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IDA/R2018-0014/1

January 29, 2018

**Closing Date: Thursday, February 15, 2018  
at 6:00 p.m.**

FROM: Vice President and Corporate Secretary

**Nigeria - Electricity Transmission Project**

**Project Appraisal Document**

Attached is the Project Appraisal Document regarding a proposed credit and a Scale-Up Facility (SUF) credit to Nigeria for an Electricity Transmission Project (IDA/R2018-0014), which is being processed on an absence-of-objection basis.

**Distribution:**

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Report No: PAD 1707

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON

A PROPOSED CREDIT

IN THE AMOUNT OF SDR 86.2 MILLION  
(US\$122 MILLION EQUIVALENT)

AND

A SCALE-UP FACILITY CREDIT

IN THE AMOUNT OF US\$364 MILLION

TO THE

FEDERAL REPUBLIC OF NIGERIA

FOR AN

ELECTRICITY TRANSMISSION PROJECT

January 25, 2018

Energy and Extractives Global Practice  
Africa Region

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CURRENCY EQUIVALENTS  
(Exchange Rate Effective November 30, 2017)

Currency Unit = Nigeria Naira (NGN)  
US\$1 = NGN 305  
US\$1 = SDR 0.70650408

FISCAL YEAR  
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

AFD	<i>Agence Française de Développement</i> (French Development Agency)
AfDB	African Development Bank
ARAP	Abbreviated Resettlement Action Plan
ATC&C	Aggregate Technical, Commercial, and Collection
BPE	Bureau of Public Enterprises
CBN	Central Bank of Nigeria
CEO	Chief Executive Officer
CPS	Country Partnership Strategy
DFID	U.K. Department for International Development
DISCOs	Distribution Companies
EBP	Energy Business Plan
EHS	Environment, Health, and Safety
EIRR	Economic Internal Rate of Return
EPC	Engineering, Procurement, and Construction
ERGP	Economic Recovery and Growth Plan
ERP	Enterprise Resource Planning
ERSU	Environmental, Resettlement, and Social Unit
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
EU	European Union
FAU	Finance and Accounts Unit
FGN	Federal Government of Nigeria
FIRR	Financial Internal Rate of Return
FMEnv	Federal Ministry of Environment
FM	Financial Management
FMF	Federal Ministry of Finance
FPFMD	Federal Project Financial Management Division
FPM	Financial Procedures Manual
FX	Foreign Exchange
FY	Fiscal Year
GDP	Gross Domestic Product
GENCOs	Generation Companies
GHG	Greenhouse Gas

GIZ	<i>Deutsche Gesellschaft für Internationale Zusammenarbeit</i> (German Agency for International Cooperation)
GRM	Grievance Redress Mechanism
GW	Gigawatt
GWh	Gigawatt Hour
HV	High Voltage
ICB	International Competitive Bidding
IDA	International Development Association
IFC	International Finance Corporation
IFR	Interim Financial Report
IPF	Investment Project Financing
ITP	Independent Transmission Project
JICA	Japan International Cooperation Agency
kV	Kilovolt
kWh	Kilowatt Hour
MDAs	Ministries, Departments, and Agencies
MIGA	Multilateral Investment Guarantee Agency
MO	Market Operator
MW	Mega-Watt
MYTO	Multi-Year-Tariff-Order
MVA	Megavolt ampere
NBET	Nigerian Bulk Electricity Trading PLC
NCB	National Competitive Bidding
NEGIP	Nigeria Electricity and Gas Improvement Project
NERC	Nigerian Electricity Regulatory Commission
NGN	Nigeria Naira
NPV	Net Present Value
O&M	Operation and Maintenance
OEM	Original Equipment Manufacturer
PAD	Project Appraisal Document
PATRP	Power Africa Transactions and Reform Program
PCB	Polychlorinated Biphenyl
PDO	Project Development Objective
PforR	Program for Results
PIE	Project Implementing Entity
PIP	Performance Improvement Plan
PMU	Project Management Unit
PPAs	Power Purchase Agreement
PPE	Personal Protective Equipment
PPP	Public-Private Partnership
PPSD	Project Procurement Strategy for Development
PSRP	Power Sector Recovery Program
QCBS	Quality- and Cost-Based Selection
RAP	Resettlement Action Plan
REA	Rural Electrification Authority
RPF	Resettlement Policy Framework

RTU	Remote Terminal Unit
SBD	Standard Bidding Document
SCADA	Supervisory Control and Data Acquisition
SCF	Standard Correction Factor
SDR	Special Drawing Rights
SO	System Operator
SoE	Statement of Expenditure
SUF	Scale-Up Facility
SVC	Static Var Compensator
TCN	Transmission Company of Nigeria
TEM	Transitional Energy Market
TREP	Transmission Rehabilitation and Expansion Program
TSP	Transmission Service Provider
US\$	United States Dollars
USAID	U.S. Agency for International Development
WTP	Willingness to Pay

Regional Vice President:	Makhtar Diop
Country Director:	Rachid Benmessaoud
Senior Global Practice Director:	Riccardo Puliti
Practice Manager:	Wendy Hughes
Task Team Leader:	Jianping Zhao
Co-Task Team Leader:	Kyran O’Sullivan

**FEDERAL REPUBLIC OF NIGERIA  
ELECTRICITY TRANSMISSION PROJECT (NETAP)**

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**PAD DATA SHEET***Nigeria**NG-Electricity Transmission Project (P146330)***PROJECT APPRAISAL DOCUMENT***AFRICA**Energy and Extractives Global Practice*

Report No.: PAD1707

Basic Information			
Project ID P146330	EA Category B - Partial Assessment	Team Leader(s) Jianping Zhao,Kyran O'Sullivan	
Financing Instrument Investment Project Financing	Fragile and/or Capacity Constraints [ ]		
	Financial Intermediaries [ ]		
	Series of Projects [ ]		
Project Implementation Start Date 15-Feb-2018	Project Implementation End Date 31-Dec-2023		
Expected Effectiveness Date 15-Jun-2018	Expected Closing Date 31-Dec-2023		
Joint IFC No			
Practice Manager/Manager Wendy E. Hughes	Senior Global Practice Director Riccardo Puliti	Country Director Rachid Benmessaoud	Regional Vice President Makhtar Diop
Borrower: Federal Republic of Nigeria			
Responsible Agency: Transmission Company of Nigeria			
Contact: Telephone No.: 2348188058522	Mohammed Usman Gur	Title: Email: mohammed.ug@tcnmail.com	Managing Director/CEO
Project Financing Data (in US\$ Million)			
[ ] Loan	[ ] IDA Grant	[ ] Guarantee	
[ X ] Credit	[ ] Grant	[ ] Other	
Total Project Cost:	490.00	Total Bank Financing:	486.00
Financing Gap:	0.00		



Financing Source					Amount					
BORROWER/RECIPIENT					4.00					
International Development Association (IDA)					486.00					
Total					490.00					
Expected Disbursements (in US\$ Million)										
Fiscal Year	2018	2019	2020	2021	2022	2023	2024			
Annual	0.00	46.00	102.00	152.00	96.00	56.00	34.00			
Cumulative	0.00	46.00	148.00	300.00	396.00	452.00	486.00			
Institutional Data										
Practice Area (Lead)										
Energy & Extractives										
Contributing Practice Areas										
Proposed Development Objective(s)										
The project development objective is to increase the transfer capacity of the transmission network in Nigeria.										
Components										
Component Name							Cost (US\$ Millions)			
Transmission Network Strengthening and Improvement							448.00			
Capacity Building and Technical Assistance							42.00			
Systematic Operations Risk- Rating Tool (SORT)										
Risk Category								Rating		
1. Political and Governance								Substantial		
2. Macroeconomic								Substantial		
3. Sector Strategies and Policies								Substantial		
4. Technical Design of Project or Program								Moderate		
5. Institutional Capacity for Implementation and Sustainability								Substantial		
6. Fiduciary								Substantial		
7. Environment and Social								Moderate		
8. Stakeholders								Moderate		
9. Other										
OVERALL								Substantial		

Compliance			
<b>Policy</b>			
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 [ ]
<b>Safeguard Policies Triggered by the Project</b>		<b>Yes</b>	<b>No</b>
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
<b>Legal Covenants</b>			
<b>Name</b>	<b>Recurrent</b>	<b>Due Date</b>	<b>Frequency</b>
Appointment of a board of directors for the PIE, Schedule 2, Section IV, A		15-Dec-2018	
<b>Description of Covenant</b>			
The Recipient shall, not later than six (6) months after the Effective Date, appoint a board of directors for the PIE in accordance with the provisions of the Companies and Allied Matters Act 1990.			
<b>Name</b>	<b>Recurrent</b>	<b>Due Date</b>	<b>Frequency</b>
Provision of a five-year investment plan, Schedule 2, Section IV, B	X		Yearly
<b>Description of Covenant</b>			
The Recipient shall, in each fiscal year after the Effective Date, prepare and furnish to the Association during said fiscal year, a five-year investment plan for transmission network expansion, all in form and substance satisfactory to the Association.			
<b>Name</b>	<b>Recurrent</b>	<b>Due Date</b>	<b>Frequency</b>
Project report, Schedule 2, Section II	X		Semi-annual

<b>Description of Covenant</b>			
The Recipient shall furnish to the Association each Project Report not later than one month after the end of each calendar semester, covering the calendar semester.			
<b>Name</b>	<b>Recurrent</b>	<b>Due Date</b>	<b>Frequency</b>
Preparation of Project Implementation Manual, Schedule 2, Section I, C, 1, a		15-Jun-2018	
<b>Description of Covenant</b>			
The Recipient shall cause the PIE to prepare, in accordance with terms of reference acceptable to the Association and furnish to the Association for review, a manual, which shall include provisions on the following matters: (i) capacity building activities for sustained achievement of the Project’s objectives; (ii) arrangements on financial management, setting forth the detailed policies and procedures for financial management under the Project; (iii) procurement management procedures, including a manual to guide procurement; (iv) institutional administration, coordination and day to day execution of Project activities; (v) monitoring and evaluation; (vi) reporting; (vii) information, education and communication of Project activities and results; (viii) guidelines for assessing potential environmental and social impacts of Project activities and designing appropriate mitigation, management and monitoring measures in respect of said impacts (namely, guidelines for preparation and implementation of Safeguards Instruments as required by the Safeguards Frameworks); and (ix) such other technical and organizational arrangements and procedures as shall be required for the Project.			
<b>Name</b>	<b>Recurrent</b>	<b>Due Date</b>	<b>Frequency</b>
Adoption of Project Implementation Manual, Schedule 2, Section I, C, 1, b		15-Jun-2018	
<b>Description of Covenant</b>			
The Recipient shall cause the PIE to afford the Association a reasonable opportunity to exchange views with the Recipient on said manual, and thereafter, shall adopt such manual, as shall have been approved by the Association (“Project Implementation Manual”).			
<b>Name</b>	<b>Recurrent</b>	<b>Due Date</b>	<b>Frequency</b>
Annual Work Plan and Budget, Schedule 2, Section I, C, 2, a	X		Yearly
<b>Description of Covenant</b>			
The Recipient shall cause the PIE to prepare and furnish to the Association not later than September 30 of each Fiscal Year during the implementation of the Project, a work plan and budget containing all activities proposed to be included in the Project (including Safeguards Instruments applicable to said activities in accordance with the provisions of Section I.E of this Schedule 2) during the following Fiscal Year, and a proposed financing plan for expenditures required for such activities, setting forth the proposed amounts and sources of financing.			
<b>Conditions</b>			
<b>Source of Fund</b>	<b>Name</b>		<b>Type</b>
IDA	Execution of Subsidiary Agreement Article V, 5.01 (a)		Effectiveness
<b>Description of Condition</b>			

The Subsidiary Agreement has been executed on behalf of the Recipient and the Project Implementing Entity.				
Source of Fund	Name			Type
IDA	Financing Agreement dated the same date as this Agreement Article V, 5.01 (b)			Effectiveness
Description of Condition				
The Financing Agreement dated the same date as this Agreement, between the Recipient and the Association, providing a credit in support of the Project (“Financing Agreement”), has been executed and delivered and all conditions precedent to its effectiveness or to the right of the Recipient to make withdrawals under it (other than the effectiveness of this Agreement) have been fulfilled.				
Source of Fund	Name			Type
IDA	Ratification of the Subsidiary Agreement Article V, 5.02			Effectiveness
Description of Condition				
The Additional Legal Matter is that the Subsidiary Agreement has been duly authorized or ratified by the Recipient and the Project Implementing Entity and is legally binding upon the Recipient and the Project Implementing Entity in accordance with its terms.				
Team Composition				
World Bank Staff				
Name	Role	Title	Specialization	Unit
Jianping Zhao	Team Leader (ADM Responsible)	Senior Energy Specialist		GEE08
Kyran O'Sullivan	Team Leader	Lead Energy Specialist		GEE08
Adebayo Adeniyi	Procurement Specialist (ADM Responsible)	Senior Procurement Specialist		GGOPA
Bayo Awosemusi	Procurement Specialist	Lead Procurement Specialist		GGOPA
Adewunmi Cosmas Ameer Adekoya	Financial Management Specialist	Senior Financial Management Specialist		GGOAS
Akinrinmola Oyenuga Akinyele	Team Member	Senior Financial Management Specialist		GGOAS
Amos Abu	Environmental Safeguards Specialist	Senior Environmental Specialist		GEN07
Chita Azuanuka Obinwa	Team Member	Senior Program Assistant		GEE01

Christine Makori	Counsel	Senior Counsel		LEGAM
Edda Mwakaselo Ivan Smith	Social Safeguards Specialist	Senior Social Development Specialist		GSU20
Inka Ivette Schomer	Team Member	Operations Officer		GTGDR
Jaeyoung Jin	Team Member	Senior Energy Specialist		GEE08
Juliana Chinyeaka Victor	Team Member	Senior Operations Officer		GEE08
Leonard Ewang Ngumbah Wolloh	Team Member	Program Assistant		GEE08
Michael Gboyega Ilesanmi	Social Safeguards Specialist	Social Development Specialist		GSU20
Muhammad Abba Wakil	Team Member	Energy Specialist		GEE08
Ogochukwu Joy Medani	Team Member	Program Assistant		AFCW2
Pedro E. Sanchez	Team Member	Lead Energy Specialist		GEE07
Roland Lomme	Team Member	Senior Governance Specialist		GGOAS

#### Extended Team

Name	Title	Office Phone	Location
Thomas Walton	Environmental Safeguards Specialist		

#### Locations

Country	First Administrative Division	Location	Planned	Actual	Comments
Nigeria	Lagos	Lagos State	X		
Nigeria	Katsina	Katsina State	X		
Nigeria	Kano	Kano State	X		
Nigeria	Kaduna	Kaduna State	X		
Nigeria	Borno	Borno State	X		
Nigeria	Anambra	Anambra State	X		
Nigeria	Akwa Ibom	Akwa Ibom State	X		
Nigeria	FCT	Federal Capital Territory	X		
Nigeria	Abia	Abia State	X		

Nigeria	Adamawa	Adamawa State	<b>X</b>		
Nigeria	Edo	Edo	<b>X</b>		
Nigeria	Enugu	Enugu State	<b>X</b>		
Nigeria	Kebbi	Kebbi State	<b>X</b>		
Nigeria	Kogi	Kogi State	<b>X</b>		
Nigeria	Osun	Osun State	<b>X</b>		

## I. STRATEGIC CONTEXT AND RATIONALE

### A. Country Context

1. **The 2015 elections marked, for the first time in Nigeria's history, a peaceful democratic transfer of power between two political parties, but the new administration faced a fast-deteriorating macroeconomic environment.** Gross domestic product (GDP) growth fell from 6.3 percent in 2014 to 2.7 percent in 2015, and to -1.6 percent in 2016, bringing Nigeria's first full year of recession in 25 years. In 2016, global oil prices reached a 13-year low and oil production was severely constrained by vandalism and militant attacks in the Niger Delta. While the oil sector represents only 8.3 percent of the total GDP, it provides the majority of foreign exchange (FX) earnings and three-quarters of government revenues. The decline in FX earnings from oil exports, compounded by the introduction of several FX allocation/utilization rules that restricted access to FX at the official market rate, by the Central Bank of Nigeria (CBN), had significant negative spillover effects on non-oil sectors dependent on FX for the import of inputs and raw materials.

**Table 1. Selected Economic Indicators, 2014–2017**

	2014	2015	2016	2017 f
Real GDP growth, at constant market prices (percent)	6.3	2.7	-1.6	1.0
Private consumption (percent)	0.6	1.5	-5.7	-1.7
Government consumption (percent)	-7.0	-11.9	-15.1	-4.6
Gross fixed capital investment (percent)	13.4	-1.3	-5.0	0.5
Exports, goods, and services (percent)	24.1	0.1	11.5	5.8
Imports, goods, and services (percent)	6.0	-25.7	-10.4	-14.8
Real GDP growth, at constant factor prices (percent)	6.2	2.8	-1.6	1.0
Agriculture (percent)	4.3	3.7	4.1	4.0
Industry (including oil) (percent)	6.8	-2.2	-8.9	2.2
Services (percent)	6.8	4.8	-0.8	-0.9
Inflation (Consumer Price Index) (percent)	8.0	9.0	15.7	16.3
Fiscal balance (consolidated government, percent of GDP)	-1.8	-3.5	-4.8	-4.7
Debt (consolidated government, percent of GDP)	12.5	13.2	17.3	21.4
Poverty rate (US\$1.9/day purchasing power parity terms)	46.8	46.8	48.4	49.0
Poverty rate (US\$3.1/day purchasing power parity terms)	72.9	72.9	73.9	74.4

*Source:* National Bureau of Statistics, World Bank, and International Monetary Fund staff projections.

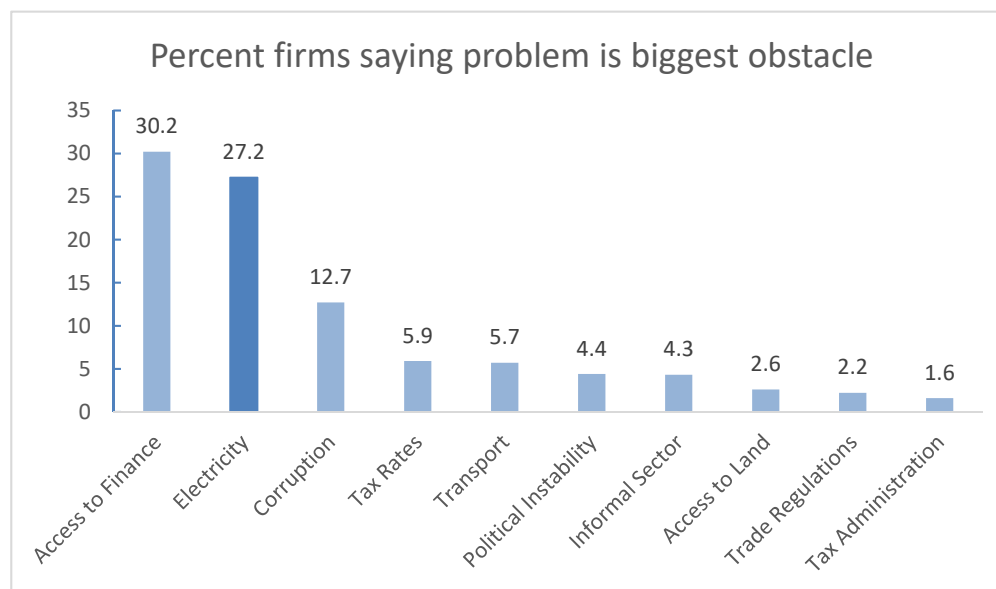
2. **Economic growth is expected to recover slightly, to above 1 percent in 2017, but this is subject to significant risks, leaving the fiscal sector outcomes uncertain.** Economic recovery in 2017 depends primarily on the restoration of oil production, supported by continued strong growth in agriculture and recovery of the non-oil and service industries. Nigeria's GDP returned to growth in Q2 and reached 1.4 percent (year on year) in Q3 of 2017. This has been driven by the recovery of oil production as well as a more stable oil price. The non-oil industry also returned to growth in Q2 but contracted by 0.8 percent (year on year) in Q3. Inflation remains sticky at just below 16 percent despite monetary tightening from the CBN. The parallel exchange rate premium as against the official exchange rate remains stable at just under 20 percent. With higher oil prices and production and economic growth, fiscal revenues are expected to increase slightly, although

they will remain below pre-crisis levels. However, there is a high degree of fragility and risk to economic recovery.

3. **In March 2017, the Federal Government of Nigeria (FGN) launched the national Economic Recovery and Growth Plan (ERGP) for the period 2017–2020.** The ERGP sets out a plan to restore macroeconomic stability in the short term, as well as structural reforms, infrastructure investments, and social sector programs to diversify the economy and places it on a path of sustained inclusive growth over the medium to the long term. It sets an ambitious target of 7 percent real GDP growth by 2020.

4. **Reliable power supply is central to supporting the ERGP targets for growth in the non-oil sectors, particularly in manufacturing and services.** Firm-level data from the 2014 Nigeria World Bank Enterprise Survey shows that provision of electricity supply is the biggest constraint to doing business in Nigeria. Electricity is the second most significant obstacle in all regions except the northwest. Larger firms, exporters, and manufacturers are most likely to identify provision of electricity as the biggest obstacle. Having reliable electricity supply is consistently associated with higher levels of firm productivity.

**Figure 1. The Most Important Obstacles to Doing Business in Nigeria 2014**



Source: World Bank Enterprise Survey 2014

## B. Sector Context

5. **Access to energy is low.** Approximately 80 million people lack access to grid electricity. The national electrification rate is about 55 percent and only 39 percent in rural areas. Nigeria has the second largest electricity access deficit of any country after India.<sup>1</sup> To achieve universal access to electricity by 2030, Nigeria would need to connect between 500,000 to 800,000 households per year. The majority of unserved people live in rural areas and rely on candles and flashlights for lighting. Both grid extension and off-grid solutions will be needed to provide quality services to the unserved and underserved households and businesses on time. Although female-headed

<sup>1</sup> Energy Access Outlook 2017, International Energy Agency, 2017.



households are more likely to be connected to the grid—72 percent—compared to male-headed households—53 percent, women tend to suffer more from inefficient electricity provision.<sup>2</sup>

6. **Nigeria's power sector is unbundled and largely privately owned.** Following the passage of the Electric Power Sector Reform Act (2005), the sector was unbundled into six generation companies (GENCOs), eleven distribution companies (DISCOs) and the Transmission Company of Nigeria (TCN). The privatization of the DISCOs and GENCOs was managed by the Bureau of Public Enterprises (BPE) and completed in 2013. Three of the five thermal GENCOs (that use natural gas as fuel) were sold in their entirety to new owners while three hydropower plants were concessioned to private operators. TCN has remained a fully government-owned monopoly and fulfills the roles of system operator (SO) and market operator (MO). In the current stage of market development known as the transitional market, the government-owned Nigerian Bulk Electricity Trading Company (NBET) fulfills the role of bulk trader buying electricity from GENCOs, including from Azura Power, the first of the independent power producers (whose commissioning is anticipated in early 2018), under power purchase agreements (PPAs) and reselling it to DISCOs under vesting contracts.

7. **The transition from a public to private sector-led power market, which began in 2013, has come under severe stress.** High losses, low collections, and tariffs that do not allow for recovery of sector companies' revenue requirement have resulted in annual financial deficits of about US\$1 billion in the sector. The poor financial situation of the 11 DISCOs severely constrains their access to commercial financing, limiting their ability to make the investments necessary to improve service, connect new customers, and meet their operation and maintenance (O&M) expenses. Because DISCO remittances to the bulk electricity trader, NBET, are insufficient to make full payments to GENCOs, the latter, in turn, accumulate arrears to gas suppliers.

8. **The causes for the crisis are interlinked and self-reinforcing.** The inconsistent application of the tariff policy (Multi-Year-Tariff-Order [MYTO]) weakened the sector's financial situation. Particularly, lack of adjustment for depreciation of the naira in 2016 severely affected the power sector, because approximately 65 percent of the sector costs are denominated in FX. DISCOs revenues fell further, constraining access to financing by DISCOs, whose balance sheets were already weak. Without access to financing, DISCOs have not progressed with much-needed investments in metering and rehabilitation of networks that would improve service delivered to customers. Inadequate service delivery, in turn, has constrained the government's ability to raise tariffs and enforce key contracts (including DISCOs' vesting contracts) with resulting nonpayment across the supply chain and to the gas suppliers. Payment arrears to the gas suppliers and the occasional sabotage of the gas infrastructure have led to erratic gas supply, further deteriorating the service delivery

9. **The operating and financial situation of the sector is further aggravated by weak governance and inadequate enforcement of contracts.** These factors have exacerbated the flaws of privatization that resulted in new ownership without a strong track record in the management of electricity utilities and that purchased DISCOs' shares with high leverage. Lack of financial viability hinders full activation and enforcement of sector contracts, that is, the financial consequences of sector companies being unwilling or unable to meet their contractual obligations

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<sup>2</sup> General Household Survey 2015–2016

are not enforced. The power market thus functions on the ‘best effort’ basis with resulting lack of accountability and poor service delivery.

**10. The institutional and market arrangements in the current Transitional Energy Market (TEM) are as follows.** The NBET, a government-owned public company, acts in an aggregator capacity as a bulk power trader. It has entered into PPAs with GENCOs and resells power on to the DISCOs under vesting contracts that allocate a percentage of the capacity and energy output from one or more GENCOs to the relevant DISCO. The Nigerian Electricity Regulatory Commission (NERC) has the primary licensing function in the power sector and has the mandate to conduct retail tariff reviews that produce and update the MYTO. The TCN is a monopoly transmission service provider (TSP) that is fully government-owned and controlled. TCN incorporates the roles of SO and MO under key regulations, including the market rules and grid rules, and enters into connection agreements with both GENCOs and DISCOs, regulating their connection to the transmission network.

**11. The TEM is expected to evolve into a full-fledged competitive wholesale market over time.** In the future, DISCOs are expected to be fully commercially viable and will then be expected to purchase power directly from the GENCOs, and NBET’s intermediary role will gradually lessen. Generation projects are expected to be competitively procured and eventually do not require Government backing of the PPAs. However, it is likely that this stage of market evolution will not be reached before five years.

**12. Three years after privatization, the reform program has not yet delivered substantial improvement in electricity services.** Although installed generation capacity is approximately 13 Gigawatt (GW) comprising 2 GW of hydro and over 11 GW of gas-fired power plants, the technical available capacity is only about 7 GW. The actual average operating capacity has been around 3.5 GW in early 2017 increasing to about 4 GW in Q3 of 2017, with a peak operating capacity of close to 5 GW. Since July 2017, the distribution segment has emerged as the largest constraint, with DISCOs rejecting up to 2 GW of the system load, thus curtailing supply from power plants to around 3,500 MWh per hour. The reasons why operating capacity is so much lower than what is technically available include gas constraints (commercial and technical constraints), transmission constraints.

**13. The FGN recognizes the critical role of the power sector in Nigeria’s economic development.** Ensuring energy sufficiency is one of the key priorities of the ERGP for 2017–2020. The Power Sector Recovery Program (PSRP) for 2017-2021 that the Federal Executive Council approved in March 2017 was developed by a government task force with the support of the WBG to realize the goal of increased power supply and more reliable service. Specifically, the PSRP aims to restore the sector’s financial viability, improve power supply reliability to meet growing demand, strengthen the sector’s institutional framework and increase transparency, implement clear policies that promote and encourage investor confidence in the sector, and establish a contract-based electricity market.

**14. The PSRP seeks to de-risk the power sector for private investment through a comprehensive package of financial, operational/technical, governance, and policy interventions.** The PSRP embraces the role of the Government and public funding in ensuring that the revenue requirement of the privatized power market is met. The FGN has prepared a

financing plan as part of the PSRP to ensure financial sustainability of the power sector and included the financing plan in the Medium-Term Expenditure Framework and Fiscal Strategy Paper approved by the National Assembly in December 2017. The financial interventions of the PSRP aim to fully fund historical and future sector deficits, so that sector companies receive their required revenue. The PSRP has measures to contain costs and carefully manage contingent liabilities to ensure affordability of tariffs, which will be increased in a phased manner to reach full cost recovery by 2021 i.e. by then sector companies will receive their required revenues from the tariff. The proposed World Bank Power Sector Recovery Program for Results project (PforR) (P164001) will cover years 2018-2021 of the PSRP and support the implementation of key financial, operational, regulatory, and policy measures to Reset the power sector for sustainable operation. The Reset will entail a redefinition of the revenue requirements of the DISCOs and TCN, based on new performance parameters and well-specified Performance Improvement Plans (PIPs) of DISCOs.

**15. The financial and technical interventions of the PSRP are complemented by actions to strengthen sector governance and enforce contracts.** Because it is essential that the sector does not incur costs that cannot be sustained, additional investment in power infrastructure will be guided by least-cost power planning. A communications program to inform stakeholders about the PSRP reform program, commenced in 2017.

#### *Transmission Sub-Sector Context*

**16. TCN has three main divisions - the MO, the SO and the TSP.** The MO conducts the measurement and accounting of the flow of energy through the grid. It also handles payment/settlement for services provided by TCN, NERC, and NBET, and frequency/voltage control and other services provided by GENCOs. The SO conducts system planning and manages the flow of energy in real time through its national and regional control centres. The TSP is responsible for the construction and maintenance of the physical network. The Electric Power Sector Reform Act, 2005 envisions that the SO and MO are to be merged into one organization known as the Independent System Operator and separated from the transmission system provider function. This potentially allows for the creation and licensing of other TSPs (nationwide or regional), which may be privately owned and funded.

**17. The primary (330 kilovolt (kV) transmission network is strong. The binding network constraint is the 132 kV system which includes 330/132 kV substations, 132 kV overhead lines, and 132 /33 kV substations that is, the interface points between transmission and distribution networks.** The transmission network consists of 330 kV and 132 kV transmission lines and substations (330/132 kV, and 132/33 kV). The 330 kV system has adequate levels of redundancy and so is secure (that is, it can withstand a single fault without losing major load) following the commissioning in 2016 of the Enugu-Makurdi-Jos south to north 330 kV link and the commissioning of the Ikot Ekpene substation and Afam-Calabar 330 kV link. The 330 kV system can comfortably evacuate 7 GW of generation. To achieve delivery of 7 GW to DISCOs, TCN must strengthen the capacity of 132 kV lines and increase transformer capacity at both 330/132 kV and 132/33 kV substations. The 132 kV lines in need of reconductoring and the 330/132 kV and 132/33 kV substations to be rehabilitated (by addition of control equipment, switchgear, and 330/132 kV and 132/33 kV transformers) are located across the country. TCN has prepared the Transmission, Rehabilitation, and Expansion Program (TREP) that is the transmission

subcomponent of the PSRP. The TREP cost is US\$1.25 billion to be financed by US\$486 million from IDA under the proposed project and US\$370 million, US\$200 million, US\$200 million from *Agence Francaise de Developpement* (French Development Agency - AFD), African Development Bank (AfDB), and Japan International Cooperation Agency (JICA), respectively.

**18. TCN has improved its execution of capital projects (that is, ensuring efficient contract management).** Current funding sources for TCN's capital projects include donors, the FGN budget, and, since February 2016, a transmission charge incorporated in the MYTO. During the past few years, TCN has executed about US\$200 million per year on capital projects. FGN funding for TCN's capital program is through annual budget appropriations and this has led to delays in execution of projects (that is, specific infrastructure investments) pending replenishment of funds with which to pay contractors. The FGN and TCN management have taken steps to address this issue. Beginning in 2016, TCN has prioritized projects in the capital program and directed available financial and managerial resources to these priority projects. This prioritization effort has been supported with technical assistance from the U.K. Department for International Development (DFID) and the U.S. Agency for International Development (USAID). This has resulted in improved rates of project execution in 2016 and 2017.

**19. The proposed project will also support the public institutions whose professional capacity and efficiency is essential for the smooth implementation of the PSRP.** It will finance technical assistance for capacity building in the Ministry of Power, TCN, BPE, NERC, NBET, and other government agencies such as the power task force attached to the Vice President's office. Technical assistance under the project will support TCN's efforts to commercialize and corporatize its business and operations, including enhancing TCN's governance and accountability framework, and enhancing TCN's managerial and staff capacity to strengthen planning, developing, and operating the transmission system. Technical assistance will also support the implementation of the project by strengthening the existing Project Management Unit (PMU) in TCN, which is responsible for implementing ongoing World Bank-funded projects. The BPE, the agency mandated with the overall responsibility of implementing FGN policy on privatization, will receive support through technical assistance for post-privatization performance monitoring of GENCOs and DISCOs. Technical assistance for the NBET will support its capacity to engage with private sector developers and investors in generation. Technical assistance will support the NERC in developing the retail tariff methodology and market monitoring systems.

**20. The proposed project is anchored in the World Bank Group's strategy to support power sector development in Nigeria.** Consistent with the World Bank Group Energy Directions Paper,<sup>3</sup> the World Bank Group Energy Business Plan (EBP) coordinates the financing support of the World Bank, International Finance Corporation (IFC), and Multilateral Investment Guarantee Agency (MIGA) for sector development in Nigeria (Table 2).

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<sup>3</sup> World Bank. 2013. *Toward a Sustainable Energy Future for All: Directions for the World Bank Group's Energy Sector*.

**Table 2: WBG program (ongoing and planned) in the power sector**

<b>Sector Challenges</b>	<b>WBG Instrument</b>	<b>WB financing</b>
Lack of reliable electricity supply; poor financial viability; weak governance and efficiency	Power Sector Recovery Performance Based Loan (PforR IDA)	US\$1,000 million planned
Poor performance of DISCOs	IDA lending to strengthen the quality and reliability of power supply to customers by improving the operational and commercial performance of DISCOs. The operation is at the identification stage. Potential IFC debt and equity investments.	Up to US\$500 million planned
Transmission constraints	Ongoing Nigeria Electricity and Gas Improvement Project (IDA) lending for the rehabilitation and refurbishment of transmission infrastructure to enhance system stability. Proposed NETAP.  Investment lending (IPF) is complemented by sector dialogue through the proposed PforR which has the objective of improving sector governance including corporate governance in TCN and other agencies.	US\$300 ongoing and \$486 million in proposed NETAP
Generation and gas supply constraints	<ul style="list-style-type: none"> <li>• IFC debt and equity investments to support private brownfield and greenfield investments in power generation and domestic gas supply.</li> <li>• MIGA political risk insurance to support private investments in power generation and domestic gas supply.</li> <li>• International Bank for Reconstruction and Development (IBRD) guarantee support for private investment in power generation.</li> <li>• Technical assistance (Trust Funds and IDA) for gas policy development.</li> </ul>	US\$ 868 million IFC direct or mobilized financing, US\$ 492 million MIGA guarantee and IBRD/IDA US\$387 million guarantee extended to date <sup>4</sup>
Low access to electricity	IDA lending to support investment in off-grid electrification to increase access in primarily rural areas.	US\$350 million planned

<sup>4</sup> IFC has provided loans of US\$80 million and mobilized US\$213 million of third-party direct foreign investment loans for the 459 MW Azura Edo Project (P120207), a private power project for which IBRD is providing up to US\$275 million in guarantees (debt and liquidity), and MIGA is providing US\$492 million in guarantees to cover commercial bank debts, equity, and interest rate hedging. IFC has also invested in domestic gas producer Seven Energy (equity of US\$75 million and anchor investor in a US\$500-million bond), and MIGA has provided a US\$200 million guarantee to Seven Energy for its investment in Accugas Ltd. An IDA guarantee in the amount of US\$112 million in support of the gas sales agreement between Accugas and the 560 MW Calabar power plant that is publicly owned became effective on September 22, 2017.

### C. Higher Level Objectives to which the Proposed Project Contributes

21. **The proposed project fully supports the country's social and economic development objectives.** The economic recession in 2016 was in part due to an underperforming power sector. The ERGP of March 2017 recognizes that establishing a viable power sector is critical to the success of the ERGP and it was on this basis that the PSRP was prepared. A key element of the PSRP is removing gas infrastructure and transmission constraints that hamper production and supply of power to customers. By removing transmission constraints, the project will contribute to making more power available for the commercial and industrial sectors, thus contributing to economic growth and job creation.

22. **The project will contribute to restoring sector financial viability.** The proposed project will assist in restoring financial viability in two ways. First, by increasing the capacity and reliability of the network to transport power, the project will make more and reliable power available for sale to customers. Combined with loss reduction efforts of DISCOs, increased power sales should lead to increased revenue and collections. Second, by preparing a pilot concession to a private sector entity for a greenfield transmission line using competitive procurement, it will serve as a cost-effective model for private sector investment and ownership in future network expansion infrastructure thus reducing the requirement for public funding of transmission infrastructure.

23. **The project will contribute to improved governance and enhanced capacity of TCN.** An assessment carried out by the management contractor, whose term expired in July 2016, found skills gaps in most of TCN's business units, including in planning, O&M, human resource management, performance management, financial planning, accounting, administration, and health, environmental, and social management. Technical assistance activities will seek to enhance TCN's managerial and staff capacity to plan, develop, and operate the growing power network in accordance with good international practices. These activities are complementary to the activities under the Power Africa Program of the U.S. Government as well as those under the DFID-funded support for the sector.

24. **The proposed project is fully aligned with the 'Maximizing Finance for Development' approach and with the World Bank Group's twin goals of reducing poverty and boosting shared prosperity as articulated in the FY14–17 Nigeria Country Partnership Strategy (CPS).<sup>5</sup>** The CPS focuses on three strategic clusters in support of inclusive economic growth, including maintaining non-oil growth aimed at transforming Nigeria's economy by promoting private sector participation in fundamental infrastructure sectors. Cluster 1 of the CPS Federally-led Structural Reform Agendas for Growth and Jobs, aims to support the FGN in promoting diversified growth and job creation by reforming the power sector, enhancing agricultural productivity, and increasing access to finance. By removing constraints in the public-sector transmission network, the project leverages and sustains private investment in the majority private-owned distribution and generation subsectors.

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<sup>5</sup> Report No. 82501-NG.

## II. PROJECT DEVELOPMENT OBJECTIVES

### A. PDO

25. The Project Development Objective (PDO) is to increase the transfer capacity of the transmission network in Nigeria.

#### Project Beneficiaries

26. **Direct beneficiaries.** The proposed project's direct beneficiaries are current and future electricity consumers, including grid-connected households as well as businesses who will benefit through improved electricity service benefiting both men and women in grid-connected households equally. Improvement in electricity service will require complementary measures to increase electricity supply from generation and in delivery of electricity by DISCOs. TCN, NBET, NERC, BPE, and the Ministry of Power, for whom technical assistance for capacity building will be provided under the project, will also be direct beneficiaries.

27. **Indirect beneficiaries.** Additional transmission capacity developed under the proposed project will help to increase productivity and spur economic growth. Significant improvements in power supply through support from the project aim to improve the foundation for job creation, poverty reduction, and improved prospects for shared prosperity.

#### PDO Level Results Indicators

28. The proposed PDO indicators are:

- Transformer capacity added to the transmission system (megavolt ampere - MVA).
- Transmission lines upgraded, rehabilitated, or strengthened (km).

29. The project Results Framework is included in Annex 1.

## III. PROJECT DESCRIPTION

30. **The project supports priority investments for rehabilitation and upgrading of existing substations and rehabilitation of existing transmission lines across the country to increase power transfer on the transmission network.** The rehabilitation to be carried out under the project is to address binding constraints and contribute significantly to increasing power transfer capacity from about 5 GW currently to at least 7 GW. The project also includes installation of a Supervisory Control and Data Acquisition (SCADA) system to improve system control necessary to maintain system stability. The substations are part of the transmission network located across the country. Rehabilitation under the project will expand transformer capacity by 3,060 MVA for transformation at 330/132 kV (currently 8,138 MVA) and by 3,500 MVA for transformation at 132/33 kV (currently 10,162 MVA). Rehabilitation of the proposed substations and transmission lines is a major part of TCN's TREP (that is also financed by AFD, AfDB, JICA, and FGN) to achieve transmission capacity of 7 GW. The increase in maximum power transfer capacity from about 5 GW to 7 GW will enable DISCOs to supply consumers with additional power.

31. The rehabilitation of transmission infrastructure to be carried out under the proposed project is complementary to AFD, AfDB, JICA, and FGN-funded rehabilitation to address the constraints of the 132 kV transmission system to ensure that 7 GW can flow to the 11 DISCOs. The implementation and operation of the proposed project does not depend on the implementation of investments financed by other donors.

32. **The proposed project will pilot private participation in the transmission sector.** To expand the transmission network to cater for supply and demand in excess of 10 GW, private sector investment will be required. Thus, the project's technical assistance component will support efforts to engage the private sector in transmission by financing a transaction advisory consultancy. This consultancy will pilot the design and selection of a sponsor to develop a transmission line under public-private partnership (PPP) arrangements, that is, an Independent Transmission Project (ITP) under a public-private partnership (PPP) arrangement.

33. The project also provides technical assistance to help TCN develop a clear accountability framework and a functional governance structure, fill the gaps in both managerial and staff capacity, and explore private financing for the development of greenfield transmission projects. The two components are described below and further detailed in Annex 2.

#### **A. Project Components**

34. **Component 1: Transmission Network Strengthening and Improvement (US\$408 million equivalent, of which the FGN US\$4 million and IDA and IDA SUF US\$404 million equivalent, excluding contingency).** This component has four subcomponents: (a) the upgrading and rehabilitation of up to 48 existing substations—of these, approximately 11 require the replacement of transformers, while the others require the addition (not the replacement) of transformers, and addition and replacement of protection and control systems, switchgear, and associated equipment; (b) replacement of conductor on up to 13 132 kV transmission lines and conversion of up to two 132 kV lines from single circuit to double circuit (the total length of the transmission lines is about 1,260 km); (c) the upgrading and expansion of the network's SCADA and telecommunication systems and construction of four regional control centers; and (d) installation of static var compensator (SVC) at the remotely located Gombe substation in the northeast, which is supplied by a long 132 kV line, and purchase of spare equipment.

35. **Component 2: Capacity Building and Technical Assistance (IDA and IDA SUF US\$32 million equivalent, excluding contingency).** This component includes the following activities: (a) consulting services (transaction advisory to support the preparation of transaction documents and procurement of a sponsor i.e. private developer) for a pilot PPP for transmission infrastructure that is part of network expansion (that is, greenfield infrastructure); (b) consulting support and capacity building to improve the TCN PMU's performance; (c) consulting services and capacity building to support TCN's corporatization and commercialization efforts and strengthening its institutional, governance and accountability framework; (d) consulting services for construction supervision and management (including environmental and social due diligence); (e) consulting services for feasibility studies of priority investment projects such as rehabilitation and construction of additional substations and transmission lines, and for undertaking associated environmental and social impacts' due diligence; and (f) consulting services, training and capacity building, including information and management systems to support public institutions in the



sector, including the TCN, NERC, BPE, NBET, FMF, FMP, the Rural Electrification Authority (REA), the National Power Training Institute of Nigeria, and other government bodies, such as the Ministry of Power and the power task force attached to the Vice President's office. Activities to advance implementation of the PSRP, including studies, consulting assignments (including consulting assignment to support the NERC, BPE, NBET, and REA), and communication and outreach activities will be supported by the technical assistance component of the project.

## B. Project Financing

36. **The total project cost is estimated at US\$490 million as summarized in the table, including contingencies.** The lending instrument for the proposed project is Investment Project Financing (IPF) in the form of a U.S. dollar denominated IDA SUF Credit in the amount of US\$364 million equivalent and an IDA Credit in the amount of US\$122 million equivalent. The World Bank will finance the supply and installation of all the equipment, civil works, consulting services, and part of the PMU's operating costs, including contingency; TCN counterpart funding of US\$4 million will finance any resettlement compensation. The compensation is expected to be limited to compensation of encroachers on existing transmission lines and will not involve land compensation.

**Table 3: Project Cost and Financing**

<b>Project Components</b>	<b>Amount (US\$, millions)</b>	<b>IDA and IDA SUF Financing (US\$, millions)</b>	<b>Counterpart Funding (US\$, millions)</b>	<b>% IDA Financing</b>
<b>Component 1: Transmission Network Strengthening and Improvement</b>	<b>408.0</b>	<b>404.0</b>	<b>4.0</b>	<b>98</b>
• Subcomponent 1(a): Upgrading and rehabilitation of substations	244.5	244.5	0.0	
• Subcomponent 1(b): Upgrading of transmission lines	49.5	49.5	0.0	
• Subcomponent 1(c): SCADA and telecommunication system	65.0	65.0	0.0	
• Subcomponent 1(d): Installation of SVC at Gombe substation and purchase of spare equipment and purchase of spare equipment at Ojo	45.0	45.0	0.0	
• Counterpart Funding: Compensation under Subcomponents 1(a) and 1(b)	4.0	0.0	4.0	
<b>Component 2: Capacity Building and Technical Assistance</b>	<b>32.0</b>	<b>32.0</b>	<b>0.0</b>	<b>100</b>
Consulting services and training	25.0	25.0	0.0	
Operating costs	7.0	7.0	0.0	<b>100</b>
<b>Front-end Fee</b>	<b>0.91</b>	<b>0.91</b>	<b>0.0</b>	
<b>Contingencies</b>	<b>49.09</b>	<b>49.09</b>	<b>0.0</b>	
<b>Total Estimated Cost</b>	<b>490.0</b>	<b>486.0</b>	<b>4.0</b>	<b>99.2</b>

### C. Lessons Learned and Reflected in Project Design

37. A lesson of World Bank experience in countries faced with severe power infrastructure constraints that are the result of market failure is that addressing the institutional and regulatory issues cannot succeed if the binding physical infrastructure constraints are not addressed in parallel. Thus, rehabilitation of transmission infrastructure to remove transmission network bottlenecks that the project will fund is complementary to the reform actions in the PSRP.

38. **The conditions for private investment and ownership in transmission are not yet in place in Nigeria.** Thus, public investment in transmission is necessary to sustain present private investment in generation and distribution. The PSRP that is a comprehensive program of policy, legal, regulatory, operational, and financial interventions is aimed at restoring long-term power sector viability. The measures that will be implemented through 2021, are aimed at improving transparency and service delivery and reestablishing investor confidence and, hence, investment in the sector. It is anticipated that significant private investment could be mobilized for new greenfield transmission infrastructure (to increase transmission capacity beyond 10 GW) beyond the project period (that is, after 2024). In anticipation of this, the project will fund the necessary transaction advisory for greenfield expansion with private participation. This technical assistance for the preparation of a pilot transmission line to be concessioned to the private sector will build on lessons from other countries that have successfully done so. Due to the size of the investments needed in the transmission sector and the scarcity of FGN budget resources and donor funding available, this pilot will help to catalyze long-term private sector financing for transmission network expansion.

39. World Bank experience demonstrates that to sustain the infrastructure that will be financed under the project, accompanying technical assistance is necessary to build the capacity of the transmission company. Technical assistance under the project will support strengthening the planning function for least-cost expansion where the SO that is part of TCN has a key role.

40. Lessons learned from the ongoing NEGIP, which is financing similar infrastructure contracts as the proposed project, have been incorporated into the design of the project. Change orders to supply and installation contracts necessitated by adjustment of the scope of works will be minimized. The scope of works to be financed by the proposed project at each of the proposed sites has been preliminarily identified. An independent engineering firm has been engaged by TCN to confirm the proposed scope of work at each site. Advanced preparation of bidding documents and increased capacity support for the PMU are also being undertaken. These activities will help reduce the likelihood of implementation delays.

41. **The lessons from contracts that failed in this sector in Nigeria in the past due to unsuitable procurement methods are addressed in the project.** The project applies the World Bank's Procurement Framework approved in July 1, 2016. Application of the framework will be based on experience under NEGIP. If nonprice factors that the framework allows (for example, methodology for carrying out the services) could have been more systematically evaluated under NEGIP contracts, some of the implementation challenges may have been avoided. As part of project preparation, a Project Procurement Strategy for Development (PPSD) has been prepared. The PPSD serves as the cornerstone for ensuring that the procurement approach is properly planned and designed to avoid issues in contract delivery. This will enable the selection of the

most appropriate suppliers of infrastructure services and consultant firms (see procurement section in Annex 3). Ineffective implementation quality experienced in the past would be mitigated through adequate and clear qualifications of contractors and subcontractors and close and proactive contract management and site supervision. Delays in clearing imports of materials and equipment due to lengthy procedures in obtaining import duty waivers in previous projects are mitigated, as the project will be eligible for these types of taxes.

42. Experience under NEGIP also demonstrates that there is a need for continuous capacity building of the TCN PMU. This is addressed in the project design. Previously, staff seconded from TCN to the PMU had not been through competition that would ensure selection of the best qualified and experienced candidate. Systems have now been established for competitive selection of staff to the PMU. Staff in key positions in the PMU will be subject to an annual performance review. The technical assistance component of the project, will finance capacity strengthening of the PMU.

43. **Although the project does not involve greenfield investments and the safeguards risks are considered moderate, there is still the need for adequate attention to social and environmental issues as demonstrated by lessons from other projects in Nigeria and similar projects in other countries.** Therefore, under the proposed project, consulting contracts for supervising engineers and engineering, procurement, and construction contracts (EPCs) for construction will include clear clauses and responsibilities related to the supervision and implementation of Environmental and Social Management Plans (ESMPs). In addition, an independent consultant will be hired to monitor the implementation of ESMPs and Resettlement Action Plans (RAPs) (if required). An individual consultant will be engaged to help assess and monitor gender-based violence issues in labor camps and provide risk mitigation and to submit a report to both TCN management and the World Bank on a quarterly basis. Responsibility for preventing instances of gender based violence will be included in all construction contracts. Contracts for supervising engineers will include responsibility for monitoring and reporting any instances of gender based violence.

#### **D. Partnership Arrangements**

44. Donor activities in the power sector are coordinated through the Development Partner Power Sector Working Group, which is currently co-chaired by DFID and the World Bank. It meets regularly to exchange information on the activities of the various donors in the sector and to discuss pertinent issues of power sector policy. The FGN participates in the meetings.

45. The design of the proposed project has been carried out in consultation with development agencies that are active in the sector, particularly with regard to transmission investments. These include the AfDB, AFD, DFID, the European Union (EU), German Agency for International Cooperation (*Deutsche Gesellschaft für Internationale Zusammenarbeit*, GIZ), JICA, and USAID, who all have programs with activities in the transmission subsector with TCN.

46. Nigeria is a focus country under the Power Africa Initiative of the U.S. Government. The Initiative funds the Power Africa Transactions and Reform Program (PATRP) that provides support to TCN. The PATRP has in recent years provided a team of advisors with expertise in technical, financial, and legal aspects of transmission system development to work with TCN to

further the goal of increasing investment in high priority transmission projects. The team has assisted TCN to develop and prioritize its capital program, prepare financial plans and tariff submissions, identify funding gaps, and prepare selected projects for implementation. In 2017, PATRP delivered workshops on cost regulation, financial modelling and transmission tariff setting and supported TCN in its tariff filing to NERC. In 2018, its focus is on business process engineering, regional devolution, financial planning and tariff setting. The PATRP will close in 2018 when a new program will replace it. The work plan for the new program will be done in collaboration with the World Bank to ensure coordination with the technical assistance program under the proposed project.

47. Technical assistance of AFD, EU, GIZ, JICA, and others support institutional development and capacity building for the sector's key agencies including for the competitive procurement of renewable energy and its integration with the grid.

## IV. IMPLEMENTATION

### A. Institutional and Implementation Arrangements

48. TCN will be the implementing agency for the project, and a Steering Committee comprising the Permanent Secretaries of the Ministry of Finance and the Ministry of Power, the Managing Director of TCN, and the Director General of the BPE will oversee project implementation.

49. **A Program Coordinator will coordinate TCN's overall transmission expansion program funded by donors (including the World Bank, AFD, AfDB, Islamic Development Bank, and JICA).** The primary responsibilities of the Program Coordinator include (a) coordinating the performance of the entire program, resolving project management issues that are beyond the capacity of the project managers that head the PMUs; (b) coordinating relationships with federal ministries of power and finance, other ministries, departments, and agencies (MDAs), states, and local government agencies and resolving interagency issues to ensure smooth performance of the program; (c) coordinating and facilitating major activities such as environment, resettlement, and social safeguards to ensure the smooth implementation of the program; and (d) supervise the monitoring and evaluation, internal audit, and annual audit of the PMUs.

50. **The Program Coordinator will be the direct correspondent with the World Bank on important aspects of project implementation,** including but not limited to (a) providing quarterly progress reports, (b) solving critical project implementation issues which require high level of government intervention and decisions, (c) solving issues related to compensation which require local government support; and (d) solving issues which have not been resolved by the PMU within an agreed time line; and others as deemed necessary.

51. **The existing World Bank PMU within TCN that is implementing the ongoing NEGIP will be responsible for implementing the proposed project.** The PMU under the supervision of the Program Coordinator will be responsible for the day-to-day activities of project implementation. Weaknesses in the PMU's capacity in the areas of record keeping, procurement, contract management, and environmental and social safeguards management that have caused delays under NEGIP are being addressed through the recruitment of additional staff and consultants in these areas.

52. **There will be a Project Manager heading the World Bank PMU.** The scope of work of the Project Manager shall be (a) managing the PMU's multidisciplinary personnel on a day-to-day basis; (b) supervising the work of project coordinators and ensuring the execution of the project in line with the PDO; (c) communicating with the World Bank, Federal Ministry of Finance, and other relevant agencies on behalf of TCN; (d) overseeing the preparation and execution of procurement of all contracts and being responsible for the performance of all contracts under the project; (e) submitting quarterly progress reports, annual reports, and ad hoc reports to TCN management and World Bank; and (f) performing other functions as may be assigned by the Program Coordinator or the Managing Director from time to time. There will be three other PMUs each headed by a project manager for the activities financed by AFD, AFDB and JICA respectively under the TCN program. See Annex 3 for further details.

53. The Project Implementation Plan, prepared by TCN, has been reviewed by the World Bank and is acceptable. It forms part of project documentation. The PMU will prepare an annual work plan and budget and submit it to the World Bank for approval.

## **B. Results Monitoring and Evaluation**

54. The Results Framework attached in annex 1 identifies the PDO indicators as well as the intermediate results indicators for each of the key activities. The PMU will have the overall responsibility for monitoring the implementation of each component and activity. An engineering consultant will be employed to assist with implementation of all EPC contracts, including supervision of environmental and social safeguards in ESMPs and RAPs, if required, and provide the PMU with monthly reports on the implementation status, issues, and challenges, and on the required actions by the PMU, which will also be shared with the World Bank team. The PMU will prepare a quarterly progress report summarizing implementation progress of all project activities, including the implementation of ESMPs and RAPs, and submit it to the World Bank. In addition, qualified, independent social and environmental consultants (team of two) will be engaged to review and supervise the implementation of the ESMPs and RAPs.

## **C. Sustainability**

55. The FGN is fully committed to supporting the proposed project. The sustainability of the project depends on the ability of the PMU to procure contractors efficiently and to ensure good contract management to commission the infrastructure. It will depend thereafter on TCN's ability to maintain and operate the infrastructure. The long-term sustainability of transmission infrastructure is bound up with the FGN's efforts to establish financial sustainability of the sector. It is important that after 2021 (when the financial interventions of the PSRP to fully fund the sector deficit ends) tariffs adequately provide for full recovery of TCN's O&M transmission costs to cater for maintenance of the facilities constructed under the project. In addition, improved governance (improved internal audit, appointment of a professional board and other measures) to ensure professional management in TCN through an improved accountability framework are important for the project's sustainability.

## V. KEY RISKS AND MITIGATION MEASURES

### A. Overall Risk Rating and Explanation of Key Risks

56. The overall risk rating of the project is substantial largely due to the risk related to the TCN PMU's institutional capacity and the financial crisis in the sector. The main mitigation measure is the strong sector dialogue of the World Bank both in the context of the Joint World Bank Group EBP for Nigeria as well as the World Bank Group's engagement with the Government in the context of the PSRP. Key risks are further discussed in the following paragraphs.

57. **Political and governance.** Country political and governance developments carry substantial risk for the project. TCN itself has inadequate governance systems. The investment component financed by the project should not be negatively affected by country political developments because the investment program supported by the project is countrywide with all regions benefiting. A few substations whose rehabilitation will be financed by the project are in areas that are sometimes affected by unrest. However, these substations have small footprints, have perimeter walls and can be fairly easily secured. The technical assistance component of the project will support improved governance in TCN (for example, through support for strengthening the internal audit). However, the impact of the technical assistance component activities to strengthen TCN governance as well as the capacity of sector institutions, such as the BPE, NERC, and NBET can be negatively affected should there be a lack of FGN commitment to the action plan of the PSRP during project implementation. The World Bank's strong sector dialogue with the FGN can mitigate these risks.

58. **Macroeconomic.** Macroeconomic risk is substantial. Future exchange rate risk that would cause the cost of maintaining the infrastructure constructed under the project to escalate will need to be mitigated in tariff reviews during the lifetime of the assets. Risk of naira depreciation could impact TCN's financial health as it would increase the cost of servicing future borrowing that it might assume.

59. **Sector strategies and policies.** There is substantial sector policy risk. The financial condition of TCN (and thus its ability to maintain and sustain the investments under the project) will be affected by how successfully the PSRP is implemented. The Reset (including a major MYTO review) will determine the revenue requirement of TCN from 2018 onwards. Although the PSRP has a well-specified financing plan for funding the revenue requirement of sector companies until 2021, the plan (that is integrated into the Medium-Term Expenditure Framework and Fiscal Strategy Paper approved by the National Assembly in December 2017) relies in part on Federal Government funding. The financing plan will be updated and approved regularly posing a risk on timely availability of government funding. After 2021, tariffs should be set to ensure that companies including TCN receive their revenue requirements. These risks are mitigated by the World Bank's strong policy dialogue with the FGN. In addition, the increasing share of private ownership in the sector (in generation and distribution) is creating pressures on TCN to become more disciplined and improve its performance because the ability of privately owned GENCOs to sell power to privately owned DISCOs depends on TCN transferring power between them. The communications and transparency activities under the PSRP will also contribute to increased scrutiny of TCN's performance.

60. **Institutional capacity for implementation and sustainability.** There is a substantial risk of project implementation delay if the TCN PMU does not efficiently manage the procurement process for construction contracts and supervise construction activities. This risk will be mitigated through international consultant support to the PMU and employment of an engineering consultant to assist with contract management and construction supervision throughout the implementation period as well as by application of the World Bank's July 2016 Procurement Framework. There is also a risk that TCN may not be able to maintain and operate the transmission assets constructed under the project. This latter risk is mitigated by capacity-building activities for TCN management and staff that is coordinated with the technical assistance of other donor partners to support the institutional development of TCN.

61. **Fiduciary.** Fiduciary risks are deemed substantial. The PMU has considerable experience in implementing World Bank-funded operations. However, due to the retirement of one experienced procurement manager and the departure of his successor, the PMU's procurement capacity of the PMU has weakened. This will be addressed through training of the newly appointed procurement officers. The PMU has had training in applying the World Bank's July 2016 Procurement Framework. TCN has not had an external audit of its financial statements until publication of its 2013 and 2014 audits in March 2016. The external audits for 2015 and 2016 are ongoing and expected to be published by March 2018. The FM risk is deemed moderate in light of the agreed FM action plan (see Annex 3 for details).

62. **Climate and disaster risks.** The project has been screened for risks related to climate change and disaster risk management. There is minimal potential impact of climate-related disasters to the project activities. Temperature rise is not expected to have an impact on the performance of the facilities to be installed under the project as the associated equipment are designed to operate under a wide temperature range. Mechanical design is also robust enough to withstand floods or droughts.

63. **Environmental and social.** These risks are considered moderate given that no greenfield infrastructure will be built. The key mitigation measure will be to ensure that TCN maintains sufficient capacity for identification of risks, properly incorporating environmental and social issues in bidding documents, and monitoring compliance of contractor and subcontractors with the provisions of the ESMPs and RAPs. Assessment of contractor and subcontractor qualifications should include their capacity to comply with the ESMPs, including the associated costs to be covered by them. Responsibility for preventing instances of gender based violence will be specified in ESMPs and included in all construction contracts. Contracts for supervising engineers will include responsibility for monitoring and reporting any instances of gender based violence.

## **VI. APPRAISAL SUMMARY**

### **A. Economic and Financial Analyses**

#### **Economic Analysis**

64. **Rationale for public sector financing.** There is substantial private investment and ownership in the generation and distribution sectors. The conditions for private investment and ownership in transmission are not yet in place so rehabilitation must be funded through the public

sector. Thus, public investment in transmission will help sustain present private investment in generation and distribution. The project's technical assistance component provides for a transaction advisory consultancy to support the preparation of transaction documents and procurement of a private developer for a pilot PPP for greenfield transmission infrastructure. Thus, while supporting public investment in urgently needed rehabilitation, the project will lay the basis for private investment in greenfield transmission infrastructure.

65. **Value-added of World Bank support.** The World Bank Group has a strong policy dialogue with the FGN. The project will thus be influential in informing policy and institutional development in the transmission sector by (a) drawing on the World Bank's global and Sub-Saharan African expertise in the implementation of power transmission projects (including the deployment of the most advanced SCADA with fiber optic communication technology); (b) tapping into the World Bank's experience with institutional development of transmission utilities, including incorporation of strong corporate governance aspects; and (c) using transparent procurement processes under World Bank-financed projects.

66. **Economic rate of return.** Only the investment component is analyzed and the proposed investment is economically viable. Project investments are expected to bring substantial economic benefits to Nigeria's power sector by helping displace expensive diesel-based self-generation and improving the efficiency of the power system. The baseline economic internal rate of return (EIRR) of the 'with project' scenario is 46.7 percent with a net present value (NPV) of US\$2,055 million, using conservative estimates of average 'willingness to pay' (WTP) for electricity in Nigeria and a discount rate of 7 percent.<sup>6</sup> Annex 5 provides more information on the methodology, assumptions, and results of the economic analysis.

67. **Environmental costs and benefits.** The project will help reduce environmental pollution by displacing diesel self-generation leading to a decrease in overall greenhouse gas (GHG) emissions of 9 million tons over the life of the project. Local and global environmental benefits add 4.2 percentage points and US\$353 million, to the EIRR and NPV, respectively.

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<sup>6</sup> The World Bank's guideline on discount rate, issued in May 2016, recommends the use of a discount rate twice the expected long-term per capita growth rate. Because Nigeria has grown at an average rate of 3.5 percent over the last 5 years, a 7 percent discount rate is used in the base case in this analysis.



**Table 4. Summary of Economic Analysis**

Base Case		
<b>Economic rate of return</b>		
ERR	[%]	42.5 %
ERR+local externalities	[%]	44.6 %
ERR+local+GHG@BankGuidanceValues	[%]	46.7 %
<b>Composition of NPV</b>		
Generation Costs	[US\$m]	661
Transmission Costs	[US\$m]	360
Distribution Costs	[US\$m]	67
<b>Total costs</b>	<b>[US\$m]</b>	<b>1,088</b>
Additional electricity supplied	[US\$m]	2,790
<b>Total benefits</b>	<b>[US\$m]</b>	<b>2,790</b>
<b>NPV (before environmental benefits)</b>	<b>[US\$m]</b>	<b>1,702</b>
Local env. benefits: avoided grid gen.	[US\$m]	184
<b>NPV (incl. local environmental benefits)</b>	<b>[US\$m]</b>	<b>1,886</b>
Value of avoided GHG emissions	[US\$m]	169
<b>NPV (including environment)</b>	<b>[US\$m]</b>	<b>2,055</b>

68. **Sensitivity analysis and risk assessment.** Sensitivity analysis shows that the project EIRR is robust to unfavorable outcomes of variables such as cost, construction delay, additional electricity supply, and lower average WTP. The project cost would have to be eight times higher, construction delay 14 years, WTP one-fourth of average WTP, and energy transferred 84 percent of the base value for the EIRR to fall below the hurdle rate (Table 5).

**Table 5. Switching Values**

Input	Unit	Baseline Value	Switching Value
Cost overrun	US\$, millions	353	2,936
Construction delay	Years	0	14.5
Energy supply	% of base case	100	84
WTP	US\$ per kWh	0.18	0.047

69. **Actions during implementation.** To revisit the economic analysis at midterm and for the Implementation Completion and Results Report, the following data on the costs and benefits of specific investment financed will be collected during project implementation: additional electricity transported by substations rehabilitated through the project investments.

## Project Financial Analysis

70. The financial analysis of the project was carried out by valuing the additional electricity delivered as a result of the project in financial terms (that is, the average transmission tariff), adding taxes and duties to the project costs used in the economic analysis and excluding global and environmental benefits from the program benefit. The analysis shows that the financial internal rate of return (FIRR) of the project will depend on the tariff trajectory approved by the NERC. Under the current average transmission tariff level, which is estimated at US\$8.5 per MWh, the project has a negative FIRR. It is expected to be positive as the transmission tariff reaches cost-reflective level taking into account of wheeled electricity and collection by 2021 under the PSRP.

## **Sector Financial Analysis**

71. Financial sustainability of sector companies is critical to breaking the vicious cycle of poor sector financial performance, which prevents the enforcement of contractual and regulatory obligations and results in poor service delivery. The FGN has prepared a financing plan as part of the PSRP to ensure financial sustainability of the power sector and included the financing plan in the Medium-Term Expenditure Framework and Fiscal Strategy Paper approved by the National Assembly in December 2017. The financial interventions of the PSRP aim to fully fund historical and future sector deficits, so that sector companies receive their required revenue. The financing plan will be monitored regularly and incorporates contingencies should the sector shortfall deviate from the base case assumptions. The financing plan will ensure the payment of invoices of GENCOs, TCN and gas suppliers from January 2017 i.e. it is already under implementation in 2017.

72. The PSRP has measures to contain costs and carefully manage contingent liabilities to ensure affordability of tariffs, which will be increased in a phased manner to reach full cost recovery by 2021 i.e. by then sector companies will receive their required revenues from the tariff. The PSRP also comprises complementary measures to improve sector's financial viability, including a major MYTO review based on Performance Improvement Plans to be prepared by DISCOs and TCN and approved by NERC. On the basis of these Performance Improvement Plans the revenue requirements of TCN and the DISCOs will be determined and approved by NERC

## **TCN Financial Analysis**

73. TCN has been incurring losses for the last six years. Net losses after depreciation and impairment charges during 2011–2014 amounted to NGN 107 billion (US\$685 million), or on average NGN 26.7 billion (US\$171 million) annually according to the audited financial statements. The deteriorating remittances from DISCOs since 2015 have caused reduced payments to TCN for the energy wheeled. TCN has not received more than 70 percent payment against its invoices in any month since privatization. An application for a transmission charge increase by TCN was approved and incorporated in the December 2015 MYTO (applied from February 1, 2016). The collection rates for the whole of 2015 and 2016 were 42 percent and 35 percent, respectively, compared with 60 percent in both 2013 and 2014. TCN needs to collect at least 60 percent of its invoice values to remain operationally viable. The market owes TCN about NGN 88 billion (US\$288 million at current official exchange rates) for the years 2015 and 2016 of which NGN 74 billion (the portion of the shortfall due to inadequate tariff) will be included in settlement of the historical shortfall under the PSRP.

## **B. Technical**

74. Nigeria's transmission system, which consists of about 15,000 km of 330 kV and 132 kV high-voltage (HV) lines, substations, and control facilities is owned and operated by TCN. While the transmission system managed to evacuate 5,074 MW on February 2, 2016, and a record of 5,156 MW on December 8, 2017, the system is operating well below internationally accepted reliability and efficiency standards. Despite some improvements in recent years, there were six major system collapses and a total system loss of 7.7 percent in 2016. The average monthly measured forced number of system outages in 2016 on the 330 kV lines and 132 kV lines were 43

and 80, respectively. There were also many frequency and voltage violations, particularly in the northern part of the system, which is far away from the generation sources in the south. The system collapses and outages are related to outdated equipment (and heavy vegetation growth) and generation deficiencies (lack of spinning reserves), but are primarily because of the lack of a comprehensive SCADA system to manage real-time control of the power system.

75. The main constraint to increased transmission capacity and improved reliability is at the 132 kV network level, including 330/132 kV substations, 132 kV lines, and 132/33 kV substations. The project supports part of the short to midterm investments that are urgently needed to address the constraint at the 132 kV network so that the transmission system's transfer capacity could reach over 7 GW with increased operational reliability. The investment activities will include (a) the rehabilitation and upgrading of existing 330/132 kV and 132/33 kV substations, which are seriously overloaded or are poorly performing; (b) reconducting of existing 132 kV overhead lines; and (c) the installation of a SCADA system and SVC facilities. The implementation of the investment activities will help to improve system reliability and security, reduce system losses, and contribute to increasing the transmission network transfer capacity to over 7 GW by 2022 as part of TCN's transmission and expansion program.

76. The technical viability of the substations and lines under consideration for upgrading have been appraised by TCN and the PMU, whose engineers conducted site visits for all the substations and selected sections of the lines that are proposed for rehabilitation under the proposed project. In addition, an engineering firm has been engaged to perform due diligence on the scope and visit all the candidate substations to review the proposed options, confirm the technical viability of the proposed rehabilitation schemes, and define the scope of work for the supply and installation contracts to be procured through an International Competitive Bidding (ICB) process. The construction involving rehabilitation of substations and reconductoring of transmission lines is of a well-tested, routine nature.

77. Rehabilitation and reinforcement of substations as well as the reconducting of transmission lines involve well-established technologies. One of the packages to be executed under NETAP is the integration of new substations into the SCADA system and construction of four new regional control centers. Some aspects of the existing SCADA equipment are proprietary. The PMU has engaged a consulting firm under NEGIP to carry out feasibility studies for existing SCADA/telecommunication system in the TCN network. The procurement approach will be designed to attract involvement of the original equipment manufacturers (OEMs) to drive the execution of the contracts using the EPC model.

### **C. Financial Management**

78. The responsibility for the FM arrangements of the project will be with the Finance and Accounts Unit (FAU) in the TCN PMU. The FAU is presently involved in the implementation of the World Bank-assisted project NEGIP. The FAU will however execute the FM responsibilities in consultation with the Federal Project Financial Management Division (FPFMD).

79. To further strengthen the project's FM arrangements, a project-specific FM action plan has been prepared. The action plan aims to ensure that the FM arrangements meet the minimum FM requirements in accordance with the World Bank's IPF Policy and Directive. Considering the risk

mitigation measures already in place, the FM risk for the proposed project is moderate. Annex 3 provides additional information.

#### **D. Procurement**

80. 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 as of July 1, 2016 apply to the project.

81. All procurement-related activities for the investments supported under the project will be implemented by the TCN PMU. Delays in the procurement process have been experienced in the ongoing NEGIP due to limited capacity to process multiple large procurements in parallel. There were delays in finalizing the award of a large contract because of safeguard documents not being prepared on time. These capacity constraints will be addressed through recruitment of additional staff and contracting of consultants.

82. TCN's relevant departments will provide inputs to the scope, technical specifications, and terms of reference for all investments under Component 1 (Transmission Network Strengthening and Improvement). The relevant sector institutions will prepare terms of reference for the technical assistance activities related to their respective institutions under Component 2 (Capacity Building and Technical Assistance). In addition, TCN and the sector institutions will participate in the bids/proposal evaluation and contract administration, including delivery and acceptance of the contracts for their respective institutions.

83. The project will apply the World Bank's July 2015 Procurement Framework to achieve the best project outcomes. Application of the framework will take into account experience under NEGIP, which has financed similar infrastructure contracts. To prepare for application of the framework, the PMU has prepared a PPSD, which will support planning to avoid issues in contract delivery. The PPSD serves as the cornerstone for ensuring that the procurement approach is properly planned and designed.

84. The PPSD is based on a market assessment and experience under the ongoing NEGIP as well as previous projects implemented by TCN and funded by IDA. It concluded that the procurement approach used in the previous and ongoing projects were characterized by low quality of equipment and installation services as well as delays in the execution of the contracts by EPCs without the involvement of OEMs. Considering that 60 percent to 70 percent of the contract costs constitute the HV equipment supplies, the PPSD proposed that OEMs be involved directly in the execution of the contracts either as a single entity with experience in design and construction or with the support of subcontractors appointed by the OEMs for design and construction activities.

85. The market analysis carried out in preparing the PPSD has shown that there are many OEMs in the HV equipment market that have participated in contracts execution with other players either as joint ventures or subcontracting arrangements. This was the case for the successful completion of the design, supply, installation, and commissioning of units 5, 6, and 12 in Kainji Hydropower Plant under the World Bank-supported Niger Basin Authority Water Resources Development and Sustainable Ecosystem Management Project (P093806) where the OEM was in a joint venture with a design engineering firm. The installation services were undertaken by a subcontractor under

the supervision of the joint venture contractor. The selection method shall be open competition to select an EPC contractor who shall be a manufacturer, as there are many manufacturers in the HV equipment market.

86. Procurement risk is substantial. A number of procurement and stakeholder risks were identified and mitigation measures are included in the PPSD. Annex 3 provides more information.

### **TCN Governance and Accountability**

87. TCN is bound by legal and regulatory requirements as a public enterprise incorporated under the Companies and Allied Matters Act and as a NERC licensee should adhere to NERC's Code of Corporate Governance Guidelines (see Annex 8 for further details). Currently TCN is not complying with many of these provisions, for example, appointment of a board is pending and financial audits have been prepared after delay. As part of the PRSP, TCN will be closely monitored by the Implementation and Monitoring Team reporting to the Vice President's Office for compliance with these obligations. This is consistent with the emphasis in the PRSP of improved sector transparency and information availability. A key focus will be on timely completion of audits (within six months of the close of the financial year) and addressing qualifications (if any) in the audits.

88. The legal and regulatory requirements on TCN include the following:

- (a) As a state-owned enterprise, TCN falls under the Freedom of Information Act of 2011 which requires that it publicly discloses: factual reports, inspection reports, and studies whether prepared by or for the company; information relating to the receipt or expenditure of public or other funds of the company; the name of every official and the final records of voting in all proceedings of the institution; a list of (i) files containing applications for any contract, permit, grants, licenses, or agreements; (ii) reports, documents, studies, or publications prepared by independent contractors; and (iii) materials containing information relating to any grant or contract made by or between the institution and another public institution or private organization.
- (b) As TCN is a registered company, the provisions of the Companies and Allied Matters Act apply, including the appointment of a board of directors to govern TCN by establishing broad policies and setting out strategic objectives and to oversee the activities of the company. The act also requires the disclosure of interests by directors and the disclosure of audited financial statements.
- (c) As an NERC licensee, TCN is required to 'comply with all applicable laws in Nigeria, whether in force at the date hereof or in the future,' including financial reporting requirements under the Companies and Allied Matters Act.

89. Technical assistance provided by the project, which will be complemented by ongoing technical assistance being provided to TCN by other development partners (notably GIZ, DFID, and USAID), will help TCN comply with these corporate governance legal requirements.

## **E. Environmental and Social (including Safeguards)**

90. The proposed project is classified as Environmental Assessment Category B (partial assessment). An Environmental and Social Framework (ESMF) prepared by the PMU in accordance with OP/BP 4.01 has been disclosed on March 30, 2017. A Resettlement Policy Framework (RPF) prepared by the PMU in accordance with OP/BP 4.12 (Involuntary Resettlement) has been disclosed on April 4, 2017.

91. Investments consist of rehabilitation and upgrading works at existing TCN substations and transmission lines. Potential environmental and social impacts are not significant. The project activities are not expected to require the acquisition of any land as there are expected to be sufficient spaces in the existing substations to accommodate all construction activities. The replacement of conductor and, in some cases, conversion of single circuits to double circuits on existing transmission towers (to increase power transfer capacity) will be carried out within the transmission line corridors which are already owned by TCN. The main environmental impacts off-site are construction traffic, noise, and dust; they are localized to the facilities and immediately adjacent communities and can readily be avoided or mitigated through the application of good practices and, where appropriate, preparation and implementation of site-specific ESMPs. The main on-site concern is workplace safety (including fire safety), which will also be addressed through health and safety measures to be included in the ESMPs. World Bank Group Environmental, Health, and Safety (EHS) Guidelines, both general and industry-specific, should be fully applied. The project will also assist TCN in applying good practices for workplace safety by providing personal protective equipment (PPE) to substations personnel. Contractors and subcontractors will also be required to comply with health and safety requirements, including World Bank Group EHS Guidelines, through ESMPs.

92. Significant social impacts are not expected; the labor force at each site will be small, hence large workers' camps and large numbers of in-migrating workers will not be needed. Resettlement will only be necessary if there are encroachers that need to be relocated from the transmission line corridor, in which case RAPs or Abbreviated Resettlement Action Plans (ARAPs) will be prepared. In accordance with the RPF that has been prepared, the RAPs will involve full and fair stakeholder consultations with men and women, and ensure gender equity. ESMPs will explicitly require monitoring for gender-based violence. Any RAPs and ARAPs that are needed will ensure that women benefit appropriately from compensation. Issues that could be looked at in preparing any RAPs and ARAPs include, among others, the different needs, treatment and compensation of women and men that are displaced and/or resettled (for example, livelihood sources and social systems). A Grievance Redress Mechanism (GRM) will also be part of any RAP or ARAP that will enable men and women to lodge any concerns or complaints related to the compensation and resettlement process. Responsibility for preventing instances of gender based violence will be specified in ESMPs and included in all construction contracts. Contracts for supervising engineers will also include responsibility for monitoring and reporting any instances of gender based violence. Full environmental and social impact assessments will not be called for under World Bank safeguards policies and are not likely to be required by FGN law or regulations because of the type of investments the project will support.

93. An individual consultant who is a specialist in gender-based violence will be engaged by the TCN PMU to assist it in monitoring instances of such violence and in providing for risk

mitigation. The consultant will also train TCN staff and social safeguards staff in particular and support it in developing its codes of conduct.

94. A framework approach is being applied to the project as the precise scope of all project activities is not known at the time of project appraisal. A technical (engineering) consultant has been contracted to determine the technical viability and the detailed scope of activities for each candidate substation site and transmission line. This verification exercise can lead to a particular candidate substation or line being excluded from the project. The preparation of the site-specific ESMP for the first group of substations which have been confirmed for inclusion in the project (Lot 1) has been reviewed by the World Bank and was disclosed in the Infoshop on January 22, 2018. The ESMP for the second group of substations (Lot 2) is expected to be finalized and disclosed in February 2018. The key elements of ESMPs will be incorporated into the bidding packages. There will be one ESMP for each group of substations that will be packaged as regional lots for contracting and one for each transmission line. The RPF outlines the resettlement process in terms of procedures for preparing, approving, and monitoring RAPs where required; likely categories of affected people, eligibility criteria and categories, compensations rates, methods of valuing affected assets, community participation, and information dissemination. The RPF paid particular attention to the development of the GRM at the community level to ensure that it is accessible to all stakeholders.

95. A partial inventory conducted by the Federal Ministry of Environment (FMEnv) as part of the World Bank/Global Environment Facility-supported Nigeria Polychlorinated Biphenyl (PCB) Management Project in 2015 found PCB oil in some distribution and transmission transformers, but contaminated transformers made up a relatively small percentage of the number of transformers sampled. The NETAP ESMF includes basic mitigation measures for PCB contamination. The various ESMPs will require sampling of any transformers that are leaking and any that are going to be replaced, followed by abatement of leaks and packaging and removal of contaminated soil to safe storage. Any PCB-containing transformers that will be taken out of service as part of NETAP-supported work will also be moved to safe storage. The budget for implementation of the NETAP ESMF includes funding for a specialized contractor that will provide TCN with training and equipment for PCB sampling, carry out remediation of contamination, and oversee handling and storage of contaminated soil and equipment.

96. ESMPs (and RAPs, if required) are prepared as the detailed scope of work for the proposed candidate substations and transmission lines are confirmed. In Nigeria, drafts of safeguard instruments (that is, drafts of ESMPs and RAPs) are disclosed in the project-affected areas as part of the FMEnv review process that includes a public hearing and comment period. When drafts disclosed by the FMEnv have already been cleared by the World Bank, this disclosure also satisfies the disclosure requirement of the World Bank. In cases when following disclosure in the country, a revised safeguard instrument is subsequently cleared by the World Bank, TCN will make a separate in-country disclosure of the revised instrument.

97. Additionally, independent annual environmental and safeguard audits will be commissioned by TCN under specific terms of references that have been prepared and approved during project preparation. The audits will focus on the adequacy of implementation of ESMPs and RAPs and compliance of contractors and subcontractors, and highlight any systemic issues and propose solutions.

98. The capacity of the Environmental, Resettlement, and Social Unit (ERSU) of the PMU has been enhanced in 2016 by recruitment of additional qualified staff, based on the recommendations of a recent institutional review of the PMU. It will be further enhanced through training during project implementation. TCN's broader ERSU that was established during NEGIP now numbers 12 staff in headquarters and 1 in each of the eight transmission regions, providing enhanced capacity for safeguards implementation during construction and operation. These ERSU staff will receive additional environmental, social (including on gender aspects), health, and safety training and other capacity building under Component 2 of the project.

99. Component 2 of the project will finance a transaction adviser to support TCN in procurement of a pilot PPP transmission line transaction. An ESMF will be prepared with assistance from the transaction adviser that will be cleared and disclosed by the World Bank. The private sector developer of the line will be responsible for undertaking and environmental and social impact assessment, as needed, and preparing an ESMP as well as a RAP (if required) in accordance with the ESMF cleared by the World Bank.

#### **F. Citizen Engagement/Beneficiary Feedback**

100. Citizen engagement (including on gender aspects) has been incorporated in the project design. The FGN will organize stakeholder forums with participation from the Ministry of Power and other relevant government agencies, non-governmental organizations, civil society organizations, and industry representatives to discuss project implementation issues and provide a platform to articulate and address concerns about community, and social and environmental aspects of project implementation. Immediately after World Bank Board approval, the client will prepare a detailed project-specific stakeholder engagement and communications strategy. This will (a) identify key stakeholders and the most effective methods and structures through which to disseminate project information and to ensure regular, accessible, transparent and appropriate consultation; (b) build mutually respectful, beneficial, and lasting relationships with stakeholders; and (c) a stakeholder's engagement process that provides stakeholders with an opportunity to engage throughout the project lifecycle.

101. These interventions will leverage the platform already established by NEGIP to support ongoing dialogue, transparency, information sharing, and community outreach programs. Beneficiary feedback (including on gender aspects) experience under NEGIP has identified that an effective beneficiary feedback and GRM is critical to building trust between the project and its stakeholders. To this end the PMU will, as part of project implementation, establish a dedicated project-specific beneficiary feedback and GRM. This will help to provide information about project implementation, provide a forum for resolving grievances and disputes at the lowest level, resolve disputes relatively quickly before they escalate to an unmanageable level, facilitate effective communication between the project and affected persons, mitigate adverse impacts of the project on communities, and facilitate appropriate corrective or preventive action.

102. The PMU will gather information about Component 1 activities where complaints have been brought forward, including information on how they were resolved and relevant follow-up. This information would be included in an annual project progress report and taken into account under the project, as relevant, during implementation. The Results Framework of the project (annex 1) provides for an indicator reflecting citizen engagement.



## **G. World Bank Grievance Redress**

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

## Annex 1: Results Framework and Monitoring

**Country: Federal Republic of Nigeria**

**Project Name: Electricity Transmission Project (P146330)**

### Results Framework

#### Project Development Objectives

The Project Development Objective is to increase the transfer capacity of the transmission network in Nigeria.

Project Development Objective Indicators								
		Cumulative Target Values						
Indicator Name	Baseline	2018	2019	2020	2021	2022	2023	End Target
Transformer capacity added to the transmission system (MVA)	0	0	0	860	4,600	6,560	6,560	6,560
Transmission lines upgraded, rehabilitated, or strengthened (km)	0	0	0	200	860	1,270	1,270	1,270
Intermediate Results Indicators								
Indicator Name	Baseline	Cumulative Target Value						
		2018	2019	2020	2021	2022	2023	End Target
Intermediate Results (Component 1)								
EPC and goods contracts signed (number)	0	2	7	9	9	9	9	9
Substations rehabilitated (number)	0	0	0	6	30	48	48	48
Installation of SCADA (Yes/No)	No	No	No	No	Yes	Yes	Yes	Yes
Installation of SVC (Yes/No)	No	No	No	No	Yes	Yes	Yes	Yes
Intermediate Results (Component 2)								
PPP framework for transmission prepared (Yes/No)	No	No	Yes	Yes	Yes	Yes	Yes	Yes

Pre-qualification or bidding document launched to procure investor/concessionaire for PPP transaction in transmission (Yes/No)	No	No	No	Yes	Yes	Yes	Yes	Yes
Selection of a private investor/concessionaire for PPP transaction in transmission (Yes/No)	No	No	No	No	No	Yes	Yes	Yes
Feasibility studies (for new lines and substations or for further rehabilitation) completed (number)	0	0	10	20	25	30	35	40
Staff trained in the participating FGN entities (number)	0	0	100	200	200	250	300	400
<b>Overall</b>								
Disclosure of TCN audited financial statements (Yes/No)	No	No	Yes	Yes	Yes	Yes	Yes	Yes
TCN implements action plan to address qualifications (if any) in annual financial audits (Yes/No)	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Appointment of TCN board members (Yes/No)	No	No	Yes	Yes	Yes	Yes	Yes	Yes
TCN PMU performance assessment (Yes/No)	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Beneficiary feedback recorded and monitored in annual project progress reports (Yes/No)	No	No	Yes	Yes	Yes	Yes	Yes	Yes

Indicator Description				
Project Development Objective Indicators				
Indicator Name	Description (indicator definition and so on)	Frequency	Data Source/Methodology	Responsibility for Data Collection
Transformer capacity added to the transmission system (MVA)	Capacity added at substations through addition of transformers and/or replacement of existing transformers with large capacity transformers. Measurement unit is megavolt amps (MVA).	Annually	TCN	PMU
Transmission lines upgraded, rehabilitated, or strengthened (km)	Existing transmission lines in kilometers for which the conductor will be replaced to allow for greater power transfer.	Annually	TCN	PMU
Intermediate Results Indicators				
Indicator Name	Description (indicator definition and so on)	Frequency	Data Source / Methodology	Responsibility for Data Collection
EPC and goods contracts signed (number)	Number of EPC contracts signed under Component 1	Quarterly	TCN	PMU
Substations rehabilitated (number)	Number of substations rehabilitated under Component 1	Quarterly	TCN	PMU
Installation of SCADA (Yes/No)	Measures the achievements toward completion of installation of SCADA system	Quarterly	TCN	PMU
Installation of SVC (Yes/No)	Measures the achievements toward completion of installation of SVC system	Quarterly	TCN	PMU
PPP framework for transmission prepared (Yes/No)	Measures the achievements toward finalized PPP framework	Quarterly	TCN	PMU
Pre-qualification or bidding document launched to procure investor/concessionaire for PPP transaction in transmission	To procure investor/concessionaire for PPP transaction in transmission	Annually	TCN	PMU
Selection of a private investor/concessionaire for	Investor in greenfield transmission project (ITP) competitively procured	Annual	TCN	PMU

PPP transaction in transmission (Yes/No)				
Feasibility studies (for further rehabilitation) completed (number)	Number of feasibility studies completed	Quarterly	TCN	PMU
Staff trained in the participating FGN entities (number)	Number of staff benefiting from trainings under Component 2	Quarterly	TCN	PMU
Disclosure of TCN audited financial statements (Yes/No)	Monitors the progress of regular disclosure of audited financial statements	Quarterly	TCN	PMU
TCN implements action plan to address qualifications (if any) in annual financial audits (Yes/No)	Monitors if TCN is taking measures to address qualifications in the financial audits	Annually	TCN	PMU
Appointment of TCN board members (Yes/No)	Monitors the progress of appointment of a board in TCN	Quarterly	TCN	PMU
TCN PMU performance assessment (Yes/No)	Monitors regular TCN performance assessments	Quarterly	TCN	PMU
Beneficiary feedback recorded and monitored in annual project progress reports (Yes/No)	Monitors that beneficiary feedback is recorded and monitored in annual project progress reports and that follow up actions are implemented to address the feedback of beneficiaries.	Annually	TCN	PMU

## **Annex 2: Detailed Project Description**

### **Nigeria: Electricity Transmission Project**

#### **Project Description**

1. Currently, TCN operates the transmission network, which include 330 kV overhead lines, 330/132 kV substations, 132 kV overhead lines, and 132/33 kV substations.
2. While the transmission system managed to evacuate 5,074 MW on February 2, 2016, and a record of 5,156 MW on December 8, 2017, the system is operating well below internationally accepted reliability and efficiency standards. Despite some improvements in recent years, there were still six major system collapses and a total system loss of 7.7 percent in 2016. The average monthly measured forced system outages on 330 kV and 132 kV lines were at 43 and 80, respectively. There were also many frequency and voltage violations recorded outside norms. System collapses (when not caused by generation outages caused by vandalism) are primarily because of inadequate maintenance of outdated equipment and the lack of a comprehensive SCADA system to manage real-time control of the power system.
3. TCN carries out load flow analysis periodically to analyze the impact of newly commissioned generation capacity, and the impact of network rehabilitation and reinforcement to identify new constraints and bottlenecks in the transmission network and adjust its short-/mid-term investment program. This analysis was used to identify what transmission and substation rehabilitation should be prioritized for funding under the proposed project so as to increase the transmission network's transfer capacity from about 5 GW to more than 7 GW with improved operational reliability.
4. The priority investments that were identified are rehabilitation and upgrading of existing substations that are severely overloaded or poorly performing, capacity increase of lines which are bottlenecks of the transmission system, and installation of a SCADA system to maintain system stability, reduce losses, and contribute to increasing transmission network transfer capacity to at least 7 GW.
5. The current transfer capacity of the 330 kV network, including 330/132 kV substations is about 5 GW, and that of the 132 kV network, including 132/33 kV substations, is about 6 GW, but the configuration of the 132 kV network does not match well with the DISCOs' demand and delivery capacity at 132/33 kV substations, which are the interface points between TCN and DISCOs. Rehabilitation under the project will expand transformer capacity by 3,060 MVA at 330/132 kV substations (currently 8,138 MVA) and by 3,500 MVA at 132/33 kV substations (currently 10,162 MVA). Rehabilitation of the proposed substations and transmission lines together with other investments financed by AfDB, ADB, and JICA in TCN's TREP will increase the transmission network's transfer capacity from 5 to over 7 GW and will enable DISCOs to supply consumers with additional power.
6. TCN is not yet fully corporatized and not in compliance with the provisions of the Companies and Allied Matters Act. It does not have a clear accountability framework and a good governance structure. There is a gap between what exists and what is required to manage and operate the growing transmission network with regard to both managerial and staff capacity, covering almost all fields from technical to financial, safety, and health. The technical assistance component of the project will support TCN to improve its governance structure and accountability framework, and build its managerial and staff capacity. The project will also

support TCN's efforts to develop PPP transactions for the development of greenfield transmission projects.

7. To address the above, the proposed project is comprised of two components as described below.

**Component 1: Transmission Network Strengthening and Improvement (US\$408 million equivalent, of which FGN US\$4 million and IDA and IDA SUF US\$404 million equivalent excluding contingencies)**

8. This component has four subcomponents: (a) the upgrading and rehabilitation of approximately 48 existing substations—of these, approximately 11 substations require the replacement of transformers while the others require the addition (and not the replacement) of new transformers, addition and replacement of switchgear and associated equipment, and replacement of protection and control systems and other equipment; (b) the reconducting and reconstruction within existing right-of-way of about 1,260 km of 132 kV transmission lines; (c) the upgrading and expansion of the network's SCADA and telecommunication systems and construction of four regional control centers; and (d) installation of voltage regulation (SVC) at the remotely located Gombe substation in the northeast that is supplied by a single 132 kV line that is over 300 km in length (thus leading to voltage fluctuations) and purchase of spare equipment.

9. **Subcomponent 1(a): Upgrading and rehabilitation of substations.** This subcomponent includes the rehabilitation and upgrading of approximately 48 existing substations (see Annex 9). Rehabilitation will increase transformer capacity by 3,060 MVA at 330/132kV substations and by 3,500 MVA at 132/33 kV substations in TCN's network across the country. Thirty-nine substations that are heavily loaded, overloaded, or with high-load growth require the addition of new transformers ranging from 60 MVA to 300 MVA or the replacement of smaller transformers by larger transformers, the replacement of outdated control systems and switchgears, and rehabilitation of other associated equipment and instruments. Nine substations require the replacement of control and protection systems, switchgears, and associated equipment or rehabilitation of the gas-insulated substations.

10. **Subcomponent 1(b): Upgrading of transmission lines.** This subcomponent involves the replacement of conductors on up to 13 segments of the 132 kV transmission system with a total length of about 960 km and the reconstruction of two segments of 132 kV lines of about 300 km in total from single circuit to double circuits within the existing rights-of-way. The rehabilitation of these lines will permit additional power evacuation of about 3,060 MW. Aluminium conductor steel-reinforced conductors will be replaced by aluminium conductor composite core conductors on the existing towers along the existing right-of-way. Through the reconducting and reconstruction, the transmitting capacity of these transmission lines will be increased significantly.

11. **Subcomponent 1(c): SCADA and telecommunication system.** TCN has a SCADA system that was installed between 2004 and 2007. This provided partial coverage of the power network and has never been fully operational, in part, due to the lack of funding that led to a large number of field wirings not being connected to the remote terminal units (RTUs) at the substations. As a result, plant signals could not be relayed back to the master station. There are also significant problems within the telecommunication network (mainly fiber optics and radios) causing communication failure between the RTUs and the master stations. At present, TCN has commissioned all the power stations and 330 kV substation RTUs (a total of 25

RTUs). However, TCN still needs to reactivate the balance of the 132 kV and 33 kV RTUs, which requires upgrade of the underlying networks as well as integration with the recently commissioned infrastructure. The scope of work and main specifications for SCADA will be determined through the feasibility study financed under NEGIP.

12. **Subcomponent 1(d): Installation of SVC at Gombe substation and purchase of spare equipment.** The 330kV Gombe substation is located in the northeast over 800 km from the nearest generation plant. Because of the long distance that leads to losses on the line, there is a significant voltage drop at the Gombe substation. Gombe's 330/132 kV substation is feeding about six 132/33 kV substations. They are Gombe 132/33 kV substation, Damaturu 132/33 kV substation, Dambua 132/33 kV substation, Biu 132/33 kV substation, Savanah 132/33 kV substation, and Maiduguri 132/33 kV substation. The SVC will help to regulate the voltage drop.

13. In addition, this subcomponent will finance spare equipment for the system to reduce the time required to replace failed equipment. It takes quite some time to procure, deliver, and install failed equipment, particularly those which are not on the shelves. This equipment will be stored in TCN's Ojo stores. The preliminary list of spare equipment includes several power transformers of different capacity, sets of isolators, circuit breakers, insulators, and instrument transformers of 330 kV, 132 kV, and 33 kV.

## **Component 2: Capacity Building and Technical Assistance (IDA and IDA SUF US\$32 million equivalent, excluding contingencies)**

14. This component includes the following activities: (a) consulting services (transaction advisory to support the preparation of transaction documents and procurement of a sponsor i.e. private developer) for a pilot PPP for transmission infrastructure that is part of network expansion (that is, greenfield infrastructure); (b) consulting support and capacity building to improve the TCN PMU's performance; (c) consulting services and capacity building to support TCN's corporatization and commercialization efforts and strengthening its institutional, governance and accountability framework; (d) consulting services for construction supervision and management (including environmental and social due diligence); (e) consulting services for feasibility studies of priority investment projects such as rehabilitation and construction of additional substations and transmission lines, and for undertaking associated environmental and social impacts' due diligence; and (f) consulting services, training and capacity building, including information and management systems to support public institutions in the sector, including the TCN, NERC, BPE, NBET, FMF, FMP, the Rural Electrification Authority (REA), the National Power Training Institute of Nigeria, and other government bodies, such as the Ministry of Power and the power task force attached to the Vice President's office. Activities to advance implementation of the PSRP, including studies, consulting assignments (including consulting assignment to support the NERC, BPE, NBET, and REA), and communication and outreach activities will be supported by the technical assistance component of the project.

15. **Subcomponent 2(a): Transaction advisory services.** This subcomponent will provide transaction advisory services to support the FGN to undertake a PPP in greenfield transmission development. The activity is envisaged to be developed by a consultant (transaction adviser) in two phases. In the first phase, the transaction adviser would be contracted to produce, in close liaison with the Ministry of Power, TCN, and other concerned agencies such as the NERC and BPE, a comprehensive report to implement the project. The report shall include the following: (a) designing the proposed PPP transaction and the legal architecture, this will



include developing the bidding documents and the contractual arrangements and identifying, for example, the type of PPP; (b) developing a prefeasibility report for the transmission line to be promoted; and (c) preparing project due diligence, including legal aspects such as regulatory matters and land access/rights, approvals and permissions required for PPP processes before commencement of the tender process, a socioeconomic and environmental study, and initial market testing. In the second phase, the transaction adviser will support procurement of a sponsor (the private developer) under a competitive process. This will include the marketing, selection, and signing of the corresponding contract.

16. **Subcomponent 2(b): Support to PMU.** An institutional review of the TCN PMU was conducted to assess the organizational structure, number of staff, job descriptions, and business processes. The PMU was created in 2001 to facilitate and manage World Bank-financed power projects with TCN. It is composed of TCN staff and a small number of individual consultants. The following activities in support of the PMU will be undertaken:

- (a) A 2016 institutional review conducted by a human resource specialist found there are significant deficiencies in workflow processes, management information systems, and the capacity of staff. Several recommendations suggested in the review, such as changes in the organizational framework to address span of control challenges, were implemented. To build on the findings, the project will finance a performance assessment of the TCN PMU to identify areas for improvements or remediation and warrant further support during project implementation.
- (b) The performance assessment in (a) above will inform a consulting assignment (capacity support consultancy for the PMU) to help build capacity in all areas of the PMU. The consulting service will support the following business processes in the PMU: performance monitoring and reporting; environmental and social management (including quality control of ESMPs, preparation of RAPs, HIV/AIDS awareness campaign, and independent environmental and social audit), leadership and accountability; workplace culture; employee performance objectives and evaluation; and information and communications technology infrastructure and software assessment, recommendations, and implementation. The services will be implemented by an experienced consulting firm for a period of up to three years.
- (c) To ensure smooth implementation of the project, a consulting engineer will be hired to assist the PMU (see Subcomponent 2(d) below).

17. **Subcomponent 2(c): Strengthen TCN's governance and accountability framework and enhance its managerial and staff capacity.** TCN's governance and accountability framework is ruled by the legal and regulatory requirements which have to be complied with by any public entity (proactive public disclosure of information under the Freedom of Information Act, asset disclosure of public agents, oversight by the Auditor General), any incorporated company under the Companies and Allied Matters Act (establishment and effective functioning of a board of director and public disclosure of audited financial statements), and NERC licensees. The capacity-building program for TCN aims to ensure that TCN complies with legal and regulatory requirements on corporate governance and accountability; and fills the managerial and staff skill gaps. An assessment carried out in July 2016, found skills gaps in most of TCN's business units, including in planning, O&M, human resource management, performance management, financial planning, accounting, administration (inventory management, reporting, and recording), as well as health,

environmental, and social management. The capacity-building program under the project will be implemented through a combination of study visits, twinning, training, and expert support in coordination with the capacity-building activities for TCN that are financed by other development partners notably GIZ, DFID, and USAID, such as support for the internal audit and project management (that is, for implementation of ongoing network construction). TCN is also committed to comply with legal requirements on the appointment of a board of directors and public disclosure of information, including of audited financial statements.

**18. Subcomponent 2(d): Consulting services for supervision and contract management of the supply and installation contracts under Component 1 of the project.** The engineering consultant will assist the PMU with (a) contract management and supervision of all supply and installation contracts for substation upgrading, transmission line reconducting, and installation of SCADA system and SVC facilities, including review of design, checking of product quality, certification for contractor payment, monitoring of contract implementation schedule and construction quality, preparation of progress reports and so on; (b) supervision and monitoring of the implementation of the ESMPs, which will be prepared based on the existing ESMF; and (c) provision of capacity building to the PMU to improve contract management.

**19. Subcomponent 2(e): Consulting services for feasibility studies.** This component will be for consulting services for carrying out feasibility studies on future priority investment activities, such as rehabilitation and construction of additional substations and transmission lines, and for undertaking associated environmental and social impacts' due diligence.

**20. Subcomponent 2(f): Consulting services and training.** This component will support capacity building for the Transmission Company of Nigeria, the Federal Ministry of Power, Works and Housing, the Federal Ministry of Finance, Nigerian Electricity Regulatory Commission, the Bureau of Public Enterprises, Nigerian Bulk Electricity Trading PLC, and key government agencies in the sector including the power task force attached to the Vice President's office.

## **Annex 3: Implementation Arrangements**

### **Nigeria: Electricity Transmission Project**

#### **Institutional and Implementation Arrangements**

1. A Steering Committee comprising the Permanent Secretaries of the Ministry of Finance and the Ministry of Power, the Managing Director TCN, and the Director General of the BPE will oversee implementation of NETAP. The committee will meet semiannually and will provide guidance on implementation obstacles, review safeguard issues, and ensure that the technical assistance activities in the project are deployed effectively and are well coordinated with the technical assistance activities of the other development partners in addressing pertinent sector reform challenges.
2. **NETAP is part of a comprehensive TREP prepared by TCN.** TCN supported by the FGN (in particular the Ministry of Finance and Ministry of Power) and four development partners (World Bank, AFD, AfDB, and JICA) has developed the Nigeria TREP; a transmission subcomponent of the PSRP. The program cost is US\$1.256 billion comprising US\$486 million, US\$370 million, US\$200 million, and US\$200million from the World Bank, AFD, AfDB, and JICA, respectively.
3. **TREP was designed in conjunction with all DISCOs and GENCOs.** All the 11 DISCOs indicated locations where the desired additional capacity could be installed. The program was designed to ensure the (N-1) standard of lines and substations, and all control rooms in station earmarked for upgrading would be digitalized in preparation of the SCADA implementation.
4. **TREP will be coordinated by a Program Coordinator who will report directly to the CEO TCN.** The Program Coordinator will coordinate TCN's overall transmission expansion program funded by donors (including the World Bank, AFD, AfDB, Islamic Development Bank, and JICA). The primary responsibilities of the Program Coordinator include (a) coordinating the performance of the entire program, resolving project management issues that are beyond the capacity of the project managers that head the PMUs; (b) coordinating relationships with federal ministries of power and finance, other ministries, departments, and agencies (MDAs), states, and local government agencies and resolving interagency issues to ensure smooth performance of the program; (c) coordinating and facilitating major activities such as environment, resettlement, and social safeguards to ensure the smooth implementation of the program; and (d) supervise the monitoring and evaluation, internal audit, and annual audit of the PMUs.
5. **The Program Coordinator will be the direct correspondent with the World Bank on important aspects of project implementation,** including but not limited to (a) providing quarterly progress reports, (b) solving critical project implementation issues which require high level of government intervention and decisions, (c) solving issues related to compensation which require local government support; and (d) solving issues which have not been resolved by the PMU within an agreed time line; and others as deemed necessary.
6. **The existing World Bank PMU within TCN that is implementing the ongoing NEGIP will be responsible for implementing the proposed project.** The PMU under the supervision of the Program Coordinator will be responsible for the day-to-day activities of project implementation. Weaknesses in the PMU's capacity in the areas of record keeping,

procurement, contract management, and environmental and social safeguards management that have caused delays under NEGIP are being addressed through the recruitment of additional staff and consultants in these areas. Technical assistance activities under Component 2 that will benefit other power sector agencies (NERC, BPE, NBET, and so on), will be executed primarily by the respective agencies with procurement and financial management (FM) support of the PMU. The PMU is in the process of improving its record keeping and data management capability. The existing Electronic Data Management System for NEGIP is not functioning effectively. This system can be scaled up to create digital records for both NEGIP and the proposed project, which will eliminate duplicate hard copies of procurement documents. The existing Sun system software being used for FM will also be upgraded to include procurement and contract management modules for effective tracking of contract status and disbursement.

7. **There will be a Project Manager heading the World Bank PMU.** The scope of work of the Project Manager shall be (a) managing the PMU's multidisciplinary personnel on a day-to-day basis; (b) supervising the work of project coordinators and ensuring the execution of the project in line with the PDO; (c) communicating with the World Bank, Federal Ministry of Finance, and other relevant agencies on behalf of TCN; (d) overseeing the preparation and execution of procurement of all contracts and being responsible for the performance of all contracts under the project; (e) submitting quarterly progress reports, annual reports, and ad hoc reports to TCN management and World Bank; and (f) performing other functions as may be assigned by the Program Coordinator or the Managing Director from time to time. There will be three other PMUs each headed by a project manager for the activities financed by AFD, AFDB and JICA respectively under the TCN program.

8. **NETAP because of its size shall have two substation and lines Coordinators.** The scope of the work of the substation and lines Coordinators includes (a) coordinating the planning, designing, and procurement of all substations and lines contract packages; (b) coordinating the preparation of bidding documents and bidding processes of substations and lines; (c) coordinating the processes leading to contract effectiveness; (d) coordinating with the implementation substations in conjunction with the project coordinators in the regions; and (e) performing other functions as may be assigned by the Manager PMU from time to time.

9. **There shall be a Project Accountant in the World Bank PMU.** The scope of work of the Project Accountant shall include (a) being responsible for the financial management of the project; (b) preparing financial monitoring reports and all financial reports as may be required by the specific donor; (c) preparing disbursement requests and ensuring adequate liquidity of the projects; (d) ensuring strict application of internal control and segregation of duties to ensure safeguard of assets; (e) being responsible for opening of a Letter of Credit and commercial expedition of the project; (f) ensuring no demurrages are incurred; (g) being a member or nominating a member in all Procurement Evaluation Committees to ensure strict adherence to qualification criteria in a bidding document; and (h) performing other functions as may be assigned by the Manager PMU from time to time.

10. **There shall be a Coordinator Procurement for the World Bank PMU.** The Coordinator Procurement (a) shall be responsible for the procurement of all the project components, (b) shall develop the Procurement Plan and update it from time to time, (c) shall prepare bidding document and Request for Proposal for the project and launch the procurement process and answer all queries on procurement and its processes, (d) shall ensure strict compliance with procurement rules and guidelines of the respective donor in addition to the Nigeria Public Procurement Act 2007, (e) shall be the secretary or shall be assigned the

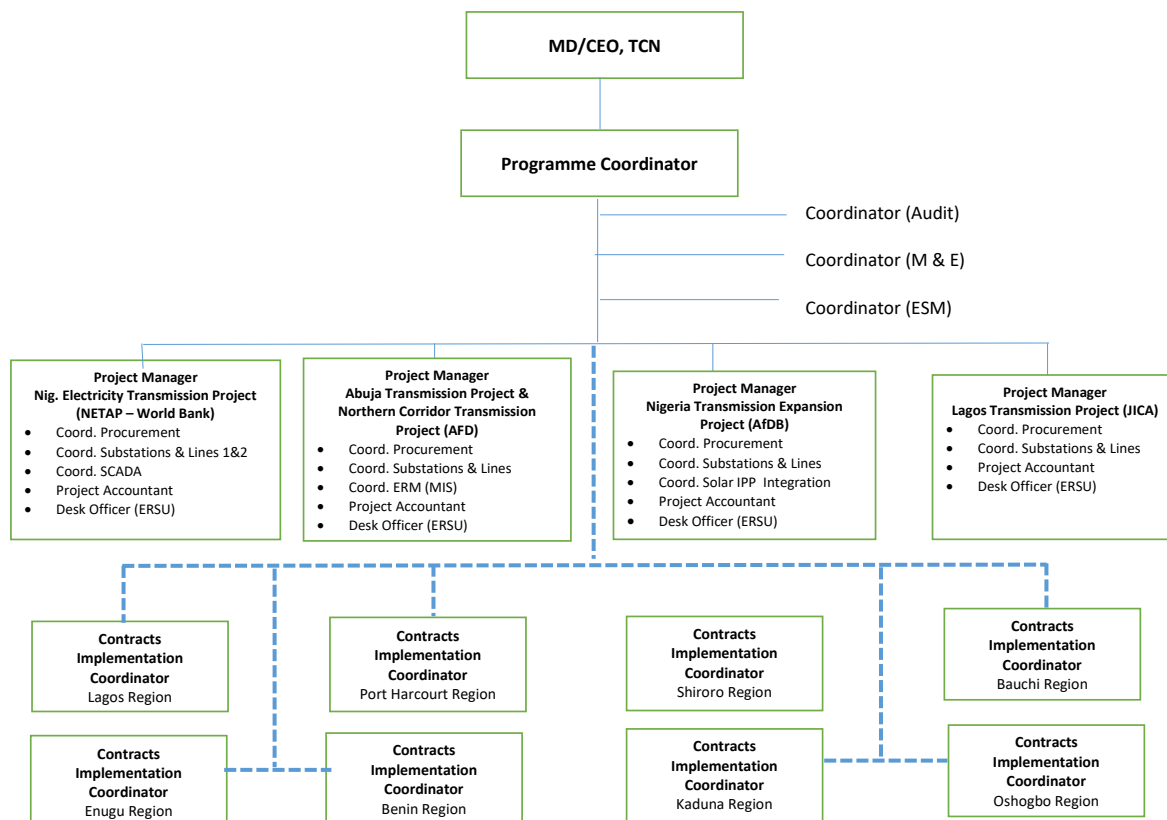
secretary of all Procurement Evaluation Committees; and (f) shall perform other functions as may be assigned by the Manager PMU from time to time.

11. **NETAP shall have a Coordinator for the SCADA component.** The scope of the SCADA coordinator's work will be to (a) coordinate with the committee set up to review the past performance of SCADA implementation; (b) coordinate the consultancy for the SCADA scope in consultation with the SCADA Review Committee; (c) coordinate the planning, designing, and procurement of SCADA; (d) coordinate the preparation of bidding documents and bidding processes for procurement of SCADA; (e) coordinate the processes leading to SCADA contract effectiveness; (f) coordinate the implementation of SCADA in all the regions; and (g) perform other functions as may be assigned by the Manager PMU from time to time.

12. **The project financed by AFD has an Enterprise Resource Planning (ERP) component to be implemented across TCN.** TCN has established a committee whose objective is to establish the reasons behind the previous failures in the implementation of ERP/management information system in TCN. Scope of work of the ERP coordinator shall include (a) coordination with the committee set up to review the past performance of ERP implementation; (b) coordination with the consultancy for ERP scope; (c) coordination of the planning, designing, and procurement of ERP; (d) coordination of the preparation of bidding documents and bidding processes of ERP; (e) coordination of the processes leading to contract effectiveness; and (f) coordination of the implementation ERP in all the regions.

13. **The organizational arrangements for TREP are schematically represented in Figure 3.1.**

Figure 3.1. Organizational Arrangements for TREP



14. The PMU for NETAP under TREP will benefit from specific capacity enhancement measures as described below.

15. Weaknesses in the PMU's capacity in the areas of record keeping, procurement, contract management, and environmental and social safeguards management that has caused implementation delays in the ongoing NEGIP are being addressed. The PMU's capacity will be enhanced through the recruitment of additional staff and consultants. In the case of technical assistance activities that will benefit other power sector agencies (NERC, BPE, NBET, and so on) in Component 2 of the project, these activities will be primarily executed by the respective agencies with support of the PMU on fiduciary issues. The PMU is in the process of improving its record keeping and data management capability. An Electronic Data Management System was established for the closed Water Resources Development and Sustainable Ecosystems Management Programme using M-Files software. This system can be scaled up to create digital records for both NEGIP and the proposed project, which will eliminate duplicate hard copies of procurement documents. The existing Sun system software being used for FM will also be upgraded to include procurement and contract management modules for effective tracking of contract status and disbursement.

16. TCN's ability to implement adequate health and safety measures at substations depends, in part, on availability of proper PPE. To support implementation, PPE will be procured under the project to provide TCN staff with basic safety needs to perform their duties.

17. Additionally, training on key relevant environmental and social issues is envisioned as follows (with both environmental and social trainings conducted for the following target groups):

- Technical courses for the NETAP ERSU PMU (potentially with certification) on (a) Environmental Monitoring and Modelling and (b) Occupational Health and Safety
- Awareness and technical training for the PMU and health and safety officers at substations
- Awareness training for TCN engineers at the substations (basic knowledge of key issues for first-level monitoring)

18. Consultants will be recruited under the project to provide assistance to the PMU for timely implementation of project activities:

- (a) **Owner's engineers.** Consortia of international and local firms will be recruited on two to four-year terms with permanent presence in the country to supervise the implementation of subprojects under Component 1. Contracts for Owner's supervising engineers will include responsibility for monitoring implementation of all aspects of construction including implementation of ESMPs, RAPs and ARAPs and monitoring and reporting any instances of gender based violence.
- (b) **Environmental and social management consultant.** An international firm with at least two individual consultants will strengthen the capacity of the Environmental and Social Department in the PMU and assist in the preparation and quality control of safeguard documents in compliance with World Bank

safeguard policies as well as the monitoring of environmental and social safeguards applying World Bank policies and regulations. The firm will be required to visit all project sites biannually to monitor the implementation of ESMPs.

- (c) **Consultants for preparation of ESMPs and RAPs for transmission lines (two separate consultants).** Because 15 transmission lines are expected to undergo rehabilitation and reconstruction within the project, preparation of ESMPs and RAPs (if required) will require consultants (potentially firms) who will be required to visit all project sites to prepare the detailed plans, including (in the case of RAPs) compensation matrices and schedules. These consultants/firms (coordinated by TCN) will also carry out stakeholder consultations and management of stakeholder expectations in World Bank-financed sub-projects involving environmental and social impacts, including resettlement programs.
- (d) **Environmental and social compliance audit consultant.** An international independent firm will be engaged by TCN to conduct annual environmental and social compliance audits to ensure ESMPs are implemented consistently and to high quality. The audit will also help improve environmental and social risk management processes.
- (e) **Specialized consultant/contractor for managing PCBs.** Contractors will provide TCN with training and equipment for PCB sampling, carry out remediation of contamination, and oversee handling and storage of contaminated soil and equipment.
- (f) **Consultant for gender-based violence:** An individual consultant will be engaged to help assess and monitor gender-based violence issues in labor camps and provide risk mitigation and to submit a report to both TCN management and the World Bank quarterly. The consultant will also provide training to TCN social safeguards staff.
- (g) **Implementation support consultant.** An international firm will be recruited for three years with experience in transmission company operations to strengthen key functions of the PMU and build the capacity of the PMU staff. The firm will also introduce new systems or strengthen existing ones, especially human resource systems (including performance assessments and information technology systems), FM systems, and environmental and social management systems. The firm will be required to travel to Nigeria for short missions to help set up new systems, provide trainings, and monitor the progress of the strengthening of key functions.

## **Financial Management**

19. An FM assessment of the implementing entity in line with the Financial Management Manual (March 1, 2010) and the World Bank's Financial Management Assessment and Risk Rating Principles (October 2010) was conducted in August 2016. The objective was to determine whether the implementing entities have acceptable FM arrangements, which will ensure (a) that all transactions and balances relating to the project are correctly and completely recorded; (b) the preparation of regular, timely, and reliable financial statements; (c)

safeguarding of the entity's assets; and (d) existence of auditing arrangements acceptable to the World Bank.

20. The responsibility for the FM arrangements of the project will be handled by the FAU in the TCN PMU. The FAU is presently involved in the implementation of the World Bank-assisted NEGIP. The FAU will execute the FM responsibilities in consultation with the FPFMD.

21. The World Bank's recent reviews showed that the performance of the FAU is moderately satisfactory.

22. The overall FM risk for the project is assessed as moderate at the preparation phase. The FM risks will be reviewed during project implementation and updated as appropriate.

23. **Planning and budgeting:** The project accountant (in consultation with key members of the implementing unit) will prepare the annual budget for the fiscal year based on the approved work plan. A Budget Committee will be established to coordinate budget preparation and track financial performance. The budget will be submitted to the World Bank Task Team Leader at least two months before the beginning of the fiscal year. Detailed procedures for planning and budgeting will be documented in the Financial Procedures Manual (FPM).

24. **Funds flow.** Project funding will consist of IDA and IDA SUF credits. The project account will be opened with the CBN.

25. **Accounting.** IDA funds will be accounted for by the project on a cash basis. A computerized accounting system will be used. Annual financial statements will be prepared in accordance with the relevant International Public Sector Accounting Standards. All accounting and control procedures will be documented in the FPM, a living document which will be subject to review as appropriate.

26. **Financial reporting.** Interim financial reports (IFRs) will be prepared by the project quarterly. The project will submit the IFRs to IDA not later than 45 days after the end of each calendar quarter. The formats of the IFRs have been developed.

27. **Internal control.** Adequate internal controls are in place at the FAU, but will be strengthened further and will be applied to the project. The control features include a robust FM procedures manual; qualified staff who are trained in relevant World Bank procedures and requirements, including procurement; robust segregation of functions/duties; and highly independent and well-trained internal auditors. Additional controls in the form of an enhanced accountability framework will be implemented to mitigate the risk of misuse of funds for soft expenditures (travel, workshops, and study tours). The details of the enhanced accountability framework will be elaborated in the FPM. The FM staff are appointed by the Accountant General of the Federation.

28. **External audit.** The annual financial statements will be audited by the Auditor General of the Federation on the basis of terms of reference acceptable to IDA. The auditor will express an opinion on the annual financial statements in compliance with International Standards on Auditing. In addition to the audit report, the external auditors will prepare a Management Letter. A copy of the audited financial statements along with the Management Letter will be submitted to IDA not later than six months after the end of each financial year.



### ***Disbursements***

29. The project will use the report-based disbursement method at effectiveness. Proceeds of the loan will be used for eligible expenditures as will be defined in the Financing Agreement. Details of the disbursement arrangement will be in the Disbursement Letter.

30. Table 3.1 sets out the expenditure components and percentages to be financed out of the credit proceeds.

**Table 3.1. Allocation of Credit Proceeds to be Financed for Eligible Expenditures in each Category**

<b>Categories</b>	<b>Amount of the IDA SUF Credit Allocated (US\$)</b>	<b>Amount of the IDA Credit Allocated (US\$)</b>	<b>Percentage of Expenditures to be Financed (inclusive of taxes)</b>
1. Goods, works, consulting services, non-consulting services under Component 1 of the project	282,000,000	122,000,000	100
2. Consulting services, non-consulting services, training and operating costs under Component 2 of the project	32,000,000	0.00	100
3. Unallocated	49,090,000	0.00	
4. Front-end fee	910,000	0.00	Amount payable pursuant to Section 2.03 of this Agreement in accordance with Section 3.08 (b) of the General Conditions
5. Interest Rate Cap or Interest Rate Collar Premium			Amount due pursuant to Section 4.06 (c) of the General Conditions
Total credit amount	364,000,000	122,000,000	

31. Retroactive financing will be considered under the credits in line with World Bank requirements: (a) the activities financed by retroactive financing are related to the PDO and are included in the project description; (b) the payments are for items procured in accordance with the applicable World Bank procurement rules; (c) the total amount of retroactive financing is less than 20 percent of the total commitment amount; and (d) the payments are made by the Borrower not more than 12 months before the expected date of the signing of the Legal Agreements for World Bank financing.

### ***Financial Management Action Plan***

32. Actions to be taken for the project to further strengthen its FM system are listed in Table 3.2.

**Table 3.2. FM Action Plan**

<b>No.</b>	<b>Action</b>	<b>Date Due by</b>	<b>Responsible</b>
1	Finalise the FPM incorporating the enhanced accountability framework	Before effectiveness	World Bank/PMU/FAU
2	Designate project accountant, project internal auditor, and support accounting technicians	Before effectiveness	FAU
3	Train designated FAU staff in World Bank FM procedures and disbursement guidelines	Before effectiveness	PMU/FAU

### ***Conclusion of FM Assessment***

33. The FM assessment conclusion is that subject to the mitigation measures and the action plan being implemented according to the agreed time frame, the project has met the minimum FM requirements in accordance with IPF Policy and Directive. Further, this objective will be sustained by ensuring that strong and robust FM arrangements are maintained for the project throughout its duration. Detailed FM reviews will also be carried out regularly, either within the regular proposed supervision plan or on a more frequent schedule, if needed, to ensure that expenditures incurred by the project remain eligible.

### **Procurement**

34. All procurement-related activities for the investments supported under the project will be carried out by the PMU. The PMU has considerable work experience in managing procurement in operations financed by international financial institutions. The procurement for the project will follow the World Bank July 2016 Procurement Framework. The project procurement risk is deemed substantial.

35. The PMU is implementing the ongoing World Bank-funded NEGIP and the Nigeria component of the Niger Basin Authority Water Resources Development and Sustainable Ecosystem Management Project. The PMU also implemented the Transmission Development Project (P072018) and the Nigeria National Energy Development Project (P090104). The TCN's relevant departments will provide inputs to the scope, technical specifications, and terms of reference for all investments under Components 1 and 2 of the project. The relevant sector institutions will provide inputs into the terms of reference for the technical assistance activities under their respective institutions under Component 2 of the project. In addition, TCN and the sector institutions will participate in the bids/proposals evaluation and contract administration, including delivery and acceptance of the contracts for their respective institutions.

### ***Procurement Framework***

36. Procurement under the proposed operation will be carried out in accordance with the World Bank Procurement Regulations for IPF Borrowers: Procurement in Investment Project Financing - Goods, Works, Non-Consulting and Consulting Services of the July 2016 Procurement Framework; with 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 as of July 1, 2016; and with the provisions stipulated in the Legal Agreements. The various items under the different expenditure categories are described in general below. For each contract to be financed by the credit, the different procurement methods or consultant selection methods, estimated costs, prior review requirements, and time frame would be agreed upon between the Borrower and the World Bank

in the Procurement Plan. The Procurement Plan will be updated at least annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

37. **Procurement of works.** Works to be procured under the project will include the construction of the New Control Centre Building at the National Control Centre. Procurement of works will be carried out using the World Bank's Standard Bidding Documents (SBDs) for all ICB. National Competitive Bidding (NCB) procurement will be carried out using the national SBDs already in use at the federal level and which the World Bank has accepted for NCBs in World Bank-financed projects in Nigeria.

38. **Procurement of plant design, supply, and installation.** Plant design, supply, and installation to be procured under the project will include substation expansion, transmission lines expansion, reactive compensation at substations, SCADA restoration, and telecommunication improvement. The procurement of these activities will be carried out using the World Bank's SBDs for all ICB for the procurement of plant design, supply, and installation.

39. **Procurement of goods.** Goods to be procured under the project will include power transformers, breakers, and isolators. The goods will also include vehicles, office equipment, computers, and PPE. Procurement of goods will be carried out using the World Bank's SBDs for all ICB. NCB procurement will be carried out using the national SBDs already in use at the federal level. Readily available off-the-shelf goods that cannot be grouped or standard specification commodities for individual contracts of less than US\$100,000 equivalent may be procured under shopping procedures as detailed in paragraph 6.7 of the 'Procurement Regulations for IPF Borrowers' dated July 2016, revised November 2017 and the 'Guidance on Shopping Memorandum' issued by IDA on June 9, 2000. Procurement of vehicles estimated to cost up to US\$500,000 equivalent can also be undertaken under the same shopping procedures, provided they are procured from manufacturers or reputable first-line vehicle dealers. The procurement procedures and SBDs to be used for each procurement method as well as model contracts for works and goods procured are presented in the Project Implementation Manual.

40. **Procurement of information technology.** Procurement of information technology under the project such as the procurement for the upgrade of the settlement systems and tools will be carried out using the World Bank's SBD for supply and installation of information systems: Single-stage bidding is envisaged where it is possible to use off-the-shelf application software packages after making the appropriate reconfigurations.

41. **Selection of consultants.** Consultancy services will be provided under the operation in the following categories: feasibility studies, design and engineering supervision of substation and transmission lines expansion, and technical assistance to sector institutions. Consultancy firms and individuals will be selected from short-lists compiled after the PMU have solicited a request for expressions of interest using the World Bank's Standard Request for Proposals where required by the Procurement Regulations for IPF Borrowers. The appropriate selection method for each consulting contract will be set out in the Procurement Plan.

42. **Operating costs.** The operating costs will include staff travel expenditures, including standard government allowances, equipment rental and maintenance; vehicle operation, maintenance, and repair; office rental and maintenance; materials and supplies; utilities and communication expenses; and bank charges. The operating costs financed by the project will be procured using the FGN administrative procedures that are acceptable to the World Bank.

The operating expenses will be subject to a Statement of Expenditure (SOE) review of the World Bank.

43. **Training, capacity building, and workshops.** The project coordinating and the activity implementing units will submit their annual training plans to IDA for clearance. The plans will include, but not be limited to, the names of the officers to be trained, the training institutions and/or facilitators, the cost contents, the justification for the training, and the estimated cost of the training. The expenses for training, capacity building, and workshops will be subject to an SoE review of the World Bank.

44. **PPSD.** As part of the July 2016 Procurement Framework, a PSD was prepared by the Borrower and reviewed by the World Bank. It was based on a market assessment and experience in the ongoing NEGIP.

45. **Procurement approach options.** A range of contracting strategies for the main work packages, including rehabilitation and reinforcement of 330/132 kV substations and SCADA, were considered.

- (a) **Options 1 and 2.** The usual approach used by the TCN PMU is to introduce a series of geographically-based mini-EPC lots (design-supply-install). This can lead to disaggregation with equipment on each lot coming from different suppliers. There is also experience of inadequate synchronization and planning between the OEM and local design and construction. This approach also probably increases the coordination and project management workload and cost.
- (b) **Option 3.** The major HV equipment OEMs are targeted, particularly the power transformer manufacturers, to drive contract execution. This is because power transformers constitute the major cost element in the supply chain. The major OEM (transformer manufacturer) drives the process by contracting with other equipment suppliers and design and installation contractors or even form joint ventures, which will be led by the major OEM. In this way, the major players in the HV market are likely to be attracted by the large volume of equipment to be supplied, which eventually leads to cost reduction and timely delivery. The major OEM, being the driver of the contract, will ensure that the transformers and other equipment supplied are properly installed by competent installation contractors. However, in the event of failure of this option to meet the intended procurement objective, Option 2 (the traditional method) can be used.
- (c) **Option 4.** It is considered that the project will be more attractive to the equipment OEMs to supply all the HV equipment at the same time, as a single package made up of independent lots. This will allow the actual supply market to influence the final decision of whether to combine the different technologies (power and instrument transformers, switchgear, and so on). A design and construction contractor will then be selected to install the supplied equipment at the designated locations. However, there may be the risk of losing manufacturers' warranty obligations if the installations are not carried out in accordance with the manufacturers' procedures. There is also the risk of coordination failure between equipment delivery and site works.
- (d) **Options 5 and 6.** Options 5 and 6 are based on using a performance-related payment scheme known as a project alliance. This method has been used

significantly in the public sector in Australia and New Zealand, and is particularly suitable for projects with high levels of uncertainty and complexity. While the underlying technology in this project is very well established, the working environment has many uncertainties, especially from the perspective of international companies who may have limited recent experience in the country, and/or bad project experience in the past. Under a project alliance, the client retains most of the project risk, rather than pushing it down the supply chain with fixed-price contracts. The potential benefits are a significant reduction in cost and improved timeliness of the project. Under a project alliance, the supply partners' fee will have a performance-related element, linked to the overall project success criteria (and not the performance of their individual packages). At this stage, it is not known what the responsiveness of the supply chain will be to this approach, however the potential benefits of improved value for money, make it worth assessing this. As this approach is new in Nigeria, further study on this approach will be necessary.

- (e) For the SCADA subcomponent, Option 3 will be considered. However, if there are proprietary issues relating to the integration of new automation systems into the existing SCADA system in TCN, the Direct Contracting method may be used. Already, a consulting firm is being engaged under NEGIP to carry out a feasibility study of the TCN SCADA. The recommendations of the SCADA consultant will determine the best procurement approach to be selected from the options described above.
- (f) For smaller contracts and consultancy services, the traditional approach will be used to procure smaller contracts and consultancy services. This is because from experience, there have not been any issues of delays and nonperformance in the past.

### ***Assessment of the Agency's Capacity to Implement Procurement***

46. The TCN PMU has been implementing World Bank-funded projects as far back as the year 2000. The TCN PMU is implementing the ongoing World Bank-funded NEGIP and the Nigeria component of the Niger Basin Authority Water Resources Development and Sustainable Ecosystem Management Project. The PMU also implemented two World Bank-funded projects that have closed the Transmission Development Project and the National Energy Development Project. Procurement in NEGIP has been less than satisfactory given the depth of experience of the unit with procurement under World Bank-funded projects. Under NEGIP there have been long delays in the procurement process, inadequate contract administration resulting in cost and time overruns, and change of scope in most contracts resulting in several addenda to the contracts. There has been lack of coordination in the past between the various units in the PMU, for example, between procurement and the ERSU, the unit responsible for safeguards issues.

47. The coordination between the various units of TCN will be enhanced by various team building exercises. At least two engineers within the PMU (many engineers in the PMU have experience in World Bank procurement procedures and policies) with experience in procurement will be deployed to work on the project and NEGIP. To improve the capacity of the PMU in contract administration, an individual consultant will be engaged for one year by the PMU to assist the PMU, and train the staff of the PMU on contract administration.

48. **Procurement risks.** A number of procurement and stakeholder risks were identified and mitigated in the PPSD. These include the following:

- (a) Security, civil unrest, and insurgency which can be mitigated by identification of project sites in areas that are without severe crisis. However, in such areas, it is intended to have a robust stakeholder engagement and communication plan as a mitigation factor.
- (b) Perceived low quality of goods from some manufacturers, which shall be mitigated by strict compliance with the quality assurance plan provided by the manufacturer for continual monitoring of the manufacturing process by an independent consultant.
- (c) Internal and external influence on choice of contractor, which can be mitigated by selection of people of integrity in the Evaluation Committee. In addition, consultants may be engaged to participate in the bid evaluation process.
- (d) Inadequate implementation quality experienced in the past would be mitigated through adequate and clear qualifications of contractors and subcontractors and close and proactive contract management and site supervision.

**Table 3.3. Procurement Risk Assessment and Mitigation Action Plan**

S/N	Risk	Mitigation Action	Responsibility	Action Due Date	Remarks
(a)	Delays in the procurement process, inability to combine implementation of the project with NEGIP	The capacity of the procurement unit dedicated to NETAP should be enhanced by recruiting at least two experienced procurement specialists to replace staff who have retired.	PMU	Ongoing	
(b)	Poor contract administration skills	Engage a contract administration individual consultant to assist TCN, and train TCN staff on contract administration for one year	PMU	Three months after effectiveness	To improve the contract administration skills of project staff
(c)	Inadequately defined scope of work resulting in cost and time overruns, and multiple addenda to contracts	Engage a consulting firm to prepare and design the procurement packages	PMU	Done	By project effectiveness, the first package should be ready for bidding
(d)	Change of scope because of TCN's decision to remove some substations/lines from funding by the project during the bidding process	TCN senior management to sign off on the substations and lines proposed for rehabilitation under the project	World Bank/TCN	Done	

S/N	Risk	Mitigation Action	Responsibility	Action Due Date	Remarks
(e)	Delay in finalizing contract award because of the safeguards issues not being fully addressed	Section on the ESMP should be included in the bidding document	PMU/World Bank	During every bidding process	
(f)	Lack of coordination between the various units in the PMU	Team building workshops should be organized for the PMU	PMU/World Bank	Three months after effectiveness for the first workshop	The workshop should be conducted annually.

49. The overall procurement risk assessment for the project is substantial.

#### ***Procurement Plans***

50. An 18-month Procurement Plan for project implementation prepared by the Borrower, that outlines the procurement methods to be used, was received by the World Bank on November 22, 2017, and further discussed during negotiations, and was found to be acceptable. It will also be made available in the project's database and on the World Bank's external website. The Procurement Plan will be updated with the project team annually or as required, reflecting actual project implementation needs and improvements in institutional capacity.

#### ***Procurement Methods and Prior Review Thresholds***

51. Procurement Decisions subject to Prior Review by the Bank as stated in Annex II to the Procurement Regulations for IPF Borrowers of 2016 and revised in November 2017

**Table 3.4. Procurement Methods and Prior Review Thresholds (US\$, thousands)**

Prior-Review Thresholds					Thresholds for Procurement Methods							
Procurement Type	High Risk	Substantial Risk	Moderate Risk	Low Risk	Works			Goods, IT and Non-Consulting Services			Short List of National Consultants	
Works	5,000	10,000	15,000	20,000	Open International	Open National	Request for Quotation	Open International	Open National	Request for Quotation	Cons. Services	Engineering and Construction Supervision
Goods, IT, and Non-Consulting Services	1,500	2,000	4,000	6,000	≥	<	≤	≥	<	≤	<	≤
Consultants (Firms)	500	1,000	2,000	4,000	20,000	20,000	200	5,000	5,000	100	300	500
Individual Consultants	200	300	400	500								

**Table 3.5. Goods, Works and Non-consulting Services – 18-month Procurement Plan**

Re. No.	Description	Category	Method	Cost (US\$, millions)	Bid Invitation (after Prequalification)	Contract Award	Contract Effective
1	Substation upgrading	Works	RFB	104.0	February 05, 2018	April 30, 2018	September 04, 2018
2	Substation upgrading	Works	RFB	79.0	April 10, 2018	July 09, 2018	October 02, 2018
3	Substation upgrading	Works	RFB	62.0	July 04, 2018	September 09, 2018	January 15, 2019
4	Supply of Substation Equipment	Goods	RFB	31.0	August 21, 2018	November 19, 2018	January 30, 2019
5	Reconducting of transmission lines	Works	RFB	50.0	July 10, 2018	October 02, 2018	January 01, 2019
6	System Control and Data Acquisition (SCADA)	Works	RFB	79.0	June 27, 2018	September 22, 2018	December 10, 2018

*Note:* RFB = Request for Bids



**Table 3.6. Consulting Services - 18-month Procurement Plan**

<b>Re. No.</b>	<b>Description</b>	<b>Category</b>	<b>Method</b>	<b>Cost (US\$, millions)</b>	<b>Invitation for Express of Interest</b>	<b>Contract Award</b>	<b>Contract Effective</b>
1	PMU Support	Consulting	QCBS	1.2	February 20, 2018	August 05, 2018	September 05, 2018
2	PPP Transaction Adviser	Consulting	QCBS	2.0	April 15, 2018	October 15, 2018	November 15, 2018
3	Supervision Engineer for Substation Package 1	Consulting	QCBS	4.5	February 18, 2018	July 10, 2018	August 10, 2018
4	Supervision Engineer for Substation Package 2	Consulting	QCBS	4.0	April 15, 2018	October 15, 2018	November 15, 2018
5	Supervision Engineer for Substation Package 3	Consulting	QCBS	2.5	July 18, 2018	January 15, 2019	February 15, 2019
6	Supervision Engineer for Transmission Line	Consulting	QCBS	5.0	June 10, 2018	December 10, 2018	January 10, 2019
7	Supervision Engineer for SCADA	Consulting	QCBS	3.0	May 25, 2018	November 25, 2018	December 25, 2018

*Note:* QCBS = Quality- and Cost-Based Selection

52. The frequency of implementation support missions for procurement under the project will be twice annually.

53. **Publication of results and debriefing.** Publication of contract awards would be required for all ICB, NCB, Direct Contracting, and Selection of Consultants for contracts exceeding a value of US\$300,000. In addition, where prequalification has taken place, the list of prequalified bidders will be published. With regard to ICB and large-value consulting contracts, the TCN PMU would be required to assure publication of contract awards as soon as the World Bank has issued its 'no-objection' notice to the recommended award. All consultants competing for an assignment involving the submission of separate technical and financial proposals, irrespective of its estimated contract value, should be informed of the result of the technical evaluation (number of points that each firm received), before the opening of the financial proposals. The TCN PMU shall specify that any bidder or consultant who wishes to ascertain the grounds on which its bid was not selected, should request an explanation from the PMU. The project team shall promptly provide an explanation of why such bid was not selected, either in writing and/or in a debriefing meeting, at their option. The requesting bidder shall bear all the costs of attending such a debriefing.

54. **Fraud, coercion, collusion, and corruption.** All procuring entities as well as bidders, contractors, suppliers, and consultants must observe the highest standard of ethics during the procurement and execution of contracts financed under the project in accordance with the World Bank's 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 as of July 1, 2016.

### **Environmental and Social Safeguards**

55. The five-person ERSU within the PMU will be responsible for managing compliance with World Bank safeguards policies and the FGN's environmental legislation and regulations by means of (a) implementation of the ESMF and RPF, if necessary, throughout the project for investments that are not specifically identified by appraisal and (b) contracting and overseeing the preparation of Environmental and Social Impact Assessments and/or ESMPs and RAPs for investment activities. The ERSU has extensive experience with these processes, as it has undertaken similar functions in the National Energy Development Project, NEGIP, NEGIP Additional Financing, and the Power Sector Guarantees Project. The ERSU will also have an oversight for implementation of the safeguards instruments by TCN and its contractors, but the broader ERSU within TCN will provide day-to-day field supervision. TCN's ERSU that was established under NEGIP now has 12 staff in headquarters and one representative in each of the eight transmission regional offices.

56. In Nigeria, drafts of safeguard instruments are disclosed in the project-affected areas as part of the FMEnv review process that includes a public hearing and comment period. If the draft disclosed by the FMEnv has already been cleared by the World Bank, this disclosure will also satisfy the disclosure requirement of the World Bank; otherwise, the ERSU will make a separate in-country disclosure.

57. A budget for all environmental and social safeguard activities have been prepared and is presented in Tables 3.7 to 3.9.

**Table 3.7. Environmental and Social Safeguard Training and Monitoring (Capacity-Building Plan)**

<b>S.No.</b>	<b>Description</b>	<b>Proposed Budget (US\$)</b>
1	Technical courses for NETAP PMU (to be determined, potentially with certification): (a) Environmental Monitoring and Modelling (b) Occupational Health and Safety	132,500
2	World Bank/IFC Social Safeguard Training: (Management and implementation of RAPs, GRM, ESIAs, and stakeholder engagement plans)	150,000
3	Awareness and technical training for TCN environmental and social/health and safety officers at substations (basic knowledge of key issues for first-level monitoring)	200,000
4	Quarterly monitoring cost (TCN internal capacity) - monitoring of implementation of ESMPs and RAPs	300,000
<b>Total capacity building</b>		<b>US\$782,500</b>

**Table 3.8. Environmental and Social Safeguard-Related Procurement Needs - Goods**

<b>S. No.</b>	<b>Description</b>	<b>Proposed Budget</b>
1	<b>PPEs:</b> A set of PPEs for each EHS staff	115,000
<b>Total Goods</b>		<b>US\$115,000</b>

**Table 3.9. Environmental and Social Safeguard-Related Procurement Needs - Consulting Services**

<b>S. No.</b>	<b>Description</b>	<b>Proposed budget</b>
1	Safeguards reviewer (environmental and social quality control review for ESMPs and RAPs)	200,000
2	Preparation of RAPs for transmission lines	300,000
3	Preparation of ESMPs for transmission lines and substations	500,000
4	Specialized contractor for managing PCB impacts	200,000
5	Environmental and social compliance audit	300,000
<b>Total consulting services</b>		<b>US\$1,500,000</b>

## **Annex 4: Implementation Support Plan**

### **Nigeria: Electricity Transmission Project**

#### **Strategy and Approach for Implementation Support**

1. The Implementation Support Plan described below explains how the World Bank and other development partners will support the implementation of the risk mitigation measures identified in the Systematic Operations Risk Rating Tool. It is also linked to the results/outcomes identified in the Results Framework.

#### **Implementation Support Plan**

2. The level of technical support needed includes staff with energy sector knowledge and expertise; specialized transmission expertise including procurement experts; safeguards specialists; power engineering; and monitoring and evaluation expertise. The primary responsibility for this support lies with the Task Team Leader with key inputs from specialized World Bank experts. Evaluation of results indicators will be part of regular IDA supervision missions. The main focus in terms of support during implementation is summarized in the table below.

3. FM supervision will be consistent with a risk-based approach. The supervision intensity is based initially on the assessed FM risk rating and subsequently on the updated FM risk rating during implementation. Given the moderate residual risk rating, on-site supervision will be carried out at least once a year. On-site review will cover all aspects of FM, including internal control systems, the overall fiduciary control environment, and tracing transactions from the bidding process to disbursements as well as SoE review. Additional supervision activities will include desk review of semester IFRs, quarterly internal audit reports, audited Annual Financial Statements, and management letters as well as timely follow up of issues that arise, and updating the FM rating in the Implementation Status Report and the Portfolio and Risk Management system. Additional target reviews may be conducted depending on emerging risks. The World Bank's project team will support the monitoring of the timely implementation of the action plan. Detailed FM reviews will also be carried out regularly, either within the regular proposed supervision plan or through a more frequent schedule if needed, to ensure that expenditures incurred by the project remain eligible. Regular reporting arrangements and the supervision plan will also ensure that the implementation of the project is closely monitored and that appropriate remedial actions are taken expeditiously.

4. In terms of procurement, in addition to the prior review supervision to be carried out by the World Bank, the capacity assessment of the implementing agency has recommended that the World Bank should carry out supervision missions at least once a year to review procurement actions. These post-procurement reviews should cover at least 20 percent of the contracts subject to post-review.

<b>Time</b>	<b>Focus</b>	<b>Skills Needed</b>	<b>TCN Role</b>
First 12 months	Effectiveness, procurement, and supervision.	Task Team Leader Power Engineer Procurement Safeguards Financial Country Team	TCN PMU will lead implementation. The Project Implementation Manual sets out the procedures to be followed.

Time	Focus	Skills Needed	TCN Role
12th month–60th month  (Including midterm review and completion report)	Continued procurement, implementation, contract management, and supervision.	Task Team Leader Power Engineer Procurement Safeguards Financial Country Team Monitoring and Evaluation	TCN PMU will lead implementation

***Skills Mix Required***

Skills Needed	Number of Staff Weeks	Number of Trips	Comments
Team Leader Energy Specialist Power Engineer Financial Analyst Social Safeguard Environmental Safeguard Monitoring Procurement Financial Management	Estimated to be 6—8 weeks per person per year	2 per year Local staff 2 per year 2 per year 2 per year Local staff Local staff Local staff Local staff	To be adjusted annually depending on available supervision budget

## **Annex 5: Economic Analysis**

### **Nigeria: Electricity Transmission Project**

1. This annex presents the analysis of the project's development impact in terms of expected benefits and costs.<sup>7</sup> The analysis finds that the proposed project will bring substantial economic benefits to Nigeria's economy by displacing expensive diesel-based self-generation, meeting growing demand, and improving the efficiency of the power system. The baseline EIRR of the 'with project' scenario is 46.7 percent with an NPV of US\$2,055 million, using conservative estimates of average WTP for electricity in Nigeria and a discount rate of 7 percent.<sup>8</sup>

#### **A. Development Impact**

##### **The Project and its Rationale**

2. Nigeria faces huge economic costs from not having a universal and reliable supply of electricity. About 80 million people lack access to electricity and many who are connected rely on expensive diesel generators for backup supply during frequent supply interruptions. Self-generation of electricity (from diesel and petrol generators) is conservatively estimated at a minimum of 6,000 MW. Average annual per capita electricity consumption of Nigeria of about 129 Kilowatt hour (kWh) is about a fifth of the average low-middle-income country consumption (736 kWh) and a twentieth of the global average consumption (3,298 kWh).

3. Nigerian businesses experience an average of 239 hours of power outages per month, accounting for nearly 7 percent of lost sales. Most private enterprises are forced to resort to self-generation at a high cost to themselves and the economy (about US\$0.20–0.30 per kWh compared to the current grid-based tariff of US\$0.16 per kWh).<sup>9</sup> In the Nigeria Investment Climate Assessment, 27.2 percent of Nigerian business owners consider a lack of electricity as being the biggest obstacle to doing business. According to some estimates,<sup>10</sup> the cost of unserved energy for Nigeria is estimated to be as high as US\$1.25 per kWh.

4. Empirical studies on the relationship between electricity consumption and economic growth have found that a 1 percent increase in electricity consumption is associated with a 0.8 percent increase in economic growth in lower-middle-income countries. With improved electricity supply, Nigeria can be expected to achieve higher growth rates that are needed to reduce poverty. The proposed transmission investments are critical for realizing the large economic gains associated with successful implementation of the PSRP.

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<sup>7</sup> This economic analysis is consistent with the following World Bank guidelines: (a) Investment Project Financing, Policy and Directive; (b) Power Sector Policy and Investment Projects: Guidelines for Economic Analysis; (c) Social Value of Carbon in Project Appraisal 2014; and (d) Discounting Costs and Benefits in Economic Analysis of World Bank Projects 2016.

<sup>8</sup> The World Bank's guideline on discount rate, issued in May 2016, recommends the use of a discount rate twice the expected long-term per capita growth rate. Since Nigeria has grown at an average rate of 3.5 percent over the last 5 years, a 7 percent discount rate is used in this analysis in the base case. A sensitivity analysis was conducted for discount rates.

<sup>9</sup> For instance, Nigeria's telecommunications operators power their respective Base Transceiver Stations with over 50,000 generating sets in the country; operators are now estimated to spend about NGN 214.3 billion every year on diesel. By some estimates self-generated power now substantially exceeds grid-based power in Nigeria.

<sup>10</sup> FGN Roadmap for Power Sector Reforms 2010.

## Power Supply and Demand in Nigeria

5. Nigeria's generation capacity includes thermal (mainly gas) plants (85 percent) and hydropower (14 percent), with wind comprising less than 1 percent of the generation mix. The total installed generation capacity is approximately 13 GW. However, due to multipole factors outlined earlier, net electricity generation is currently between 3 GW and 4 GW (4 GW in Q3 of 2017) which is significantly below the suppressed demand in the country. As a result, there is significant stranded capacity in generation and the country depends on backup diesel generation to meet a large share of its demand. Self-generation of electricity (from diesel and petrol generators) is estimated to be more than 6,000 MW.

### B. Cost Benefit Analysis

6. The economic viability of the project was assessed through a cost-benefit analysis. Net benefits of the project were calculated by comparing total system costs and benefits for the 'with project' and 'without project' scenarios. TCN has prepared the Transmission Rehabilitation and Expansion Program (TREP). Funding from AFD, AfDB, JICA, and FGN complements the proposed project to increase the evacuation capacity to 7 GW. US\$486 million or 38 percent of the TREP total cost of US\$1.256 billion will be financed by the project. The project benefits have been calculated by proportionately allocating the overall benefits of the program to World Bank investments.<sup>11</sup>

7. A range of scenarios and sensitivities that meaningfully reflect the uncertainties (and correlations) of key input variables are evaluated. The analysis includes a consideration of the relevant environmental and social externalities.

### Capital Costs

8. The total project (financial) cost excluding price contingencies and interest during construction is US\$444 million<sup>12</sup> (Table 5.1). Subtracting price taxes and duties from the base cost, one obtains an economic cost of US\$355 million.

**Table 5.1. Total Project Cost**

Activity	Base Cost (US\$, Millions)	Taxes and Duties (US\$, Millions)	Economic Cost (US\$, Millions)
Upgrading and rehabilitation of substations	245	49	196
Reconducting of transmission lines	50	10	40
SCADA and telecommunication system	65	13	52
Installation of SVC at Gombe and purchase of spare equipment at Ojo substation	45	9	36
Physical contingency	40	8	32
<b>Total</b>	<b>444</b>	<b>89</b>	<b>355</b>

9. The domestic content of the investment cost is estimated at 15 percent, which amount is subject to the standard correction factor (SCF) that corrects for distortions in the exchange

<sup>11</sup> It is conservatively assumed that of the total US\$486 million, only economic cost (US\$355 million), 28.4 percent of total investments contributes to the benefit.

<sup>12</sup> The investment financed by the World Bank totals US\$486 million. However, for the purpose of this analysis the technical assistance component of US\$42 million was excluded from consideration in the economic analysis.

rate. The SCF is calculated to be 0.96. The SCF adjusted economic cost is calculated to be US\$353 million.

### **Operation and Maintenance Costs**

10. The O&M costs of generation, transmission and distribution to meet incremental generation constitute economic cost under the ‘with project’ scenario. The O&M costs are estimated based on the recent TCN study<sup>13</sup> and data from the MYTO model.

### **Costs of Incremental Generation**

11. Fuel costs of incremental generation constitute another economic cost under the ‘with project’ scenario. These costs are calculated based on the capital and gas supply requirements of producing the additional electricity that are attributable to World Bank investments. The gas is valued at the average price of gas in Europe, which serves as an estimate of the economic opportunity cost of Nigerian gas. Gas prices are based on the World Bank’s October 2017 commodity price forecasts. Generation capital costs to meet incremental generation are assumed to be zero, because approximately 7 GW of generation capacity is technically available.

## **C. Project Benefits**

### **Energy Generation**

12. The project will contribute to increasing the peak evacuation capacity of Nigeria’s grid from 5 GW to 7 GW. Under the ‘without project’ scenario, it is assumed that the average power supplied increases from 3.5 Gigawatt hours (GWh) per hour to 4.5 GWh per hour. Under the ‘with project’ scenario, this analysis assumes that the average power supplied gradually increases from 4.2 GWh per hour in 2020, when the investment in transmission starts, to 5.5 GWh per hour in 2024, a year after the completion of the transmission investment. After taking into account technical losses of approximately 13 percent, the additional electricity made available to consumers upon project completion is 7,746 GWh per year. Of this, the additional electricity supply attributable to project investments (which is equal to the share of TCN’s TREP financed by the World Bank) is 2,488 GWh per year. Table 5.2 presents the detailed energy balance of the TREP.

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<sup>13</sup> Transmission Expansion Plan: Development of Power System Master Plan for the Transmission Company of Nigeria, June 2017.



**Table 5.2. Energy Balance of the Nigeria TREP**

		2018	2019	2020	2021	2022	2023	2024	2025	2030	2040
<b>Without Program</b>											
Capacity evacuated without program	[MW]	3,500	3,833	4,167	4,500	4,500	4,500	4,500	4,500	4,500	4,500
Annual Energy Sent Out to grid	[GWh]	30,660	33,580	36,500	39,420	39,420	39,420	39,420	39,420	39,420	39,420
Transmission losses with program	[%]	8.05%	8.05%	8.05%	8.05%	8.05%	8.05%	8.05%	8.05%	8.05%	8.05%
Distribution losses with program	[%]	5.84%	4.65%	3.83%	3.83%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%
Energy Sent Out to Customers	[GWh]	26,545	29,440	32,276	34,858	34,858	34,858	34,858	34,858	34,858	34,858
<b>With Program</b>											
Capacity evacuated with program	[MW]	3,500	3,833	4,200	4,550	4,700	5,000	5,500	5,500	5,500	5,500
Annual Energy Sent Out to grid	[GWh]	30,660	33,580	36,792	39,858	41,172	43,800	48,180	48,180	48,180	48,180
Transmission losses without program	[%]	8.05%	8.05%	8.05%	8.05%	8.05%	8.05%	8.05%	8.05%	8.05%	8.05%
Distribution losses with program	[%]	5.8%	4.7%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%
Energy Sent Out to Customers	[GWh]	26,545	29,440	32,534	35,245	36,407	38,731	42,604	42,604	42,604	42,604
<b>Difference</b>											
Additional capacity evacuated under program	[MW]	-	-	33	50	200	500	1,000	1,000	1,000	1,000
Additional Energy Sent Out to grid	[GWh]	-	-	292	438	1,752	4,380	8,760	8,760	8,760	8,760
Additional Energy Sent Out to Customers	[GWh]	-	-	258	387	1,549	3,873	7,746	7,746	7,746	7,746
Additional evac. cap. attributable to Bank Inv.	[MW]	-	-	9	14	57	142	284	284	284	284
Additional energy sent out to grid attributable to Bank Inv.	[GWh]	-	-	83	124	498	1,244	2,488	2,488	2,488	2,488
Additional energy sent out to customers attributable to Bank Inv.	[GWh]	-	-	73	110	440	1,100	2,200	2,200	2,200	2,200

### Incremental Benefits

13. The additional electricity made available by the increase in transmission capacity can be valued at the consumers' WTP for electricity supply. The WTP analysis is typically based on computing the area under a derived demand curve during each year of the project's life. The key parameters needed to determine the area under the curve include total demand in each year of the project, the price elasticity of demand, and the marginal tariff. However, given the difficulties in reliably establishing these parameters for Nigeria, this economic analysis uses estimates of average WTP for Nigeria of US\$0.16 per kWh in 2012 prices and US\$0.18 per kWh in 2016 prices from Osen (2012),<sup>14</sup> which are based on surveys of 835 households in Lagos and Osun states in Nigeria. This is a conservative estimate of WTP for Nigeria since it does not include industrial and commercial customers who are likely to have a higher WTP for electricity than residential customers. This method of estimating the WTP also does not include a consumer surplus from electricity consumption.

14. Because of the high rate of aggregate technical, commercial, and collection (ATC&C) losses in Nigeria, the estimate of US\$0.18 per kWh does not apply to the entire additional electricity delivered to consumers, but only to the electricity sold to consumers, because the WTP of consumers who are using electricity without paying is lower than the WTP of consumers who pay fully. Given these uncertain estimates of WTP, sensitivity analysis has been carried out around this value. Switching values have also been calculated.

### Global Externalities

15. Global externalities constitute another economic benefit of the proposed project, given that the project will lead to a decrease in use of diesel-based self-generators. The assumption in this analysis is that the additional electricity will go toward replacing diesel self-generation.

14

<http://www.usace.org/usace2014/submissions/OnlineProceedings/MUSILIU%20OSEN%20PHD%20SECOND%20YEAR%20REPORT%20PROOF%20READ%20PAPER%202014%20IAEE.pdf>

GHG emissions of the mix of electricity supplied through the grid are lower than GHG emissions from diesel self-generation. The GHG emission factors for different sources of generation are given in Table 5.3.

**Table 5.3. GHG Emission Factors of Generation**

		Gas	Self-gen
IPCC default	[Kg/GJ]	56.1	74.1
Converted to mmBTU	[Kg/mmBTU]	53.2	70.3
Efficiency	[%]	50%	40%
Heat rate	[BTU/kWh]	7,200	8,530
Emissions	[kg/kWh]	0.3830	0.5993

16. Consistent with World Bank guidance on the social value of carbon, carbon emission reductions are valued in the base case at US\$33 per ton of CO<sub>2</sub> in 2018 increasing to US\$80 per ton in real terms by 2050. An updated price of carbon is provided in the World Bank’s 2017 Guidance Note on Shadow Price of Carbon in Economic Analysis. This note replaces the existing 2014 Social Value of Carbon in Project Appraisal Guidance Note. Since the project is being appraised during the transition between the two, a sensitivity analysis has been carried out to assess the impact of different carbon price in the economic viability of the project. In the 2017 Guidance Note, carbon emissions are valued at two ‘high’ and ‘low’ levels, both of them increasing at the rate of 2.25 percent per year.

17. **Climate change mitigation co-benefits.** Consistent with the Joint MDB Methodology for Tracking Climate Finance, climate co-benefits in the proposed project will be realized through the Subcomponent 1(a) (upgrading and rehabilitation of substations) and Subcomponent 1 (b) (upgrading of transmission line) and Subcomponent 1 (d) (installation of voltage regulation (SVC) at Gombe Substation) since those components reduce energy use and technical loss.

### **Avoided Local Externalities**

18. Local damage costs resulting from SO<sub>2</sub>, NO<sub>x</sub>, and PM<sub>10</sub> emissions of self-generation (in densely populated urban areas with no pollution controls and emissions near ground level) are an order of magnitude greater than emissions from utility scale coal and gas projects in more remote rural areas.<sup>15</sup> This reflects the fact that diesel self-generation occurs in densely populated areas with low stacks and are rarely fitted with pollution controls. Moreover, particulate emissions, largely absent from gas, are particularly damaging to human health. As a result, local damage costs are lower under the ‘with project’ scenario than under the ‘without project’ scenario.

19. No reliable Nigeria-specific health damage study is available to estimate the local air emission damage costs associated electricity generation. Consequently, a representative damage cost estimate for United States was scaled up by the ratio of purchasing power parity per capita GDP, resulting in a damage cost for NO<sub>x</sub> emissions of US\$937 per ton of SO<sub>2</sub>, US\$788 per ton of NO<sub>x</sub>, and US\$1,931 per ton of PM (Table 5.4).

<sup>15</sup> Diesel self-generation mostly occurs in densely populated areas with low stacks and are rarely fitted with pollution controls. Particulate emissions, are particularly damaging to human health.

**Table 5.4. Environmental and Health Damage Costs**

Variable	Unit	SO <sub>2</sub>	NO <sub>x</sub>	PM
US Damage costs	US\$/ton	8,870	7,460	18,280
US PPP per capital GDP	US\$	51,340	51,340	51,340
Nigeria PPP per capita GDP	US\$	5,423	5,423	5,423
Nigeria Damage Costs	US\$/ton	937	788	1,931

## Economic Analysis

### Assumptions

20. In addition to the costs and benefits noted in the previous section, the economic analysis rests on the following additional assumptions:

- **Discount rate for calculation of NPV.** The World Bank’s guideline on discount rate, issued in May 2016, recommends the use of a discount rate twice the expected long-term per capita growth rate.<sup>16</sup> Since Nigeria has grown at an average rate of 3.5 percent over the last 5 (2012–2016) years and can be expected to accelerate this rate going forward, a 7 percent discount rate is used in this analysis in the base case. NPV values for 2 percent and 12 percent discount rates is presented as a sensitivity analysis.
- **Construction cost phasing.** Most of the construction costs are incurred in the first two years while the additional power supplied to consumers increases gradually.

**Table 5.5. Assumptions Cost Phasing and Power Supplied**

	2020	2021	2022	2023
Construction Cost (%)	65	30	2.5	2.5
Average power supplied (MWh/hour)	4,200	4,550	4,700	5,000

- **Project completion year:** 2023
- **Life of investments:** 20 years

### Results

21. The economic analysis demonstrates that the proposed project is economically viable. The baseline economic return of the proposed project against the ‘without project’ scenario is 46.7 percent and the NPV is US\$2,055 million, including local and global environmental benefits, which added 4.2 percentage points, or US\$353 million, to the economic return and NPV, respectively. Table 5.7 shows the summary of the calculations of the economic returns, for both 2 percent and 12 percent discount rates.

<sup>16</sup> The guidance on appropriate social discount rates is anchored in welfare economics. Standard welfare analysis tells us that the net benefits of a project at different points in time should be valued according to their marginal impact on welfare at the time they occur. Higher (lower) growth prospects would normally imply a higher (lower) discount rate for a particular country. Given reasonable parameters for the other variables in the standard Ramsey formula linking discount rates to growth rates, a 3 percent per capita growth rate translates into a 6 percent discount rate, and per capita growth rates of 1 percent to 5 percent yield discount rates of 2 percent to 10 percent.

**Table 5.6. Summary of the Economic Analysis**

		2018	2019	2020	2021	2022	2023	2024	2025	2030	2040
<b>Generation Costs</b>	[US\$m]	-	-	3	5	19	47	94	94	94	94
Generation Fuel Cost - Gas (Variable)	[US\$m]	-	-	3	4	17	43	86	86	86	86
Generation O&M Cost	[US\$m]	-	-	0	0	2	4	8	8	8	8
<b>Transmission Costs</b>	[US\$m]	-	-	230	107	14	19	19	17	10	3
Transmission Capex	[US\$m]	-	-	229	106	9	9	-	-	-	-
Transmission O&M Costs	[US\$m]	-	-	1	1	5	11	19	17	10	3
<b>Distribution O&amp;M Costs</b>	[US\$m]	-	-	1	1	4	9	16	14	8	3
<b>Total costs</b>	[US\$m]	-	-	234	113	36	75	128	125	112	100
<b>Benefits</b>											
Additional energy sent out to Customer	[US\$m]	-	-	13	20	79	198	396	396	396	396
<b>Total benefits</b>	[US\$m]	-	-	13	20	79	198	396	396	396	396
<b>Total economic flows</b>	[US\$m]	-	-	(221)	(93)	43	123	268	271	284	296
Avoided local externalities	[US\$m]	-	-	0	1	3	9	18	19	25	44
Avoided GHG emissions	[US\$m]	-	-	1	1	4	10	20	21	24	32
<b>Net economic flows incl. externalities</b>	[US\$m]	-	-	(220)	(91)	50	142	307	311	334	372

**Table 5.7. Economic Analysis Results**

		2%	Base Case	12%
<b>Economic rate of return</b>				
ERR	[ % ]	42.5 %	42.5 %	42.5 %
ERR+local externalities	[ % ]	44.6 %	44.6 %	44.6 %
ERR+local+GHG@BankGuidanceValues	[ % ]	46.7 %	46.7 %	46.7 %
<b>Composition of NPV</b>				
Generation Costs	[US\$m]	1,258	661	378
Transmission Costs	[US\$m]	463	360	291
Distribution Costs	[US\$m]	112	67	43
<b>Total costs</b>	[US\$m]	<b>1,833</b>	<b>1,088</b>	<b>711</b>
Additional electricity supplied	[US\$m]	5,304	2,790	1,596
<b>Total benefits</b>	[US\$m]	<b>5,304</b>	<b>2,790</b>	<b>1,596</b>
<b>NPV (before environmental benefits)</b>	[US\$m]	<b>3,470</b>	<b>1,702</b>	<b>884</b>
Local env. benefits: avoided grid gen.	[US\$m]	375	184	99
<b>NPV (incl. local environmental benefits)</b>	[US\$m]	<b>3,845</b>	<b>1,886</b>	<b>983</b>
Value of avoided GHG emissions	[US\$m]	333	169	94
<b>NPV (including environment)</b>	[US\$m]	<b>4,178</b>	<b>2,055</b>	<b>1,077</b>

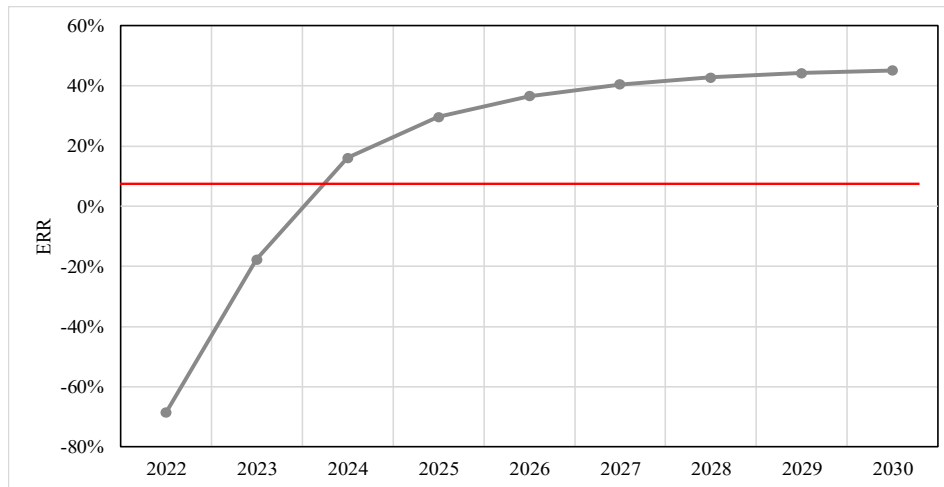
22. In the World Bank's 2017 Guidance Note on Shadow Price of Carbon in Economic Analysis, carbon emissions are valued at 'high' and 'low' levels, starting at US\$77 per ton and US\$38 per ton in 2018 and ending at US\$156 per ton and US\$78 per ton in 2050. Social values of carbon recommended by the 2017 World Bank guidance do not impact the returns of the project significantly (Table 5.8).

**Table 5.8. Price of Carbon**

<b>Social Value of Carbon</b>	<b>NPV</b>	<b>EIRR</b>
Base Case, 2014 Guideline	2,055	46.7
Low Case, 2017 Guideline	2,066	46.9
High Case, 2017 Guideline	2,245	49.2

23. The payback period of the investment is less than four years—the hurdle rate of 7 percent is reached in 2024 (Figure 5.1).

**Figure 5.1. Payback Period**



24. These are high rates of economic return compared to other transmission projects recently financed by the World Bank and indeed compared to power sector projects in general. These large benefits are attributable mainly because the additional generation from the project will help to displace high-cost diesel self-generation and address power shortages in Nigeria. The high returns indicate the value that the incremental transmission investments bring to Nigeria's power sector.

## D. Risks

### Construction Cost Overruns

25. Table 5.9 shows the sensitivity of the EIRR to construction cost overruns. The switching value (that is, the value at which the EIRR falls to the hurdle rate of 7 percent) is US\$2,936 million, or more than eight times higher than the baseline value of US\$353 million. Cost overruns of this magnitude are extremely unlikely.

**Table 5.9. Project Cost versus EIRR**

Project Cost (US\$, millions)	EIRR (%)
353	46.7
706 (2 times the base case)	28.8
1,412 (4 times the base case)	16.4
2,936	7.0

### Construction Delays

26. Construction delays are often closely linked to construction cost overruns. When delays occur before significant expenditure has been incurred, such as due to environmental or social issues, the effect on the EIRR is minimal. However, if delays occur after the vast majority of investments have been made, the effect on the EIRR can be substantial. For instance, in the case of the World Bank-funded Nigeria Transmission Development Project, delays mainly occurred at the outset of the project so that the EIRR of the project was not affected. Given the scale of the investments proposed under the TCN program as well as the necessity of coordinating these investments with other development partners, there is significant risk that the proposed investments may be delayed. Table 5.10 shows the sensitivity of the EIRR to

construction delays under a worst case scenario in which the delay occurs after the bulk of the investment outlays have been made—with a switching value of 14 years, which is highly unlikely.

**Table 5.10. Construction Delay and EIRR**

Construction Delay (Year)	EIRR (%)
0	46.7
1	37.4
5	22.5
10	13.9
14	7.0

### Electricity Supply Disruptions

27. Nigeria's electricity is vulnerable to electricity supply disruptions. Table 5.11 shows the sensitivity of the EIRR to the electricity transferred. This indicates that the project would meet the hurdle rate as long as the additional electricity evacuated using the transmission lines is at least half of the planned evacuations. While such an extreme scenario cannot be completely ruled out, it is highly unlikely.

**Table 5.11. Electricity Supply and EIRR**

Energy Supply	EIRR (%)
Base case	46.7
90% of base case	23.2
84% of base case	7.0

### Average Willingness to Pay

28. As mentioned above, the additional electricity evacuated by the project is valued based on surveys of residential households. Since actual WTP should ideally also take into account industrial and commercial customers, the values used in this economic analysis are subject to high uncertainty. As shown in table 5.12, the switching value is just US\$.0.047 per kWh.

**Table 5.12. Average WTP and EIRR**

WTP (US\$ per kWh)	EIRR (%)
0.18	46.7
0.09	23.3
0.047	7.0

### Switching Values

29. The switching values analysis is summarized in Table 5.13. The analysis indicates that the project is robust to the major risk factors and to the main input assumptions. In particular, it is seen that the project is robust to significant delays in the implementation schedule as well as disruptions in electricity supply.

**Table 5.13. Switching Values**

Input	Unit	Baseline Value	Switching Value
Cost overrun	US\$, millions	353	2,936
Construction delay	Years	0	14.5
Energy supply	% of base case	100	84
WTP	US\$ per kWh	0.18	0.047

## **Financial Analysis**

30. The financial analysis of the project was carried out by valuing the additional electricity delivered as a result of the project in financial terms (that is, the average transmission tariff), adding taxes and duties to the project costs used in the economic analysis and excluding global and environmental benefits from the program benefit. The analysis shows that the financial internal rate of return (FIRR) of the project will depend on the tariff trajectory approved by the NERC. Under the current average transmission tariff level, which is estimated at US\$8.5 per MWh, the project has a negative FIRR. It is expected to be positive as the transmission tariff reaches cost-reflective level taking into account of wheeled electricity and collection by 2021 under the PSRP.

## **Annex 6: Sector Financial Analysis**

### **Nigeria: Electricity Transmission Project**

1. **Electricity service delivery is poor with serious repercussions for the Nigerian economy and citizens.** Average annual per capita electricity consumption of Nigeria (147 kWh) is a fifth of the average low-middle-income country consumption (736 kWh) and a twentieth of the global average consumption (3,298 kWh). The unreliable power supply results in non-payment by customers of the DISCOs, drives industry to pursue off-grid alternatives, and causes economic losses in excess of US\$25 billion annually (the PSRP estimate). Nigerian businesses experience an average of 239 hours of power outages per month, accounting for nearly 7 percent of lost sales. Most private enterprises are forced to resort to self-generation at a high cost to themselves and the economy (about US\$0.20–0.30 per kWh, as compared to the current grid based tariff of US\$0.16 per kWh). In the 2014 Nigeria Investment Climate Assessment, 27.2 percent of Nigerian business owners considered lack of electricity as the biggest obstacle to doing business. The steep decline in power output in 2016 from the peak of over 5 GW in March 2016 to less than 3.5 GW in early 2017 contributed to the contraction of economic activity by an estimated 1.5 percent in 2016.

2. **The underlying causes of poor service delivery are the serious challenges of the power sector.** The principal challenges include (a) erratic gas supply and transmission and distribution network constraints; (b) poor performance of DISCOs; (c) poor financial viability of sector companies; (d) weak governance and inadequate enforcement of contracts; (e) lack of investment planning and a Procurement Framework; and (f) low access to electricity supply. Many of these challenges are interlinked. Lack of financial viability does not allow DISCOs to adequately maintain their assets and invest in new assets, which results in poor service quality and reliability. This, in turn, affects customers' WTP, and causes difficulties in raising tariffs and enforcing collections. Low collections of DISCOs and the lack of enforcement of the contractual framework (specifically DISCOs' Vesting Contracts) has led to non-payment across the supply chain and to the gas suppliers. The latter affects security and reliability of gas supply. The absence of investment prioritization and planning, as well as competitive Procurement Frameworks, further exacerbates the sector issues and leads to increased costs and contingent liabilities.

3. **Electricity supply is unreliable because of distribution constraints and, to a lesser extent, erratic gas supply and constraints in transmission.** The installed power generation capacity is approximately 13 GW, comprising 2 GW of hydro and 11 GW of gas-fired power plants. However, mechanically available capacity is only around 7 GW and, on average, less than 4 GW was dispatched over the last two years, largely due to constraints in gas supply resulting from non-payment and gas pipeline vandalism. Capacity of the primary transmission network (330kV) is not currently a constraint; however, the transmission system is operating well-below international reliability and security standards. Since July 2017, the distribution segment has emerged as the largest constraint, with DISCOs' rejecting up to 2 GW of the system load, thus curtailing supply from power plants to around 3,500 MWh/hour in late 2017. The causes of load rejection are multiple: lack of investments in distribution networks, congestion at the transmission and distribution interface to satisfy the differentiated demand growth, and DISCOs' disconnection of feeders in areas where collection losses (non-payments) are high.



4. **The poor operational and commercial performance of the DISCOs since their privatization is a key reason for the overall poor performance of the power sector.** The sector ATC&C losses are high; averaging 54 percent in 2016 versus 32 percent projected in the tariff regulation/order. DISCOs need to make significant investments in network improvement and expansion to attain the contractual targets set in their performance agreements (including for reducing ATC&C losses). The poor financial situation of the DISCOs, coupled with their highly-leveraged balance sheets, has severely constrained DISCOs' ability to access commercial financing. Local commercial banks are reluctant (and, in some cases, unable) to extend further financing to the DISCOs due to their high exposure to the power acquisition companies during the 2013 privatization round. The privatized assets were purchased with significant leverage (assumed to be 70 percent debt and 30 percent equity), with most of the debt provided by the local commercial banks. International lenders and investors also do not have appetite for financing, as the sector is nascent and lacks the requisite mitigation arrangements necessary to meet their risk acceptance criteria. Most DISCOs will need to be restructured/refinanced, depending on the extent of their financial and operational nonperformance.

5. The sector has been accumulating a sizable financial deficit across the value chain. Between January 2015 and December 2016, the unpaid electricity bills owed by end-consumers were estimated at NGN 420 billion (US\$1.38 billion). End-user tariffs have fallen below cost-recovery due to their inadequate adjustment for inflation, exchange rate, and actual amount of energy delivered. A portion of the sector deficit is the result of non-payment of DISCOs' electricity bills by the FGN's MDAs with about NGN 26 billion (US\$85 million) in arrears at the end of 2016. On average, only 29 percent of invoices issued by the NBET were settled by DISCOs in 2016. As a result, NBET remittances to GENCOs have been low, and GENCOs have not been able to meet their ongoing operational costs, especially fuel and maintenance costs. Inability to pay fuel suppliers has resulted in the curtailment of gas supply and a resulting reduction in electricity produced. Inadequate enforcement of contracts further aggravates sector financial and operational instability. For the reasons cited, the sector's revenue deficit creates a vicious cycle, whereby underpayments to GENCOs and gas suppliers constrain power generation, thus reducing electricity sold to customers and further exacerbating the lack of market liquidity.

6. **Weak governance and inadequate enforcement of contracts further undermine the sector's financial and operational performance.** Overall, the legal, regulatory, and institutional framework in Nigeria is comprehensive and in accordance with international good practices. The content of regulations, in particular the Grid Code, Distribution Code, and the Market Rules, include mechanisms to improve performance. Tariff methodology is also overall adequate, allowing for full recovery of costs and incorporating incentive-based regulation. However, poor governance and associated weak transparency and accountability, together with overlapping roles and responsibilities of different agencies, lead to lack of enforcement of laws, regulations, and contracts. The latter, in turn, renders the sector dysfunctional with lack of payment discipline, high losses, and poor service quality and reliability.

7. **Lack of investment prioritization and a competitive Procurement Framework increases the sector liabilities and risks.** The power sector has sizable investment needs. Yet, investments currently do not follow least-cost planning principles, which would balance sector needs and manage the build-up of FGN contingent liabilities. At the same time, generation capacity has historically been contracted largely based on unsolicited proposals. Due to lack of

competitive procurement processes (such as auctions), the sector lacks mechanisms for controlling costs.

8. **Financial sustainability of sector companies is critical to breaking the vicious cycle of poor sector financial performance, which prevents the enforcement of contractual and regulatory obligations and results in poor service delivery.** The PSRP supports a suite of measures to improve the sector's financial viability.

9. **To ensure financial sustainability of the sector, under the PSRP all sector companies must receive their required revenue.** The revenue requirement of sector companies from 2019 will be defined based on the MYTO major review that is part of the Reset. The Reset entails a redefinition of the revenue requirements of the DISCOs and TCN, based on new performance parameters and well-specified Performance Improvement Plans (PIPs) of DISCOs. The end-user tariff adjustment trajectory will be defined on the basis of the MYTO to ensure that tariff revenue and the revenue requirement of the sector converge by 2021. The revenue requirement of DISCOs before the Reset will be determined based on the existing MYTO.

10. **The revenue shortfall for 2017–2021 in the current PSRP financing plan is assessed as the difference between the sector revenue requirement and the tariff revenue.** The 2017–21 revenue shortfall of the power sector is assessed at NGN 1,150 billion (US\$3,770 million). The financing plan in the Medium-Term Expenditure Framework and Fiscal Strategy Paper that was approved by the National Assembly in December 2017 identifies three sources of funding for the revenue shortfall: CBN Payment Assurance Facility (a short-term bridge financing for 2017–18, which is already established and has started disbursing), and the proposed World Bank's PforR and additional Federal Government budgetary contribution.

11. **In addition to the revenue shortfall, the financing plan includes the historical shortfall,** defined as the difference between revenue requirement of the sector and the tariff revenue accumulated from January 2015 till December 2016. The historical shortfall amounts to NGN 420 billion (US\$1,378 million). The historical shortfall does not accrue interest payments and the financing plan envisages that it will be repaid by 2021.

## **Annex 7: TCN Financial Analysis**

### **Nigeria: Electricity Transmission Project**

1. TCN is a state-owned entity that is structured to operate on commercial principles. However due to low transmission tariffs, reduced energy flows through the TCN system, and poor payments of the company's bills by DISCOs, TCN's financial condition has deteriorated and is reliant upon the government's budgetary support to keep it financially viable.
2. TCN has been making losses for the last six years. Net losses after depreciation and impairment charges between 2011 and 2014 amounted to NGN 107 billion (US\$685 million) or on average NGN 26.7 billion (US\$171 million) annually, as per the audited financial statements. Net losses excluding exchange losses in 2015 and 2016 combined are expected to reach NGN 58 billion (US\$264 million). Provisions for uncollected billings accounted for 31 percent in 2011–2014 and 161 percent in 2015–2016. TCN's collected billings have not covered its operating expenses (excluding depreciation) since 2011.
3. Given the role of capex in enabling TCN to meet projected offtake requirements, combined with the need to maintain existing assets while being in a distressed financial position, liquidity rather than profitability is the primary measure of TCN's financial condition. However, capital funding support from the government has fallen significantly in recent years (to NGN 266 million in 2015 against NGN 12 billion in 2013 and NGN 8 billion in 2014).
4. While TCN has a positive cash balance, it needs the FGN's budgetary support to generate adequate headroom to cover its ongoing investment program and its operations. Cash constraints are affecting TCN's performance and its maintenance, rehabilitation, and reinforcement of the transmission network.
5. The historical cash flows of TCN show that TCN has continued to manage its liquidity, effectively. An important reason for its liquidity thus far has been TCN's access as a government-owned company to the global and local bank and bond markets and to FGN funding.
  - TCN has experienced financial stress due to the devaluation of the naira with the currency having depreciated by over 50 percent since early 2016. While TCN's revenues are in local currency, its financial obligations to international suppliers and lenders remain in foreign currency. The invoices due, when combined with foreign exchange losses will require TCN to draw upon its cash reserves to meet its debt service obligations to its lenders and make payments to its suppliers. TCN would need to proactively manage its foreign exchange exposure to guard against future foreign exchange losses undermining its financial position, liquidity, and market access.
  - TCN's financial condition has deteriorated over the last two years due to the low collection rates, low energy sales leading to reduced remittances from the DISCOs, delays in the approval of proposed transmission tariff increases, insufficient funding to maintain existing assets, and related areas. TCN is also subject to the negative consequences of the general macroeconomic downturn characterized by high inflation, a depreciating currency, and potential shortage in the availability of foreign exchange. Unless these issues are addressed on time, their impact would continue to negatively affect TCN's financial condition. For TCN to continue to

make needed improvement in transmission infrastructure, it is therefore necessary that the government continues the tariff reform process in the context of the PSRP and to support TCN's access to capital for its investment program.

## **Annex 8: Strengthening TCN Corporate Governance and Accountability**

### **Nigeria: Electricity Transmission Project**

1. The FGN is keen to strengthen the governance framework of TCN. As part of project appraisal, an assessment was made on initial steps on how this could be achieved by laying out how TCN is expected to align with its current legal requirements. The assessment also suggests options to strengthen its corporate governance in line with good practices recommended by the Nigerian Stock Exchange Commission for listed companies.

2. As a registered company, TCN should be fully corporatized in compliance with the provisions of the Companies and Allied Matters Act. As a public entity, it is bound by accountability obligations. As a licensee, it is also required to comply with the regulatory requirements of the NERC.

#### **Corporatization and Market Discipline**

3. Under the Companies and Allied Matters Act, registered companies are to be run by a board of directors in compliance with its provisions on the good governance of the board (including the disclosure of interests by directors and so on). A registered company is also required to disclose audited financial statements.

4. Beyond the legal requirements of the Companies and Allied Matters Act, TCN would benefit from aligning with the Code of Corporate Governance of Public Companies issued by the Stock Exchange Commission as a “guide to facilitate sound corporate practices and behavior” setting “minimum standards for corporate governance particularly of [listed] public companies.” The Code of Conduct lays out good practices in three particular critical areas: (a) board governance; (b) risk management and auditing; and (c) accountability and reporting.

5. Particular attention should be paid to membership of the board (number of independent directors) and its effectiveness (oversight of the management team, quality of information reporting to the board, board performance assessment, and so on).

6. On risk management and auditing (internal and external), institutional capacity and robustness of corporate fiduciary systems and internal and external controls matter; the risk of corruption also calls for particular attention and can be usefully assessed in coordination with law enforcement agencies, such as the Economic and Financial Crimes Commission, the Independent Corrupt Practices Commission or the Bureau of Public Procurement when it comes to contracting.

7. Accountability calls for public disclosure of information, including on performance targets and objectives. As a state-owned enterprise, TCN falls under the Freedom of Information Act of 2011 which requires that it publicly discloses the following:

- Factual reports, inspection reports, and studies whether prepared by or for the company;
- Information relating to the receipt or expenditure of public or other funds of the company;

- The name of every official and the final records of voting in all proceedings of the institution; and
- A list of: (a) files containing applications for any contract, permit, grants, licenses, or agreements; (b) reports, documents, studies, or publications prepared by independent contractors; and (c) materials containing information relating to any grant or contract made by or between the institution and another public institution or private organization.

8. Technical assistance under the project will support TCN to conduct an assessment of its corporate governance, to identify weaknesses and opportunities for improvement.

### **Strengthening Oversight and Accountability**

9. As a parastatal essentially funded through budget appropriations, TCN is accountable to the FGN and falls under its oversight. Framing and strengthening this oversight will also help enhance its corporate governance. Oversight of state-owned enterprises should be exercised through the directors appointed to the TCN board by the FGN. To effectively exercise its ownership and oversight of state-owned companies, the FGN should consider the following: appointing directors from different ministries and agencies including the Ministry of Finance because of its fiscal responsibility and the Bureau of Public Enterprise that is mandated by the Public Enterprises (Privatisation and Commercialisation) Act to, “ensure that public enterprises are managed in accordance with sound commercial principles and prudent financial practices”; to “interface with the public enterprises, together with the supervising Ministries, in order to ensure effective monitoring and safeguard of the public enterprises managerial practices” and; to “request for and obtain from any public enterprise statistical and other information including reports, memoranda and audited accounts and other information relevant for its functions.”

10. The composition of the board should be in accordance with NERC’s Code of Corporate Governance Guidelines. The Code specifies the minimum number of Board members (including the number of independent members), as well as requirements pertaining to Board members’ qualifications, tenure, and conflict of interest situations.

11. It is recommended that the exercise of the FGN ownership and oversight be framed through a performance agreement between the Ministry of Power and the TCN board with mutually agreed commitments. Such performance agreements are envisaged by the Public Enterprises (Privatisation and Commercialisation) Act, which vests the BPE with authority to oversee their effectiveness.

### **Fulfilling License Requirements**

12. As a licensee of the NERC, TCN is required to comply with the following requirements:

- Certified audited financial statements and accounts for the immediate past three years should be submitted along with application for license; and
- Under the license agreement itself, TCN is required to “comply with all applicable laws in Nigeria, whether in force at the date hereof or in the future,” including financial reporting requirements under the Companies and Allied Matters Act.

## **Conclusion**

13. All legal and regulatory requirements pertaining to TCN corporate governance and accountability should be complied with. By aligning with good practices and market discipline principles, TCN would be in a better position to negotiate commercial transactions such as PPPs. FGN oversight should be framed (through the appointment of directors and professionalization of the board and possibly by way of a performance agreement with the board of directors) to both strengthen TCN accountability to the Government but in respect of its corporatization.

## Annex 9: Map

### Nigeria: Electricity Transmission Project

