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U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
Global Bureau and the Office of Transition Initiatives

In collaboration with:

THE U.S. DEPARTMENT OF ENERGY
Office of International Affairs

REPORT

SHORT TERM REFORMS FOR THE NIGERIAN ENERGY SECTOR

December 1999

Prepared under Contract for:
United States Agency for International Development
LAG-I-00-98-00006-00
Short-Term Technical Support

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23865-222-079-0002

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Introduction

Background

This report describes the findings of a USAID-funded scoping trip to Nigeria to develop a set of short term interventions that will lead to critical reforms for the Nigerian Energy Sector. The purpose of the mission was to identify and prioritize high impact interventions that can be accomplished in the next six to twelve months to support the energy sector policies of the newly elected government.

The USAID-led team, consisting of representatives of USAID/OTI, USAID/ENV, USDOE, the U.S. Embassy in Lagos, and Bechtel National, Inc., visited Nigeria in the second week of November 1999 for a series of interviews with leaders in the energy sector. Meetings were held with representatives of federal ministries, international development banks, commercial banks, international oil and gas companies, local and federal governments, the Nigerian national utilities for electricity, oil and gas, and the U.S. Embassy in Lagos.

Based on requests made by the Nigerian authorities and information gathered during the visit, the team developed a set of short term interventions that will initiate meaningful progress in the Nigerian energy sector. These intervention projects are recommended for funding by USAID, U.S. Department of Energy (DOE), or other international agencies and donors. The projects have been prioritized to address urgent or important issues, tackle solvable problems, build on USAID's and DOE's areas of core competence, leverage USAID funding to the Nigerian energy sector, and complement the World Bank energy program currently under development.

Taken together, these activities represent a coherent program that:

- Will help the democratic government get short term results, particularly in the area of independent power production;
- Combine synergistically for integrated impact;
- Have short-term impact but are critical building blocks for long-term reforms;
- Can be initiated by one donor (such as USAID/OTI , USAID/ENV or DOE) and later assumed and deepened by another (such as USAID/Nigeria or the World Bank); and
- Are essential precursor activities essential to the success of the proposed World Bank privatization loan and to the privatization strategy of the Government.

During the scoping mission, the team looked at the oil, gas and electric power sectors for possible interventions. However, the recommended interventions focus mainly on the power sector. This is because of a number of conclusions that emerged during our visit. First, it became clear from the Nigerians that electric power is a priority concern. Second, the fuel shortage problems that had been causing long gas lines had already been resolved by government actions. Third, the magnitude of funding needed to work in all three sectors necessitated a more

focused program. Fourth, the cost of the needed interventions in the oil sector are beyond the expected budget of USAID and DOE. Fifth, the World Bank has proposed a comprehensive oil and gas program that will address most of the oil and gas issues.

Our interviews with government officials and other donors revealed that no work is currently being done in Nigeria in the energy sector by other bilateral or multilateral donors. This hiatus of donor activity is due to the record of the previous military government, which resulted in the withdrawal of most donors from Nigeria. Only now is the World Bank putting together a loan package for a privatization program for both the oil and power sectors. However, these proposed loans will take time to put together, may not be accepted by the Nigerians, and need to be supported in early stages with essential policy reforms, technical assistance and training. This donor void represents a major opportunity for the U.S. Government to help shape Nigerian economic and energy policy. The expressed commitment of the Nigerians to engage in deep reform warrants support by the U.S. Government and is in line with U.S. Government policy.

Why Energy Interventions?

The U.S. government needs to help stabilize Nigeria's nascent democracy by helping the country to address its energy problems. Although it is not publicly articulated, Nigeria has an energy crisis. USAID has the opportunity to help avert a looming political crisis – and perhaps a return to military government – stemming from continued economic stagnation caused, in part, by energy shortages and related energy sector problems.

Stable, reliable and plentiful supply of energy is an essential building block of a sustainable economy and a stable democracy. Long term reforms in the energy sector are necessary to solve Nigeria's economic ills and to fuel the economic growth necessary to alleviate poverty. While a long-term reform program is important, there is a critical need for immediate progress. Fuel shortages and electric power blackouts are destabilizing the government. The trouble is, energy sector problems cannot be resolved overnight. Energy investments are extremely large and lead times are long.

What is the solution? In the short term, the government must take action. A coherent energy strategy, meaningful reforms, highly visible action, and the promise of improvement will build public confidence in the government's competence. These elements will buy the government the time it needs to set in place the policies and enabling environment that will attract investment in the sector and provide a sustainable solution to Nigeria's energy problems.

Short Term Interventions

This report presents one-page descriptions for the recommended interventions. Each description provides a summary of the intervention and rationale, target audience, Nigerian counterpart companies and agencies, project objectives and results expected, level of effort for the implementation team and project schedule. The interventions have been categorized by level of priority, as indicated below.

First Tier Priorities

The first tier of high priority interventions will assist the Nigerians to implement key reforms and create the enabling environment that will accelerate the pace of new energy infrastructure projects and attract investment. The projects have been designed to complement the World Bank loan that will include technical assistance and capacity building in the Nigerian energy sector. The projects come at an opportune time, as the government of Nigeria has shown its commitment by passing the Privatization and Commercialization Decree No 28 of 1999 covering many state-owned enterprises including the energy utilities.

USAID can leverage its program off the ongoing government reforms and development bank assistance programs, especially in the electric sector, which is most in need of immediate reforms. The first tier interventions are:

- Public Awareness, Consensus Building and Education Campaign
- Restructuring / Privatization / Regulatory Reform Seminar
- Energy Industry Investment Workshop
- Investment Framework Assistance
- IPP / PPA Workshop and Technical Assistance
- Enabling Legislation and Legal Technical Assistance
- Regulatory Framework Seminar and Technical Assistance
- Electricity Pricing Study, Seminar and Technical Assistance
- Gas Value Chain Analysis
- Capacity Building

A suggested schedule for the first tier interventions is shown in the attached diagram. Fast action is critical as the new government moves forward with its ambitious reform program. In recognition of the favorable environment for change, we recommend that the first tier interventions begin as soon as possible in the first quarter 2000. All of the first tier interventions should be initiated in the first three quarters of the year. Several interventions are expected to continue over the course of the year. While all of the interventions identified in this report can be completed in 2000, some of them (such as capacity building activities) could and should be continued into subsequent years as part of a sustained donor program in the energy sector.

Second Tier Priorities

The second tier interventions are recommended as important priorities which will result in major improvements for the overall efficiency of the sector. While they will contribute to the overall progress of energy sector reform, they could be deferred. For this reason, we have not provided

a firm schedule for these interventions. They should be initiated as soon as possible within the limits of funding for the activities. These interventions are:

- Rural Electrification Workshop and Technical Assistance
- Liquid Product Pricing Seminar
- Procurement Practices Workshop
- Data Collection and Modeling Technical Assistance
- Valuation Techniques for Assets Seminar

In addition to the interventions described in this report, a number of other projects are required to support the change process in the short term. The following important interventions should be taken up by other agencies:

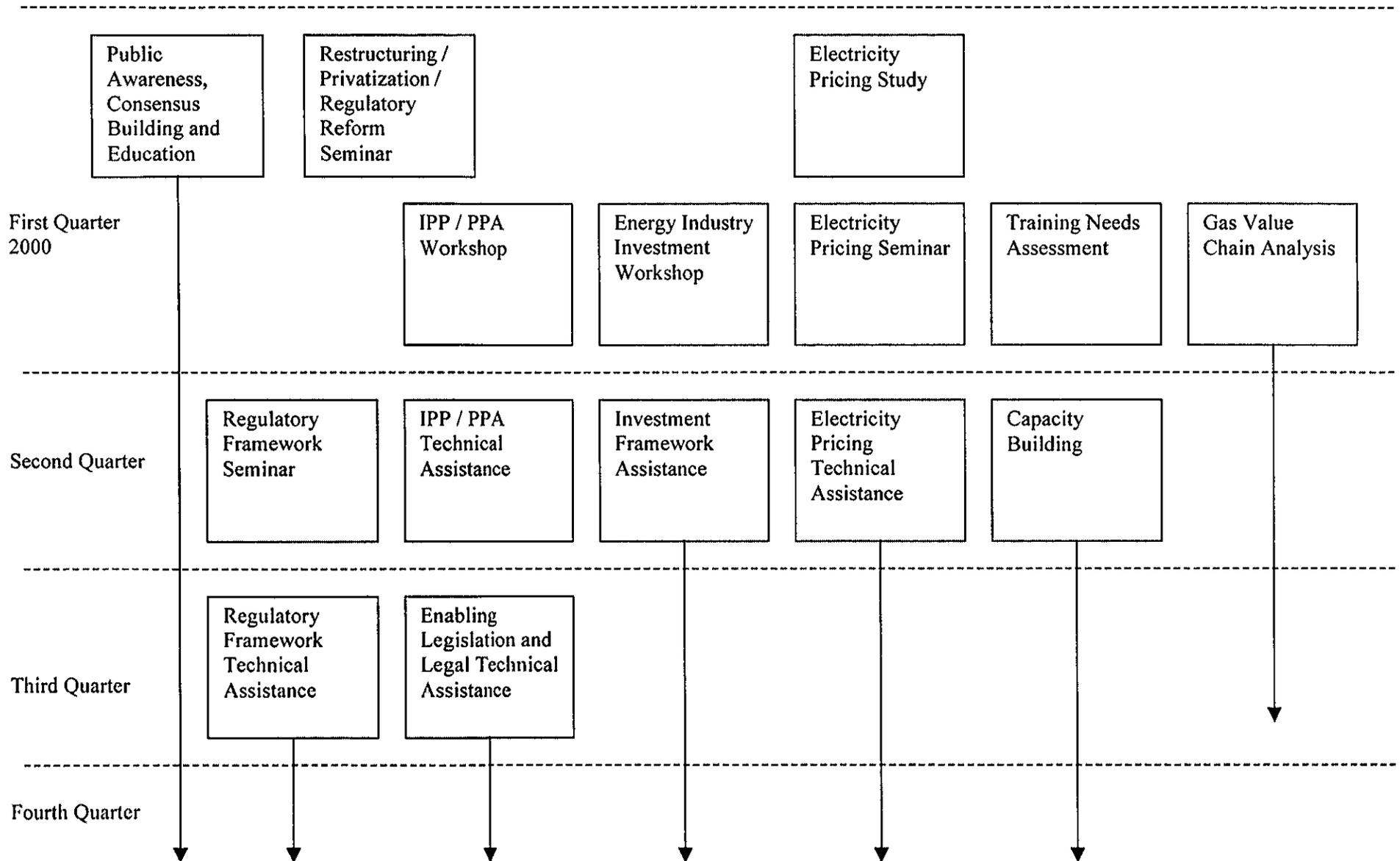
- Fuel Purchase Agreement Formulation
- Improved Transparency in Taxation
- Drafting of the Electricity, Energy and Oil and Gas Laws
- Labor Outplacement and Transitional Support Programs
- Triage Analysis of Generation and Transmission
- Transparency in Recruitment
- Debt Management for Governments
- Energy Efficiency and Demand Side Management

Overview of Report

The main body of the report consists of the Introduction Section followed by the one-page summaries of the tier one and tier two interventions. Following the intervention sheets are the following attachments:

- Attachment 1 presents an overview of the Nigerian oil, gas and electric sectors highlighting key issues.
- Attachment 2 provides a diagram of typical restructuring/deregulation process for the energy sector.
- Attachment 3 is a list of the meetings conducted by the USAID team.
- Attachment 4 is background information on the Nigeria Electric Power Authority provided to the team by NEPA.

Schedule of "First Tier" Interventions



Public Awareness, Consensus Building and Education Campaign

Description and Rationale:

Nigerian politics has been dominated for many years by traditional socialist views on state intervention in national assets such as the energy industry. However, the debate has started on the restructuring and deregulation of the Energy Industry. Many Nigerians have seen the beneficial effects of deregulation in the USA, UK and African countries. However, the level of debate is not high and pressure is often exercised through riots by small vested interests.

It is easy for those immediately affected by the potential changes to highlight the potential problems of deregulation – such as job losses in overstuffed public sector utilities and this can encourage parochialism and nationalistic sentiments. The gains are not being championed sufficiently, usually due to lack of knowledge. The need for this type of intervention was clear from the interviews in Nigeria. Most of the individuals we met support deregulation, but lack the ability to clearly articulate the case. The Nigerian Government is proposing a major privatization initiative. This intervention would help the Government to make its case to the people, explain the advantages and disadvantages, and build public consensus for reform.

The intervention will provide published academic work on the benefits of deregulation in forms that are directly relevant and accessible to the media, government officials and politicians. This will be achieved by dialogue at several levels – small briefings for senior people and larger forums for the media. The support of Nigerian associations, such as the Economic Forum and Nigerian business associations, will be sought. Ad-hoc assistance to Nigerian deregulation champions will be provided via a full time Nigerian national, who will be recruited to work from the OTI office. This person will monitor the media, help respond to questions, provide information to the Government to support its case for reform, and coordinate a public awareness and education campaign. The contractor will provide support from the home office to respond to questions and issues that arise.

Target Audience / Counterpart:

Deregulation champions need to be identified amongst political, media, officials and the private sector.

Objective and Results Expected

The primary objective is to create a consensus for reform by providing unbiased information, raising public awareness, and educating policymakers and the public. Unless this is done, the work of other interventions and of the World Bank will be frustrated. The direct results will be a set of materials and media coverage that provides an informed debate on restructuring issues and shows the benefits and the potential problems. Deregulation champions will be identified.

Level of Effort

The project will require 6 person months for team leader and 12 months full time for Nigerian local staff, plus an allowance of 6 weeks of input from keynote speakers. Additional support for this activity will be provided by OTI staff. The team leader should have a thorough knowledge of deregulation and must be able to provide part time coverage for the duration of the project to rebut stories as they appear in the Nigerian media. For seminars in Nigeria, keynote speakers will assist the team leader.

Schedule:

The intervention should start as early as possible in the first quarter 2000 with suitable high level seminars. The ad-hoc rebuttal advice service should be active throughout the year.

Restructuring / Privatization / Regulatory Reform Seminar

Description and Rationale:

The Government of Nigeria has committed to restructuring and privatization of the power sector as the means to achieve investment, competition and commercial orientation. The Bureau of Public Enterprises has been given the mandate to privatize NEPA, and NEPA has submitted its own plans for restructuring along business lines, however no tangible steps have been taken and key decisions are yet to be made.

At this early stage in the reform process, it is important that Nigerians gain a basic understanding of international experience with power sector reform, and how to apply that experience within the Nigerian context. A USAID-sponsored seminar (perhaps with World Bank co-sponsorship) for key decision-makers and their staffs will set the stage for deciding on the policy and institutional framework for the sector and developing a step-by-step approach to implementation. Broad media coverage should be contemplated for this seminar to help publicize the issues raised and engage public awareness of the government's restructuring initiative.

The seminar will include two separate sessions: a one-day session for top officials focussing on the key decisions that must be made, and a subsequent two-day session for staff focussing on approaches to restructuring, privatization and regulatory reform of the power sector. The seminar will cover the following topics: international experience in restructuring; consensus building on structure of Nigerian electricity sector; international experience selling state-owned assets; unbundling; overview of IPPs; role of the regulator; regulatory framework alternatives for generation, transmission and distribution companies.

Target Audience / Counterpart:

The target audience for the seminar will include:

- Session 1—high level one-day seminar for the Privatization Council, Minister of Power and Steel, NEPA Managing Director and key aides, energy leaders in the Nigerian legislature, journalists
- Session 2—workshop on implementing reforms: Ministry of Power and Steel Directors, NEPA Executive Directors and key staff, Bureau of Public Enterprises, regional governments

Objective and Results Expected

The objective of the seminar is to prepare people for change by building Nigeria's capacity to implement a competitive framework for the power sector, carry out required enterprise privatizations and establish the power sector regulator. This project aims to raise awareness of options and build a consensus for the basic elements of reform to be put in place in the coming months.

Level of Effort:

The project will require 8 person weeks (5 weeks team leader; 3 weeks team member). The team should consist of: 1 power sector restructuring/privatization specialist; 1 electricity regulatory specialist; invited guest speakers from Nigerian IPPs, commercial banks, World Bank and others.

Schedule

The seminar should be held in the first quarter 2000.

Energy Industry Investment Workshop

Description and Rationale:

Given the lack of investment over the past ten years, many of the key decision makers can benefit from a workshop on investment in electricity, oil and gas. Nigerian's need to understand more clearly the requirements that international bankers, investors and developers will demand in order to invest in Nigeria. In this intimate workshop for top officials, USAID will bring bankers, investors and developers to share with top Nigerian officials the investment environment that they require to make investments in countries like Nigeria. This workshop should be small and intimate, and structured in a way that senior officials can ask questions of investors that they ordinarily would not in more public forum.

The workshop will cover the following topics:

- international market for energy project development and developers' requirements
- status of energy investment policies, regulations and legal framework in Nigeria contrasted with other relevant international examples
- financial, economic and commercial issues
- distribution of benefits and risks to the private investor, Nigerian energy companies and the Government of Nigeria
- regulatory requirements to attract energy sector investments;
- financial and legal encumbrances of the World Bank/IMF programs for Nigeria and how these affect the assessment of investments.

Over the course of the workshop, the project team will develop a plan for ongoing USAID investment framework assistance. Following the workshop, the team will begin the process of implementing the ongoing technical assistance described in the next intervention.

Target Audience / Counterpart:

The target audience for this activity is the top management level of the Privatization Council, the Bureau of Public Enterprises, NEPA, NGC/NNPC, the Ministry of Finance, and relevant members of the Legislative committees. The counterpart agency for this activity will be either the BPE or the NCP.

Objective and Results Expected:

The objective of this activity is to advise the senior Nigerian officials and legislators of the investment environment necessary to attract investment, and to provide them with guidance about the actions that they must take to enhance Nigeria's investment climate.

Level of Effort:

The project will require 1.5 person months for a team consisting of 2 people: one an experienced financial and economic analyst familiar with economic reform programs, the other a lawyer familiar with international energy investments.

Schedule: The activity should be completed over a period of two days, with the production of materials to precede the workshop. The project should start in the first quarter 2000.

Investment Framework Assistance

Description and Rationale:

Over the past ten years, Nigeria has suffered a severe shortage of domestically-oriented investment, from within Nigeria or from abroad. As a result, the executive branch, legislators and other decision-makers require ongoing assistance to establish an appropriate investment environment. Officials with line authority for approving energy investments need to be able to evaluate competing proposals in their day-to-day jobs.

The investment framework technical assistance will help officials to:

- Understand and identify the essence of various proposals, and enable them to compare investments. (In part by providing the essential macro-level tool kit, including case studies).
- Evaluate different proposals from investors.
- Understand different legal and regulatory frameworks that promote energy sector investments.
- Design and propose specific interim regulatory activities to permit new investments in electricity, gas and oil supply or transport (transmission) for domestic consumption.
- Create an IPP Committee with the charge of evaluating and implementing electricity supply projects.

Over the course of the previously discussed investment workshop, the project team will develop a plan for ongoing USAID investment framework assistance. Following the workshop, the team will begin the process of implementing the ongoing technical assistance described above.

Target Audience / Counterpart:

The target audience for this activity is the top management level of the Privatization Council, the Bureau of Public Enterprises, NEPA, NGC/NNPC, and relevant members of the Legislative committees. The counterpart agency for this activity will be either the BPE or the NCP.

Objective and Results Expected:

The objective of this activity is to build the capacity of the Nigerian officials with line responsibility for investment approval.

Level of Effort:

The project will require 6-8 person months for a team consisting of 2 people: one an experienced financial and economic analyst familiar with economic reform programs, the other a lawyer familiar with international energy investments.

Schedule:

The activity should be completed over the 12 months following the workshop. The project should start in the first quarter 2000.

IPP / PPA Workshop and Technical Assistance

Description and Rationale:

The electric power supply system of Nigeria is seriously deficient in its ability to supply the populace with reliable power. With endemic blackouts and unpredictable supply, expensive private generation is an operational requirement for any factory or business. Since much of the generation capacity is seasonal hydroelectricity, and much of the rest unreliable, there is a clear demand for new generation capacity that is both less expensive than backup units and more reliable than the NEPA system.

A number of power development companies have seen this opportunity and have presented proposals to NEPA or other governmental units to build independent power plants and sell to the system with power purchase agreements. It is inevitable that this activity will occur during an interim period over which much of the country's electricity system will be reorganized and sold off. This activity will assist the government in framing consistent, standardized power purchase agreements. The project will consist of three phases:

1. Investigation of the current power system and the IPP proposals that have been made to the government. Provide targeted advice on terms and conditions for purchase agreements.
2. A half day work shop for senior officials on the fundamentals of power purchase agreements, sufficient to give them a basic understanding of IPP issues.
3. A 3-5 day workshop for relevant officials on the nature of power purchase agreements, the types of clauses that are needed for consistency and long term viability, and a generalized format for these contracts consistent with international practices.
4. After the workshop, a TA will construct a framework for PPAs that promotes the goals of private power development for the country. This TA will include legal and regulatory assistance on planning and managing energy sector investments and regulating IPPs.

Target Audience / Counterpart:

The target audience will be NEPA, Ministry of Power and Steel, NCP, Ministry of Finance, NNPC and others at the General manager level. The audience will include potential staff of the IPP Committee and the interim regulator. Counterparts should be from NCP and NEPA.

Objective and Results Expected

A successful completion of this activity will leave the country with a core of officials who

- Understand the fundamentals of IPPs and power purchase agreements, including the key risk factors which contributors to success or failure of these projects;
- Have the ability to evaluate proposed IPPs and their enabling PPAs, and understand basic structuring of PPAs and IPP transactions;
- Understand how to make PPAs consistent with subsequent power system restructuring.

Level of Effort:

The project will require 5 person months (1 x 2.5 + 1 x 1.5 + 1 x 1.0). The team will include an experienced financial and economic analyst familiar with IPPs and electric power restructuring programs (team leader and creator of the workshop materials), a power system expert on IPP programs, and a lawyer familiar with international PPAs.

Schedule:

The activity should be completed over a period of three months starting first quarter 2000.

Enabling Legislation and Legal Technical Assistance

Description and Rationale:

Virtually every official interviewed by the USAID team mentioned legal and regulatory activities as a key area for short term focus and improvement in governance. For the country's network energy industries, power grids and oil & gas pipelines, there needs to be consistent and transparent regulation that will enable the energy supply firms and their customers to transact business in an efficient, fair and transparent manner. This proposed intervention will meet this goal by providing short term assistance in the following areas:

- A legal framework for network access;
- Enabling legislation (e.g., electricity law or energy network law) to permit needed transactions to occur (e.g., power wheeling, gas pipeline common carrier, etc.);
- Establishment of an independent interim regulatory authority;
- Legal advice on tariffs and transaction regulations.

An initial mission to interview Nigerian government officials and potential investors, buyers and sellers will be conducted prior to the legal technical assistance. This mission will determine the split between the short and long term interventions and will define the nature of the transactions that can be effectively regulated in the interim period.

Target Audience / Counterpart:

The intended audience for this activity will include legislators, ministries, the interim regulatory body, if appointed, NPC, NEPA, NGC and the Utilities Charges Commission (Office of the President). A counterpart team will be assembled among key legislators, regulators, NPC, NEPA and the UCC.

Objective and Results Expected:

The objective of this activity is to provide prototype legislation and devise an interim legal framework that will encourage new investments. The legal framework will institute fair pricing, reduce transactional costs for all participants, provide access to the network industries and make more transparent the nature of the charges in the network systems. At the completion of this activity, the country will have proposed legislation or executive orders for the following areas of concern:

- Open access to networks with appropriate legal and regulatory common carrier provisions;
- Direct transactions between buyers and seller through networks; and
- Establishment of regulatory body to act as referee and to represent the public interest.

Level of Effort:

The project will require 6 person months for a 2 or 3 person team. The team leader will be an energy lawyer with diverse international experience on similar assignments. The team leader will be assisted by a legal/regulatory specialist and possibly a power system economist or financial analyst. The actual production of relevant decrees or interim regulations may involve additional lawyers and technical experts.

Schedule:

The activity should be initiated in the first quarter 2000. The assistance program will be implemented over a period of 6-8 months.

Regulatory Framework Workshop and Technical Assistance

Description and Rationale:

As Nigeria takes steps to negotiate its first IPP purchases and privatize its state-owned power companies, leaders in the government, the energy agencies and NEPA are recognizing the need for an independent regulator to protect the interests of consumers, power companies and the government alike. Initially the energy regulatory function may reside within the Ministry of Power and Steel. This agency has no institutional experience regulating private companies. There is an urgent need to identify and adopt an appropriate regulatory framework, and to train the regulator in the basic processes of regulating private and state-owned energy companies.

This project will review alternative regulatory frameworks that have been used in other countries under circumstances similar to Nigeria's, and provide a seminar on regulatory approaches. The seminar will serve as a forum for building knowledge and consensus on the preferred regulatory framework for Nigeria. Topics for the seminar will include: role of the regulator; cost regulation for generation, transmission and distribution; the power procurement process including least-cost planning, competitive tendering and negotiating PPAs; public participation; theory and practice of regulation; and other topics to be decided in co-operation with Nigerian counterparts.

Following the seminar, a technical assistance project will provide training for the regulator in implementing a competitive market structure, licensing, access to grids, tariff setting, planning process for capacity expansion and grid enhancement, overseeing market function, grid codes, dispute resolution, public process, social impacts and public outreach.

Target Audience / Counterpart:

The scoping mission to Nigeria was unable to identify counterpart individuals for this project because the regulatory body has not been formed. In fact, the role of the regulator is yet to be established in legislation. This lack of progress on regulation is a source of concern since the country is moving ahead with privatization and IPPs without a transparent regulatory framework or a designated regulator. With time, and as other USAID interventions emphasize the need for the regulator, it is likely that a counterpart will emerge either at the Ministry or in a new agency formed by the government. In addition to the new regulatory body, the target audience will include ministries, NEPA, legislators, IPPs, and the Privatization Council.

Objective and Results Expected

The objective of the project is to establish market-based regulation of the energy sector by providing an appropriate regulatory framework and training for the future regulator and other interested parties. The expected results include government adoption of an appropriate regulatory framework, and improved knowledge of regulatory approaches for the energy sector. The project will deliver a 2.5 day seminar in lecture and workshop format.

Level of Effort

The workshop will require a two-person team of regulatory specialists for a total of 6 weeks (3 weeks per person, 1 week in home office and 2 weeks in field to plan and conduct the workshop). The technical assistance will require 20-25 person-weeks of effort by a combined team of legal/regulatory specialists and pricing specialists.

Schedule:

The project should be sequenced after the restructuring seminar and after the government's plan for the regulatory body is better developed. The workshop will be held in the second quarter of 2000, and the technical assistance will begin in the third quarter.

Electricity Pricing Study, Seminar and Technical Assistance

Description and Rationale

Nigerian electricity tariffs, which average 2 cents per kilowatt-hour, are too low to provide for required investments in power infrastructure. Many NEPA customers are ready to pay higher tariffs for more reliable power supplies, but the government continues to set prices below cost as a means to protect the poorest consumers. Pricing studies are prepared internally for the National Planning Commission.

There is strong support for rational tariffs among the professionals at NEPA and power agencies, however there is lack of knowledge on the theory and practice of pricing for electric services. Improved knowledge of economic pricing will provide the ammunition for key players in the sector to convince government decision makers that Nigeria must transition to cost-based tariffs and establish incentive transfer pricing between generation, transmission and distribution.

This project will include three components, 1) a TA on long-run marginal cost pricing, 2) a seminar on the theory and practice of tariff setting, transfer pricing, wheeling charges and price regulation and 3) ongoing technical assistance to a core group of tariff specialists and key officials. The TA will evaluate cost-based tariffs for Nigeria based on the least cost development plan for the sector, provide recommendations for tariff reform and subsidies, and produce a short report that can be circulated to key decision makers. The TA will provide the background needed to develop an effective seminar relevant to the Nigerian situation. The seminar will train Nigerians professionals in price setting for end-use tariffs and in transfer pricing for generation, transmission and distribution. Following the seminar, a program of ongoing technical assistance will provide continuing support for pricing reforms.

Target Audience / Counterpart:

The technical assistance will benefit NEPA, the Ministry of Power and Steel, the Ministry of Finance, the "transitional regulator", if identified, and the National Planning Commission. Representatives of NEPA and the Ministry will work directly with the consultant to develop required data and methodology, and gain on-the-job training in pricing.

Objective and Results Expected

The objective of the project is to provide recommendations and training on cost-based electricity prices and transfer prices between generation, transmission and distribution. The project will provide a basis for implementing a tariff transition strategy and a framework for cost regulation of an unbundled electricity industry. The project will provide a greater understanding of cost-based pricing, spur progress in pricing reform, and develop an open access transmission tariff.

Level of Effort

The pricing study will require a total of 10-12 person weeks split between a team leader specializing in electricity pricing and price regulation, and a finance expert. The seminar will require 1 week in the home office and 1 week in the field for 2 consultants. The level of effort for ongoing technical support will depend on the results from the pricing study and seminar.

Schedule:

The TA can be completed over the course of 10-12 weeks in the first quarter 2000. Then the seminar can be conducted over the 2 weeks immediately following the TA.

Gas Value Chain Analysis

Description and Rationale:

Nigeria has major gas resources and flares approximately 75% of gas the 35 bn cubic meters it currently produces; probably the worst performance in the World. The Government has been concerned by the issue and has introduced penalties for gas flaring, although these are small. However, gas prices are extremely low, which discourages these investments and results in confused price signals reaching the oil companies. Some gas projects can be viable under the current arrangement solely due to the tax system – effectively the Nigerian Government finances the projects through taxation forgone on oil exports. The end result has been the sub-optimal development of gas. Rational gas prices and secure supplies are essential for real IPP projects to come to fruition. The intervention would support the longer terms plans for development of the gas sector currently planned by the World Bank, but would focus on providing a quick framework for gas prices and encourage the development of IPPs. The need for this intervention was stated in nearly half of the interviews in Nigeria.

The intervention would look at both the supply and demand side of gas use. The supply side in Nigeria is particularly complex, as most gas is associated gas from relatively small fields. The economics of these are not well known and a critical, but high level, review is needed of the operating companies costings for gas supply to the trunk pipeline. On the demand side, there are a number of competing uses, including power generation, LNG, nitrogenous fertilizer production, iron and steel and aluminum. All of these are demanding special pricing concessions from the Government. A simplified view of the economics of these industries is needed to show the breakeven cost of gas for them. Comparisons should be made with other countries. The results of the TA should be presented and discussed at workshops with relevant officials.

The core of this work will be on focussing attention and debate onto the best uses for gas. This will allow more detailed work to be undertaken later by the World Bank to be concentrated on to the most important issues and will help eliminate sub-optimal gas utilization projects being developed. The work will provide a reasonable gas price range that would facilitate the development of IPP projects.

Target Audience / Counterpart:

The primary target audience and counterpart will be NNPC and its subsidiary, NGC. However, the Ministry of Power and Steel is the principle gas consumer and must be part of the work.

Objective and Results Expected

Provide the officials with a rational framework for gas pricing and with good data on the *long run marginal cost* of gas. This will allow them to screen out prospects for gas, both supply and demand, and to focus efforts on high value added projects. The information on gas supply is critical in the formulation of IPPs and this project should encourage more high quality proposals to meet the country's critical power supply problem.

Level of Effort

The project will require 12 person-weeks. A team of three is envisaged, one specialist in upstream oil and gas to handle the supply issues, one on the gas industry and the third specialist to handle the economics of gas utilization.

Schedule:

The project can be completed in the first half of 2000, including a seminar and training to present findings and discuss.

Capacity Building

Description and Rationale:

While Nigerians need an appropriate regulatory and legislative framework, policies, and pricing, they simultaneously need training in each of the subject areas of the technical assistance program. They also require and have asked for capacity building, training and workshops in technical areas relevant to the operations of different energy institutions that operate, regulate or create policies.

The first element of this task is to conduct a training needs assessment. This task will offer a mechanism to draw upon training resources for needs that are identified by the assessment and during the course of the other interventions. For example, courses that could possibly be offered, but are not limited to, include: bid solicitation, bot/privatization, competitive bidding, deregulation for power transmission and distribution, energy economics and finance, gas industry development, integrated resource planning, power plan operation and maintenance, power purchase agreements, power sector regulation, tariff structure and analysis, utility regulation, utility management, and petroleum finance and economics.

Target Audience / Counterpart:

Target audience should be NEPA, Ministry of Power and Steel, NCP, Ministry of Finance, NNPC, and other organizations identified as requiring training.

Objective and Results Expected:

This activity will build local capacity to analyze, compare options, and make decisions and will result in a core of managers, analysts, technicians and decision-makers trained in best international practices in the energy industry.

Level of Effort:

Person-months for capacity building activities will depend on training needs assessment and needs identified during the course of interventions.

Schedule:

The training needs assessment should be conducted during the first quarter of 2000. The activity should be conducted during the life of the assistance program, and will be taken over by the Mission or other entities subsequent to the OTI intervention. Capacity building activities should start in March 2000.

Rural Electrification Workshop

Description and Rationale:

Many of the rural customers in Nigeria are served by unreliable radial lines, or not served at all by the integrated grid system. The path to improved service for the rural areas involves technical measures as well as institutional measures to attract international investment, to develop sustainable energy sources, and to raise the capabilities of Nigerian energy professionals to international standards. The Federal Government of Nigeria can play an important role in rural electrification, but the World Bank RE Program, private/public partnerships and RE cooperatives fashioned after the NRECA model offer promising new means to achieve greater success in rural electrification where the government has fallen short.

The Rural Electrification Workshop will provide a forum for promising new technical and policy solutions to chart the path forward to improve rural electrification in Nigeria. The workshop will be developed in coordination with the experts retained by the World Bank to provide assistance in this area.

Target Audience / Counterpart:

The Ministry of Power and Steel will serve as counterpart for the Rural Electrification Workshop. The target audience will include NEPA, Ministry of Power and Steel, Government of Nigeria, state and local officials, developers and journalists.

Objective and Results Expected

The objective of the workshop is to bring new ideas to stimulate progress in rural electrification and to empower Nigerian professionals working in the field of rural electrification. The workshop will provide a forum to initiate ongoing technical assistance to GON agencies, NGOs and local governments on technical, institutional and policy issues for rural electrification and renewable energy. The workshop participants will produce a white paper with ideas for improving government policies on RE, initiatives for public/private partnerships, alternatives to grid-connected power, willingness to pay and transition issues.

The workshop will set the stage for follow-up activities and technical assistance to be led by DOE and the national labs. These subsequent technical assistance projects will provide information on renewable energy technologies and their application to rural electrification.

Level of Effort

6 consultant weeks (3 weeks each for 2 rural electrification specialists, 1 week in home office and 2 weeks in field to meet with counterparts and present the workshop). Ongoing RE technical assistance will be provided under a separate program.

Schedule:

January or February, 2000

Liquid Product Pricing

Description and Rationale:

Nigeria currently operates a system of fixed prices for refined oil products. These are part of an implicit social contract between the Government and the consumers and are viewed as a mechanism for allowing the population to benefit from the nation's resources. However, the prices seriously impair the efficiency of the system – the low level of prices discourages investment in the refineries and has resulted in insufficient domestic production and subsidized imports to meet demand. Smuggling of low domestic price Nigerian oil products also occurs, further damaging the industry and the Government's budget. Further subsidies within the domestic price structure for diesel and kerosene distort investment and operational decisions in the electricity industry, since all major consumers generate their own electricity from diesel generators; an inefficient practice.

The simple solution would be to move immediately to international *import parity* market prices and this is the proposal from the World Bank team. However, this transition needs to be justified and planned. The focus of this intervention will be on justifying to the various stakeholders why the transition is so important and how the benefits will outweigh the disadvantages to some special interest groups. The initial TA will be required to postulate schemes for the transition and to assess the impacts of these, particularly on vulnerable segments of the population. The knowledge should be transferred in workshop format to the Nigerian counterparts.

The later task that will be taken up by the World Bank will be to devise and implement an interim arrangement. This interim arrangement will be designed to provide the refineries' management with the opportunity to learn how to operate in a competitive market and to develop the current arrangements for price equalization across the country so that it can cope with liberalized prices.

Target Audience / Counterpart:

NNPC will be the primary counterpart, since they will be most affected by the changes. However, other ministries, such as DPR and the Ministry of Finance should also participate. Other stakeholders, such as the regional politicians will also be briefed on the subject.

Objective and Results Expected

The primary objective is to provide a clear framework for the transition to market prices.

The overall results expected will be:

- A rational framework for development of the refining sector, including potential ownership by western strategic investors of refineries. Rational prices in the long term will result in a drop in refinery throughput as more of the barrel is converted to automotive fuels and less heavy fuel oil is exported.
- The development of the IPP sector will be encouraged, since the true costs of self-generation will be visible.

Level of Effort

The project will require 8 person-weeks split between a team leader with experience in petroleum product pricing and an expert in refinery management and strategy.

Schedule:

The work can start as early as first quarter 2000, and be completed in three months.

<p>Procurement Practices</p>
<p>Description and Rationale:</p> <p>Nigeria has developed an unfortunate reputation in the international business community. US equipment and engineering companies find it difficult to work directly in Nigeria due to the restrictions imposed by the FCPA. There is a lack of transparency on almost all procurement activities. Open international competitive bidding is not the norm and asymmetric information to bidders is usual. The end result is a loss to the Nigerian economy – projects cost more to implement.</p> <p>The intervention will seek to support efforts within Nigeria to reform the procurement process in the Energy Sector. Comparisons should be made with the systems in other countries, such as the USA, EU and developing countries. The benefits to the nation will be highlighted.</p>
<p>Target Audience / Counterpart:</p> <p>The primary target audiences will be senior staff at NNPC and NEPA, as well as relevant Ministries such as Finance.</p>
<p>Objective and Results Expected</p> <p>The objective will be to raise the profile of procurement practice in Nigeria, with a view to encouraging a more formal project to draft new regulations.</p> <p>The anticipated results would be an increase in transparency of the procurement process (support to good governance), greater US company involvement, lower costs for projects and a net gain to the Nigerian economy.</p>
<p>Level of Effort</p> <p>The project will require 4 person months. The team leader should be an international procurement expert able to handle the basic legal and procedural issues. The project may require support from an expert in the economics of procurement.</p>
<p>Schedule:</p> <p>The intervention is part of a longer-term program and could be started after the initial set of interventions covering restructuring of the Energy industry. The project will require up to 4 months to implement.</p>

Data Collection and Modeling Technical Assistance

Description and Rationale:

Nigeria can make immediate and significant efficiency gains in the energy sector by implementing modern systems of data collection and modeling. This TA will develop energy sector data collection and modeling capabilities necessary to support GON efforts to restructure and privatize the energy sector and to evaluate the potential impacts of proposed GON policies and programs. The TA will leverage work done by the Energy Information Administration (EIA) of the DOE in several developing countries including Ghana, South Africa, Philippines and Bangladesh. The steps involved are:

- Assess current conditions and capabilities
- In-country assistance to help the relevant entities develop their data collecting and modeling capabilities
- Develop GON capabilities to independently evaluate events in the energy sector
- Provide support for GON modeling of the energy sector

A second possible intervention would assist the regulatory body to develop an information system to support the day-to-day functioning of the agency. The information system would cover the following areas:

- Energy resources inventory for Nigeria
- Statistics on the power sector (e.g. NERC, FERC, EIA, SEC)
- Least cost planning for generation and transmission
- Financial and tariff modeling

Other areas to be defined in consultation with Nigerian counterparts

Target Audience / Counterpart:

GON, NEPA, NNPC and Ministry of Power and Steel

Objective and Results Expected

The objective of this TA is to implement modern data collection and modeling practices to enhance the efficiency of the counterpart organizations.

Level of Effort

The data collection and modeling for the GON would involve a 3-person team for 1-2 years on a part time basis. Over the course of the project the team would make 4-5 trips to Nigeria. The information system for the regulatory body would require a 2 person team of utility information specialists with for 3-4 months each.

Schedule:

Project can start in first quarter of 2000. Expected duration of 1-2 years.

Valuation Techniques for Assets Seminar

Description and Rationale:

This task will introduce valuation techniques that can be applied to state assets to be sold off in the privatization process. Establishment of an agreed-upon value for state assets is a key component of successful privatization programs. Ultimately, the purpose of privatization is to permit the assets to produce more economic value for the country. For infrastructure industries, such as refineries, pipelines and electricity, the value produced for the economy from successful privatization and operation far outweighs the state receipts from the privatization itself.

The proposed intervention will consist of three workshops to introduce standard methods of valuation and project analysis. The workshops will be preceded by TA to assess issues and needs of the relevant participants and to obtain necessary data. The workshops will be followed by further TA aimed at applying the valuation skills to specific investment or asset divestiture issues. The issues to be addressed in the valuation workshops will include:

- Cash flow analysis techniques, including estimation and selection of discount rates;
- Balance sheet analysis;
- Use of simulations to improve cash flow projections;
- Analysis of the role of taxes and levies on value; and
- Market assessment techniques for demand forecasts.

Target Audience / Counterpart:

Target audience should be NEPA, Ministry of Power and Steel, NCP, Ministry of Finance, NNPC and others at the General Manager (Finance) level + relevant GM (finance) staff. Counterparts should be NCP/NEPA GM (finance).

Objective and Results Expected:

A successful completion of this activity will leave the involved audience with a core of managers and analysts trained in standard valuation and project analysis techniques. They will be able to:

- Conduct standard and generally recognized valuation analyses and cash flow projections;
- Understand valuations derived from standard techniques used by potential asset purchasers;
- Estimate discount rates for projects and understand the implications of such estimations
- Advise the government on the potential revenues from asset sales.
- Work with US advisors on actual matters of the moment to the Government of Nigeria, thereby reinforcing the workshop knowledge while addressing pressing needs.

Level of Effort:

The project will require 4 person months (2 x 2 mm); 0.5 mm for materials preparation + 3.5 mm for 3-4 seminars/workshops. The team will include 1 financial analyst and 1 economist, each familiar with valuation, project financial analysis and privatization

Schedule:

The activity should be completed over a period of 8 months with 3-4 workshops or courses.

Attachments

Attachment 1

Overview of the Nigerian Oil, Gas and Electric Sectors

Upstream Oil and Gas

Nigeria is the 12th largest oil producer in the world, and the largest in Africa. It currently produces 2.1 million bbl/d of crude and around 35 bcm (1.1 Tcf) of gas. It is also the most populous country in Africa with a fast growing population of around 110 million people. Proven oil reserves are 22.5 billion bbl - approximately 2% of the world's total reserves. Most of the proven reserves are spread over 250 small fields, containing less than 50 million bbl each. High gas to oil ratios mean that large quantities of associated gas must be produced along with the crude.

Nigeria contains an estimated 124 Tcf of proven natural gas reserves (10th largest in the world). With both associated and non-associated gas reserves, the total could reach as much as 300 Tcf. Nigeria currently flares over 75% of gas produced - in 1997 Nigeria flared 26 bcm from a total annual production of 36 bcm. In fact, nearly 10% of the total annual gas production of Africa, was flared in Nigeria.

The Nigerian economy is largely dependent on the oil sector, which accounts for nearly 50% of its GDP and 95% of its foreign currency earnings. This dependence can be gauged by observing that a change in the oil price by US\$1 per barrel increases/decreases Nigeria's foreign exchange earnings by about US\$650 million or 2% of GDP. Nigeria represents 47% of the West African population and 43% of its GDP.

Security of contract in a highly personalized political environment remains unassured. Tensions in the oil producing Niger delta place companies in this area at risk from kidnap and sabotage by marginalized ethnic groups. The people of the Niger Delta know that oil worth billions of dollars flows from under their feet but they get nothing from it. They suffer from polluted rivers, disrupted farming and cut-down forests, without any local economic benefit from oil. In the past when oil was spilt, the local chief was paid off. This has created a "compensation culture": damage a pipeline, then demand cash for the damaged land.

The industry is regulated by the Department of Petroleum Resources (DPR). The DPR and NAPIMS play a very crucial role in the day to day activities throughout the industry. Most oil and gas projects are formed as joint venture operations between foreign oil companies and NNPC (as the major shareholder). Due to the increasingly difficult financial situation in Nigeria, NNPC has been unable to make its cash calls on new projects and NNPC owes its joint venture partners several billion dollars. To avoid this problem, new exploration agreements have switched from joint-venture deals to production sharing contracts.

Downstream Oil

Lack of money coupled with sabotage, fire and poor management has contributed to the current state of disrepair of the downstream infrastructure, which is generally 100% owned by NNPC. Domestic oil consumption is around 300,000 bbl/d and domestic refining capability (440,000 bbl/d) should easily meet this. However, the nation's refineries produce too much heavy products such as fuel oil, which must be exported at a price half that of crude oil, and the poor condition of the refineries further reduces output. Nigeria imports significant quantities of automotive fuels, for which the Government pays World market prices. The Nigerian Government regulates the transfer prices paid within NNPC and sets product prices at wholesale and retail level well below World prices. It is estimated that the government pays \$2.5 billion in subsidies for oil products. Subsidized product prices encourage large-scale smuggling to neighboring states for re-sale at World prices.

Some rehabilitation work is underway on the Kaduna refinery, but this contract has been beset by controversy over the price. Refineries are listed in the Government's *Privatization and Commercialization Decree No.28 of 1999*, with a potential 40% of shares being available to a strategic investor. Discussions with the management of NNPC highlighted the uncertainty on the value of these assets.

Downstream Gas

The government aims to create an enabling environment and infrastructure for the development of gas to electricity projects and projects aimed at increasing the domestic and industrial use of natural gas. Official government policy is to cease all flaring by 2010. However, the pricing of natural gas, both from oil companies and to major industrial consumers, is far from World prices or from a level that fairly reflects the industries costs. Consequently, gas supply projects are not progressed and exportable oil is being used instead. We found that estimates of the value of gas and the fair cost of gas amongst government officials and politicians were very low and not based on any specific assessment of the domestic market for gas. Whilst Nigerian gas is relatively low in sulphur and hence treatment costs should be low, collecting gas from the large number of wells will be costly. The government does apply penalties to the oil companies for flaring gas and has provided tax incentives for the oil companies to develop gas projects. These penalties have further complicated the picture, creating a situation whereby the government effectively finances most of the industry costs from crude oil revenues forgone.

There is one major gas pipeline in Nigeria from Escravos to Lagos – the *ELP*, operated by the National Gas Company, an NNPC subsidiary. The pipeline operates at 35% of its 800 MM scf/d capacity due to lack of supply.

Electricity

Nigeria currently has 5,800 MW of installed electrical generating capacity and around 8,000 MW of hydroelectric development is planned. The current operable capacity is 1,600 MW, although only 1200 MW in normally in service. Approximately 43% of the population have access to an intermittent supply of electricity. Nigerian Electric Power Authority (NEPA) has

plans to boost this share to 85% by 2010, but no clear idea on how this can be financed or physically achieved. Due to low tariffs and lack of maintenance the country's electricity supply remains unreliable such that more than 90% of commercial establishments have to rely on expensive back-up diesel generators. Over the past ten years, national consumption of diesel fuel has doubled, a much higher growth rate than gasoline. This indicates the level of reliance the economy has had to place on diesel generation to maintain business – we estimate that private diesel generation amounts to the equivalent of an average of 700MW operating – i.e. over a third of electricity is being produced on standby diesel. This could easily be replaced by approximately 1 bcm (~100 mmscf/d) of gas burnt in combined cycle power plants resulting in a net benefit to the economy of about \$500 million each year. This quantity of gas could be accommodated in the existing ELP line.

37% of NEPA's generation is hydroelectric, which is subject to seasonal fluctuation and occasional drought conditions. Of the remaining, 37% is gas fired and represents the more modern equipment in the system. The remaining 26% is oil-fired. NEPA has not invested in a major project for ten years. NEPA engaged Lahmeyer of Germany to conduct a review of the existing assets. Based on Lahmeyer's findings, they currently have a sole source proposal from ABB to refurbish some of the power plants and transmission system. Electricity supply is heavily biased to the south of the country, the lack of a network in the north is the source of political tensions. Restructuring activities will need to address this regional bias along with the inevitable impacts of restructuring on NEPA staffing.

Two major IPP projects have been the subject of serious negotiations and many others have been put forward. Enron has proposed a two stage project, the first stage taking electricity supply from a diesel engine power barge to be delivered to Lagos in December 1999, with a much larger combined cycle plant to be built later. The terms of the project seem not to be well known among key officials. Mobil has promoted another project and its economics are heavily dependent on tax incentives on crude oil production from the Nigerian government. Until some effort is expended in setting a framework for the restructured sector, IPP negotiations will continue to be ad-hoc and consume significant amounts of senior officials' time. The World Bank has suggested privatizing NEPA by dividing it up into various component entities (generation, transmission, distribution and/or regional) prior to privatization and a restructuring along these lines is being planned by the Bureau of Public Enterprises.

Development Assistance and Finance

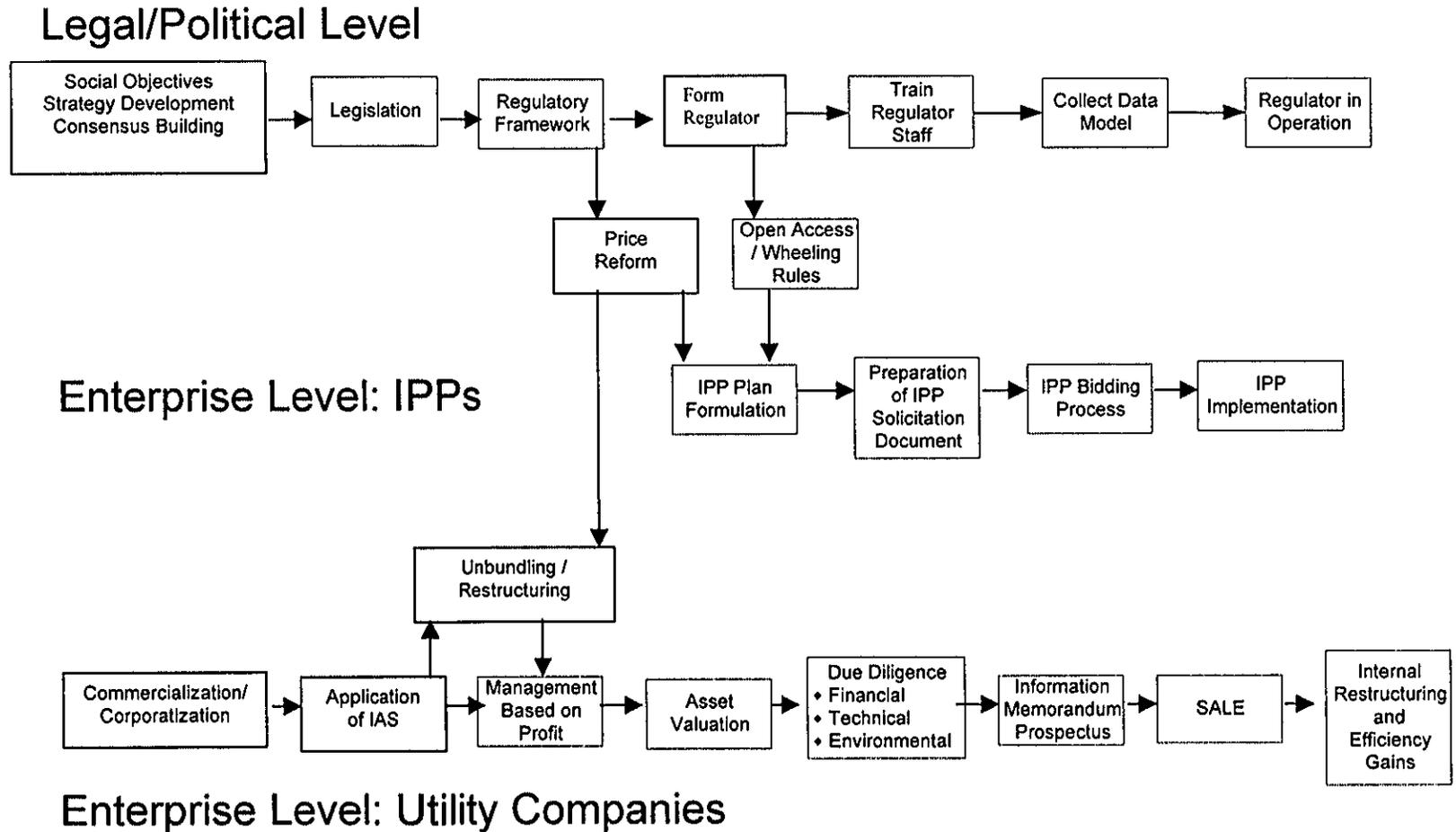
The World Bank, like other multilateral and bilateral aid organizations had ceased operations in Nigeria during the last years of military rule. It is currently planning a major technical assistance loan to the energy sector in Nigeria to meet some of the critical needs mentioned above. Nigerian banks have no capacity to fund major projects and any energy sector project will have to attract private sector and export credit agency funding.

Privatization and Restructuring

The Bureau of Public Enterprises was established by the *Privatization and Commercialization Decree No 28 of 1999* to oversee the process. To date, some industrial enterprises that have little

political influence have been successfully privatized. The more controversial companies, such as subsidiaries of NNPC and NEPA are planned for the last stage. Although, early *commercialization* work has occurred in both.

Attachment 2 Typical Restructuring/Deregulation Process



Attachment 3 List of Meetings

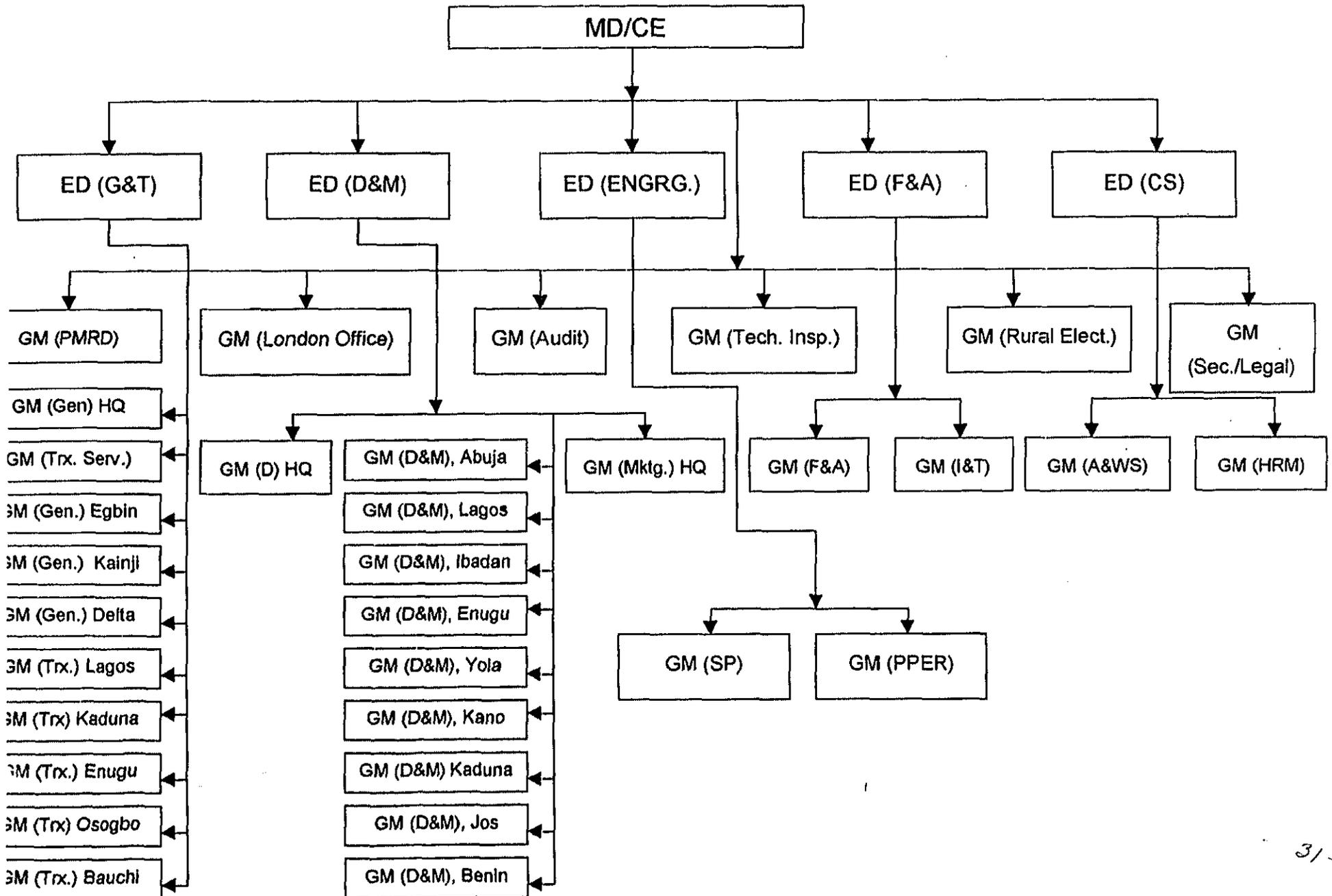
Organization	Place	Individuals Interviewed
US Embassy	7 th Nov Lagos	Dundas C. McCullough - Chief of Economic Section
US Ambassador		
Mobil	8 th Nov Lagos	Earl F. Keiser Jr -Chairman & Managing Director
Office of Transition Initiatives	8 th Nov Lagos	Olayemi Cardoso - Hon. Commissioner, Ministry of Economic Planning and Budget Mrs G.K. Daodu - Permanent Secretary, Ministry of Economic Planning and Budget And others
Citibank	8 th Nov Lagos	Michel - Managing Director Saleem Sheikh - Deputy Managing Director Mrs Olusola Oworu - Deputy General Manager (Project Finance) Austine Ometoruwa - Executive Director, Corporate & Project Finance
International Finance Corporation	9 th Nov Lagos	Akbar Husain - Resident Representative, Resident Mission in Nigeria Subs-Saharan Africa Department Frank Onwu - Investment Officer, Nigeria Resident Mission
Chevron	9 th Nov Lagos	J.O Anyigbo - Chevron Nigeria Ltd
World Bank	10 th Nov Abuja	Trevor A. Byer - Resident Representative - Nigeria
Federal Ministry of Power & Steel	10 th Nov Abuja	Joseph K. Babatunde - Director of Power
Nigerian National Petroleum Corporation	10 th Nov Abuja	Mansur Ahmed - Group Managing Director for Refineries & Petrochemicals And others
Bureau of Public Enterprises	11 th Nov Abuja	Alhaji Salisu Liadi - Director of Privatisation - Director of Commercialisation - Director of Corporate Services - Head of Legal

Organization	Place	Individuals Interviewed
House of Representatives	11 th Nov Abuja	Ezeani Ndamdi Thanksgod
Senate	11 th Nov Abuja	Senator R.S. Owu - Power & Steel Senator Daniel Ubengo Aluko - Deputy Chief Whip Senator J.K.N. Waku - Chairman, Senate Committee on Water Resources Senator Femi Okurounmu - Vice-Chairman, Banking & Currency Senator Abdallah Wah - Senate Leader Senator Dalhata Tafida - Chairman, Rules & Procedures Senator O.A. Osunba - Chairman, Governmental Affairs Senator A.B Angie - Chairman, Steel Sub-Committee
Nigeria Electric Power Authority	12 th Nov Abuja	Suleiman Bello - Managing Director And others
Ministry of Power & Steel	12 th Nov Abuja	Olu Aunlove – Special Adviser to the Minister

Attachment 4

**Background Information
on the Nigeria Electric Power Authority**

NEPA ORGANISATIONAL STRUCTURE: EXECUTIVE MANAGEMENT



DESCRIPTION OF SYSTEM.

GENERATION PLANTS

Presently, NEPA operates 8 Power Stations. These are made up of 3 Hydro Power Stations and 5 Thermal Power Stations. The history and status of the generation units in the power stations as at November 3, 1999 is as shown in the table below:

STATION/ INSTALLED CAPACITY	RATING OF UNIT AND DATE COMMISSIONED	STATUS OF UNIT
KAINJI HYDRO 760MW	4X80MW IG7-IG10 -1968 2X100MW IG11-IG12 -1976 2X120MW IG5-IG6 -1978	IG5, IG6, IG9, IG10 & IG12 are available. IG11 under complete rehabilitation. IG7 & IG8 under minor repairs including replacement of Generator/Transformer for both units.
JEBBA HYDRO 540MW	6X90MW -1978 2G1-2G6	All six units are available
SHIRORO HYDRO 600MW	1X15MW -1989 3G4 3X150MW -1990 3G1-3G3	All units are available except 3G1 which is awaiting overhaul.
EGBIN STEAM 1320MW	2X220MW -1985 ST1-ST2 2X220MW -1986 ST3-ST4 2X220MW -1987 ST5-ST6	ST2 & ST6 are out due to major problem on their boilers. ST3 is out of service on annual maintenance, it is expected back on 25/11/99. All other units are available.
SAPELE STEAM 720MW	6X120MW ST01-ST06 -1978	ST01, ST02 & ST06 are available.
SAPELE GAS 300MW	4X75MW GT1-GT4 -1981	All other Steam and Gas units are out of service.
AFAM I GAS 45.3MW	1X10.3MW GT1 1965 2X17.5MW GT3 -GT4 -1965	All the units are not available except GT11
AFAM II GAS 95.6MW	4X23.9MW GT5-GT8 -1978	
AFAM III GAS	4X27.5MW	

STATION/ INSTALLED CAPACITY	RATING OF UNIT AND DATE COMMISSIONED	STATUS OF UNIT
110MW AFAM IV GAS 450MW	GT9-GT12 -1978 6X75MW GT13-GT18 1982	All the units are not available except GT11
DELTA I GAS 36MW DELTA II GAS 120MW DELTA III GAS 120MW DELTA IV GAS 600MW	1X36MW GT2 - 1966 6X20MW GT3-GT8 - 1975 6X20MW GT9-GT14 - 1978 6X100MW GT15 - 1989 GT16-GT20 - 1990	All units are not available except GT16 & GT17
IJORA AGO 60MW	3X20MW GT4-GT6 -1978	All units are out service except GT5

TRANSMISSION LINES & ASSOCIATED TRANSMISSION STATIONS

The Authority operates the following voltage levels:

- * Distribution Voltages are 230V; 415V; 11kV and 33kV.
- * - Transmission Voltages are 33kV; 132kV and 330kV.

Presently, there are in the System the following:

- * National Coverage of 330kV lines is 5,000km
- * National Coverage of 132kV lines is 6,000km.
- * National Coverage of 33kV lines 23,925km
- * National Coverage 11kV lines 19,336km
- * Total Number of 132/33kV Substations is 95
- * Total Number of 330/132/33kV Substations is 23

* Total Number of 33/11kV Substations 700

* Total Number of 11/0.415kV Substations 21,600

PROPOSED MAJOR CAPITAL PROJECTS IN THE COUNTRY

A. NEW POWER PLANTS

- | | | |
|----|--------------------------|---------|
| 1. | ABUJA THERMAL | 300MW |
| 2. | GEREGU(AJAOKUTA) THERMAL | 300MW |
| 3. | ZUNGERU HYDRO | 950MW |
| 4. | MAMBILA HYDRO | 3,960MW |

B. POTENTIAL LOCATIONS FOR POWER PLANTS

- | | | |
|----|---------------------|--------|
| 1. | KADUNA THERMAL | 450MW |
| 2. | MAKURDI HYDRO | 1062MW |
| 3. | ONITSHA GAS/LIGNITE | 1200MW |
| 4. | OJI RIVER COAL | 900MW |
| 5. | MAKURDI THERMAL | 1200MW |
| 6. | ORON THERMAL | 120MW |
| 7. | ONITSHA HYDRO | 1050MW |

C. 700kV TRANSMISSION PROJECTS AND ASSOCIATED S/S.

1. MAMBILA - MAKURDI - ABUJA -SHIRORO D/C
2. MAKURDI - AJAOKUTA D/C
3. AJAOKUTA- OSHOGBO-LAGOS S/C
4. AJAOKUTA - BENIN - LAGOS S/C

D. 330KV TRANSMISSION PROJECTS AND ASSOCIATED S/S

1. GOMBE-POTISKUM-MAIDUGURI
2. JOS-MAKURDI
3. ALIADE-NEW HAVEN
4. NEW HAVEN-ALAOJI
5. GOMBE-YOLA
6. 2ND BENIN-ONITSHA
7. BIRNIN KEBBI-SOKOTO
8. SHIRORO-ABUJA
9. YOLA-JALINGO-BALI-NGHU
10. ABA-CALABAR
11. IKEJA WEST-SAKETE (Benin Republic)

E. 132KV TRANSMISSION PROJECTS AND ASSOCIATED S/S.

1. KANO-DUTSE-AZARE D/C LINE
2. GOMBE-DAMATURU
3. ALAOJI-UMUAHIA-OKIGWE
4. BENIN MAIN-BENIN NORTH-ASABA
5. AJAOKUTA-LOKOJA
6. ITU-UYO
7. AKWANGA-LAFIA

8. AKURE-ADO EKITI
9. KAINJI-KAIAMA
10. AJAOKUTA-OKENE
11. OWERRI-AHOADA-IMIRINGI-YENOGOA
12. BAUCHI-NINGI
13. DAMBOA-ASKIRA-MUBI
14. OTTA-AIYETORO
15. ONDO-OKITIPUPA
16. MAKURDI-YANDEV-WUKARI
17. YANDEV-OGOJA
18. NSUKKA-AYANGBA
19. NGHU-LEKITABA
20. MAIDUGURI-NEW MARTE
21. ILE-IFE-ILESHA
22. ILORIN-OGBOMOSHO
23. IJEBU ODE-EPE-IWOPIN
24. AFAM-ONNE
25. YOLA-MAYO BELWA-GANYE
26. KADUNA (MANDO)-KADUNA REFINARY

NEW TARIFF STRUCTURE
SCHEDULE A: RESIDENTIAL TARIFF
(FOR LOW VOLTAGE CUSTOMERS ONLY)

TARIFF CODES		TYPE OF CUSTOMER	FIXED CHARGE PER MONTH	DEMAND CHARGE PER KVA	ENERGY CHARGE PER KWH
OLD	NEW				
L1	LL	Residential Single Phase supply with single phase meters consuming between 0-50Kwh	N20.00	None	N1.20
L1	L1	Residential Single Phase supply with single phase meters consuming over 50Kwh.	N30.00	None	N2.60
L2	L2	Residential Three Phase supply with three Phase Meters only	N120.00	None	N3.02
L3	L3	Residential Three Phase supply with Maximum Demand Meter (MD) meters.	N120.00	N200.00	N3.30.

SCHEDULE B: SMALL COMMERCIAL AND LIGHT INDUSTRIAL TARIFF
(FOR LOW VOLTAGE CUSTOMERS)

TARIFF CODES		TYPE OF CUSTOMER AND METER	FIXED CHARGE PER MONTH	DEMAND CHARGE PER KVA	ENERGY CHARGE PER KWH
OLD	NEW				
L4	L4	Commercial with Single Phase not exceeding 15KVA.	N90.00	None	N3.60
L4	L7	Industrial Phase with load not exceeding 15KVA.	N90.00	None	N3.60
L4	W4	Welders on Single Phase Commercial with load not exceeding 15KVA	N90.00	None	N3.60
L5	L5	Commercial with Three Phase Meters.	N120.00	None	N3.80
L5	L8	Industrial with Three Phase Meters.	N120.00	None	N3.80
L5	W5	Welders with Three Phase Meters.	N120.00	None	N3.80
L6	L6	Commercial with M.D/ Low Voltage Meters.	N240.00	N230.00	N4.74
L7	L9	Industrial with M.D. Low Voltage Meters.	N240.00	N230.00	N4.74

**SCHEDULE C: LARGE RESIDENTIAL/COMMERCIAL/HEAVY INDUSTRIAL
TARIFF (FOR HIGH VOLTAGE CUSTOMERS) AND STREET LIGHTS**

TARIFF CODES		VOLTAGE OF SUPPLY	FIXED CHARGE PER KVA	ENERGY CHARGE PER KWH	MINIMUM DEMAND (KVA) CHARGEABLE PER MONTH
OLD	NEW				
H1 H1 H1	H1 H2 H3	6.6/11KV	₦250.00	₦4.74	125KVA
H5	H4	6.6/11KV	₦250.00	₦4.74	Not Applicable.
H2 H2 H2	H5 H6 H7	33KV	₦270.00	₦4.50	500KVA
H6	H8	33KV	₦270.00	₦4.50	Not Applicable.
H3	H9	132KV	₦290.00	₦4.38	2000KVA
H4	HA	330KV	₦300.00	₦4.30	5000KVA
D	SL	Not Applicable.	Not Applicable.	₦3.80	Not Applicable.

MAP OF NIGERIA SHOWING NEPA GRID SYSTEM DEVELOPMENT PLAN UP TO DECEMBER 2005

