

# EXPANDING ACCESS TO PRO-POOR ENERGY SERVICES IN NIGERIA



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## Executive Summary

Nigeria experiences a remarkable paradox – the abundance of energy resources and widespread energy poverty. Only about 40% of the population has access to the country's grid electricity. About 72%<sup>1</sup> of the population depends on traditional fuelwood for cooking. Despite this, government financing of energy services that benefits majority of Nigeria's population has been grossly inadequate. Private sector investments and donor support have not fared better.

This paper examines the current level of energy poverty in Nigeria. It analyses the level of government, private sector and donor funding for energy services that benefit the poor. It further reviews international best practices in expanding access for pro poor energy services.

The paper finds a significant decline in political interest for expanding electricity services to rural areas. Even though ambitious policy reforms have commenced, agreed programmes are not implemented effectively. Not only is investments in rural electrification in decline, there is no history of annual budgeting for cooking energy programmes.

The paper recommends a number of action points for expanding access to energy services that benefit the poor. These include the development and launching of a new national rural electrification strategy; establishment of a national cooking energy programme; and the development of clear policy incentives to support private sector investment in energy services for the poor. It calls on the Nigerian Central Bank of Nigeria to set aside 10% of the existing power intervention fund for pro poor energy financing; and the Nigerian Electricity Regulatory Commission to establish a clear framework for the utilization of the Consumer Assistance Fund. Other recommendations include the use of a proportion of the Ecological Fund to finance cooking energy; establishment of a donor's platform on pro poor energy; and the mobilization of civil society in providing community-level energy services.

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<sup>1</sup> NBS-CBN-NCC Collaborative Survey, 2011

## Introduction

Access to sustainable, modern, affordable and reliable energy services is a fundamental prerequisite for poverty reduction and sustainable human development. Energy services impact upon all aspects of people's lives and livelihoods – people without access are constrained to a life of poverty. Nigerians experience some of the worst forms of energy poverty in the world.

Currently, 15.3 million households lack access to grid electricity; and for those connected to the national grid, supply is erratic at best<sup>2</sup>. Per capita electricity consumption has been less than 150KWh<sup>3</sup> per annum. Rural areas suffer the most electricity deprivation.

Energy deprivation in Nigeria goes beyond lack of access to electricity. An estimated 72% of Nigerians depend solely on wood as a source of fuel for cooking<sup>4</sup>. Contrary to the expectations of the National Energy Policy of 2003, deepening poverty has forced a reversal in the transition to modern and efficient energy forms. Today, more Nigerians are climbing down the energy ladder – moving from electricity, gas and kerosene to fuel wood and other traditional biomass energy forms.

**Table 1: Nigeria socio-economic indicators**

Population living in poverty (1980)	17 million
Population living in poverty (2010)	112 million
Access to electricity	47%
Number of households without electricity	15.3 million
Number of black-outs per day	28
Electricity consumption per capita	150kwh
% of pop. dependant on biomass	72%

*Source: Nigeria Poverty Profile 2010 - National Bureau of Statistics, Little Green Data Book 2011*

According to the World Health Organisations, cooking smoke from traditional biomass stoves causes 95,300 deaths in Nigeria annually<sup>5</sup>. After Malaria and HIV/AIDS it is the biggest killer of mostly women and children. In addition to this health problem, traditional biomass stoves burn 90% more wood than is necessary thus costing poor families and institutions money that could be put to better use on education, health and nutrition. Women and children in rural areas spend several hours a week fetching wood – time that could be spent in activities that empower women and children. What is more, millions of open fires in Nigerian homes contribute to the build-up of greenhouse gases that cause climate change.

This paper defines pro poor energy as the quantity and quality of energy services that are available, accessible, affordable, sustainable, and empowers both men and women, especially the poor. It focuses on measures to scale up low carbon electricity services and as well as cooking energy.

<sup>2</sup> <http://www.thenationonline.net/2011/index.php/business/energy/3413-100m-nigerians-don't-have-access-to-electricity,-says-bpe.html>

<sup>3</sup> World Development Indicators, Little Green Data Book 2011

<sup>4</sup> NBS-CBN-NCC Collaborative Survey, 2011

<sup>5</sup> World Health Organization, National Burden of Disease Estimates 2010

The paper comes at a time the United Nations declared 2012 as the year of sustainable energy for all. It seeks to support a new momentum to launch energy access on the national policy agenda. The paper reviews international experiences in expanding energy access, analyses the depth of energy poverty in Nigeria, review current efforts to address this problem and proposes measures to grow access to pro-poor energy services.

## International experiences in scaling up energy access

Presently, over 20% of the global population lack access to electricity and 40% rely on the traditional use of biomass for cooking<sup>6</sup>. The United Nations estimates that if nothing is done by 2030, 900 million people will not have access to electricity, 3 billion people will still cook with traditional fuels, and 30 million people will have died due to smoke-related diseases and many hundreds of millions would be confined to poverty due to lack of energy access<sup>7</sup>.

Some countries have recorded significant successes in extending access to electricity. For example, China has connected 500 million people in rural areas since 1990 whilst Vietnam has increased coverage from 5% to 98% in 35 years<sup>8</sup>. Other countries have made notable progress in improving access to both electricity and household cooking energy using some innovative approaches. For example, Cambodia, Mali<sup>9</sup> and Madagascar have made significant progress by providing support to the private sector from their rural electrification funds. In Bangladesh and Nepal, local operatives owned by consumers are developed to run electricity services.

At the end of Apartheid in 1994, only one-third of the population of South Africa was connected to the electricity grid. As part of the Reconstruction and Development Plan, electricity coverage was doubled ten years later<sup>10</sup>. The national power company, ESKOM moved from connecting a few thousand households to electrifying 300,000 households annually and reducing the cost of connection by 50%.<sup>11</sup>

Chile launched a rural electrification programme in 1994 using a bidding process where regions and private companies compete on the basis of connection costs and are paid on delivery of projects. It increased the coverage of electricity in rural areas from 53% in 1992 to 76% by the end of 1999, exceeding the 75% target set for 2000.<sup>12</sup> The programme in Chile demonstrated that it is possible to use market incentives that lead to efficient private solutions to rural electrification.

Smart subsidy schemes have also been employed to increase electricity access to rural households. Senegal and Mozambique uses 'output based aid' subsidies to reduce the cost of electricity to rural dwellers. Brazil also launched an initiative in 2003 called 'Light for all'. The program has already connected more than 2.4 million households.<sup>13</sup>

In some countries where clean cooking initiatives have been launched, governments are putting in place strategies to increase access to clean cooking technologies including efficient biomass stoves, LPG, etc. In 2009, the Indian Ministry of New and Renewable Energy launched a

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<sup>6</sup> IEA, 2010

<sup>7</sup> Practical Action (2012)

<sup>8</sup> Energy Poverty guide, October 2011

[http://uk.oneworld.net/guides/energy\\_poverty?gclid=CNKh6bvp1K4CFYMRNAodUFH1aw](http://uk.oneworld.net/guides/energy_poverty?gclid=CNKh6bvp1K4CFYMRNAodUFH1aw)

<sup>9</sup> Mali employed the services of Electricite de France (EDF). The company achieved its targets through the development of Rural Energy Services Companies (RESCos).

<sup>10</sup> Bernard Bekker, Anton Eberhard, Trevor Gaunt and Andrew Marquard (2008), South Africa's rapid electrification programme [http://www.erc.uct.ac.za/Research/publications/08bekker-et-al\\_electrification%20programme.pdf](http://www.erc.uct.ac.za/Research/publications/08bekker-et-al_electrification%20programme.pdf)

<sup>11</sup> Rob Stephen (2002) Increasing the Pace and Lowering the Cost of Rural Electrification Connections

<sup>12</sup> Alejandro Jadresic (2002) Enabling Rural Electrification Scale Up – The Role of the State in Chile.

<sup>13</sup> World Energy Outlook, 2011

'National Biomass Cookstove Initiative' to improve the quality of energy services to millions of households<sup>14</sup>.

Between 2001 and 2010, the Chinese program for the Development and Promotion of Biogas Utilization in Rural China built some 30 million biogas systems benefitting around 105 million people in rural areas. Focused government financial support on the poorest, setting minimum technical and quality control standards, adapting technology to match local resources are some measures that helped in the success of this initiative. The scheme benefits from an investment partnership of the Chinese Federal Government, state agencies and energy distributors<sup>15</sup>.

Almost without exception, the central role of government has been crucial in delivering successful programmes. Further, smarter business delivery models, innovative financing and partnership with sub-national governments and the private sector are vital in achieving large scale expansion of energy access to the poor.

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<sup>14</sup> C. Venkataraman et al (2010), The Indian National Initiative for Advanced Biomass Cookstoves: The benefits of clean combustion

<sup>15</sup> [Chunsheng Yao](#) (2010), The Prospects for Biogas Systems in Rural China: Incentives, Barriers and Potentials

## Energy poverty in Nigeria

The growing energy poverty in Nigeria is strongly linked to the broader increase in the population of the poor in the country. As shown in table 2 below, the population living in poverty has remarkably grown from 1980 to 2010.

**Table 2: Poverty level in Nigeria (Million)**

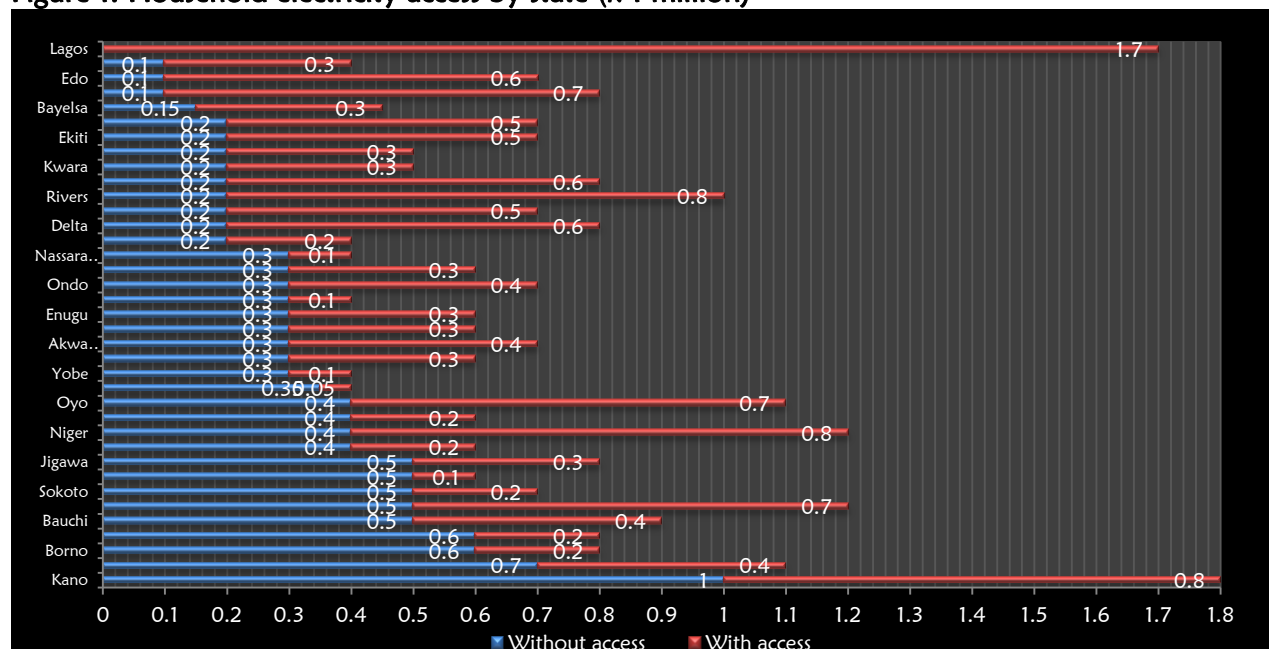
Year	Estimated population	Population in poverty	Poverty incidence (%)
1980	65.0	17.1	27.2
1985	75.0	34.7	46.3
1992	91.5	39.2	42.7
1996	102.3	67.1	65.6
2004	126.3	68.7	54.4
2010	163.0 <sup>16</sup>	112.47	69.0

Source: National Bureau of Statistics – Nigeria Poverty Profile 2010

There is a clear North and South energy access divide. In Lagos State virtually all the 1.7 million households are connected to the grid. At the other extreme, over one million households in Kano are not connected to the grid as shown in figure 1.

For a majority of Nigerians, cooking is the most important energy requirement of the family. In all 72% of the population depends on firewood for cooking using traditional “three stone fires”<sup>17</sup>. As shown in figure 2, some states especially those in the northern parts of the country have over 90% of households that depend on firewood for cooking. These are the states where deforestation and desertification are most prevalent and threatening the livelihood of inhabitants.

**Figure 1: Household electricity access by state (x 1 million)**



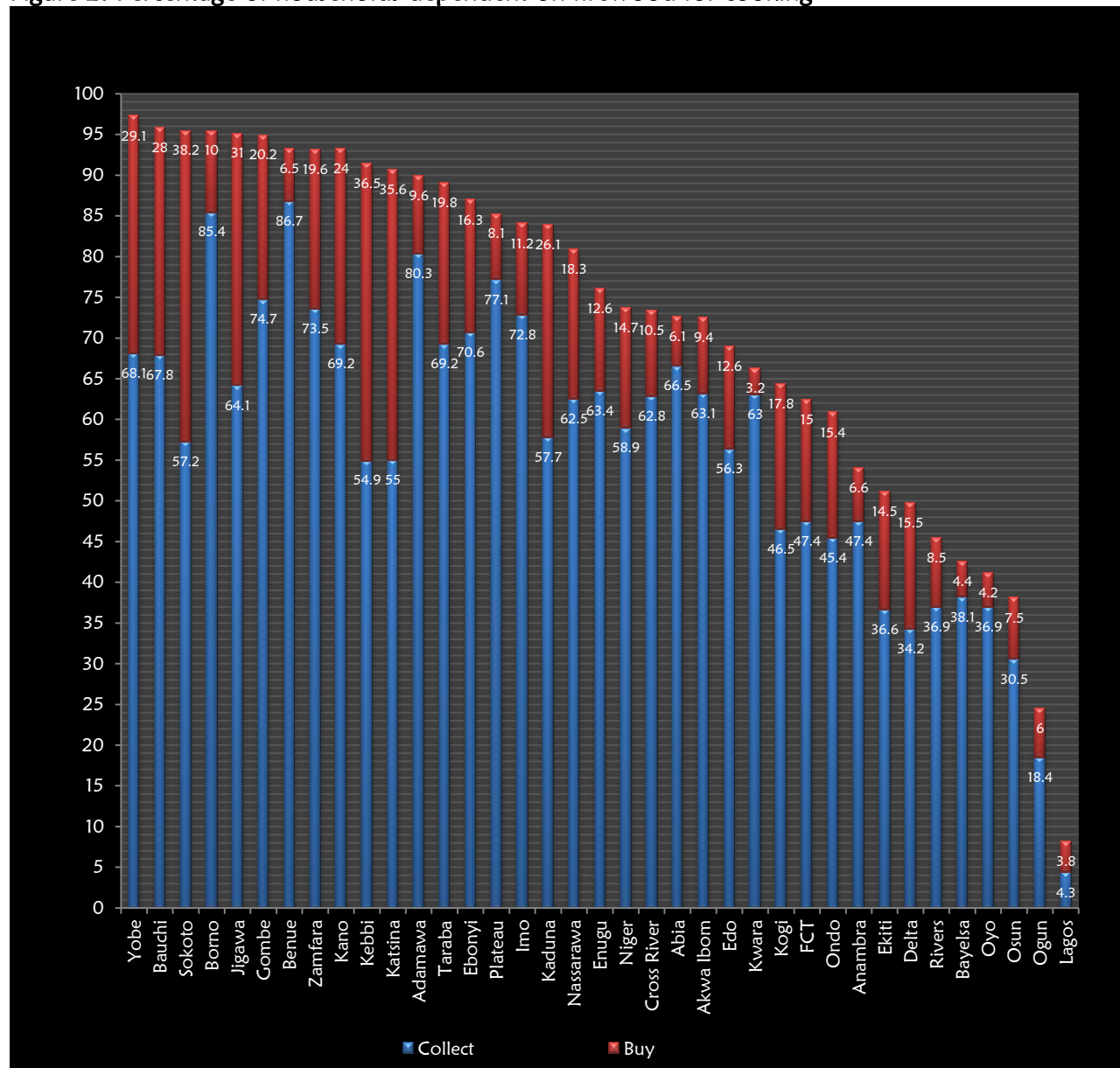
Source: IFC 2011

<sup>16</sup> National Population Commission’s estimates

<sup>17</sup> NBS-CBN-NCC Collaborative Survey, 2011



Figure 2: Percentage of households dependent on firewood for cooking

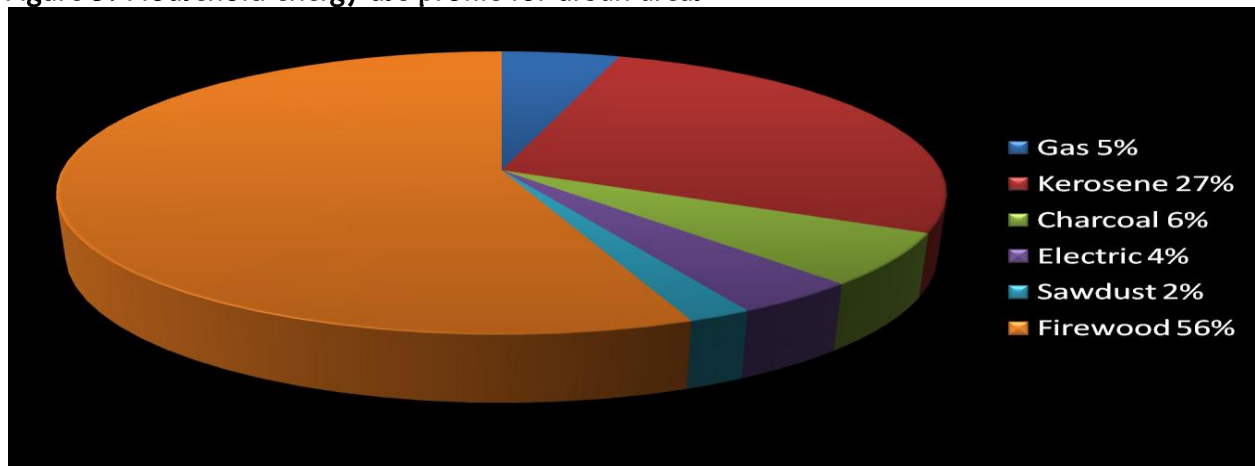


Source: NBS/CBN/NCC Socio-economic survey on Nigeria, 2010

Most families still collect wood for their cooking, while some, especially in the urban areas buy wood. More households in the wood deficit Northern parts of the country tend to buy wood.

Firewood is not only a source of energy for rural areas, it is also the energy of choice for urban poor. According to an ICEED Survey of 2007 shown in figure 3, 56% of households in semi urban and urban areas depend primarily on firewood for cooking.

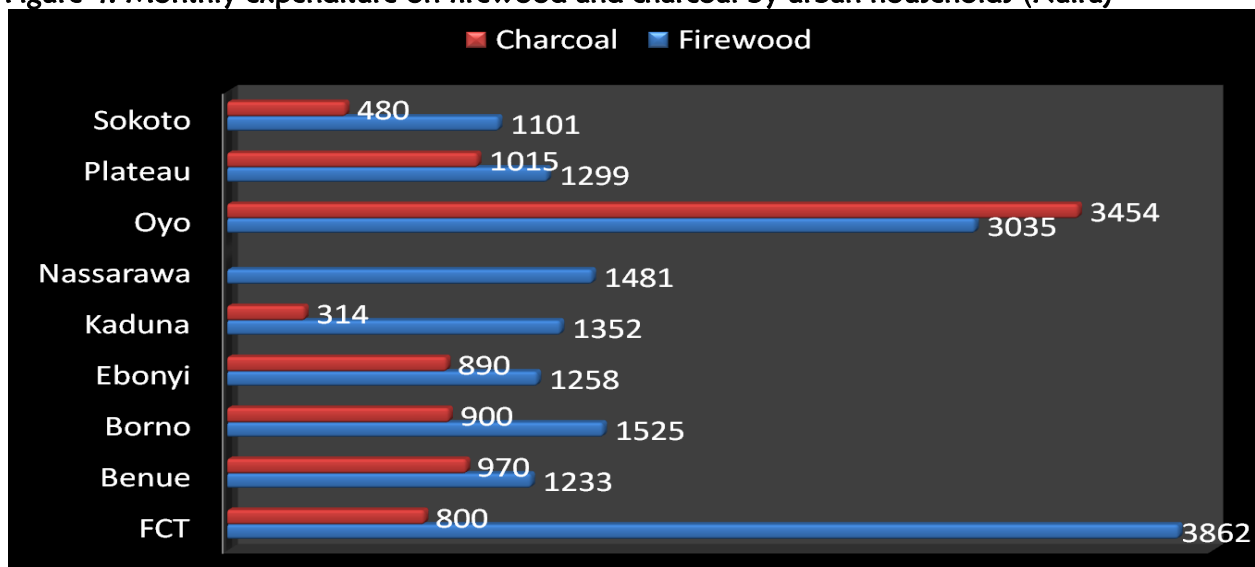
Figure 3: Household energy use profile for urban areas



Source: ICEED 2007

Firewood is increasingly commercialized as an energy source. As much as 38% of households in Nigeria buy firewood from the market. The ICEED survey of 2007 also established that households in urban areas spend significant portion of their budget on buying firewood as shown in figure 4.

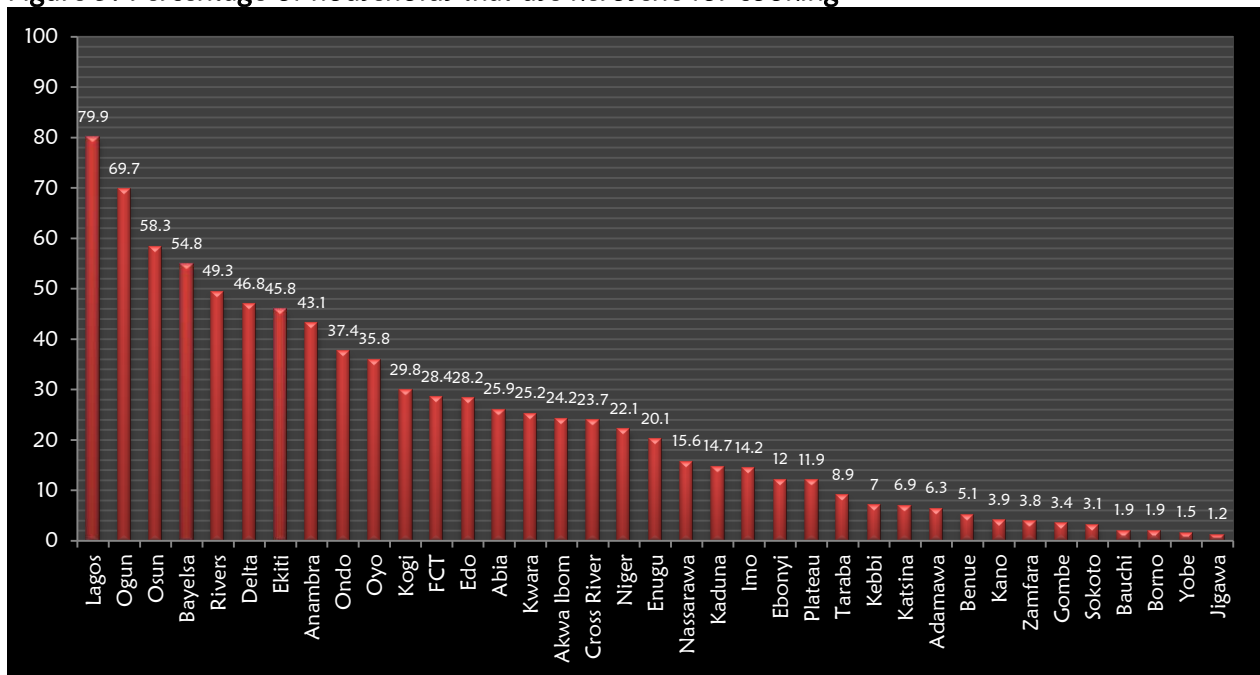
Figure 4: Monthly expenditure on firewood and charcoal by urban households (Naira)



Source: ICEED 2007

More families in the South use kerosene for cooking than in the North. Figure 5 shows the national distribution of households using kerosene.

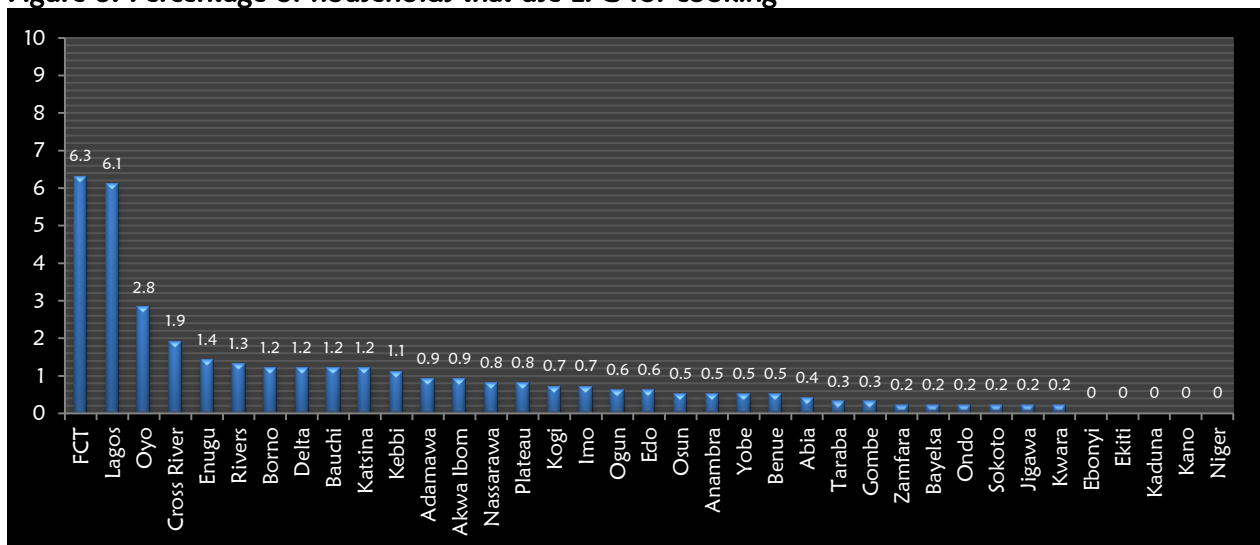
Figure 5: Percentage of households that use kerosene for cooking



Source: NBS/CBN/NCC Socio-economic survey on Nigeria, 2010

Per capita LPG use in Nigeria is one of the lowest in Africa, despite being one of the world's leading exporter of natural gas. Even in Lagos and the FCT - two states that top the national LPG usage, the number of households cooking with gas is still dismally low.

Figure 6: Percentage of households that use LPG for cooking



Source: NBS/CBN/NCC Socio-economic survey on Nigeria, 2010

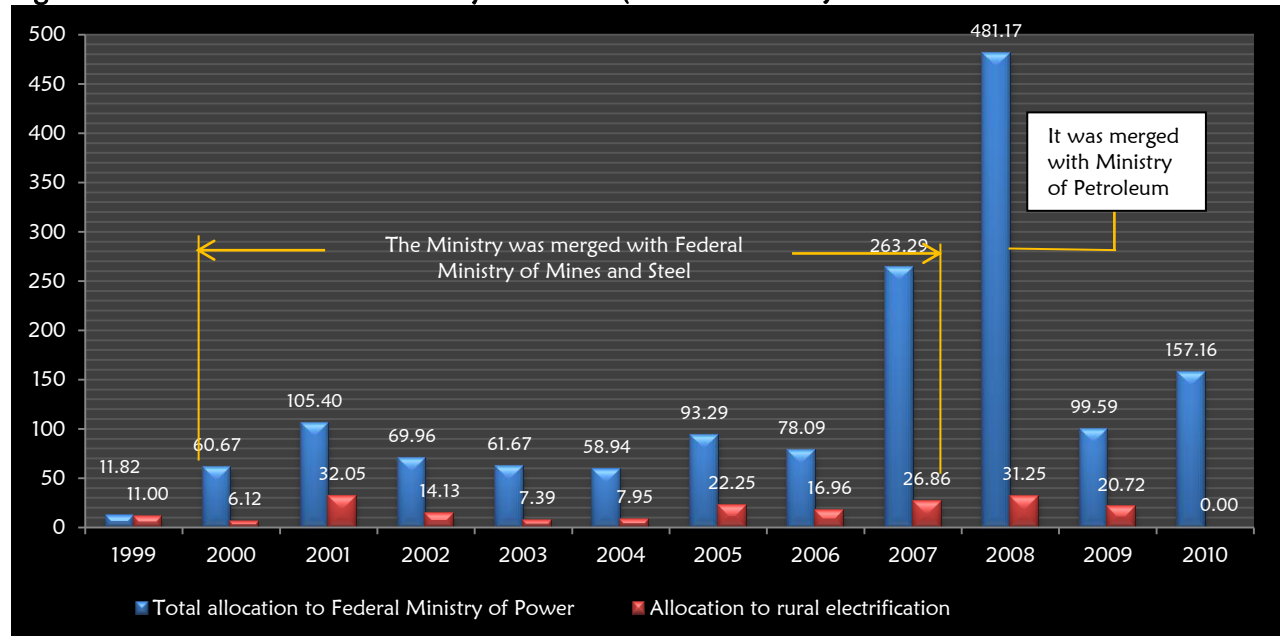
## Current efforts to address energy poverty in Nigeria

Significant efforts are being made by various levels of government in Nigeria to address the deepening energy poverty. The private sector, NGOs and donors are investing resources in providing poor people with energy services. The following is a snapshot of current and planned activities.

The Electric Power Sector Reform Act mandated the establishment of Rural Electrification Agency (REA). In 2006, the REA set out to achieve 75% electricity access by 2020. As a result of serious governance issues, the board and management of the agency were removed in 2009. The Federal Government has only recently re-constituted both the board and management of the agency. The agency is currently working with partners to re-launch a national programme for electricity expansion.

The inability to scale up access to electricity may not entirely be a result of lack of funding by the government. From 1999 to 2010, the federal government has allocated about 1.5 Trillion Naira to the power sector through the Federal Ministry of Power<sup>18</sup>. About 191 Billion of these resources was dedicated specifically to rural electrification. Figure 6 below shows budgetary allocations to rural electrification in relation to total allocation to the Federal Ministry of Power from 1999 to 2010.

**Figure 7: Total allocation to Ministry of Power (in Billion Naira)**



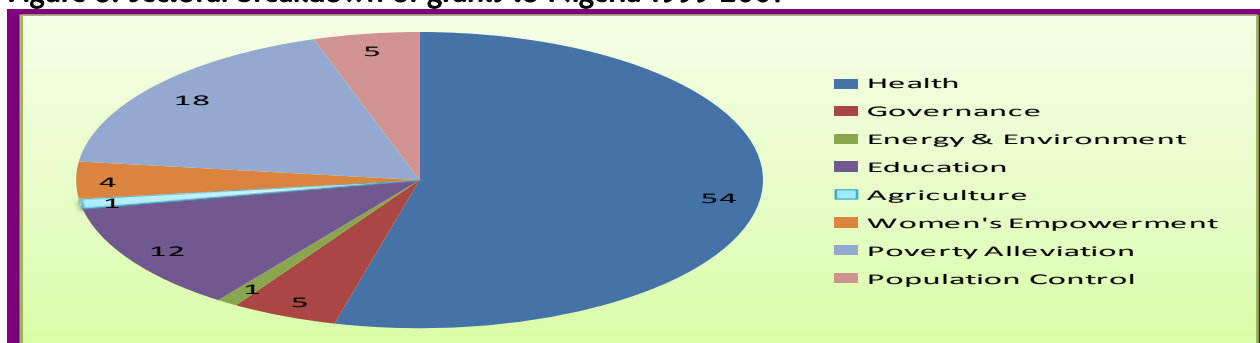
Source: Office of the Accountant General of the Federation (the figures for rural electrification do not include supplementary allocations for this period because the supplementary allocation budgets were not disaggregated)

<sup>18</sup> Appropriation and Supplementary Appropriation Acts of the Federal Republic of Nigeria from 1999 to 2010. This figure includes both recurrent and capital allocations. The Federal Ministry of Power was merged with the Federal Ministry of Steel from 2000 to 2007, and with Ministry of Petroleum from 2008 to 2009. So the budget allocations were not to Power alone.

The Nigerian Alliance for Clean Cookstoves was launched in 2012. This public-private partnership seeks to introduce 10 million clean cookstoves to the Nigerian market by 2020. It seeks to strengthen policy frameworks, technical standards, create more innovative financing and promotion. Until recently, the Federal Government had not provided any budget lines for promoting access to cooking energy services.

The lack of priority accorded to energy access by the federal government is replicated by donors in Nigeria. An analysis of donor funding from 1999 to 2007 shows that energy and environment received a dismal 1% of total grants as reflected in figure 8 below<sup>19</sup>.

**Figure 8: Sectoral breakdown of grants to Nigeria 1999-2007**



Source: NPC ODA publication 2008

Table 3 below shows details of donor support for pro poor and sustainable energy services.

**Table 3: Examples of existing and planned donor programmes**

Donor agency	Funding details
USAID	i. \$10m - \$32m Partial Risk Guarantees for renewable energy and energy efficiency. ii. \$1.3m for ongoing Energy Efficient Woodstoves project in Lagos and Ebonyi States.
GIZ/EU	i. €9m Renewable Energy and Energy Efficiency (likely €20m including EU match funding) 4 year technical assistance programme to Ministry of Power agreed March 2012, including pilot projects in 3 states
DFID	i. Nigeria Infrastructure Advisory Facility Climate Change Programme focusing on promoting access to energy services for small businesses and households
UNDP	i. GEF Nigeria Energy Efficiency Project \$5m, data gathering for energy performance standards, set up testing centres, focused behavioural change awareness, and pilot projects. ii. \$2 million of UNDP/Bank of Industry access to renewable energy scale up initiative
UNIDO	i. Distribution of 200 solar lanterns in Ebonyi State in 2011 ii. Completion of 30KW and 150KW SHP pilot projects in Enugu and Bauchi States respectively.
GEF	i. \$2.62m project Mini-grids based on Renewable Energy Sources to Augment Rural Electrification. Project is being implemented by UNIDO ii. \$2.73m Small Scale Associated Gas Utilization project. Project started in 2011 and is being implemented by IBRD
JICA	i. Funding for the 2 billion Naira solar projects in Katsina State. ii. Funding for rural electrification projects between 2007 to 2010

<sup>19</sup> The total breakdown of expended funds by sectors

## Findings

The following are the key findings of this report:

1. **Rural Electrification has fallen outside the policy radar.** Nigeria embarked on an ambitious Rural Electrification Programme in 1981. The goal of the programme was to connect all local government headquarters to the national grid. From the local government nodes, power could be distributed to all nooks and crannies of the country. The programme received even more political support after the setting up of the Rural Electrification Agency. Today, political support for an ambitious programme does not exist and must be built if power must reach the majority of rural people.
2. **Nigeria has no history of budgeting for cooking energy programmes.** Until recently, governments at all levels, almost without exception had not addressed the cooking energy challenges faced by poor families. Federal and state agencies have no history of setting out annual appropriations for cooking energy.
3. **Non-Implementation of agreed policy, legal and regulatory frameworks:** A number of good policy documents exist but faithful implementation is lacking. The National Energy Policy of 2003, National Policy Guidelines on Renewable Electricity of 2006, Renewable Energy Master Plan of 2005, National Energy Master Plan of 2006, and Renewable Electricity Action Programme of 2006 bear witness to the good intentions of government, but no commitments to effective implementation.
4. **Weak institutional champions:** No agencies have shown clear leadership in delivering a vision of universal access to both power and cooking energy for poor people. Besides a newly constituted REA and new efforts by the Federal Ministry of Environment, there are no strong institutions with clear vision and resources to champion universal access to energy services.
5. **Inadequate access to finance:** Families and SMEs have no available financial products that enable them to acquire pro-poor energy services such as clean biomass cookstoves, LPG and solar lanterns.
6. **No clear service delivery models:** There are no alternative service delivery models for public support to expanding access to energy services, except the ineffective direct government contract awards.

## Recommendations

Considering the above challenges, the authors recommend the following:

- 1. Develop and launch a new national rural electrification strategy**  
The REA should as a matter of urgency re-launch a new national rural electrification programme and develop an operation framework for the Rural Electrification Fund.
- 2. Establish a national cooking energy programme.**  
The Federal Government should establish a public-private-partnership to expand access to sustainable cooking energy services. The Nigerian Alliance for Clean Cookstoves presents a possible template for this national programme.
- 3. Develop clear policy incentives to support private sector investment in energy services for the poor.**  
Private sector investment for sustainable energy services has been inadequate. This is mainly due to lack of supportive policies and enabling environment. The Federal Government must identify and develop clear policy incentives for increased private sector participation in the delivery of off-grid power and clean cookstoves.
- 4. Central Bank of Nigeria to set aside 10% of the power intervention fund for pro poor energy financing.**  
Donors may also contribute to this fund.
- 5. NERC to establish a framework for the utilization of the Consumer Assistance Fund.**  
The Nigerian Electricity Regulatory Commission has set up a Power Consumer Assistance Fund to support low income users, expand rural coverage and encourage the use of renewable energy. The commission should establish a transparent framework for the utilization of this fund.
- 6. Use a proportion of the Ecological Fund to finance cooking energy.**  
The Federal Government established the Ecological Fund as a pool of funds that would be solely devoted to funding of environmental problems. Since firewood is the primary source of cooking fuel for a majority of Nigerian families and contributes to deforestation, a proportion of the Ecological Fund should be set aside for clean cooking energy
- 7. Establish a donor's platform on pro poor energy.**  
There is no coordinated donors' forum where plans and lessons are shared. There is therefore the need to establish a pro-poor energy forum for donors.
- 8. Mobilize NGOs to provide community-level energy services.**  
Non Governmental Organizations are known to be closer to communities than state agencies. NGOs must engage on energy issues and empower communities to demand accountability in energy service delivery.

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