected electrified urban areas from the upgrading, rehabilitation, and densification of the distribution network; and (3) electrification of new urban developments currently without Nigelec's distribution network. It is estimated that over the 2016-2019 period a total of 51,900 new residential customers and 9,100 new commercial and industrial users - representing an increase of 27 percent in Nigelec's 2014 customer base - will be connected to Nigelec distribution networks through the extensions included in the project. Important increases in electricity consumption of each center are therefore expected.

7. For each of the above mentioned seven centers, the number of customers and level of access to electricity services in 2014, the additional customers expected over the next three years and the annual estimated growth in the consumption of electricity due to the project is provided in Table 1 below.

Table 1: Electricity Access in the Selected 7 Project Centers

Urban Center	**Estimated Current Access (%) (2013)**	**Number of customers (2013)**	**Expected additional Customers from Project**	**Expected annual increase in the supply of electricity in the areas served by the project (%)**
Niamey	~59	102 685	36 120	2014-2017: 11.1 After 2017: 9.2
Tillaberi	~40	5 394	3 025	2014-2017: 8.2 After 2017: 6.7
Dosso	~48	3 626	1 110	2014-2017: 12.0 After 2017: 9.8
Maradi	~41	16 196	7 597	2014-2017: 13.9 After 2017: 10.4
Tahoua	~31	7 899	4 830	2014-2017: 13.7 After 2017: 10.3
Zinder	~26	13 931	3 450	2014-2017: 14.3 After 2017: 10.4
Agadez	~35	6 983	3 870	2014-2017: 13.0 After 2017: 9.7
7 CENTERS	_____	156 714	60 000	_____

8. Total project costs including investment in the seven distribution networks (as developed through the engineering study of May 2015), project management, technical assistance to the Ministry of Energy, and physical and price contingencies, are estimated to amount to US$65 million. The project costs breakdown is provided in Table 2:

Table 2: Project Costs Breakdown

Cost Category	Project Costs (US$ million)
Distribution Investment (excluding VAT and import duties)	46.04
Distribution Investment contingencies (10%)	4.60
Engineering and Supervision	1.39
Sub-Total	*52.03*
Additional upstream investment	6.50
Technical Assistance and Capacity Building (to Ministry and Nigelec)	4.47
Project Management	2.00
TOTAL PROJECT COSTS	**65.00**

9. About 51.7 percent of the project financial resources have been allocated to the capital Niamey, followed by Maradi and Zinder with an investment budget of respectively 19.7 percent and 10 percent. Table 3 provides the allocation of the investment in each of the seven centers.

Table 3: Allocation of Distribution Investment by Urban Center

Allocation of the Distribution Investment by Center	Percent of Proposed Investment
Niamey	51.7
Dosso	2.8
Tillaberi	2.1
Maradi	19.7
Tahoua	8.5
Zinder	10.0
Agadez	5.2
TOTAL	100.0

II. Evaluation of the Project Economic Benefits

Economic Benefits Evaluation Criteria

10. The economic analysis seeks to estimate the net economic benefits for Niger's society of the proposed distribution investment over the investment economic life by comparing, for each of the seven centers, and the benefits stream of the additional consumption of electricity by the households, commercial and productive users due to the project to the stream of economic costs (additional capital expenditures, generation and transmission and distribution costs) associated with the additional electricity services used by the consumers impacted by the project.

11. Scenarios With and Without the Project. For each urban center the benefits of delivering additional electricity due to the project investment have been estimated through simulating the operations of the distribution networks for two scenarios: a 'Without-the-Project' scenario - where

no such distribution investment is carried out; and a 'With-the-Project' scenario comprising project investment in network strengthening, rehabilitation, densification, and extension.

Main Assumptions

12. For the project economic analysis, the main assumptions relate to the proposed project investment, the economic value of the electricity consumed, the economic costs of the electricity supplied to each center, the associated technical losses, and the evaluation period.

- Project Economic Investment. The engineering study, carried out by Studi International (Report #1 May 2015), has estimated the investment requirements for each center based on the physical condition of the existing network, the network development plan, the unit prices for equipment and works to be performed in each center, and the expected demand for electricity. The total investment requirement is provided in Table 2 above. These economic costs exclude the VAT and duties on imported equipment and are in constant 2014 US$.

- Economic Value of the Additional Electricity Consumed. The additional electricity made available through the proposed investment will benefit two types of urban customers: (1) customers within electrified areas benefitting from network rehabilitation, strengthening and densification; and (2) new customers living in non-electrified new urban developments. In the absence of specific surveys of the values assigned to electricity services in Niger, for the purpose of this analysis limited checks on the costs of using small stand-alone diesel systems and on charges from electrified households were carried out. It has been assumed conservatively that the economic value/willingness-to-pay (WTPs) for quality services are as follows: USc18/kWh (FCFA105/kWh) for the Low Voltage Residential Social Tranche, USc19kWh (FCFA112/kWh) for low voltage productive-uses consumers, and USc17 /kWh (FCFA100/kWh) for the Medium Voltage customers. These WTPs should however be considered as quite conservative as the analysis of expenditures incurred in Niger for small stand-alone diesel generators and of payments made for accessing electricity services are significantly higher.

- Availability and Costs of imports and domestic generation. Three separated power grids currently provide electricity to the 7 urban centers each with their own generation mix and outlook. No generation/transmission least-cost master plan nor demand/supply balances are available for the grids; the preparation of a master plan is included in the Kandadji project activities but no initial plan is available. For the purpose of this economic and financial analysis two key assumptions regarding the availability and costs of electricity, imported from Nigeria or generated domestically, were therefore made. Regarding Nigeria's power supplies and following exchanges with Nigelec, the base case assumptions assume that supply will remain at the 2014 level on the saturated 132kV line supplying Niamey, and that the costs to Niger will not change drastically over the planning period. Regarding new generating facilities in Niger, the following is considered: the Gorou Banda 80 MW diesel units in the outskirts of Niamey (to be commissioned early 2016), the Kandadji multipurpose hydroelectric project (to be commissioned in 2020-2021), the Sakaldamna coal project (to be commissioned in 2022) with the related transmission network interconnecting six of the subject urban centers (Agadez in the northern part of Niger remaining isolated from the national power grid), and solar PV plants.

- Supply Costs. There are currently five grids ("Fleuve, Centre, Est, Nord, and Ouest") not yet connected into a national interconnected system. In the current generation and transmission program three systems will be interconnected around 2022 once the proposed Salkadamna coal project and the associated transmission lines are commissioned. In order to estimate the generation costs, estimates of generation programs and generation costs for each of the three grids (Fleuve, Centre and Nord) have therefore been made in conjunction with Nigelec and the engineering consultant. Up to their assumed interconnection in 2022, the economic costs of electricity supply will vary for each separated power system depending upon the generation mix/sources supplying the additional demand in each center at a given time. The sources of generation for each center are described in Table 4.

Table 4: Sources of Generation

Urban Center (included in the project)	Generation Sources
Niamey and Tillaberi	2014-2020: Additional power provided by the new diesel units sited at Gorou Banda (outskirts of Niamey) as the current 132 kV interconnector with Nigeria is saturated and unreliable. Starting in 2021: Kandadji hydro and solar PV will contribute to the generation mix Starting in 2022: Sakaldamna new domestic coal generation will contribute significantly to the generation mix.
Dosso	Additional power will continue to be provided through the Nigeria 132 kV interconnector.
Maradi, Tahoua, Zinder	Additional power for the three centers will be provided through the second interconnector with Nigeria as there is available capacity on the line. As needed additional power could be provided by the extension of SORAF refinery diesel plant at Zinder (+8MW), and from 2022 on by the Sakaldamna new coal generation plant.
Agadez	Additional power will be provided by the 25MW extension of the SONICHAR coal power plant in Agadez

- Transmission and Distribution Costs: Incremental transmission economic costs are estimated to be marginal. Incremental distribution costs are estimated to represent 3 percent of the project investment.

- Technical transmission and distribution losses. The proposed project will effect decreases in technical distribution losses and these have been credited to the project through simulating the operations of each distribution network in two scenarios: with and without-the-project. With the project, losses are estimated to be totaling 10 percent of the energy generated.

- Environmental and Social Impacts. Only minor negative environmental and social impacts are expected and are not factored in this analysis. Positive social impacts such improved lighting conditions, improved air quality (substitution from kerosene lamps or from stand-alone small gasoline generators) and lower noise levels are also not included.

- Additional GHG emissions. The additional emissions related to the implementation of this distribution project have not been estimated as the additional demand to be served is relatively small (in the order of 10-15 percent of Niger electricity demand) and difficult to estimate as it is impacted by the changes in generation mixes in Niger and Nigeria, the timing and efficiency of the generating plants.

- Sensitivity Analysis. Impacts on the net economic benefits of key variables such as increased generation costs (+10 percent), investment cost overruns (+10 percent), increased expected benefits to reflect higher WTPs or expected electricity usages (+10 percent) have been assessed through the sensitivity analysis.

Project Net Present Values (NPVs) and Internal Rates of Return (EIRRs) - Base Case

13. The Base Case NPVs and the EIRRs for the project as a whole and for each of the seven urban centers are presented in Table 5. Overall the proposed project is expected to yield substantial net economic benefits and a high economic return (EIRR of 22.6 percent). The variations in the NPVs and EIRRs estimated for each center reflect the initial physical condition of the distribution networks, specific assumptions regarding future population growth and economic prospects, and the expected costs and availability of imports from Nigeria and from domestic generation.

Table 5: Project NPVs and EIRRs

Center	NPVs (10%) (US$ '000)	Economic Rate of Return (EIRR) (%)
Project (7 centers)	**50.9**	**22.6**
Niamey	44.0	29.4
Tillaberi	-0.3	5.8
Dosso	.18	12.0
Maradi	6.52	18.1
Tahoua	.16	10.6
Zinder	-0.22	9.4
Agadez	0.66	14.4

Project Net Economic Benefits - Sensitivity Analysis

14. The proposed project is expected to provide substantial positive net economic benefits under a wide range of situations. The key factors impacting project net economic impacts would be increases in project investment costs, and in the generation costs of the additional electricity made available through the project, and increases in economic benefits. The results of the sensitivity analysis are provided in Table 6.

Table 6: Summary of the Economic Analysis (Base Case and Key Sensitivity Scenarios)

Case	NPV (at a 10% discount rate) US$ million	EIRR (%)
Base Case	50.9	22.6
Increase of 10% in generation costs	42.4	20.5
Increase in investment (all contingencies included)	45.4	20.3
Increase in benefits of 10 % (higher willingness-to-pay or higher electricity consumption)	60.5	24.6

III. Financial Analysis

15. The financial analysis of the proposed investment in the distribution networks seeks to assess: (a) the financial returns expected by Nigelec from the implementation of the investment in the seven urban centers; and (b) the impacts of the proposed project on Nigelec's finances. Indicators selected to carry this financial assessment are the project Financial Internal Rate of Return (FIRR), the debt service coverage ratio and the comparison of the unit costs of the electricity delivered to the users with the current tariff levels granted to Nigelec. Similar to the economic analysis presented above, the financial analysis is carried out for each urban center and then for the whole investment.

Nigelec's Main Financial and Operational Indicators and Financial Outlook

16. Nigelec key financial and operational indicators for 2013 and 2014 are presented in Table 7. The evolution of Nigelec's self-financing over the 2010-2014 period shows a relative decline in the utility ability to generate financial resources from its operations. This evolution is due to various factors: (1) Nigelec's tariffs have remained broadly constant over the last 10-years (in 2001 the Government opted for a tariff decrease benefitting water pumping for irrigation, and in 2012 for a tariff decrease for the first tranche - social tranche - of domestic users); (2) the implementation of a rural electrification program requested by the Government; and (3) an increase albeit moderate in Nigelec's operational costs.

Table 7: Overview of Nigelec's Financial and Operational Performance (2013 and 2014)

Indicator	Value	
	2013	2014
Turnover (Millions US$)	92	106
Self-Financing Capacity (Million US$)	10.0	18.0
Number of customers	218 500	305 500
Estimated total Peak Demand (MW)	120	130
Energy sold (gWh)	667.6	758.3
Average Tariff (USc/kWh)	13.7	14.0
Electricity imported from Nigeria (% of electricity supplied in Niger)	73.8	77.7
Import Tariff from Nigeria (excl. losses) (USC/kWh)	3.1	2.9
Distribution Losses (%) Transmission Losses (%)	10.6 8.5%	10.5 9.5
Collection Performance (%)	78.2	78.8

17. Niger Power Sector and Nigelec's Investment Program. There is currently no indicative master plans for generation and transmission investment, for distribution, and for rural electrification. A large investment program at various stages of development is being discussed without however a comprehensive assessment of its financial impacts. Regarding generation: the 80 MW diesel plant at Gorou Banda should be commissioned early 2016; the Kandadji multipurpose hydrolectric project is now expected to be commissioned in 2020-2021; the Sakaldamna coal project (with possible installed capacity varying between 200-600MW) and the associated transmission lines (and the development of the mine and of coal briquettes plant) could be commissioned around 2022; a possible second phase of 25 MW for the SONICHAR coal power plant for the Agadez region power system could be operational in 2017-18 as would be a 8 MW extension of the SORAZ refinery power plant; solar PV installations of 20-30 MW are also discussed. Regarding transmission: A large transmission 330kV investment program is also under discussion in the context of the West Africa Power Pool (WAPP) and of the Sakaldamna coal power project; this program will support the development of a national grid interconnecting at least the two main sub-grids and strengthening the two Nigeria interconnectors. Regarding distribution, through AFD financing, a master distribution plan for the capital Niamey is under preparation. Finally, rural electrification is expected to pick up to significantly increase access to electricity services in the rural areas of Niger.

18. Nigelec's Financial Outlook. The overall relatively good (but deteriorating) financial performance of Nigelec has been largely due to the fact that Nigeria continues to provide 74 percent of Niger's electricity supply at low and stable tariffs (less that USc4/kWh). The quality of imports is however deteriorating, notably in the hot season. Inexpensive imports have allowed the Government of Niger to maintain tariffs at relatively low levels, not reflecting cost increases and even reducing end-users tariffs for irrigation and the social tranche consumers. Looking forward, and in the absence of tariff adjustments and improved operational performance, Nigelec’s financial situation will most likely deteriorate if tariffs are not adjusted soon. However, in the context of the World Bank DPO, discussions are underway for electricity tariffs to be cost-reflective by 2017. The expected financial stress will be linked to significant increases in generation costs as domestic production should significantly increase to meet fast increasing demand in response to the supply constraint on one of the two 132 KV transmission lines from Nigeria, and liquidity problems to finance fossil fuels. In the short run the Gorou-Banda (80 MW) diesel units will have substantial impacts on Nigelec's finances. It should be noted that the Kandadji multipurpose hydroelectric project on the Niger River, expected to come on stream in 2020-2021, is highly seasonal with a generation of only about 30MW during the dry season. The ambitious Sakaldamna coal project (likely to be conceived as an independent power producer operation) may also impact heavily on Nigelec's finances.

Project Financial Internal Rate of Return (FIRR)

19. Methodology and Main Assumptions. The methodology and main assumptions to estimate the project FIRR are described below:

- Current Tariff Levels. Nigelec 2014 tariff for the three customer categories - Residential Low Voltage, Commercial/Productive Usages Low Voltage, and Productive Usages Medium Voltage customers - impacted by the project are provided in Table 8.

Table 8: Nigelec Current Tariffs

Customer Category	FCFA/kWh	USC/kWh
Residential Low Voltage (BT)	82	13.9
Commercial/Productive Usages Low Voltage (BT)	87	14.7
Productive Usages Medium Voltage (MT)	80	13.6
Average	83	14.0

Exchange Rate: 1 US$=590 FCFA

- Tariffs Adjustments in 2017: In the context of the DPO support, the Government and the World Bank are discussing electricity tariffs adjustments to make them cost-reflective by 2017. As no comprehensive sector financial review and tariff analysis is available and much uncertainty exists regarding key cost-drivers and timing (with respect to Kandadji, Sakaldamna power, Nigeria tariffs, etc.), it has been assumed that the average tariff adjustment from current levels will be in the order of 15-25 percent.
- Payments by Nigelec of the Value Added Tax (VAT) and of import duties. The financial analysis assumes that the project and Nigelec will not be paying the VAT and duties on imported equipment. Nigelec will however be paying all other duties and fees and the taxes on net business income.
- Financing plan. All project costs will be financed through an IDA Credit under standard IDA Credit terms.
- Prospects for improved Nigelec's operational and financial performance. Following the 2014 institutional, financial and operational audit of Nigelec carried out by an external auditor, a Task Force has been set-up to develop a series of implementable measures to improve the utility's performance. Once the Action Plan is produced and productivity gains delineated, the Task Force conclusions as well as the pricing policy regarding pricing of petroleum products to Nigelec will be factored in a tariff adjustment decision.

20. Project Financial Viability - Reference Scenario. The Reference Scenario (Scenario SC1) assumes that by 2017, electricity tariffs will be cost-reflective (for this analysis and in the absence of up-to-date investment plans and estimates of the revenues requirements, the 2014 tariffs are assumed to be adjusted in 2017 within a range of 15-25 percent). In such a scenario, the proposed project is estimated to yield Nigelec a satisfactory FIRR of between 5.8 to 10.2 percent, with a satisfactory debt service coverage ratio varying between 3.1 and 4.7. Assuming current tariffs were to be maintained at their 2014 level the project would yield an unsatisfactory FIRR of -4.4 percent, and a debt service coverage ratio below 1. Table 9 shows the estimated FIRRs and debt service coverages for the Reference Scenario (SC1) and in order to ascertain the financial robustness and risks associated with the project, FIRRs and the debt service coverage ratios for a broad range of scenarios (SC2 to SC7).

21. Sensitivity Analysis of Project Financial Rates of Return. The following sensitivity analysis on the financial viability/sustainability of the proposed project have been carried out and are presented in Table 9 below:

- No adjustment in the retail electricity tariffs; tariffs are maintained at their current levels- Scenario SC2. The project FIRR will be -4.4 percent, and the debt service coverage ratio below the minimum level of 1.
- Adjustment in the retail tariffs to meet the Weighted Average Cost of Capital, WACC) - Scenario SC3. An adjustment in the retail tariffs averaging 8.2 percent would be required for Nigelec to financially break-even on the proposed project.
- Increase of 10 percent in generation costs - Scenarios SC4 and SC5. There are risks of generation costs above those assumed in the reference case regarding imports from Nigeria or domestic generation (higher fossil fuel costs, higher investment cost or costly delays in the commissioning of less expensive generation sources). A 10 percent increase in the generation costs for supplying the additional electricity demand from the project will lead to a negative FIRR of -11.7 percent (Scenario SC4). To meet project financial viability, the average tariff would need to be increased by 20.8 percent (Scenario SC5).
- Decrease of 10% in generation costs and increase of 10 percent in additional sales of electricity - Scenarios SC6 and SC7. A decrease of 10 percent in generation costs and a 10 percent increase in electricity sales would provide a FIRR of 0.7 percent and a debt service coverage ratio below 1. To meet the WACC a tariff adjustment of 0.6 percent would be required.

Table 9: Project Financial Scenario Analysis

Scenario	FIRR (%)	Debt Service Coverage Ratio	Average Tariff Adjustment (%)
SC1: Reference Case (cost reflective tariffs reached by 2017) .... Average tariff Adjustment of 15% .... Average Tariff Adjustment of 25%	 5.8 10.2	 3.2 4.7	 15 25
SC2: Tariffs maintained at their 2014 levels	-4.4	0.51	---
SC3: Retail tariffs adjusted to meet the project WACC (other assumptions same as for scenario SC1)	1.0	1.78	8.2
SC4: Generation Costs 10% higher than in scenario SC1	-11.75	-1.15	
SC5: Generation Costs 10% higher than in the reference case SC1 with tariff adjusted to meet the project WACC	1.0	1.69	20.8
SC6: Scenario de Base SC1 with decrease of 10% in generation costs and increase of 10% in electricity sales due to the project	0.7	1.1	
SC7: Decrease of 10% in generation costs and increase of 10% in electricity sales due to the project, with tariff adjusted to meet the project WACC	1.03	1.8	+0.6%

Annex 6: Project Map

NIGER: Electricity Access Expansion Project