**Appraisal of TCN Project Financing Packages**

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**Appraisal of TCN Project Financing Packages**

# Purpose of this Investment Appraisal

The purpose of this investment appraisal package is to request expressions of interest from investors who want to participate in TCN’s transmission expansion program by providing capital funding in the form or loans or equity investment. This appraisal package provides the following information about TCN’s requirements:

* This **Executive Summary** provides the context for the request for funding, and summarizes the opportunities for investment.
* **Annex 1** provides descriptions and schedules for projects that are currently underway and in the planning stages, and shows the funding requirements both at the individual project level and by project groupings.
* **Annex 2** provides an economic assessment of new projects currently in the planning stages.
* **Annex 3** provides a financial assessment of the new projects.
* **Annex 4** provides a financial assessment of TCN covering the recent past performance for 2011-2013, and the projected performance for 2014-15.

**Annex 5** shows the guidelines to be used for competitive procurement and contracting.

The target audience for this investment package includes FGN, state and local governments, sovereign funds, development banks, contractors, developers and others potential sources of capital funding. Investors can use this appraisal document to gain a better understanding of TCN’s transmission expansion plans and the size and timing of the company’s capital funding requirements, and to identify projects and sets of projects that provide the best fit for the investor’s particular funding preferences and requirements.

TCN is now actively inviting expressions of interest from interested investors. If you want to participate in this opportunity, you are encouraged to contact Mr. Shahid Mohamad, TCN Executive Director, Transmission Services Provider, at email [smohammad@mhi.mb.ca](mailto:smohammad@mhi.mb.ca) or phone (+234) 812 882 3233.

# Need for Transmission Refurbishment and Expansion

Nigeria’s transmission system, which consists of 330kV and 132kV high voltage lines, substations, and control facilities is owned and operated by a single government-owned company, Transmission Company of Nigeria (TCN). TCN consists of four business units: the Transmission Services Provider (constructing, owning, operating and maintaining transmission facilities), System Operator, Market Operator and TCN Headquarters.

TCN now faces a pressing need to improve the reliability of the power system and expand its capacity to deliver energy from generation to load. TCN’s capital program has been developed to address the following key drivers for transmission improvements:

* The existing system will be able to deliver up to 7 GWs of generation to load with completion of NIPP projects. However, much of the existing system is old, unreliable and unstable, which results in too frequent customer outages at the transmission level.
* The system has limited redundancy in its design and experiences an unacceptable number of total system blackouts. These blackouts impact customer, particularly commercial and industrial users, and have the real potential of making Nigeria a less attractive country to start a new business or expand an existing business.

Existing substations and lines are in desperate need of refurbishment, as past funding of TCN’s capital requirements has not kept pace with the need for refurbishment.

* NBET’s PPAs with Successor Company GenCos and new IPPs provide for a large amount of new and refurbished generation projects that will be developed in the coming years with the expectation that TSP will expand its network to wheel the power to the DisCos.

The system as-is cannot support the anticipated growth in per capita usage and numbers of customers in all classes. If the existing system is not expanded it will negatively impact the country’s potential to increase its GNP.

Figure 1 shows the expected phased expansion of the transmission system compared to the expected peak capability of the generation connected to the grid. The primary targets for expanding the transmission system are to increase the wheeling capacity of the grid from about 7 GW in 2014 to 10 GW by 2017, and to 20 GW by 2020. The figure below demonstrates that TCN’s transmission expansion program, if implemented on a timely basis, will keep pace with the expected in-service dates for new generation, plus a prudent margin of around 30% in extra wheeling capacity.

Figure : Available Generation Compared to Transmission Capability

# Capital Funding Requirements for TCN Business Units

## Transmission Services Provider

The Transmission Services Provider Business Unit is the owner of the transmission network and is responsible for maintaining and constructing lines and substations. TSP’s mission is to provide electricity transmission services in a cost effective, efficient and reliable way.

TSP needs to implement an ambitious program of transmission improvements. For the period 2014-15, TCN will focus mainly on refurbishing existing facilities to restore the network to its original capacity, finishing projects that are in various stages of construction, and initiating the construction of over 120 new lines and substations, and many new voltage control facilities, to expand the network to a total load carrying capability of 10,000 MW by 2017.

TCN has conducted extensive planning and engineering studies to develop an optimal expansion plan to meet the targets for grid expansion from 7 GW at present to 10 GW by 2017, and to 20 GW by 2020. The detailed studies and results are shown in Annex 1 of this Investment Appraisal Package. As further explained in the annex, groups of projects will be completed in phases according to the schedule shown in Table 1 below.

Table : TSP Targets for Transmission Refurbishment and Expansion Program

|  |  |  |  |
| --- | --- | --- | --- |
|  | **USD Millions** | **GW Target** | **In Service** |
| Capital Refurbishment | $947 | - | 2015 |
| Projects under Construction | $989 | 7-8,000 | 2015 |
| Expand to 10 GW; increase network reliability | $2,235 | 10,000 | 2017 |
| Expand from 10 GW to 13 GW | $1,570 | 13,000 | 2018 |
| Expand from 13 GW to 16 GW | $1,000 | 16,000 | 2019 |
| Expand from 16 GW to 20 GW | $1,000 | 20,000 | 2020 |
| **Total: 2014-18** | **$7,742** |  |  |

Besides lines and substations projects, TSP needs to set up new regional stores to support the expansion of the network and the maintenance and construction needs of the regions. Table 2 lists the numbers required. It is planned to complete the exercise within 15 months starting from the availability of funds.

Table : TSP Additions to Land and Buildings 2014-15

|  |  |
| --- | --- |
| **TSP Land & Buildings** | **Number** |
| Regional Warehouses/Stores | 8 |
| Add - Transformer Reclamation Workshop | 1 |
| Add - Regional Manager Offices | 8 |

Table 3 shows needed TSP vehicle additions. With expansion of the network and transfer of NIPP facilities to TSP, many new vehicles will be needed in 2014-15, including a new fleet of heavy duty maintenance vehicles that will have the capabilities to reach the off-road and remote locations in the grid to ensure proper maintenance is conducted in the most efficient manner, and specialized utility vehicles like bucket trucks and cranes. Heavy utility trucks are also needed for each of the eight TSP Regions across the country.

Table : TSP Vehicle Additions

|  |  |  |
| --- | --- | --- |
| **Vehicle Fleet** | **2014** | **2015** |
| TSP Maintenance Vehicles | 200 | 120 |
| TSP Utility Vehicles | 8 |  |
| TSP Other Vehicles | 103 | 52 |

## System Operator

The System Operator ensures integrated operation of the power system in Nigeria. All generating plants, distribution companies and the Transmission Service Provider are stakeholders of SO. The main responsibilities of SO include:

* Monitor system parameters and security.
* Ensure integrated operation of the power system to deliver quality uninterrupted power.
* Facilitate merit order dispatch.
* Facilitate the operation of the power market through bilateral exchange.
* Undertake power system studies, comprehensive system planning and contingency analysis.

Maintain and augment telemetry, computing and communication facilities.

The SO needs to undertake the following major new projects in 2014-15, in addition to expenditures for basic office and transport needs:

* SCADA Restoration and Expansion: $33 Million
* Telecoms improvement project: $26 Million

New Control Center Building at NCC: $40 Million

The following sections provide the justification for the required capital expenditures.

***SCADA and Telecom***

The present SCADA system (World Bank 2009 project) is mostly dysfunctional and is being made to somehow serve the purpose with reactivation contracts. Further, since 2009 till date, new generating stations and substations have been added into the power system, which are not connected to the SCADA system through RTUs. So a new modern SCADA system is required and once it is implemented it has to be maintained and updated. The cost towards the new SCADA system has been captured in the capital budget while the cost towards maintaining and updating the system besides providing for spares is captured in the operating budget. The project to have a new SCADA system will take eighteen months from placing orders to successful commissioning.

The voice and data communication is done through optic fibre, micro wave and PLCC. This system is radial which makes it very vulnerable to outages. Hence it is planned to make a ring network configuration encompassing the new and old stations, so that in case of any outage there is always an alternate path available. Secondly the identified weak links need to be revamped for seamless communication for the SCADA system. Thirdly many new stations which have come up are not effectively covered through a communication link. Lastly we need to put in place a hotline voice communication from NCC to other control centers or stations of Discos and Gencos without which real time operation of the power system is highly vulnerable with dependency on GSM network.

All these need to be completed in phases so that we have an effective communication system in place. The costs for implementation and maintaining the communication system is captured in the Capital and Operating budgets respectively. If funded, the entire communication system upgrade project will take around eighteen months to commission.

***New Control Centre Building at NCC***

The control center building at Osogbo is in a dilapidated state and is very small from the perspective of housing up all the SCADA & Telecom servers and maintenance tools besides having the viewing gallery and control room for real-time operation and setting up scheduling desks for TEM. So it is planned to build a new control room within the stretch of available land in Osogbo. The project to have a fully functional new control centre building will require around fifteen months.

## Market Operator

The Market Operator is the Nigerian electricity market administrator designated for the implementation of the Market Rules. The MO has been administering the Pre-Transitional Stage of the market since the formal inception of the organized electricity market in 2004. The Market Rules require the MO to operate in a manner that guarantees efficiency, transparency and non-discriminatory market administration service to all Participants.

The MO is responsible for the following duties:

* Review the efficiency and adequacy of Market Rules and Market Procedures and propose such amendments as may be required to ensure their efficacy and adequacy;
* Admit & Register Participants; organise and maintain a Participants’ Register; centralise the Information required for market administration, and organise and maintain the related data bases;
* Verify that each Connection Point (Trading Point) where a Participant injects or extracts energy has proper commercial metering related to physical exchange (injection and consumption) of energy, provision of Ancillary Services and other necessary commercial transactions;

Manage the market settlement process, including preparation and transmittal of market invoices to Market Participants, revenue collection from DisCos, payment to services provides (MO, SO, NBET, NERC), finance and banking, and dispute resolution related to settlements and contract quantities.

The MO capital expenditure budget for 2015 provides for a one-time major project to upgrade settlement systems and tools to achieve the following goals:

* Improve telecommunications and website interface to automate and streamline business processes for meter data collection and settlements;
* Improve ICT in line with corporate governing structure, ICT policy and standards document to cover ICT operations across the enterprise network;
* Establish internal controls and security for market sensitive data;
* Create special fit-for-purpose server room in a restricted part of the building with security arrangements, centralize server resources across the various sections and improve authentication for users;
* Fully implement AMR as the primary system for collecting grid meter data and feeding the data to the settlement system;
* Install redundant AMR (hub – ACTARIS System) to address risk of unplanned AMR hub outage;
* Create private built-for-purpose web portal for all energy data from the System Operator and all market data supplied to Market Participants;

Create hosted e-discovery services should be procured as part of the hosted email service contract.

The full specification of this project is not yet available. The estimated capital expenditure requirement for the project is $10 Million USD (1.6 Billion Naira).

# Funding Sources and Uses

## Summary of TCN Capital Expenditure Budgets

This section summarizes TCN’s capital expenditure budget by Business Unit. The budget projections are driven by the need to refurbish existing facilities, expand/reinforce the network, improve system operations and prepare for the Transitional Electricity Market (TEM). The Business Unit budgets fully reflect the amounts needed to grow the infrastructure in step with rapid expansion of generation and load. The budget amounts are significantly higher than past spending levels, reflecting the fact that in the past TCN has suffered from inadequate funding.

Table 4 and Table 5 show the capital expenditure budgets by Business Unit for 2014-18 in dollars and Naira, respectively. The figures shown here include allocation of common costs for shared services to the BUs. The assumed disbursement profile for major projects like lines and substations is front loaded to open letters of credit covering 70% of project costs.

Table : Capital Expenditure by Business Unit, 2014-18 in Million 2013 USD

| $USD Millions (2013 $) | 2014 | 2015 | 2016 | 2017 | 2018 |
| --- | --- | --- | --- | --- | --- |
| TSP Capital Expenditure |  |  |  |  |  |
| Substation Refurbishment | 568.0 | 236.7 | 47.3 | 47.3 | 47.3 |
| New Lines and Substations | 495.4 | 2059.2 | 1434.3 | 1270.8 | 1085.6 |
| Land & Buildings | 104.0 | 104.0 | 20.0 | 20.0 | 20.0 |
| Office Tools, Furniture & Equipment | 11.5 | 12.4 | 3.6 | 3.3 | 3.2 |
| Motor Vehicles | 38 | 13.2 | 9.8 | 9.8 | 9.8 |
| TOTAL TSP CAPEX | 1,216.9 | 2,425.5 | 1,515.0 | 1,351.2 | 1,165.9 |
| SO Capital Expenditure |  |  |  |  |  |
| SCADA and Telecom | 26.2 | 33.7 | 6.0 | 6.0 | 6.0 |
| Land & Buildings | 0 | 40.0 | 0 | 0 | 0 |
| Office Tools, Furniture & Equipment | 3.4 | 2.0 | 0.6 | 0.6 | 0.6 |
| Motor Vehicles | 1.1 | 1.5 | 1.9 | 2.3 | 2.7 |
| TOTAL SO CAPEX | 30.7 | 77.2 | 8.5 | 8.9 | 9.3 |
| MO Capital Expenditure |  |  |  |  |  |
| Land & Buildings | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Office Tools, Furniture & Equipment | 1.5 | 11.6 | 0.9 | 0.5 | 0.5 |
| Motor Vehicles | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 |
| TOTAL MO CAPEX | 2.2 | 12.3 | 1.6 | 1.2 | 1.2 |
| TOTAL CAPEX | 1,249.8 | 2,514.9 | 1525.1 | 1361.3 | 1,176.4 |
| Cumulative CAPEX | 1,250 | 3,765 | 5,290 | 6,651 | 7,828 |

Table : Capital Expenditure by Business Unit, 2014-18 in Billion 2013 Naira

| Billions Naira (2013 N) | 2014 | 2015 | 2016 | 2017 | 2018 |
| --- | --- | --- | --- | --- | --- |
| TSP Capital Expenditure |  |  |  |  |  |
| Substation Refurbishment | 88.1 | 36.7 | 7.3 | 7.3 | 7.3 |
| New Lines and Substations | 76.9 | 319.6 | 222.6 | 197.2 | 168.5 |
| Land & Buildings | 16.1 | 16.1 | 3.1 | 3.1 | 3.1 |
| Office Tools, Furniture & Equipment | 1.8 | 1.9 | 0.6 | 5.1 | 5.0 |
| Motor Vehicles | 5.9 | 2.0 | 1.5 | 1.5 | 1.5 |
| TOTAL TSP CAPEX | 188.9 | 376.3 | 235.1 | 214.2 | 185.4 |
| SO Capital Expenditure |  |  |  |  |  |
| SCADA and Telecom | 4.1 | 5.2 | 0.9 | 0.9 | 0.9 |
| Land & Buildings | 0.0 | 6.2 | 0.0 | 0.0 | 0.0 |
| Office Tools, Furniture & Equipment | 0.5 | 0.3 | 0.1 | 0.1 | 0.1 |
| Motor Vehicles | 0.2 | 0.2 | 0.3 | 0.4 | 0.4 |
| TOTAL SO CAPEX | 4.8 | 11.9 | 1.3 | 1.4 | 1.4 |
| MO Capital Expenditure |  |  |  |  |  |
| Land & Buildings |  |  |  |  |  |
| Office Tools, Furniture & Equipment | 0.2 | 1.8 | 0.1 | 0.1 | 0.1 |
| Motor Vehicles | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| TOTAL MO CAPEX | 0.3 | 1.9 | 0.2 | 0.2 | 0.2 |
| TOTAL CAPEX (NAIRA) | 194.0 | 390.1 | 336.6 | 215.8 | 187.0 |
| Cumulative CAPEX | 194 | 584 | 921 | 1,137 | 1,324 |

provides a bar chart of the capital expenditure budget projection by Business Unit.

Figure : Capital Expenditure Budgets for BUs for 2014-18 in $Million 2013 USD

Table 6 shows the total capital funding requirement for TCN for 2014-5, excluding items to be funded from internal resources (i.e. office tools and equipment, motor vehicles).

Table : TCN Total Capital Funding Requirement for 2014-15

|  |  |  |
| --- | --- | --- |
| **Year** | **Capital Funding Requirement** | |
|  | USD Millions ($) | Billion Naira (N) |
| 2014 | 1,212 | 189 |
| 2015 | 2,556 | 411 |

## Existing and Potential Sources of Capital Funding

Table 7 shows existing and potential sources of funding to meet the capital funding requirement.

Table : Existing and Potential Sources of Capital Funding for TCN

|  |  |  |
| --- | --- | --- |
| **Source** | **Capital Funding** | |
|  | USD Millions ($) | Billion Naira (N) |
| Secured debt funding | 623 | 103 |
| FGN budget appropriations | 125 per yr. | 21 per yr. |
| Proceeds from the sale of NIPP GenCos | 1,600 | 264 |
| Other Loans (TBD) | - | - |

Table 8 provides a breakdown of existing sources of borrowing for capital expenditures.

Table : Existing Borrowing for TCN Capital Program

| **Source** | **US$ M** |
| --- | --- |
| Secured Funding - Debt |  |
| AfDB (EPSERP) | 100 |
| AfDB (EPSERP) | 50 |
| World Bank (NEGIP) | 108 |
| World Bank (NEGIP) | 60 |
| Eurobond | 136 |
| Agence Francaise de Development (AFD) | 170 |
| Total | 623 |

Figure 3 provides a comparison of capital funding requirements with existing sources of funding. It is clear that there is a major funding gap that needs to be addressed.

Figure : Capital Funding Requirements versus Existing Sources of Funding

# Summary of Investment Opportunity

## Financing Packages

below shows the TCN transmission refurbishment and expansion program grouped into a set of investment funds (“Financing Packages”). The detailed list of projects within each grouping is shown in Annex 1.

TCN’s most immediate goal is to subscribe investment funds for the following packages:

* Capital refurbishment;
* Package 1, which consists of new projects already under various stages of construction; and

Package 2 Groups 1-5, which consist of new projects required to increase wheeling capacity from 7 to 10 GW.

Once the investment funds for the above groups are fully subscribed, TCN intends to apply any additional available funding to expansion projects in the following phases: Package 3 (10-13 GW), Package 4 (13-16 GW) and Package 5 (16-20 GW).

Table : TCN Financing Packages

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Finance Package** | **Description** | **In Service** | **$M USD** | **Naira Billions** |
| -- | Capital Refurbishment | 2015 | 947 | 152 |
| 1 | Projects under Construction | 2015 | 989 | 158 |
| 2 | Increase from 7 to 10 GW | 2017 | 2,208 | 353 |
| 3 | Increase from 10 to 13 GW | 2018 | 1,570 | 251 |
| 4 | Increase from 13 to 16 GW | 2019 | 1,000 | 160 |
| 5 | Increase from 16 to 20 GW | 2020 | 1,000 | 160 |
| **Total** |  |  | **7,742** | **1,239** |

## Project Prioritization

To the extent possible, TCN prefers to direct the available capital funding from investors to the projects that will address the most immediate needs. TSP has developed the following prioritization for the transmission refurbishment and expansion program:

* First priority: critical refurbishment & replacement
* Second priority: critical on-going projects to be completed

Third priority: projects to increase wheeling capability (to be started in parallel with above)

***First priority: critical refurbishment & replacement***

Table 10 shows the funding requirements for critical refurbishment and replacement projects. The purpose of this set of projects is to restore the reliability and stability of the existing system.

Table : Funding Requirements for Critical Refurbishment & Replacement

|  |  |  |  |
| --- | --- | --- | --- |
| Category | No. | USD ml | NGN bn |
| Replacement of breakdown equipment | 116 | 32 | 5.1 |
| Reinforcement Projects | 26 | 111 | 17.7 |
| New trans lines & substations | 10 | 238 | 38.12 |

The refurbishment and replacement projects will provide the following benefits:

* Provide two country-wide 330kV double circuit loops to enhance reliability and stability
* Supplement the generation, transmission and distribution projects constructed under the National Integrated Power Project (NIPP)
* Restore over 600 MVA transformation capacity
* Enhance stability and reliability of the system
* Alleviate overloads that lead to equipment breakdowns
* Mitigate frequent failures and system collapses

Increase WAPP wheeling revenues

The projects are considered low risk/high reward for the following reasons:

* No need for feasibility, wayleave, compensation, environmental studies
* Short implementation time, immediate benefits

Relatively low cost and low risk of project completion

***Second priority: critical on-going projects yet to be completed***

Table 11 shows summary statistics for on-going projects that have no firm commitment for timely capital cash flow. There are 226 such projects. Table 12 shows a breakdown of percentage completion for these projects.

The ongoing projects are critically important to enhance system reliability, stability and efficiency. Issues such as cost escalation, wayleave, non-payment of contractor invoices, and quality control have delayed commissioning. Delayed completion of these projects limits TCN’s ability to start new projects and stay ahead of the expansion targets

Table : Summary Statistics for Ongoing Projects

|  |  |  |
| --- | --- | --- |
| Voltage Level | Miles of Lines | Transformation Capacity |
| 330 kV | 600 kM | 3,720 MVA |
| 132 kV | 4,182 kM | 5,510 MVA |

Table : Percentage Completion for Ongoing Projects Requiring Capital Funding

|  |  |  |
| --- | --- | --- |
| Percent Complete | Number | Billion Naira |
| Completed w/outstanding payments | 18 | 1.90 |
| Projects ≥75%, <100% completed | 36 | 10.44 |
| Projects ≥40%, <75% completed | 16 | 29.41 |
| Projects ≥10%, <40% completed | 43 | 80.23 |
| Projects with little/no activity | 7 | 20.76 |
| Projects with planning underway | 29 | 5.49 |

***Third priority: projects to increase wheeling capability***

TCN’s immediate priority for system expansion is to increase system capability to wheel load from 7 GW to 10 GW by 2017 (“Financing Package 2”). These projects must proceed on a timely basis to keep up with the anticipated expansion of generation and load.

The projects in Financing Package 2 are organized into 5 groupings based on geographical regions to optimize the overall benefits, as projects in Groups are interdependent and must be completed together. Grouping projects within the same geographical area may be advantageous for mobilizing construction work, since all components of the group are within the same proximity. It is the hope of TCN that funders will support a specific group of projects, or combine with others to fund a group. Once funding is in place for a specific group, contractors (or consortiums) will be invited to bid for a contract to develop that group of projects.

Table : Project Groups to Expand System from 7 GW to 10 GW by 2017

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Fund Group** | **Description** | **Substation & Line Projects** | **Voltage Control Projects** | **Million USD** | **Bn Naira** |
| 1 | Kainji-Birnin Kebbi-Gusau | 11 | 13 | 438 | 70 |
| 2 | Lagos | 25 | 21 | 548 | 88 |
| 3 | Jos – Gombe – Damaturu | 4 | 8 | 246 | 39 |
| 4 | Awka – Ugwuaji – Jos | 16 | 13 | 617 | 99 |
| 5 | Benin – Katampe | 5 | 16 | 385 | 62 |
|  | **Totals** |  |  | **2,235** | **358** |

# Investment Framework

Investors are invited to participate in financing packages that best fit their particular funding preferences and requirements. TCN intends to work with interested investors to form a consortium for each financing package. Funds invested in a package will be pooled. It is envisioned that each investor consortium will have an executive oversight function. TCN intends to comply with any requirements imposed by investor consortia for project implementation such as program design, monitoring, controls and reporting. The following sections provide a general framework for oversight and management of the investment funds.

## Investment Fund Structure

TCN has developed the following basic structure to be used for the investment funds:

* Sets of projects will be grouped into “financing packages.”
* Investors will form a consortium for each package.
* Funds invested in a package will be pooled.
* Each consortium will have an oversight function.
* TSP will set up Project Implementation Unit(s).
* Each package (or multiple packages) will be managed by a single Owner’s Engineer reporting to the PIU.
* Universally accepted procurement guidelines will be used.
* FGN will be involved for approvals, guarantees, oversight, waivers etc.

TCN Board will approve investment plans.

The foregoing structure is provided as a basic guideline. The framework will be refined and revised as needed to meet the needs of investors.

## Roles and Responsibilities

Figure 4 shows a graphical depiction of the roles and responsibilities for the executive management, oversight, administration and execution of the investment funds.



Figure : Roles and Responsibilities for Investment Funds

## Duties of Owner’s Engineer

TCN intends to engage an Owner’s Engineer for each investment fund or multiple investment funds, similar to the approach used for the NIPP projects. The Owner’s Engineer must bring international qualifications in large-scale infrastructure investment programs. The Owner’s Engineer will have the following duties:

* Pre-tender feasibility studies and basic engineering
* Bidding strategy including bid packaging concept
* Assessment of contractor qualifications
* Technical specifications
* Cost estimates
* Commercial documents
* Bid evaluation and contract finalization
* Engineering reviews
* Interfaces, integration, project phasing
* Review of contractors’ specifications and plans
* Statutory permits and clearances
* Construction management
* Commissioning and trouble-shooting

Project completion activities

## Contracting Alternatives

TCN is open to any of the following forms of contracting, depending on investors’ needs and preferences:

* Traditional Engineer Procure Construct (EPC)
* Build Own Transfer (BOT)
* Build Own Operate (BOO)
* Build Own Operate Transfer (BOOT)

Build Own Operate Maintain Transfer (BOOMT)

Annex 5 shows the guidelines to be used for competitive procurement and contracting.

## Banking and Payments

TCN will work with investors to institute effective banking and payment arrangements. In general, investment funds will be kept separate from TCN general funds. The Investment Consortium will be involved in selection of banks and approvals for release of funds to contractors. Investors will have the option to make direct payment to contractors. Such terms and conditions will be set out in the funding agreements.

## Matching Investors to Investment Funds

The following considerations, among others, will be used to match investors to investment funds:

* Ability to meet required funding disbursement schedule
* Investor’s internal corporate governance restrictions
* Investor’s requirements for due diligence and approvals
* Amount of investment required versus investor’s capacity
* Investor’s requirements for return on investment
* Extent of studies completed versus investor’s requirements
* Investor’s requests for non-standard terms and conditions
* Flexibility of funding model eg BOT
* Investor’s track record

Level of counterpart funding required

# Economic and Financial Assessments of Projects

Annex 3 provides an economic assessment of the new projects included in Financing Package 2. The economic analysis compares two cases, with and without the transmission projects. Project benefits are calculated as the savings to consumers for replacement of costly self-generation from diesel and petrol generators with grid-supplied power priced at prevailing tariff levels. Project costs are calculated as the sum of project completion costs plus economic values of lands occupied by transmission. All of the groups of projects in Financing Package 2 are estimated to be cost effective from the consumer’s standpoint.

Annex 4 provides an assessment of the financial viability of each group of projects assessed in terms of project benefits (tariff revenues collected for the increase in wheeled energy) and costs (investment costs, operations & maintenance (O&M) costs and corporate income tax on profits). Each group is considered financially viable if its Financial Internal Rate of Return (FIRR) is equal to or greater than the Weighted Average Cost of Capital (WACC), estimated at 7.5% (real after tax as per NERC estimates for MYTO tariff evaluation).

The benefits are evaluated for two alternative tariff scenarios, MYTO II tariff levels and fully cost reflective tariffs. The assessment indicates that fully cost reflective tariffs will provide the required positive financial results for all Groups in Financing Package 2. However, financial returns are inadequate if existing MYTO II tariff levels will persist into the future. To address this risk, TCN intends to make an application to NERC for higher tariffs to reflect changes since the tariffs were developed, which have been unfavourable to TCN from a revenue standpoint.

#### Annex 1 Transmission System Development Plan and Capital Funding Requirements

#### Annex 2 Economic Benefit Assessment of Financing Package 2 Projects

#### Annex 3 Financial Analysis of Financing Package 2 Projects

#### Annex 4 Financial Assessment of TCN

#### Annex 5 Guidelines for Competitive Procurement and Contracting

Section 1: Nigeria Public Procurement Act, 2007

Section 2: Nine Essential Steps in Public Procurement

Section 3: Bureau of Public Procurement Thresholds for Service-wide Public Procurement