Africa Infrastructure Review

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AFRICA FINANCE CORPORATION

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NIGERIAN POWER DISTRIBUTION

The Commercial Imperative

Dear All,

Introduction:

As we enter the second decade of the 21st century, Africa faces interesting opportunities and challenges in infrastructure development. I am pleased to write to you in this maiden edition of the Africa Infrastructure Review, a quarterly publication of the Africa Finance Corporation (AFC). This is a momentous time in the history of some of the markets where AFC is most active. The objective of this quarterly review is to share with you our perspective on topical issues relating to infrastructure development, financing and investment in Africa. We hope to offer practical and innovative solutions, based on our expertise, local knowledge and unique insight into the African infrastructure space.

This quarter, we focus on the electricity sector in our host country, Nigeria. It is a sector that is undergoing unprecedented reforms within the broader context of market-defining developments in the country. As always, such significant change-events bring with them great potential for profit, and come with commensurate levels of risk. Much has been said and written about the Nigerian Electricity Supply Industry (NESI). I will not dwell here on the well-known problems, previous abortive reform efforts and the plethora of solutions that are already being implemented successfully in other emerging markets. Suffice to say that there now seems to be a greater level of national consensus that private investment and management of the power sector is the best route to delivering on the country's substantial short, medium, and long-term power supply needs. There also appears to be a sense that this needs to be done in an environment that reflects commercially viable tariffs across the value chain. A significant amount of work is now underway to create the enabling institutional, business and regulatory environment for greater private sector participation in the Nigerian electricity sector. This is being centrally coordinated by a Presidential Task Force on Power (PTFP). I believe however, that a great deal of the effort and discourse has focused on key issues and barriers to private investment in the upstream components of the sector, namely gas supply, power generation and transmission, and less on the crucial downstream distribution sector.

I believe that more focus needs to be placed on the strategies and tactics that will be required by operators in the distribution sub-sector to ensure power delivery with minimal system losses, and efficient collection of cash from consumers to pay upstream operators. This is particularly so given that these cash flows constitute the underlying basis of the financial viability of the entire industry. While off-take guarantees, payment security and credit enhancement mechanisms are being worked out to help catalyse immediate investments (especially in fuel supply and private generation), the reality is that the long-term sustainability of private investment in the sector is highly dependent on the industry's ability to consistently, effectively and efficiently ensure that available power reaches the end user, is paid for, and that cash so raised flows back up into the system.

BOX I - CURRENT STATUS OF NIGERIA POWER SECTOR REFORMS AND KEY NEXT STEPS

Following the launch of Nigeria's Power Sector Reform Roadmap in August 2010 by President Goodluck Jonathan, certain milestones have been achieved along the route to implementation of the Electric Power Sector Reform Act (EPSRA). This is paving the way for the entrance of private sector investors into the industry. The following are some of the recent positive developments in the Nigerian power sector:

- **Establishment of an Appropriate Pricing Regime** - The Nigerian Electricity Regulatory Commission (NERC) will undertake a major review of the tariff regime, and will complete this exercise by mid 2011. The objective is to replace the national uniform tariff structure with a new genuinely cost reflective policy for determining end-user tariffs. NERC's aim is also to protect lower income consumers with the inclusion of a lifeline tariff along with much greater price differentiation. Supporting this would be the introduction of an inclining block tariff whereby the rate paid for electricity would vary depending on the level of consumption. The tariff regime is governed by a Multi-year Tariff Order (MYTO) a methodology for setting cost reflective tariffs that should enable an appropriate return on investment. MYTOs set tariffs for 15 years; with minor reviews every year and major reviews every five years. The MYTO process incorporates feedback from power companies and consumer groups.

- **Establishment of a Bulk Purchaser** - The Nigerian Bulk Electricity Trading Company (NBET) has now been incorporated and is being appropriately resourced. NBET is negotiating appropriate power purchase agreements, not just with successor generating companies and existing independent power producers (IPPs) but also with potential new entrants into the power generating market. NBET will buy electricity from power generation companies on behalf of the distribution companies, and the government will assume the liabilities of the distribution companies until they establish credit worthiness.

- **Provision of Federal Government Credit Enhancement** - The Federal Ministry of Finance will back-stop NBET with appropriate credit enhancement instruments through an innovative payment security package mechanism. Additional enhancement for the Nigerian electricity supply industry will come through partial risk guarantees from the World Bank Group. In addition, the Nigerian Electricity Liability Management Company (NELMCO) will assume non-operating assets and liabilities of the Power Holding Company of Nigeria (PHCN) and the successor companies being privatised.

- **Gas Supply and Pricing** - The Nigerian Government has announced a scaled and upward review of gas-to-power tariffs over the next few years. This is in an effort to encourage investments in domestic gas production and supply. World Bank Group Partial Risk Guarantees (PRGs) are also being put in place for existing and proposed gas supply agreements.

- **Transmission Company** - This is expected to be handed over to a credible private sector company under a five-year management contract. The Bureau of Public Enterprises (BPE) has initiated the process necessary to re-engage advisers for the completion of the transmission company management contract process. When this process is completed, the adviser will re-start the procurement exercise for the management contract by extending invitations to the three original bid submitters, who will resubmit their offers for evaluation before the ultimate award of the contract. The process is expected to be completed by February 2011.

In summary, the following are some of the key immediate next steps:

- Electric Power Investors Forum by the BPE: **January 2011**
- Expressions of Interest (EOIs) in six generation and 11 distribution companies for sale/concession: **February 2011**
- Conclusion of privatisation transactions: **May/June 2011**

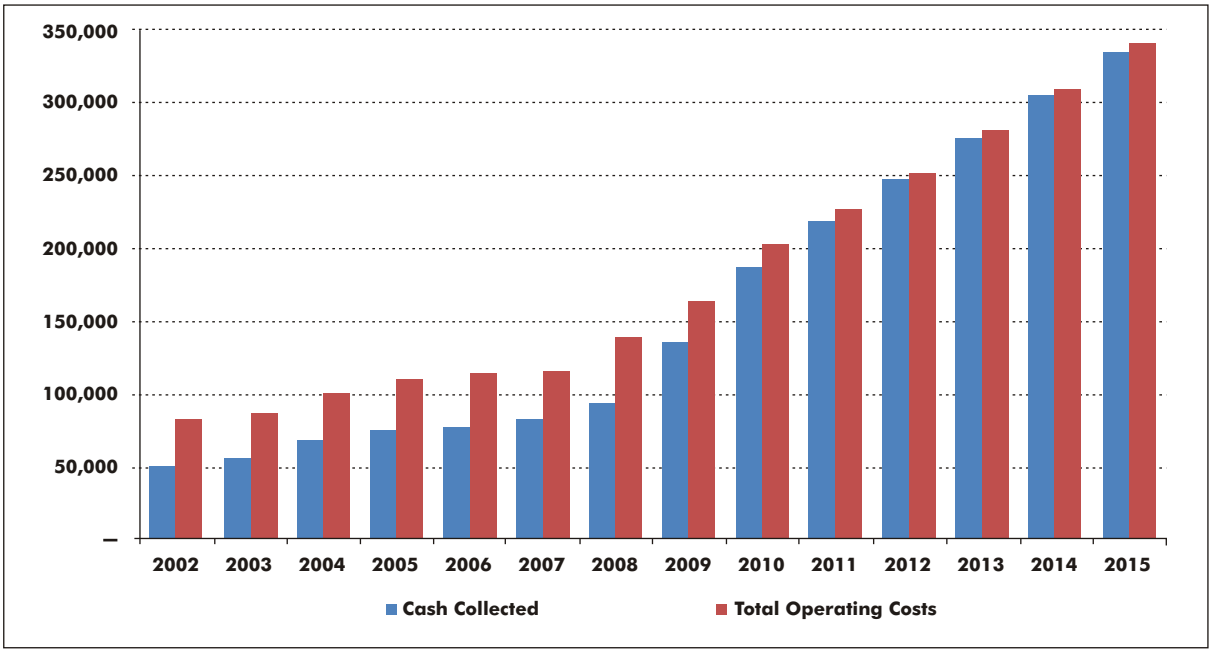
I would like to use this edition of our review to discuss some of the ideas that we have at AFC for how dramatically improved cash collection rates can be achieved in a typical Nigerian distribution company. Eleven of these are scheduled to be privatised in 2011. I will make reference to other parts of the developing world (in this case, Africa) where the electricity industry has been successfully transitioned to private management, commercially oriented tariffs and self-sustaining industry cash flows. These strategies and tactics for minimising technical, non-technical and collection losses, and for maximizing revenue collection at the retail level, are critical not only for potential investors in distribution companies, but also for the long-term credit-worthiness and viability of the entire industry. They are important for the government (to ensure guarantees never get called), for the regulator (to ensure system stability, expansion and growth), for investors in gas supply and generation and transmission assets (to get paid in

full and on time); and for the overall success of the private sector participation model for infrastructure delivery in Nigeria.

Current Industry Cash Collection Status: Historically, collection rates by the national electric utility have fallen significantly short of the amounts required to meet operational costs and other revenue requirements across the industry value chain. According to figures from the Power Holding Company of Nigeria, and the World Bank, the industry collected N136.2bn (USD907.8m) in cash during 2009 - just slightly over the N10.0bn on average per month estimated by the Presidential Action Committee on Power, (PACP). As the figure below shows, there is a significant shortfall between these collections and the total operating costs of the sector.

Further, even after taking into account the anticipated graduated upward MYTO tariff adjustments over the next few years, on current trends, the World Bank forecasts that gross cash actually collected will continue to trail industry operating costs significantly, well into the foreseeable future, particularly with anticipated increases in gas prices to generating companies. Fuel costs are also expected to increase as a share of total operating costs from a historical average of less than 6 percent in 2010, to more than 16 percent in future years. Clearly, such an industry will be entirely incapable of sustaining the debt servicing and equity return expectations of private investors. For this to happen, loss rates across the NESI value chain will have to reduce substantially from the current estimated level of more than 50 percent of total system loss estimate. These include technical (e.g. transmission and distribution line),

Figure 1: Nigeria Electric Power Industry, Cash Collected versus Total Operating Costs



Source: World Bank, PHCN

Figure 2: Nigeria Electric Power Industry, Historical and Forecast Loss Experience

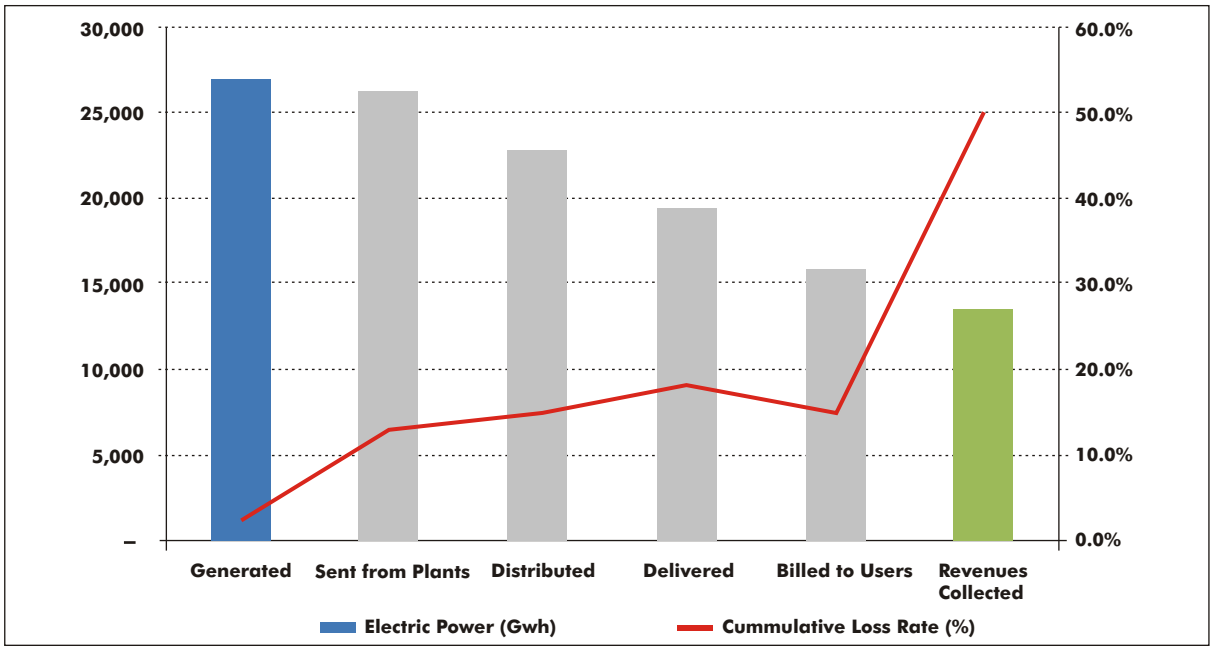
Loss Analysis	2009	2010	2011	2012	2013	2014	2015
Transmission	13.0%	11.0%	9.0%	8.0%	8.0%	8.0%	8.0%
Distribution	15.0%	14.0%	13.0%	11.0%	11.0%	11.0%	11.0%
Non-Technical	18.0%	16.0%	14.0%	12.0%	10.0%	10.0%	10.0%
Collection	15.0%	15.0%	14.0%	13.0%	12.0%	10.0%	9.0%
Aggregate	**61.0%**	**56.0%**	**50.0%**	**44.0%**	**41.0%**	**39.0%**	**38.0%**

Source: World Bank, PHCN

non-technical (e.g. theft and unbilled consumption) and collection losses (e.g. erroneous bills and arrears). Figure 2 shows historical and forecast energy loss experience as estimated by the World Bank.

Of the 26,414 gigawatts estimated to have been sent out from plants in 2009, only 22,980 gigawatts were delivered to distribution and 19,533 gigawatts to final customers. Of this amount, a further 18 percent in non-technical losses ensured that only 16,017 gigawatts were billed to customers. Finally, collection losses estimated at 15 percent resulted in revenue collected on only 13,614 gigawatts of power. This shows a staggering aggregate loss rate of over 60 percent. Figure 3 illustrates graphically what the impact of these losses is on industry operating revenues.

Figure 3: Nigeria Electric Power Industry in 2009, Loss Experience Waterfall



Source: World Bank, PHCN

Clearly, the industry will be incapable of sustaining long-term private sector debt and equity investments on this basis. At the level of distribution companies (discos) in particular, significant efforts will be required to reduce aggregate losses to more sustainable levels in the shortest possible time. Loss reduction strategies that rapidly result in substantially improved collection rates will be one major source of upside for investors in distribution companies, as better long-term internal rates of return will be the reward for quicker success. Even ahead of this though, pre-developing a feasible strategy for reducing losses will be a critical early step in the asset evaluation and financial planning process of all serious bidders for Nigerian distribution companies.

This is more so given that the preferred sale methodology being adopted by the government for distribution company assets is one where bidders demonstrate the most credible business plan for significantly reducing aggregate technical, commercial and collection (so-called ATC&C) losses. Thus, their investment and loss reduction strategy proposals will be given significant weight relative to actual bid prices in the asset sale process.

Experience from Elsewhere in Africa: I shall now discuss some of the ideas that we are considering at AFC for potential investors to approach this problem, within the unique context of the Nigerian power sector. In doing so, I shall draw on lessons learned from work done by some of AFC's senior power professionals in other parts of Africa. In particular, we draw on the highly impactful work by AFC's Senior Vice President, Batchi Baldeh. Batchi was a consultant technical advisor to the board of directors of the

Lesotho Electricity Corporation (LEC) and the Lesotho Government, under the Lesotho Utilities Reform Project (LURP, 2001-2007). This project was financed by the World Bank, the European Commission and the African Development Bank.

At the LEC, collection rates increased from 19 percent in 2001 to 99 percent in 2007. Average pre-tax profits also grew to USD5.5m in 2005/2006 from a USD4.5m loss position in 2001/2002. While there were various elements behind this success story (including regulatory reform, privatisation method policy changes, and phased cost-reflective tariff reviews), effective strategies at the commercial management, retail and collection level also played a prominent part.

BOX II LESOTHO ELECTRICITY CORPORATION TURNAROUND, A CASE-STUDY

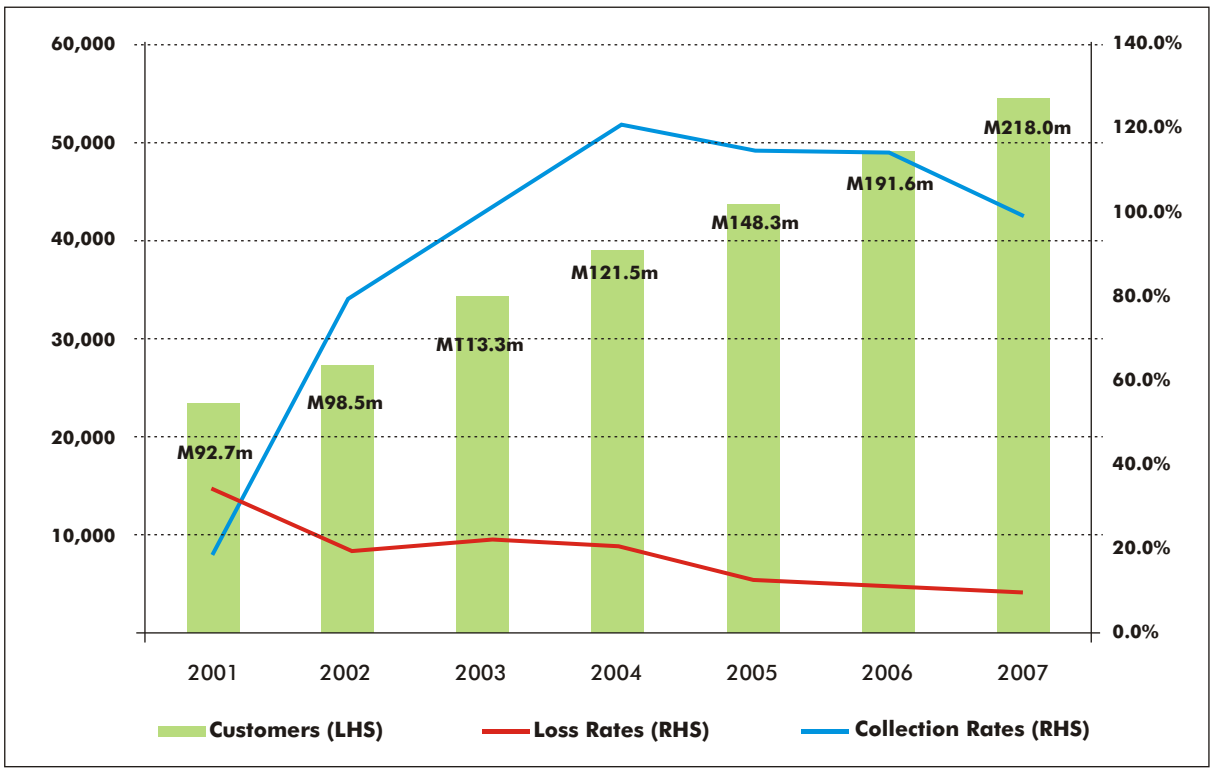
Lesotho is a small landlocked, mountainous country, and remains one of the poorest countries in Southern Africa. With a population of about 1.8m people, it is heavily dependent on South Africa and rides its neighbour's waves of economic development. The Lesotho Electricity Corporation (LEC) was founded in1969 and vested with the right to undertake all tasks related to generation, transmission, distribution and supply of electricity. Approximately 75 percent of Lesotho's electricity demand is met by the 72 megawatts Muela Hydro Power Plant and about 25 percent by imports from South Africa. By 2000, the Lesotho Electricity Corporation had gone from what was a viable enterprise to a company in a poor state of financial affairs. Its billing system collapsed in late 1997. Revenue collection was 18 months late and there were 1,200 backlog connections (connections for which clients had already paid connection fees). No financial accounts had been prepared for 1998, 1999 and 2000 and accounting practices were weak. Fiscal transfers to the corporation to cover losses became untenable by the end of 1999, and public institutions had overlapping mandates regarding regulatory, policy and operational functions.

In 2000, the Lesotho government embraced a new policy for the electricity sector with several guidelines, in particular, the removal of the monopoly on transmission and distribution, the restructuring of tariffs to cover operating costs and recover costs associated with investments. This was followed by clear communication of reform goals and potential benefits to all key stakeholders, to get their early buy-in. Such stakeholders included employees, unions, customers, legislators and civil society. The government engaged a management contractor and launched the Lesotho Utilities Sector Reform (LURP) in 2001. The employee union was engaged actively through a recognition agreement, and 164 members of staff (out of 650) were disengaged between March and December 2001 without incident. This was made possible due to a transparent process, handsome packages and re-training for new business opportunities. Examples were janitorial and other services outsourced to disengaged staff. At the distribution level, there was a comprehensive door-to-door customer meter audit, deploying Global Positioning Satellite (GPS) and Geographic Information System (GIS) technology, in 2001and 2006, to establish a comprehensive and accurate database of customer and meter profiles. As a result, the customer meter database increased from 22,000 in 2001 to 55,000 by 2007, and now stands at over 87,000. A new connection fee policy was introduced, with standardised costs and one-off capital subsidies. This allowed for the recovery of connection fees over 12 to 60 months, and facilitated the rapid connection of over 3,000 backlog customers, while addressing affordability constraints. The authority also replaced over 8,000 credit meters with pre-payment meters and electronic maximum demand meters between 2001and 2004, including in government and municipal offices and facilities like street lights and obsolete billing systems.

LEC adopted a strategic policy of installing only pre-payment meters, except in identified sensitive locations, and to maximum demand customers, making it one of the few almost fully pre-payment utilities globally. A pilot project was set-up with 17 automatic vending machines and 10 vending agents providing 24-hour pre-payment vending services at strategic locations. This was complemented with readily available customer guide book and customer service centres. More than 220 statistical meters were deployed at critical network points to pin-point, measure and proactively address losses. This was further complemented by a customer-meter mapping project in 2006, and effective ongoing revenue management. The LEC also implemented a three-year tariff transition plan between 2004 and 2006, with increases and rebalancing to send cost-reflective pricing signals to customers. The project also pre-financed power factor correction equipment for eligible customers, many of whose load factors increased significantly (sometimes resulting in lower monthly bills).

As a result of these innovative initiatives, total system losses reduced from 33 percent in September 2001 to an average of 13 percent during the 2006/2007 financial year. Collection rates increased from 19 percent in 2001 to 99 percent in 2007. Over USD4.5m out of USD7.1m in arrears as at March 2001 were collected by the end of July 2002. The balance was collected through purchases made under the new pre-payment system. Electricity sales doubled between 2002 and 2007. Finally, as mentioned already, average pre-tax profits grew to USD5.5m in 2005/2006 from a USD4.5m loss position in 2001/2002. This remarkable transformation in just more than half a decade demonstrates what can be potentially achieved on a greater scale with Nigerian distribution companies in the next few years.

Figure 4: Lesotho Electricity Corporation, Key Performance Stats (2001 to 2007)



Source: World Bank; Sales Numbers Displayed in Maloti (M7 approx =USD1=ZAR 1)

Strategic Implications for Nigerian Acquisitions

In terms of size and complexity, the Lesotho Electricity Corporation cannot be compared to even the smallest Nigerian distribution company (Yola: 176 megawatts and 150,000 customers versus 116 megawatts peak load and 87,000 customers for the LEC in 2010). The Nigerian companies scheduled for privatisation have peak loads that are more in the 1,000 megawatt range and customer numbers closer to the range of 200,000 to 800,000. LEC, however, provides us with a micro case-study of the sort of strategic approach and implementation plan required to deliver a bankable distribution company within the shortest possible time. This is a company that had previously been government-owned and poorly managed. The case study illustrates how appropriate strategies can result in rapid increases in collection rates, simultaneously with exponential growth in customer coverage.

I have outlined some of the most critical imperatives into the five-point action plan below:

1. *Communication Strategy:* It is important, first, to note how crucial communication strategies are to success in an endeavour of this nature. Winning stakeholder support is a crucial requirement for long-term success, and this must be a strategic imperative that is embedded in the entire asset acquisition, investment and rehabilitation plan. Clear communication of reform goals, targets, implementation schedules and potential benefits to all key stakeholders is thus a critical success factor. New investors will thus need to work closely with government and regulatory agencies to ensure an alignment of interests and a clear understanding of differences, with a view to communicating consistently and accurately with other stakeholders, particularly the general public.

2. *Management, Technical Expertise and Incentives:* Management expertise and operational structures must be carefully thought through. The team to deliver on the company's plan must have the relevant experience and capacity, and be

appropriately incentivised. In Lesotho, the approach was to engage an expatriate management contractor, a consortium led by Sadelec SA under a performance-based management contract, complemented by an incentive bonus scheme for local staff. In Nigeria, with private majority ownership anticipated, the critical factor will be for winning bidders to appoint the appropriate management teams for the companies, and to utilize the necessary specialist third party experts, as necessary, to design and deploy new governance, management and organisational structures; as well as operational policies and procedures. The recruitment of the best available senior management and key operational staff with proven experience in similar environments -local and international- will also be critical. Remuneration will need to be market-based, and carefully structured to ensure alignment with the business plan for growing collection rates and the customer base. There should be a clear training needs assessment for existing staff. This will inform a comprehensive staff training plan, leveraging existing local expertise and resources, and inform outsourcing to local contractors and service providers where possible.

3. *Pursuing Quick Wins:* It will be important for initial quantitative and qualitative performance targets (and monitoring & evaluation systems) to focus on financial and technical stability, and incentivise achievement of quick and visibly felt improvements and turnarounds. For example, areas like better coordination of load-shedding, implementation of embedded generation solutions (if allowed) and demand-side management should be the basis of early-stage performance assessment.

4. *Data Gathering, Storage and Management:* A comprehensive door-to-door customer-meter audit will be another critical early project in which to invest. This will involve deploying Global Positioning System (GPS) and Geographic Information System (GIS) technology to establish a broad and accurate database of customer and meter profiles. Given the historical lack of effective data collection, storage and utilisation, and ubiquitous estimated and erroneous bills, it will be important to draw a line in the sand on past practices, and commence accurate data gathering, record keeping and information utilisation. There will also be a need to implement a comprehensive distribution network survey to determine the exact condition of key assets, and prioritise rehabilitation, upgrade and expansion investment requirements. This is as important for managing cash outflows and ultimately the internal rates of return on projectsas for meeting statutory Nigerian Government "Quality of Supply and Service" targets and standards.

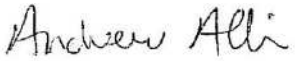
This action point should also involve installation of statistical meters at critical network points to pin-point, measure and proactively address loss sources.

5. *Aggressive Transition to Pre-Payment:* It will be important to review and rationalise existing credit and pre-payment meter standards, and attendant billing and vending platforms and revenue management systems. "Open" systems need to be utilised, which encourage competition between recognised equipment/service providers; and stakeholder support should be sought, to replace and aggressively roll-out new systems. Some examples of key targets in this area will be: increasing pre-payment penetration to double digits in the shortest possible period of time, and including appropriate electronic maximum demand meters and market-access solutions for low income customers.

Conclusion: In 2011, I am optimistic about Nigeria's potential to finally complete the long-delayed privatisation and liberalisation of its electricity supply industry. This is essential to unlock the immense opportunities for productivity, value-added and employment, particularly in the non-oil sector. Despite the substantial potential for upside, however, successful purchasers of power assets will have their work cut out for them, particularly in the distribution area. It will be important for buyers to put together not just the appropriate financing plan for any acquisitions, but also a pre-developed business plan for transforming the asset, once secured. From the government's perspective, it will be critical for privatised companies to succeed quickly in delivering a higher quality of service than public management has historically been capable of. For investors, it will be crucial that any capital being expended on rehabilitation, upgrade and expansion be carefully targeted to deliver the best possible results, and quickly too. These will not be easy tasks. But with good planning and the right partners technical, financial and otherwise am confident about the positive returns that will accrue to all stakeholders, especially customers, over the next few years.

We at the AFC are working closely with local and international partners seeking to acquire generation and distribution assets under the Nigerian power privatisation programme. We are optimistic that successful completion of the programme will result in a new era of efficient private sector management of the sector. Our objective is always to work with our partners to ensure that projects are properly structured, and financed in such a manner as to be sustainable over the long-term. In addition to our capacity to co-invest, we also offer project development, technical advisory and financial arranging services. AFC sources power projects with strong sponsors, favourable power purchase, fuel supply, and other commercial agreements, as well as partners that can meet appropriate legal, technical and regulatory requirements. Typically, our power experts are closely involved in providing the necessary technical support to reassure financiers that projects will succeed. We are also able to bring our global network of relationships to bear in sourcing the appropriate management and technical talent that is the critical first step to executing a successful turnaround of any acquired assets.

I look forward to hearing from you in the weeks and months ahead as we continue on this challenging but exciting journey.



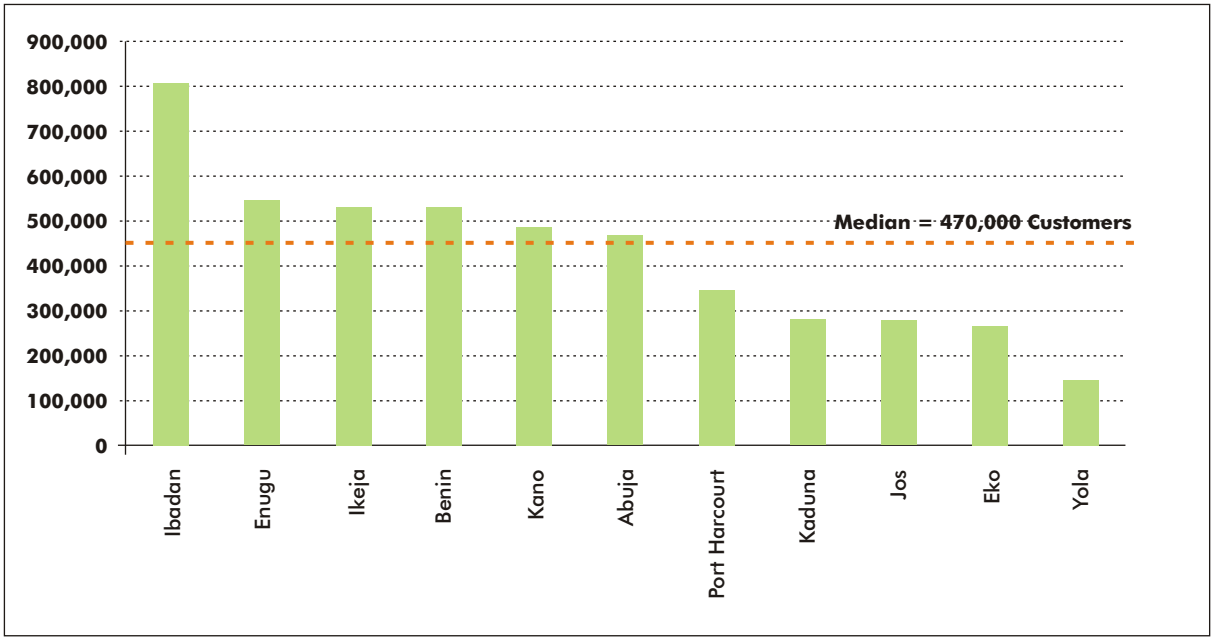
Andrew Alli
President and Chief Executive Officer

APPENDIX I - NIGERIA POWER SECTOR OVERVIEW

Poor infrastructure, particularly in the power sector, has been identified as perhaps the single biggest constraint to economic growth in Nigeria. Reliable electricity supply is essential to harness opportunities for sustainable economic growth, particularly in the non-oil sector. Nigeria currently has about 7,500 megawatts of installed capacity and 3,500 megawatts of available generation supplied through its national grid, against an estimated total demand of 10,000 megawatts. Most of the available public-sector capacity is old, dilapidated and underperforming. There are currently eight publicly-owned power generation companies in the country. Of these, only five are operational. These are: Afam (Gas) with 776 megawatts, Shiroro (Hydro) with 600 megawatts, Ughelli (Gas) with 972 megawatts, Kainji/Jebba (Hydro) with 1,330 megawatts and Sapele (Gas) with 1,010 megawatts.

Most of the existing thermal plants have been losing up to one-third of their generation capacity due to gas shortages. The considerable unmet demand by the publicly-owned national utility forces a large proportion of the population and most private enterprises to resort to self generation at high costs to themselves and the economy. This is estimated at an average of N35 to N50 per kilowatt, compared to the current grid-based tariff of N6 to N13 per kilowatt. By some estimates, self generated power now substantially exceeds public sector-delivered power in Nigeria. Shortfalls in availability have meant that only about 40 percent of the population has access to electricity, and average annual per capita power consumption is only 155 kilowatts, one of the lowest in the world. There are currently eleven publicly-owned power distribution companies in Nigeria, with 2008 estimated customer numbers shown in Figure 5 below.

Figure 5: Nigerian Distribution Companies, by Number of Customers



Source: PTFP, PHCN (2008)

APPENDIX II - ABOUT THE AFRICA FINANCE CORPORATION

AFC is an African-led international financial institution whose mission is to improve African economies by proactively creating, developing and financing infrastructure, industrial and financial assets. Founded in 2007, the corporation has as its key shareholders the Central Bank of Nigeria and leading regional financial institutions. The institution was established by international treaty, and current signatories to its Charter are the governments of Ghana, Liberia, Gambia, Sierra Leone, Guinea-Bissau, Guinea and host country, Nigeria.

AFC is involved as an investor, developer and financier of various infrastructure projects. It is the lead investor in the Cenpower Generation Company Limited (Cenpower), which is developing the Kpone Independent Power Producer (IPP) project. This is a 340 megawatt combined cycle gas turbine power plant near Tema in Ghana. In Cape Verde, off the coast of West Africa, AFC has underscored its commitment to pioneering renewable energy investments on the continent with a lead investor role in a €61.0m, 28 megawatt wind farm project currently under construction. AFC is also the main African participant in a seven-year USD825 million syndicated reserve base lending facility to develop the landmark Ghanaian Jubilee Oil Field, West Africa's largest offshore deepwater find in over a decade. AFC has also invested in the international oil and gas exploration and production company, Seven Energy Limited. Through its local subsidiary, Seven is playing a pioneering role in developing alternative sources of gas for domestic utilisation in the Nigerian power and industrial production sector.

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