

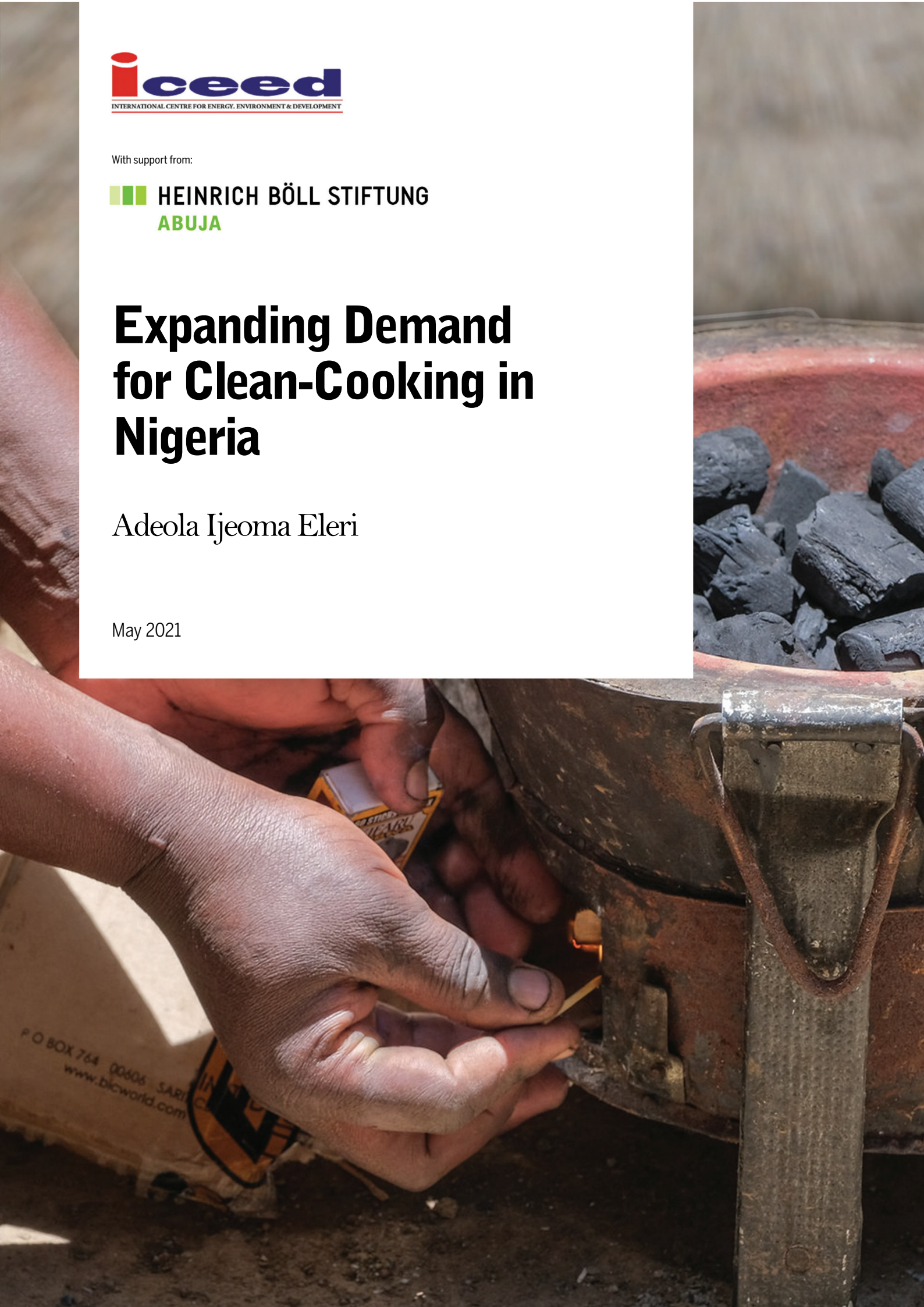
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Expanding Demand for Clean-Cooking in Nigeria

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Key Messages

The costs of clean-cooking fuels and cooking technologies are primary determinants of demand. Growing poverty, therefore, expands the scope of the challenge facing Nigeria to close the demand gap. While other factors for the choice of cooking practices are important, cooking-energy prices are pivotal in the choice that consumers make when considering a switch of fuel types or equipment. Therefore, purchasing power is at the heart of efforts to incentivise cooking-energy transitions.

Energy stacking is the norm. Most families have more than one stove type and use a variety of fuels regularly. The transition to cleaner fuels is therefore not a linear process. Stacking is a coping mechanism to improve the resilience of families to the vagaries of the market and dictates of their cooking culture. The richer the family, the more likely they will practice cooking-energy stacking.

The acceptance of LPG as the preferred fuel is high in urban areas. While most families have a combination of cooking-energy fuels, there is a clear preference for liquefied petroleum gas (LPG) in the peri-urban and urban areas surveyed. This is potentially an important component of the cooking-energy transition jigsaw for urban and rural areas. It is a different story for poorer and more rural households. There, the dominance of wood as a cooking fuel is solid.

There is a remarkable regional disparity in the choice of cooking-energy solutions. While more households in most of southern Nigeria increasingly turn to LPG as a preferred fuel for cooking, most households in the north, especially in the North East and North West regions, depend on wood as the fuel of choice. The linkage between poverty rates and the choice of wood in three-stone fires is particularly strong in the north.

Neither health nor climate mitigation figure high in the choice of fuels and technologies. While there is a growing awareness of the health impacts of smoke from the kitchen and how the use of wood for cooking affects the environment, these do not seem to be the top priority of the poor in choosing their fuels or technologies.

Availability, accessibility and awareness matter. Beyond income and purchasing power, the study found that consumers prefer fuel types that are always available and accessible. Cooking-fuel scarcity makes consumers feel vulnerable. When fuels are not accessible, either because they are sold in bulk quantities or consumers must travel a long distance to buy them, it creates uncertainties. Awareness of the value proposition of new fuels and technologies is also important when considering a possible switch in cooking-energy practices. However, the impacts of dirty cooking on family health do not seem to be the top priority of household decision-makers.

Implications for policy

One size does not fit all. Government and donors must ensure that cooking-energy initiatives reflect the fundamental linkage between households' energy choices and their purchasing power. This calls for differential policies to incentivise demand for fuels and technologies according to family incomes and considering the specific differences between urban and rural areas.

Focus LPG market expansion first and foremost in urban and peri-urban areas. There is already traction in the LPG market. Both the purchasing power of users and the suppliers' infrastructure are stronger in urban and peri-urban areas. Government and the private LPG sector should practice market intensification in these geographical areas and target universal access to LPG there.

Reliability matters. Sustain growth in the LPG market by ensuring a stable price regime. Stable prices and reliable supplies reduce the vulnerability experienced by low-income households in urban and peri-urban areas.

Build rural cooking-energy initiatives based on improved wood stoves and establish a path for a transition to cleaner fuels. Low incomes and lack of infrastructure in rural areas undermine the initiative to convert rural household cooking to LPG. Clean cookstoves provided as public goods, paid for by carbon offset and baked into livelihood programmes or a mix of market and non-market mechanisms are needed to expand clean cooking among the poor in rural areas.

Behaviour-change communication cannot be left to businesses alone. When families choose cleaner cooking practices, the society gains a lower burden of diseases, sustainable forests, a liveable climate and lower levels of poverty. Government at various levels should consider investing in behaviour-change communication to promote clean cooking in all its value chains.

Cooking-energy markets alone will not close the cooking-energy gap. Intervention by government that focuses on providing clean-cooking energy for the poorest is an imperative. Climate and domestic development finance will play important roles in lowering the high entry costs of clean cooking. The Federal Government must therefore build a well-coordinated programme to deliver these financing mechanisms.

1. INTRODUCTION

Lack of access to clean cooking poses economic, health and environmental challenges for households, businesses and the country. For more than three decades, the international community has grappled with the seemingly daunting task of reducing the number of people using traditional fuels such as solid biomass for cooking. In the period 2010–2018, the global access deficit has remained almost the same, declining from 3 billion to 2.8 billion people (IEA et al, 2020).

This situation is not much different in Nigeria. Statistics show that progress towards clean cooking has been very slow in the period 2011–2018. Clean-cooking access has moved from a very low level of under 5% to about 10% due to new efforts to promote LPG (NBS 2020). From all indications, Nigeria is lagging behind other sub-Saharan African countries in providing clean-cooking solutions for households and businesses (World Bank, 2018).

As part of the measures to address the cooking-energy challenge, a debate on the important drivers for the uptake of clean cooking-energy services has raged on. Analysts have sought to understand energy transition, especially from traditional fuels to cleaner alternatives. The dominant thinking has focused largely on socio-economic factors as key determinants for the transition to cleaner cooking solutions (Treiber, 2013). Energy transition is thus seen to be driven largely by socio-economic changes rather than a desire for modern fuels.

One school of thought has focused on the so-called “energy ladder”. It reasons that, as household incomes increase, a linear shift in cooking-fuel use ensues from solid biomass fuels to transitional fuels like kerosene, LPG and, finally, to electricity (Leach, 1992). Inherent in the energy-ladder thinking is the assumption that, although consumers may base their preferences on non-economic factors such as cleanliness, ease of use, cooking speed and efficiency, fuel switching occurs as a result of household economic welfare relative to the costs of various energy sources and their appliances (Hiemstra-Van der Horst & Hovorka, 2008).

An inherent assumption in the linear thinking on energy transition is the characterisation of wood fuel as an inferior economic good, used mainly by low-income households. The use of wood is not necessarily understood as a choice by households but rather a necessity borne out of economic circumstances. However, various other studies confirm that wood fuel is used across all the income brackets. In fact, households make wood fuel their first choice depending on a variety of reasons that range from easy availability, type of meal to be prepared and the occasion prepared for. This is important for our understanding of energy transitions and the willingness of households in Nigeria to switch from one cooking fuel or technology to another.

While this study will look at the impact of incomes and poverty on household choices of cooking fuels, it will also explore the hypothesis that fuel substitution is not necessarily perfect and that households often use multiple fuels together (Schlag & Zuzarte, 2008).

Though household income or poor socio-economic status are barriers to clean-cooking adoption, it may not be the main or only restraint (Jewitt et al., 2020). The so-called “energy stacking” school of thought rejects the linear simplification of the energy ladder and suggests that households, rather than moving up the ladder and completely abandoning less-efficient cooking solutions, slowly integrate more efficient fuels into the household energy mix and use all the different fuels in their mix (Masera et al., 2000; Ruiz-Mercado & Masera, 2015).

Understanding the various ideas that shape government interventions is important in initiating reforms on cooking energy in Nigeria. Therefore, to analyse the most important factors that shape the demand for clean-cooking solutions, this study will explore variables including income, availability of fuels, awareness of alternative solutions, issues of accessibility and the role that cooking culture can play.

The study will draw its evidence from interviews with important stakeholders such as policy makers and representatives of the clean-cooking industry and NGOs. To complement their views, the study adopted a bottom-up approach by organising four semi-structured focus-group discussions among user groups. In all, about one hundred women and men participated in the focus-group discussions. In the next sections, the study will review cooking-energy demand in Nigeria and then analyse the main barriers to access expansion through the lenses of both supply-side actors and users. From the barrier analysis, it will draw conclusions and implications for reforms in clean-cooking policies and actions in Nigeria.

2. COOKING ENERGY IN NIGERIA

Nigeria’s economy is energy-constrained. Despite being rich in diverse modern energy resources, the total energy supply of the country is predominantly fossil energy, led by biomass. Biofuels and waste represent 54% of the total primary energy supply. Others are oil products at 24%, gas at 17% and crude oil at 4%. Renewable energy, including hydro, wind and solar, constitute not more than 1% of the total energy supply.

In terms of total final energy consumption, biofuels and waste account for 60%, with 27% for oil products and gas representing 7%. Electricity accounts for only 6% of the total final energy consumption, and the contribution of renewable energy is negligible (International Energy Agency [IEA] et al., 2020) (see Figure 1).

Access to electricity is crucial for economic development, while the use of renewables and improved efficiency of energy use are important for economic growth and to meet the challenges of the changing climate. According to the NBS (2020), 44.6% of Nigerian

households do not have access to electricity. Overall, per capita electricity consumption is below 150kW per annum. According to the World Bank (2018), despite having nearly six in ten households connected to the grid, only 23% actually receive power from the grid. Nigeria has the highest level of outages in Africa at about 33 per month. An estimated 71% of all businesses in the country use their own generators.

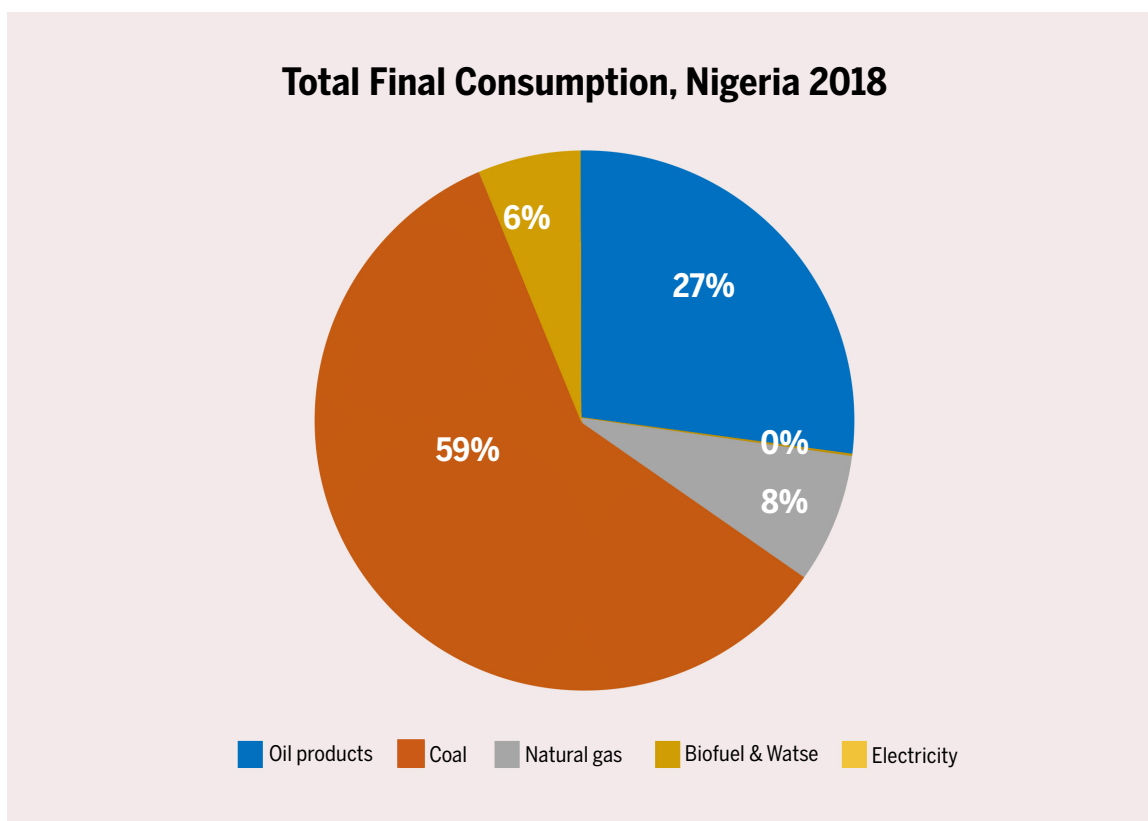


Figure 1. Total final consumption (2018) energy balance, 2018
Source: IEA et al, 2020

Access to cooking energy is even farther behind access to electricity. In the NBS (2020, p. 24) assessment, 68.3% of all households use solid biomass for cooking in Nigeria,¹ while only 10.5% use gas and 19.8% use kerosene. Only 1% of Nigeria's households use electricity for cooking. With current population estimates, over 180 million Nigerians lack access to clean-cooking fuels and technologies. The implications of this cut across the economy, environment, health and education – and for women and children, especially.

¹ This comprises three-stone fire (43.1%), self-built biomass stove (14.6%) and manufactured biomass stove (10.6%) (NBS, 2020, p. 24).

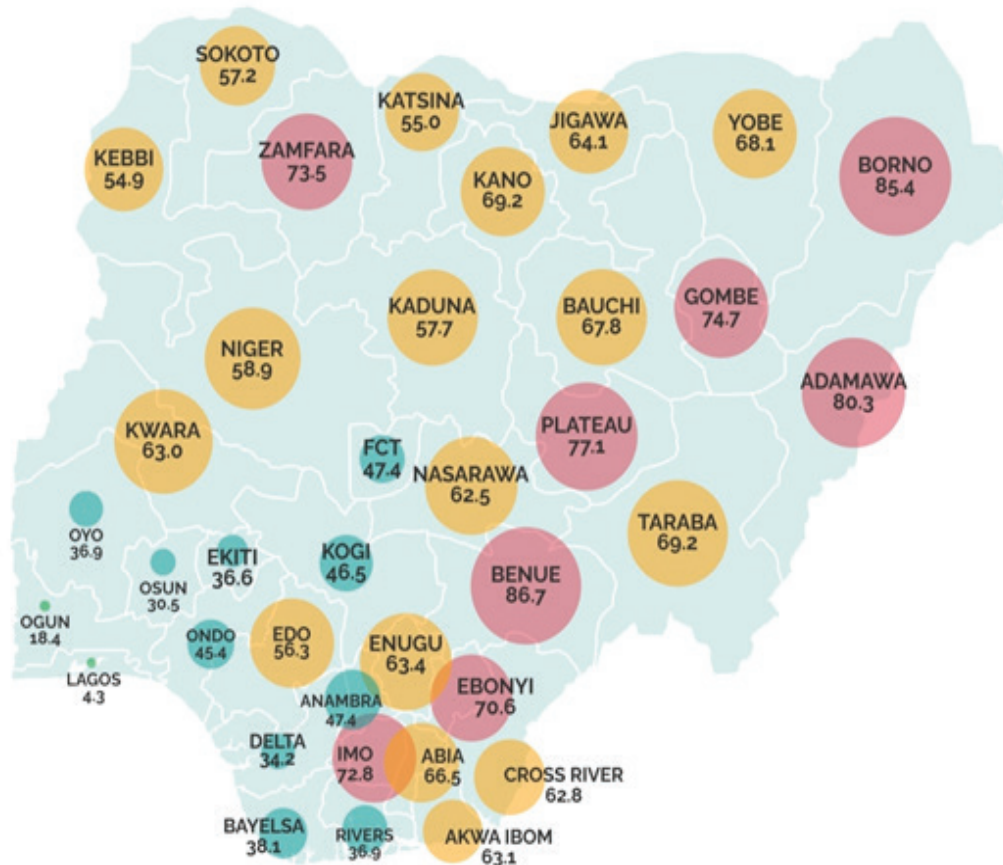


Figure 2. Percentage of households that use firewood for cooking per state
Source: NBS 2012 Household Survey

While there is widespread use of wood for cooking across the country, there is significant regional disparity (see Figure 2). States in northern Nigeria are more likely to use wood fuel than southern ones. States like Lagos and Ogun have very low numbers of households that predominantly use wood for cooking. However, the further north one goes, the more likely it is that households prefer the use of wood in traditional three stones. This is not unrelated to the existence of stronger LPG-distribution networks and higher household incomes in the more affluent southern states.

Access to clean cooking for productive uses such as institutional cooking for schools, prisons or agricultural processing lags further behind. An assessment of secondary boarding schools and street restaurants in Nassarawa and Niger States found that the cost of wood fuel represents 15% and 12%, respectively, of schools' and street restaurants' food budgets (ICEED, 2008). Virtually all of the cooks in these establishments complained about the hazard of smoke inhalation.

Demographic trends in Nigeria will likely compound the challenges of meeting the cooking-energy needs of households and institutions. With population growth of about 2.6%, at least one million new households are created in the country every year. To be able to

close the clean-cooking energy gap, government and stakeholders will require a scaled-up programme that provides an energy transition that surpasses one million households annually.

There is evidence that the Government of Nigeria has begun to take the issue of clean cooking more seriously. It has resolved to make clean cooking part of its commitment to scale up its mitigation ambition in the revised Nationally Determined Commitments under the Paris Agreement. This will likely mainstream this issue and may increase the likelihood of attracting financial resources from both local and international sources.

As part of the rising interest in clean cooking, the country's Covid-19 stimulus strategy – the Economic Sustainability Plan – is currently implementing a new initiative on LPG. It seeks to expand LPG use to 30 million households by 2025 and reach a total consumption volume of five million tonnes. The LPG plan is built on the 2017 National Gas Policy that introduced other measures such as the removal of 5% value added tax (VAT) on LPG, the establishment of the National LPG Expansion Initiative and the establishment of a Presidential Inter-Ministerial Committee on LPG with its secretariat in the Office of the Vice President.

Non-state actors are also increasingly taking interest in clean cooking. The Nigerian LPG Association is currently working with the Federal Government on the LPG Implementation Plan. The Nigerian Alliance for Clean Cook Stoves, which brings together most of the improved cookstove (ICS) businesses, has been re-launched with new leadership. More international ICS companies, like the Nairobi-based Burn Manufacturing Limited and global leaders such as Envirofit, have since taken positions in the Nigerian market.

3. BARRIERS AND OPPORTUNITIES

There is obvious momentum to improve access to clean cooking for households and institutions in Nigeria. The Federal Government has taken a number of concrete steps by making this issue a priority in its climate change response plan as well as the Covid-19 stimulus package. Getting it right depends on a good understanding of some of the main challenges and enablers for families to increase their uptake of cleaner fuels and technologies for cooking.

To identify the barriers and opportunities, we consulted with national stakeholders and four focus groups of users in Kabusa, Mpape, Guzape and Nyanya within the Federal Capital Territory (FCT).

3.1 Energy Access and Poverty

According to the National Bureau of Statistics (NBS), 40.1% of Nigerians are classified as poor: about 82.9 million people in all (NBS, 2020). Poverty is, of course, more prevalent in rural areas than in urban areas, with 52% and 18% respectively. According to the NBS, the poor are those with real per capita expenditures below N137 430 Naira per year or roughly N11 450 per month. Beyond income poverty, a more composite poverty metric makes the picture look even gloomier. Nigeria's position on the Human Development Index is 158 of the 189 countries assessed by the UNDP.

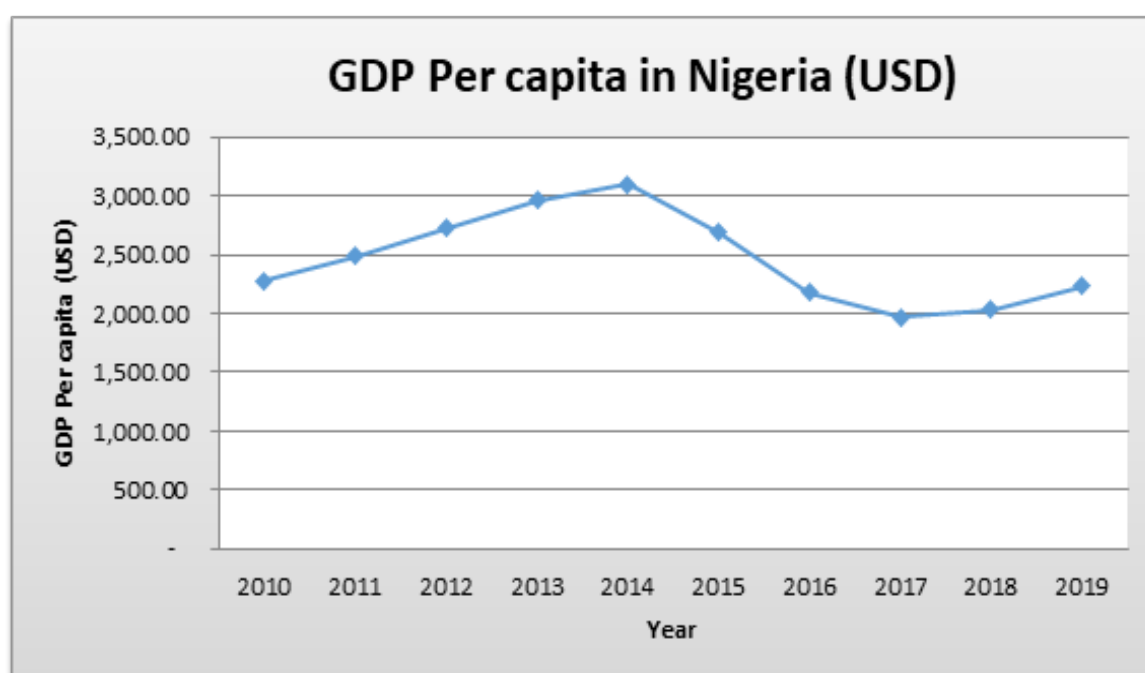


Figure 3. GDP per capita
Source: World Bank

Nigeria's economy has been recovering slowly since the 2016 recession. However, between 2014 and 2019, per capita incomes declined by 39% (see Figure 3). The Covid-19 pandemic in 2020 ground national economic activities to a halt and affected the global economy. Oil prices fell to about USD30 in March 2020. As the country depends on the export of oil for over 90% of its export earnings and about half of total federal revenue, these worsening economic conditions affected per capita incomes.

It was already well known that declining disposable household incomes affect households' ability to climb the cooking-energy ladder, as cleaner fuels such as electricity and LPG normally come with a higher price tag. For instance, most of the participants in the focus-group discussions gave cost as a reason why they do not use electricity. Others complained about the cost of refilling LPG cylinders.

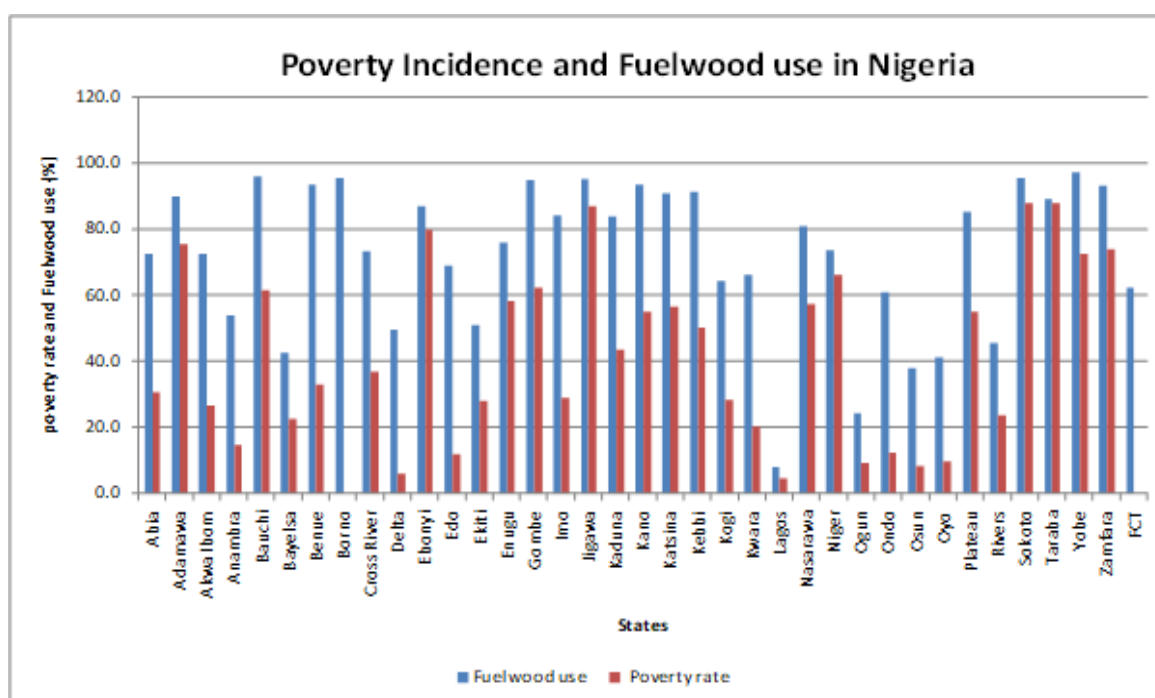


Figure 4: Poverty incidence and fuelwood use in Nigeria (NBS 2011, 2019)

Among the states of the Nigerian Federation, poverty prevalence tends to correlate with the choice of wood as a preferred cooking fuel. The southern states have also better infrastructure for the supply of cleaner energy, including LPG and electricity. With the lowest poverty incidence, Lagos also has the lowest prevalence of the use of wood for cooking. Most of the northern states, especially in the North East and North West, are among the poorest in the country and a greater proportion of their households use wood as the preferred fuel (see Figure 4).

Apparently, there is also a vicious cycle in which the lack of access to clean and modern energy services leads to low incomes and deprivation while, at the same time, low incomes ensure that clean and modern energy services are out of reach for the poor (Kara-kezi et al., 2012). This was confirmed in the focus-group discussions, where three in four participants indicated a high interest in switching to cleaner energy forms and technologies, but only about one in ten could actually pay between N2,000 and N5,000. About half of the focus-group participants could only pay between N500 and N2,000.

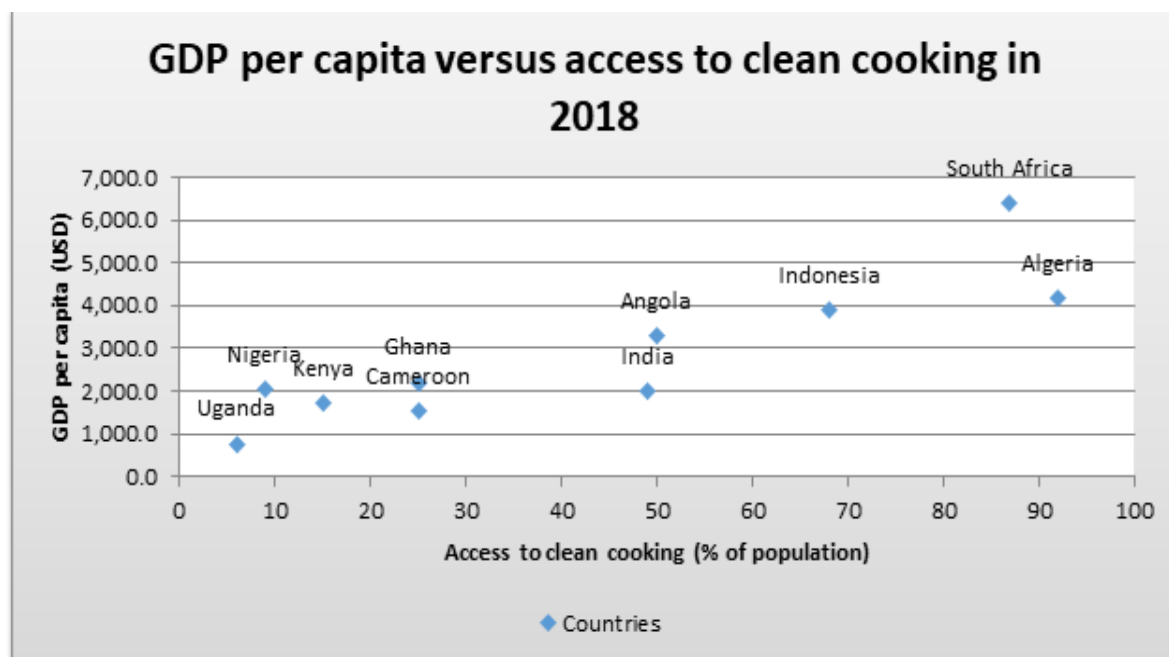


Figure 5: GDP per capita and clean-cooking access among developing countries, 2018

While it is well established that the broader economy and household disposable incomes are important determinants for the willingness of households to change cooking patterns, some countries with lower incomes have made more progress in providing better cooking solutions (see Figure 5). For instance, even though Nigeria's GDP per capita is higher than that of Cameroon, Ghana and India, these countries have more than double the proportion of their households cooking with cleaner and safer cooking methods. In fact, India has half of all its households covered, mostly with LPG. It is therefore safe to conclude that access to clean cooking is not only a matter of affordability.

3.2 Supply Constraints

There are major supply-side issues with all of the key cooking-energy forms. Improved cookstoves are almost non-existent in most Nigerian markets. There is no point telling households to shift to ICS if nobody offers efficient wood stoves or charcoal in their nearby markets. For instance, several participants in the focus-group discussions had never even seen an ICS in their local markets or the homes of their neighbours. The presence of alternative fuels and technologies for cooking gives users a chance to make decisions about them.

With the decentralisation of LPG supply, smaller skid plants that dispense LPG closer to where families reside have become common, especially in the southern parts of the country. Even though the price of a kilogram of LPG has increased, there has been a growth in

demand. In the four communities where focus-group discussions occurred, almost seven in ten participants reported using LPG because of the progress made in increasing the number of refilling plants located closer to users. Unfortunately, these positive developments in LPG supply are not being replicated in all the states of the Federation.

It is also conceivable that, should the electricity grid in Nigeria stabilise, more households will switch to electricity for cooking. Ethiopia presents an excellent example. Despite being much poorer than Nigeria, 32% of Ethiopian households use electricity for cooking. In South Africa, 80% of households cook with electricity. This has much less to do with the average GDP per capita of South Africa: rather, the country has a robust electricity supply system. The stability and reliability of electricity supply, rather than cost alone, may make electricity the preferred cooking alternative.

3.3 Cooking Culture and Resilience

The use of a combination of cooking-energy forms is quite common among the participants in the user focus groups. In all, about 70% of the participants across the four communities confirmed that they use a portfolio of energy forms for cooking. Contrary to the dominant opinion that energy stacking occurs mostly as a coping strategy, respondents saw stacking as a normal cooking culture and believed that some energy forms are best suited for preparing specific dishes.

Cooking traditions die hard. Studies have shown that, regardless of income, fuel availability and the price of alternative fuels, the form of cooking energy in use is influenced by the cooking culture, traditions and perceptions of the households. In Nigeria, it is widely believed that some meals taste better or cook faster with certain fuels. Therefore, even among high-income earners in some cities, two or more fuels are frequently used. Stacking of cooking-energy options is not necessarily a problem, especially where clean options are the most frequently used.

Many admit that seasonality and uncertainties in access to certain fuels demand that families look for alternative options. During rainy seasons, where cooking outside the house is a challenge and proper kitchens are not available, alternatives to wood fuel become attractive. When there are supply shortages for any particular fuel, households also tend to hedge themselves by making sure alternative cooking fuels are available. Stacking becomes, therefore, a strategy to strengthen resilience to weather, price changes or supply shortages.

3.4 Lack of Awareness on the Value Proposition of Clean Cooking

People are mostly stuck with the choices they know, the traditions they inherit and their special circumstances. Change comes with new information and clear reasons why a switch to a different energy form or technology is compelling. Experience from the field reveals that consumers are not always interested in clean biomass cookstoves for a number of reasons. First, they don't understand the need to change the technology when the fuel is still the same. Most were of the opinion that cooking with traditional biomass is a way of life. As one woman said, "After all, our grandmothers have been using wood fuel on traditional three stones for generations and they lived for 90 to 100 years." Several of the participants in the focus-group discussions claimed that they almost never suffer from cough, but most of those who sometimes suffered from cough were of the opinion that smoke was the cause of the cough.

There is very little awareness of the health impacts of cooking with wood in the traditional three-stone fire. In the user-group consultation, more than half of the participants were satisfied with their choice of cooking energy. Poor household decision-makers can relate to fuel and cost savings; however, the value proposition that cleaner fuels and technologies bring to family health is not always so clear and, therefore, does not become a top priority. There is work to be done in building this awareness.

Since the consequences of cooking with dirty fuels have health and economic impacts beyond an individual household, it qualifies as both a public-health and a public-good issue. Dirty cooking is already responsible for the premature death of nearly 100 000 lives annually. The welfare cost of morbidity and mortality arising from this practice should be the priority of government.

In addressing this barrier, the burden falls on governments at various levels to promote behaviour-change communication. It is less about income than winning hearts and minds to ultimately steer household choices towards a healthier and greener path.

3.5 Current Policies are Inadequate

Market-expansion policies for LPG are getting clearer and stronger. There is a national target and a road map. There are policy proposals such as the removal of 5% VAT, access to single-digit-interest loans from the Bank of Industry and the establishment of the National LPG Expansion Initiative domiciled in the Office of the Vice President. We also have the Presidential Inter-Ministerial Committee on LPG with the participation of the Nigeria LPG Association to enhance public-private coordination.

Poverty and non-existent LPG infrastructure in rural areas put the poor and rural dwellers outside the orbit of these policies. Beyond general statements on providing efficient wood stoves and LPG to rural areas, there are no concrete steps taken to implement them. There are also no specific policy measures to support cleaner biomass energy technologies in rural areas. Besides representatives of the Energy Commission of Nigeria and the

Federal Ministry of Environment, there are no active voices in government that support strong action for providing clean cooking in rural areas.

The political economy of clean cooking in Nigeria provides few incentives from influential actors to engage in the provision of pro-poor cooking alternatives. There is marginal demand for action as a result of pressure from electorates. It is also possible that the ICS sub-sector may not be able to provide the same scale of financial incentives that the oil-and-gas sector does for policy actors. Aligning incentives for influential actors to prioritise clean cooking for the poorest is, therefore, a formidable challenge.

3.6 Inadequate Sources of Finance

Both urban and rural access-expansion programmes face formidable financial hurdles. The average price the respondents in our survey were willing to expend on an LPG stove is in the range of N2 000–5 000. Only 2% were willing to spend N5 000–10 000 on the stoves. Only one in ten of all the respondents across the four communities are members of a co-operative society, and only one in twenty stated that they have had loan facilities.

A market-based approach will require patient capital for the relatively weak SMEs that dominate the provision of ICS. Users may also need consumer financing plans (e.g. pay-as-you-go) for better adoption of the new technologies. It is also known that the poorest often shy away from buying on credit to hedge themselves from income uncertainties. However, whichever way access-expansion delivery is modelled – market mechanisms or public-goods approach – funding will be required.

Given that Nigeria is currently undergoing a recession, an increased appropriation of public funds for clean cooking is a challenging proposition. Climate funding, as stipulated by Article 9 of the Paris Agreement, provides an option. However, the operationalisation of the funding mechanism is not yet clear. Like most African countries, Nigeria was unable to take full advantage of the Kyoto Protocol's Clean Development Mechanism financing regime. Significant capacity building will be needed to make Nigeria ready to attract new climate funds.

3.7 Lack of Standards, Safety and Good Industry Practice

There is a need to ensure the uniform quality of cooking devices. In the LPG space, there are no cylinder-recertification plants, hence most of the cylinders in use are old and expired. Some practitioners and consumers have found the ICS available in the market to be of poor quality and this discourages demand. Although there is an approved national standard for biomass cookstoves, it has not been enforced. With only one testing lab, the National Stove Eligibility Laboratory at the University of Nigeria Nsukka, more labs are needed around the country. The lack of a certification scheme such as that of the International Finance Corporation is also a major barrier to clean-cooking energy expansion.

4. CONCLUSIONS

With growing poverty and population increases, the outlook for achieving universal access to clean cooking is bleak. A recent modelling assessment by Maria Yetano Roche (2021) established that, with a business-as-usual scenario, the Federal Government is unlikely to meet its own clean-cooking targets by the year 2030. In fact, if current policies are allowed to continue, 60% of all Nigerian households would still be cooking with traditional fuels by 2030. Only 2% of all households would have made the transition to electricity and 1% would cook with ICS. The impact on family health, food budgets and local environments would be profound.

Broader socio-economic development factors will continue to shape the success of the transition to cleaner cooking. So far, the pointers are not good. The Nigerian economy is in recession and poverty is deepening. Meanwhile, with its increasing population, the country creates over one million new households annually. Closing the growing access gap, therefore, requires radical policies and political support.

A glimmer of hope in the policy landscape comes from new initiatives on LPG. But this is far from enough. Expanding infrastructure in urban and semi-urban areas, the lowering or outright removal of the cost of acquiring cylinders, holding LPG fuel prices stable and carrying out public awareness campaigns are a few of the important steps to achieving expanded access to LPG in urban and semi-urban areas.

Proper pricing of biomass fuels can also discourage their uses in urban areas. To assist in deepening the market for LPG in urban areas, a tax to make biomass more expensive for biomass users and traders, in relation to more modern and cleaner forms of energy, is a possible policy option. The introduction of stumpage fees at the point of harvest, production and/or importation is another way to raise the cost of biomass and thus serve as an incentive to switch to LPG.

A different suite of policies is required for the hard-to-reach rural poor. Improved cookstoves provide a path to cleaner cooking. Even though the evidence is not so strong, there is a view that the use of more modern biomass technologies will eventually help families to move to more modern and cleaner technologies like LPG or electric cooking in the future. ICS does not have strong political support or capable private-sector companies behind it. As a result, Nigeria lags behind other countries in providing acceptable cooking options for the rural poor. New initiatives have to be created for local production of relatively low-cost and low-technology efficient wood stoves. It is important that poor people can make a living producing and marketing ICS within their communities.

The transition to cleaner cooking using improved biomass technologies, LPG or electricity for productive uses has not been given adequate attention. Roadside restaurants, occasional communal cooking and cooking in schools, hospitals, prisons and other institutions consume a large proportion of key cooking fuels. Examples of policy options would include the demand for all commercial and institutional cooking in urban areas to use LPG or electricity. For commercial or institutional cooking in rural areas, the government can demand a certain performance of the biomass stoves. One other

possible policy initiative would be for the government to switch all public-owned institutions such as schools, hospitals and prisons to LPG or efficient wood stoves. This will have a strong signal effect and put the government in the leadership of the transition.

Enhancing demand for clean cooking requires a good deal of user confidence in the efficacy of technologies in the market. Lack of standards and labels creates uncertainties about the performance of stoves and cylinders. This is important both for LPG and ICS. The proposed cylinder-ownership model, in which current cylinders will be scrapped and replaced with distributor-owned cylinders, will enhance quality assurance. For ICS, the biomass stoves standards approved by the Standards Organisation of Nigeria in 2017 have yet to be activated. When successfully implemented, stove users will have greater confidence in the performance of their equipment.

Attitudinal change in favour of cleaner energy options is a public good that requires investment by government and donors. However, it is often a chicken-and-egg situation to say which comes first between delivering clean-cooking fuels and technologies in the market and spreading awareness about them. Programmes should be planned in such a way that behaviour-change communication will have a greater impact on the market for clean cooking.

The current economic situation in the country and the paucity of funds require innovative financing mechanisms. While working to enhance government funding for pro-poor cooking solutions, other non-traditional funding mechanisms are needed. One option is the Green Bond, which Nigeria has used for a number of priority projects that promote environmental and developmental objectives. Secondly, the proposed Central Bank of Nigeria-backed low-interest facility for LPG should be activated. Along with other promised fiscal measures, this would provide loans through the Bank of Industry at single-digit interest rates. Thirdly, international climate funds will be particularly important in lowering the cost of LPG and/or the outright removal of costs for ICS in semi-urban and rural areas. Capacity building for companies to register their carbon-asset projects and the active support of the Federal Government in negotiating bilateral carbon-financing deals with industrialised countries and multinational companies will also be needed. Finally, it is perhaps time to revisit the controversial issue of cooking-energy subsidies in Nigeria. A number of smart subsidy-delivery systems such as a voucher system, mobile money or the use of geospatial tracking mechanisms could be effective. Suppliers can also be supported through output-based incentive systems that ensure the delivery of clean-cooking solutions prior to the reward.

Time to seek energy justice for the poor? It is obvious that, with current policies, Nigeria will be unable to close the gap in cooking-energy access by 2030. The country will not be alone. The Africa Progress Panel (2015) predicted that sub-Saharan Africa is unlikely to achieve universal access by the middle of the century if new priorities and partnerships are not established.

It may be time to demand the right of the poor to safe cooking energy. The concept of energy rights may be justified, considering the disproportionate burden of diseases on poor families, especially women and children.. Moreover, there are hardly any good examples of countries where market forces alone provide universal access to energy services: most of the industrialised countries extended grid electricity to rural households even when these were not profitable. Likewise, industrialising countries with almost universal access have also gone beyond the trickle-down effect of the market to provide pro-poor energy services. It may now be time for the perspective of energy access as a public good along with individual rights to energy services. This requires a new narrative and political imperative.

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Annex 1: List of persons/organisations consulted

| SN | Name | Position/Organisation |
|----|--------------------------|--|
| 1 | Dr Peter Tarfa | Director Department of Climate Change, Federal Ministry of Environment |
| 2 | Dayo Adeshina | Programme manager Office of the Vice President, National LPG Expansion Plan; |
| 3 | Dr Ishmail Zarma | Energy Management Department, Energy Commission of Nigeria |
| 4 | Dr Richard Victor Osu | Team member National LPG Expansion Plan |
| 5 | Habiba Ali | CEO SOSAI Renewable Energies Company Limited |
| 6 | Happy Amos | CEO Roshan Global Services, Abuja |
| 7 | Biodun Olaore | Country director Envirofit International Nigeria Limited |
| 8 | Chinenye Anekwe | Business development manager Solar Sister, Abuja |

Source: Extracted from CLASP, 2017

Author's Bio

Adeola Ijeoma Eleri is currently completing a PhD in Energy Policy at the University of Ibadan. The focus of her thesis is on expanding clean cooking access for Nigerian households. Her career in renewable energy cuts across research, project management, training and advocacy. She is a specialist on market development for renewable energy services with specific focus on women. Adeola is currently on leave of absence from the Energy Commission of Nigeria where she holds the position of Asst. Chief Scientific Officer in the Department of Renewable Energy.



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