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Fostering an Enabling Policy Environment to Expand Clean-Cooking Access in Nigeria

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Key Findings

There are multiple but inconsistent policies and targets. Nigeria has conflicting policies and national targets on clean cooking. The time has come to have a clear, coherent, consistent and comprehensive policy on clean cooking. To achieve this requires a shared vision.

Nigeria requires multiple fuel sources and technology options in reaching its universal access goals. Both LPG and improved biomass cookstoves serve important segments of the required cooking-energy transition. These fuel sources provide a bridge to a carbon-neutral cooking future where electricity and renewable energy will meet the nation's cooking-energy needs in the long term.

Productive-cooking energy use requires attention. While households have been the focus of clean-cooking energy interventions in Nigeria, productive-use segments, such as institutional cooking in schools, hospitals and prisons as well as commercial users in restaurants, agricultural processing, etc., require interventions to enhance energy efficiency and a more rapid transition to carbon-neutral cooking.

We need an institutional home and unified leadership for clean cooking. Key influencers are fragmented. These include the Office of the Vice President, the Ministry of Petroleum Resources and the Nigerian LPG Association, which are all focusing on LPG market expansion. Meanwhile, the Federal Ministries of Environment, Women Affairs and Social Development, and Health, the Energy Commission of Nigeria and the Nigerian Alliance for Clean Cookstoves see the need to include improved biomass cookstoves in the cooking energy mix. Unfortunately, the paths of these actors don't often cross. A solid policy on clean cooking requires a strong national institution to drive an integrated approach.

Sub-national actors' involvement is crucial for policy formulation and implementation. The leadership of federal agencies in clean cooking alone will not be adequate. For effective access expansion, there is need for more involvement of state- and local-level agencies in policy formulation and implementation.

There are good templates for increasing clean-cooking access. Several countries at similar levels of development, including Ghana, Kenya and Indonesia, have made remarkable progress in providing clean-cooking solutions to their poor. Nigeria can share these lessons and develop policies that will accelerate the clean-cooking transition.

1. INTRODUCTION

Globally, access to clean cooking remains bleak as over 3 billion people still rely on polluting fuels and technologies for cooking, heating and lighting. Since the adoption of clean cooking does not seem to keep up with population growth rates, the world is not seeing the level of growth in uptake that is required (World Health Organization et al., 2018). Though there is appreciable progress in China and India, with over 450 million people gaining access to clean cooking since 2010 through the interplay of liquefied petroleum gas (LPG) programmes and clean air policies (International Energy Agency [IEA], 2019), the countries of sub-Saharan Africa (SSA), broadly speaking, are still lagging behind.

In developing Asia, 43% of the population relies on biomass for cooking while 80% of the population in SSA still cooks with solid biomass (IEA, 2017). The International Energy Agency (2017) estimates that, under current policy and population trends, 2.3 billion people globally and 60% of the rural population in developing countries will remain without access to clean cooking facilities in 2030. In SSA, over 300 million people will gain access to clean cooking by 2030, an estimated 100 million of them from clean-cooking pledges in countries' Nationally Determined Contributions (NDCs) to climate actions under the Paris Agreement.

The 2019 African Energy Outlook reports that SSA only had a marginal increase in clean-cooking-technology access – from 15% in 2015 to 17% in 2018 – leaving over 900 million people without access to clean cooking. However, a number of countries in the region are beginning to step up efforts. In Ghana, 24% of the population relied on LPG in 2018, while in Côte d'Ivoire, LPG is now used by almost 55% of urban households. Ethiopia has begun to feel the impact from gains in electricity access, as 32% of urban households were cooking with electricity in 2018 compared with only 6% in 2011. In South Africa, electricity is the main cooking fuel used by more than 80% of households nationally (IEA, 2019).

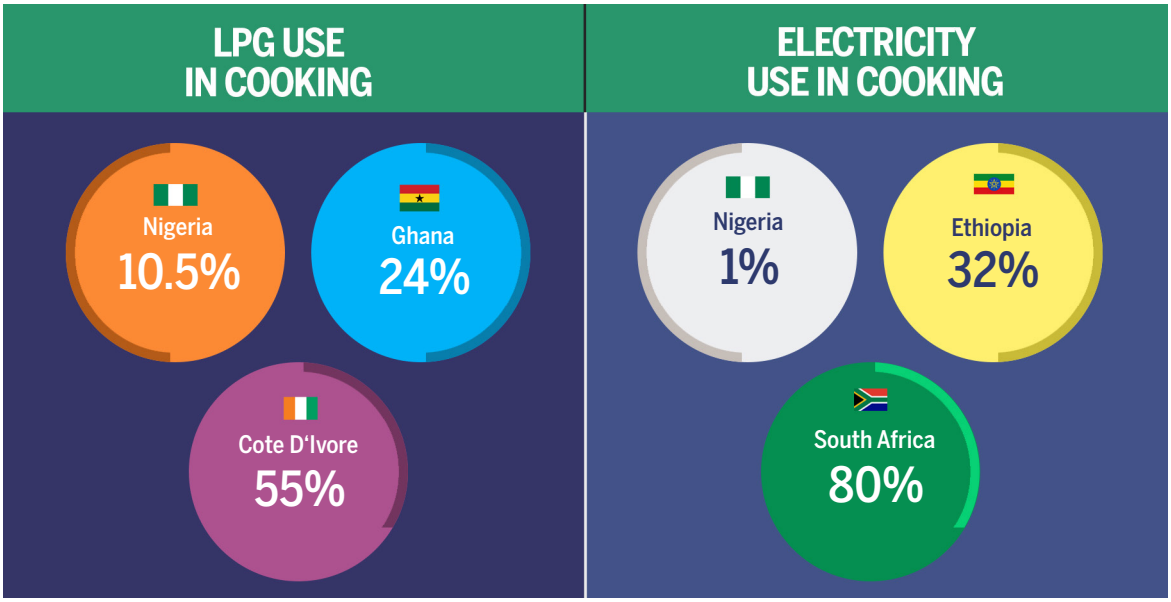

Figure 1. Representative use of LPG and electricity in cooking in sub-Saharan Africa
Source: IEA, 2019

Many countries have developed ambitious national programmes to tackle the issue of clean cooking. China launched a programme to bring clean-burning biogas stoves to rural families (Sinton et al., 2004). Indonesia's programme for families that were cooking with kerosene to switch to LPG reached over 40 million homes. In 2009, India announced a National Biomass Cookstove Initiative addressing technology, standards, testing, research and commercial dissemination. Peru and Mexico have set national goals of helping, respectively, 500 000 and 600 000 rural families to adopt clean-cooking solutions (Anenberg et al., 2013). Many other countries are moving in similar directions.

From the above, it is very clear that several countries are making remarkable progress in expanding access to clean cooking. Nigeria too can expand access to clean cooking solutions and reach millions of households if the right policies and institutions are in place, even though 10.5% currently use LPG, while about 70% use inefficient biomass for cooking (National Bureau of Statistics, 2020).

Many of the countries making progress towards clean cooking are poorer than Nigeria. Ethiopia, Ghana, Kenya and India all have per capita GDP lower than Nigeria. This brings to the fore the centrality of policies. The choices that governments make set countries apart in their ability to provide clean cooking for households and other users.

This report reviews Nigeria's clean-cooking policies, the institutions, current challenges and an overview of international best practices. The report is a result of desktop research and interviews with stakeholders in Nigeria's clean-cooking space. Prior to data collection, a wide range of national and international stakeholders from key government agencies, the private sector, development partners, academia and civil society organisations, most of whom are partners of the Nigerian Alliance for Clean Cookstoves, as well as representatives of international clean-cooking partnerships, were identified and consulted.[1]

[1] see Annex 1 for key stakeholders and Annex 2 for organisations consulted

2. NIGERIA'S CLEAN-COOKING-ENERGY POLICIES AND PLANS

There is no standalone policy for clean cooking in Nigeria. There are policy guidelines that affect clean cooking in a number of official documents.

In 2020, the Federal Government released its COVID-19 stimulus plan. The Nigeria Economic Sustainability Plan 2020 aims to mitigate the effects of a deep recession while ensuring social stability and addressing long-standing economic vulnerabilities as envisaged in the Economic Recovery and Growth Plan 2017–2020. One of the main pillars of the plan is the focus on the gas sector as an engine for economic recovery and growth. It seeks to promote the domestic utilisation of gas, among others, by encouraging indigenous manufacture of gas cylinders and other accessories and building gas filling stations to support the adoption and use of LPG. It specifically seeks to create one million jobs through the conversion of 30 million homes from dirty fuels to LPG and includes the removal of a 5% value-added tax.

The LPG Expansion Programme within the Economic Sustainability Plan was built on the National Gas Policy, 2017: it is one of the so-called "7 Big Wins" of the gas sector developed by the Ministry of Petroleum Resources and the Economic Recovery and Growth Plan. It articulates the vision of the Federal Government of Nigeria, sets goals, strategies and an implementation plan for the introduction of an appropriate institutional, legal, regulatory and commercial framework for the gas sector.

A good number of LPG implementation activities have already been rolled out. A free cylinder project has commenced in pilot states. Significant expansion in retail networks is visible in large parts of the country. New terminals in the ports of Lagos, Port Harcourt, Onne and Calabar have ensured an improved supply of products. However, an inefficient distribution chain, instability in prices, limited jetties, limited depot storage, limited and under-supplied terminals and unsafe cylinder population are some of the main challenges facing the sector. Moreover, some of the promised fiscal and development finance measures in the Economic Sustainability Plan are yet to be activated.

Prior to the new emphasis on LPG, much of the cooking-energy policies of the Federal Government were centred on the supply of kerosene. Since the oil boom in the 1970s, successive governments offered generous subsidies for kerosene, alongside gasoline and diesel. Imported and subsidised kerosene for households was accepted as part of a redistributive policy arising from the oil wealth. Despite the significant haemorrhage of state finances, with billions of US dollars spent on it, the subsidy scheme was maintained by a cabal of rent-seeking elites in business and government, as well as a coalition that includes the labour movement.

Unlike the LPG value chain, policy support for modern biomass cooking energy is almost non-existent. The National Energy Policy, 2018 emphasises the efficient utilisation of energy resources for sustainable national development with the active participation of the private sector. It calls for the promotion of efficient biomass cookstoves and other fuels and technologies for cooking. However, it has no clearly stated targets or specific measures to achieve them. The National Biofuel Policy, 2007 pledges to expand private-sector investments in the domestic production of biofuels. The government would create an enabling environment for the achievement of 100% domestic production of biofuels consumed in the country by 2020. Rather than focus on the household sector, the policy aims to replace a share of gasoline for automotive use.

A good number of policy documents seeking to encourage the use of renewable energy in cooking have emerged. *The Renewable Energy Master Plan (REMP),* 2004 and 2012 set targets for the use of renewables, especially clean biomass technologies for cooking. The national *Sustainable Energy for All (SE4ALL) Action Agenda, 2016* pledges Nigeria's commitment to global sustainable development and links with Nigeria's policy and regulatory documents on sustainable energy such as the National Renewable Energy and Energy Efficiency Policy, the *National Renewable Energy Action Plan (NREAP), 2016,* the National Energy Efficiency Action Plan etc. The NREAP targets 100% clean-cooking-fuel coverage by 2030 by providing improved cookstoves (59%), efficient charcoal production (7%) and modern fuel alternatives for cooking including LPG and ethanol gel fuel (34%). However, the document provides no mention of any plans for evaluating outcomes, follow-up assessments or details on data collection.

The REMP, SE4ALL, NREAP and other related policy documents tend to strengthen the linkage between energy delivery, including cooking energy, and the environment. The interest in carbon-neutral cooking is emerging. As Nigeria revises its NDCs, cooking has been highlighted as a priority mitigation opportunity. There is also an ongoing effort by the Rocky Mountain Institute to assess opportunities for modern energy cooking services in Nigeria. Cooking with electricity will be central, and especially opportunities for standalone renewable energy systems.

Currently, only 1% of households in Nigeria cook with electricity. According to a recent modelling by Mari Yetano Roche, no more than 2% of households will convert to electricity for cooking by 2030 under a business-as-usual scenario. The reasons are obvious, as the per capita electricity consumption in Nigeria is still under 150kW. In countries where electricity provides most of the cooking-energy needs, like South Africa, per capita electricity consumption is more than 4 000kW – although South Africa's grid is mostly fossil-based. Stakeholders in Nigeria do not seem to give much priority to zero-carbon cooking as a value on its own. But there is broad-based support for clean cooking that promotes multiple health, convenience and environmental benefits. That the environment can provide a vehicle to focus public attention on the daunting task of expanding clean cooking access is not lost on many.

While much of the attention on cooking policies has focused on households, none have

specifically addressed the needs of institutional and industrial cooking-energy users. Commercial establishments, such as bakeries, restaurants and hotels, and institutional users, such as boarding schools, hospitals, humanitarian camps and prisons, are large-scale users of cooking fuels. In Nigeria, this is predominantly wood-based, but there is also LPG used in urban areas. A number of donors have sought to pilot institutional cooking with the aim of stimulating broader adoption or policy development. Between 2012 and 2015, USAID implemented the Energy Efficient Woodstoves Project in Nigeria to build technical capacity and support the development of institutional-cooking policies in some states. The German GIZ/Nigerian Energy Support Programme's Clean Cooking Intervention 2015–2017 and the present Nigeria Institutional Cookstove Acceleration Scheme tried to raise awareness of the importance of productive uses of clean cooking by focusing on the linkage to agricultural processing. These efforts have not resulted in significant government ownership of these issues or the development of incentives to promote cleaner technologies and fuel sources for productive use.

Certain trends can be observed from the various public policy documents reviewed. They often contain conflicting policy targets. For instance, the clean-cooking targets set in SE4ALL conflict with the commitment set out in the NREAP. The SE4ALL Action Agenda 2016 set a target of 80% of the population using modern cooking fuel (LPG, ethanol, gel fuel, etc.) by 2030 while the NREAP, also in 2016, approved a target of 34% using modern cooking fuel by 2030 and 59% using improved cookstoves.

Except for the new initiatives in the LPG Plan, most of the policy documents do not have a clear implementation plan. Even the LPG implementation roadmap is yet to be defined. These policy documents have hardly any monitoring or evaluation frameworks and therefore lack a basis to assess their effectiveness and guide the actions of government and stakeholders. Equally significant is the lack of annual national appropriations for most of the prescribed policy actions. Perhaps even more concerning is that no tangible policy prescription by government has any force of law. None of the policy documents have been approved by the National Assembly.

Virtually all Federal Government policy initiatives on cooking are driven and funded by donors. The government can be seen to take independent cooking-energy initiatives in the oil and gas sectors: precisely, kerosene subsidy policies and policies around LPG. Various agencies of the government seem ever willing to embark on policy and project development for clean cooking as long as donors pay for them. In many ways, this questions the commitment and ownership of various Nigerian governments to the issue and the sustainability of public-sector initiatives on clean cooking. The attention span and resources of donors are limited. With limited domestic ownership of the policy space, consistent implementation becomes weak.

The lack of participation in policy development – both vertically, with the participation of state governments, and horizontally, ensuring the National Assembly's role in setting out policy premises – robs clean-cooking policies of much-needed legitimacy and support. Beyond such governance issues, inclusiveness in making these decisions, especially

the participation of women, seems to be weak. Since these policies often serve as a declaration of the good intentions of government, they often lack a rigorous proposal on funding and implementation. From the REMP to the Economic Sustainability Plan, there are no clear strategies for financing the envisaged implementation activities.

Lastly, there seems to be a broad understanding within government and among stakeholders that "policies" mean written documents developed by agencies of government with or without the approval of the Federal Executive Council or the National Assembly. This loosens their meaning and how much the government can be held to account for their implementation.

3. NIGERIA'S CLEAN-COOKING INSTITUTIONS

The clean-cooking industry involves different players at the federal, state and local government levels. There are also several associations and networks that promote clean cooking in Nigeria.

For LPG

The Office of the Vice President is currently anchoring the development and implementation of the National LPG Expansion Programme. This has not always been so, but it is a development that started with the Buhari administration. The programme seeks to coordinate efforts to expand access to LPG nationally. It has facilitated the establishment of extra terminals in the ports of Lagos, Warri, Calabar and Port Harcourt. It is coordinating an inter-ministerial effort to achieve the target of 5 million tons of LPG consumption by 2025, establish an LPG Energy Fund and switch the sector from a customer-cylinder-owned model to a marketer-cylinder-owned model.

The Ministry of Petroleum Resources features prominently in the Inter-Ministerial Committee on LPG. The Ministry, with its agencies, has launched a programme of "micro-distribution centres" which is expected to establish 380 000 micro-distribution centres to replace illegal and unsafe practices and standardise the re-selling of gas. The Ministry also plans to set up five cylinder-manufacturing plants and has launched a National Gas Expansion Programme Committee on LPG to oversee its work. A key agency of the Ministry, the Department of Petroleum, is charged with the responsibility of licensing LPG businesses in the country.

The Nigeria LPG Association is an important player in the LPG industry. It was established in 2003 as an umbrella body of all stakeholders in the LPG sector to promote the use of LPG in Nigeria. It has over one hundred members and works closely with the Office of the Vice President on the ongoing LPG expansion programme. The Association is an influential actor in the formulation of the policies of the current administration.

For biomass energy

While the Office of the Vice President and the Ministry of Petroleum Resources with its agencies are working to expand LPG use, the Federal Ministry of Environment has profiled itself as the agency of government with a broad mandate to address the various environmental problems caused by unsustainable cooking practices. These challenges include deforestation, land degradation and climate change. The linkage between these environmental concerns and key development issues, such as family health, adds impetus to its work and has positioned the Ministry as a champion for clean cooking. The Department of Climate Change within the Ministry has represented Nigeria internationally on clean-cooking matters and has become an important interlocutor with international bodies such as the Clean Cooking Alliance. The Ministry has launched a number of activities including the Rural Women Energy Security project and the National Clean Cooking Scheme to promote clean-cooking energy practices in Nigeria. The Ministry is currently partnering with the German GIZ's Nigeria Energy Support Project to promote clean institutional cooking. The Ministry is a key partner of the Nigerian Alliance for Clean Cookstoves.

The Energy Commission of Nigeria is perhaps the agency with the longest-standing interest in the research, development and policy on biomass cooking energy. Three of the Commission's energy research and development centres – the National Centre for Energy Research and Development, University of Nigeria, Nsukka; the National Centre for Energy and Environment, University of Benin; and the Sokoto Energy Research Centre at Usman Danfodio University, Sokoto – specialise in biomass energy research and development. The Commission is currently partnering with the Federal Ministry of Environment in the Sustainable Fuelwood Management Project in Nigeria, with funding from the United Nations Development Programme (UNDP).

The Nigerian Alliance for Clean Cookstoves, like the Nigeria LPG Association, is a public–private partnership that provides a platform for regular coordination and information exchange on clean cooking among agencies of the Federal Government, private-sector actors and NGOs. It supports policy change, better technical standards and innovative financing in the development of a national clean-cookstoves industry. The Alliance led the formation of the National Mirror Committee on Clean Cooking Solutions, which de-

veloped the Nigerian Industrial Standard for biomass-type clean cookstoves that was approved by the Standards Organisation of Nigeria in August 2018. The Alliance also established the National Stove Eligibility Laboratory, an independent laboratory for the testing of biomass stoves. The Alliance collaborates with other stakeholders to organise the annual Clean Cooking Forum.

Donor initiatives

International development partners have been very influential in shaping Nigerian cooking-energy policies. While the Federal Government had, since the 1970s, promoted petroleum-based cooking-energy alternatives and research and development in improved biomass stoves through the Energy Commission of Nigeria, it is donors and NGOs that have led the development of policies and projects on clean cooking. The UNDP funded the Renewable Energy Master Plan, which, for the first time, set policy targets for clean cooking in Nigeria. This was followed by several donor-supported policy initiatives such as the Renewable Energy and Energy Efficiency Policy. Important policy and project initiatives have been sponsored over recent years by the UK's DFID, USAID, the Food and Agriculture Organisation, the World Food Programme, the Clean Cooking Alliance and many others.

State initiatives

Even though the Nigerian Constitution places energy on the concurrent list, which gives legislative authority to both states and the Federal Government, almost all known initiatives have occurred at the federal level. However, a few states, such as Jigawa and Lagos, have taken independent steps to promote clean cooking.

The Jigawa State government set up the Alternative Energy Fund to solve problems related to deforestation and desertification. The state has locally produced and disseminated thousands of improved wood stoves free to households in Jigawa State over several years. In contrast, the Lagos State government is promoting the use of LPG as an alternative to fuelwood. In 2013, the government collaborated with Techno Oil and the Lagos Chamber of Commerce and Industry to implement a scheme aimed to ensure a healthy and sustainable environment in Lagos State. The LPG project also works with registered community development associations in the state.

4. KEY BARRIERS TO CLEAN-COOKING POLICY FORMULATION AND IMPLEMENTATION

Clean-cooking policy and implementation face the following challenges.

Policies are fragmented, conflicting and inconsistent

There are fragments of policies that address clean cooking in several documents, but these often have conflicting targets and are not always coherent. Awareness of these policies is also low, giving the impression that they are not a top priority of the government. Temilade Sesan (2021) offers the possible explanation that, except for some influential coalitions whose interests do converge on these issues, the interests of important actors are not aligned, and, therefore, the outlook for achieving the goals of universal access is bleak.

No strong institution to champion clean cooking

There is no lead agency responsible for clean-cooking policy formulation and implementation in Nigeria. While LPG has been given a place in the Vice President's Office under the Buhari administration, this office is transient and may not outlast the government. Meanwhile, there are no strong agencies with the primary responsibility to lead the government's efforts to respond to the needs of the urban and rural poor. Providing an institutional home for clean cooking will go a long way to address other barriers, including funding.

Weak enforcement of LPG standards and regulation

A majority of LPG vendors are not certified by the relevant authorities and this poses a danger to the industry overall. Weak enforcement of standards makes it impossible to regulate the downstream LPG sector in terms of quality, quantity and pricing. It is important to provide regulation that promotes the market and ensures standards and safety.

Lack of ownership of ICS sector

While LPG has strong political and industry support, such is not the case for improved biomass cookstoves (ICS). As important as biomass energy is to Nigerian households and institutional users, there are no strong institutions seeking to improve the cooking situation of poor people who depend on biomass for cooking. Instead, there is a policy of denial whereby public and private-sector actors project the idea that LPG will somehow be available to all in the foreseeable future. The path for universal access to either LPG or electricity for cooking is not clear.

Capacity constraints among policy makers

Agencies of the Federal Government have low capacity. Even though clean cooking is included in policy documents and national plans, policy makers often have limited understanding of the impacts of indoor air pollution and the potential benefits that various clean-cooking solutions are likely to deliver.

With only a few exceptions, states have no clean-cooking functions

Despite cooking energy being a window to addressing livelihood, health and environmental issues, and the presence of pilot projects in some states, only a handful are actually implementing clean-cooking initiatives.

Inadequate financing

Without proper prioritisation, adequate financial resources may not flow towards important clean-cooking programmes. From traditional annual appropriations to investments in private enterprises, including consumer financing to enhance demand, the sector is underfunded at every level.

5. INTERNATIONAL BEST PRACTICES IN CLEAN-COOKING POLICIES

This section reviews the clean-cooking policies in Ghana, Kenya and Indonesia. The aim is to identify specific successes and lessons learned, as well as constraints and difficulties in clean cooking policy formulation and implementation.

The government of Ghana has a National Policy on LPG Promotion that outlines various interventions to promote 50% access to LPG by 2020. The country's Strategic National Energy Plan sets different residential and commercial fuelwood- and LPG-related targets to be achieved by 2020. It identifies business models that can effectively attract and channel funding towards its achievement, and gives detailed information on all necessary parameters, including timelines and implementation mechanisms. Ghana has identified clean cooking as part of its NDC commitments. It specifies the need to expand the adoption of market-based cleaner-cooking solutions. Apart from the scaling up of LPG use from 5.5% to 50% in peri-urban and rural households by 2030, it seeks to expand access and adoption of 2 million efficient cookstoves by 2030.

Box 1.

Clean cooking in Kenya's NDCs

- **Kenya commits to shift to clean cooking through the development of efficient cooking solutions, thereby projecting a potential "to abate GHG emissions by 30% by 2030 relative to the business-as-usual scenario to mitigate climate change".**
- Kenya targets the number of households using improved biomass cookstoves to increase by 4 million by 2022 as part of attaining its NDC. It is expected that clean cooking will reduce the country's annual death rate attributed to household air pollution from 49% to 20%.

The Gyapa cookstove dominates the market in Ghana's urban areas. Much of its sales growth has been aided by the use of the carbon market. A department in the Ministry of Energy promotes clean cooking and helps to focus national attention as well as coordinate donor efforts.

Kenya is already a leader within sub-Saharan Africa in developing and distributing clean cookstoves. In 2015, the Kenyan government removed the excise duty on ethanol as a way to increase affordability and stimulate investment in ethanol as a cooking fuel. In 2016, with a similar aim, it removed the 16% value-added tax on LPG. Also in 2016, the East African Community, which includes Kenya, reduced the import duty on biomass cookstoves from 25% to 10% (Clean Cooking Alliance, 2019). The reduction was expected to incentivise the entry of more companies into the region and thus increase access to high-quality industrially produced stoves.

Kenya took an aggressive position against charcoal use by imposing a ban on production and restrictions on transportation and trading in order to stimulate uptake of cleaner and more environmentally friendly alternatives. Kenya has increased the excise duty on kerosene to discourage its use. The country has taken a leadership role in the development of international and national stove standards, utilising them to formulate policies. In Kenya, manufacturers and retailers benefit from well-established carbon-financing mechanisms within the country, and multiple savings and credit cooperatives have been established by Kenyan community leaders to help finance improved cookstoves (ESMAP, 2018). Kenya's County Integrated Development Plan for 2018–22 shows specific cooking-sector goals, with most of them targeting household use.
Indonesia has perhaps made the world's greatest efforts to promote LPG cooking fuels. As in Nigeria, kerosene and other petroleum products were heavily subsidised by the Indonesian government. Before 2005, households and small- and medium-sized enterprises (SMEs) without access to electricity used kerosene for their main cooking and lighting

fuel. To reduce kerosene consumption, the Indonesian government was prompted to launch the Kerosene-to-LPG Conversion Program in 2007, encouraging households and SMEs to switch to LPG for cooking. The programme was divided into several stages for the 34 provinces in Indonesia. It included the following features and results:

- free LPG starter packages were distributed to households and micro-businesses, consisting of a 3-kg filled cylinder, a one-burner stove, a rubber hose and a regulator;
- the government replaced 1 litre of kerosene with 0.39 kg of LPG, as well as provided financial support;
- by 2010, the original target of distributing 42 million starter packages by 2012 was reached;
- by 2015, over 57 million starter packages were distributed;
- the number of cylinders initially injected in the early phase of the conversion programme was insufficient to meet demand. The number of cylinder manufacturing centres grew from 13 to 67 by 2012 (Ministry of Energy and Mineral Resources [MEMR], 2016).

Overall, domestic kerosene consumption in Indonesia shrank dramatically from 10 million kilolitres in 2006 to 0.8 million kilolitres in 2015, or about 92%. In the same period, LPG household consumption rose from 1.1 million tons to 6.3 million tons, contributing to 8% of Indonesia's total energy mix (MEMR, 2016).

There are a number of lessons that can be learned from Ghana, Kenya and Indonesia, but three central themes may stand out: clear institutional leadership, consistent national policies and anchoring within important national economic goals.

Unambiguous institutional leadership matters. In Ghana and Kenya, clean cooking is led by their ministries of energy, which are charged with policy formulation and coordination. In both countries, sectoral working groups led by the ministry of energy provide a platform for the coordination of development assistance and the alignment of that assistance with national priorities.[2]

Mainstream cooking energy within important government plans. Virtually all energy policies of the Republic of Kenya have cooking-energy components. From the Energy Sessional Paper No. 4 of 2004 to the Energy Act No. 12 of 2006 and 2019, Kenya made provisions for cooking energy as an important pillar in the energy needs of its people. There are specific regulations for LPG, charcoal and improved biomass cookstoves in, respectively, the Energy (Liquefied Petroleum Gas) regulations of 2009, the Forest (Charcoal) Rules of 2012 and the Energy (Improved Biomass Cookstoves) Regulations of 2013.

[2] See Annex 3 for other countries' institutional leaders

In both Ghana and Kenya, clean cooking is an important contributor to their NDCs, with specific targets for 2030.

Align clean cooking with strategic national economic interests. Just like Nigeria, Indonesia had a costly and entrenched subsidy scheme for kerosene. This cost billions of US dollars annually in both countries. In Indonesia, it was important to reduce this pressure on the treasury by reducing or eliminating the cost of kerosene subsidies. The government turned to the policy of converting households from kerosene to LPG. The main reason was to save costs: health and environmental benefits came as bonuses. The government of Indonesia saved over US$1 billion annually and within a few years converted over 50 million households and SMEs from kerosene to LPG. This confirms the thesis that progress depends on aligning clean cooking with important national interests where influential actors are affected.

6. OPTIONS FOR POLICY AND INSTITUTIONAL REFORM

Nigerian stakeholders are discussing policy and institutional options that will accelerate the growth in access to clean cooking. The following are some of the most important policy and institutional choices to be made.

Standalone or mainstreamed disaggregated policies for clean cooking?

Today's policies on clean cooking are fragmented across several documents and barely recognisable even to policy implementers. Many argue that a standalone clean-cooking policy document should be produced by pulling together existing laws and regulations that relate to clean cooking. Such a policy development process should be carried out in a participatory manner where all important voices are heard. Others argue that clean cooking should be mainstreamed in central economic, health and environmental policy documents. In this way, the visibility of the issue is raised and resources attracted to the issue. These two views are, of course, not mutually exclusive.

Influential public and private interests?

Perhaps more important is how such a new policy initiative would embody the aspirations of influential actors. From the political-economy analysis of this issue, we understand that important policy changes depend on how they align with the interests of very influential actors. Such interests could be national, as in the fiscal issues that drove Indonesia to convert kerosene users to LPG. Or they could be private, as was the contrasting case in Nigeria, where the interests of kerosene importers – who made a fortune from the notoriously corrupt subsidy scheme – prevailed. Redesigning the policy framework, therefore, needs to look beyond the form that a new policy will take. It is also about the power and influence that drives the new policy.

LPG versus improved cookstoves?

A good example of the lack of a shared vision on clean cooking is the cleavage between supporters of LPG and ICS. An enduring policy of the Federal Government is to extend the use of natural gas for power production and for industrial, transportation and domestic purposes. This policy has broad support within the petroleum industry and among the political and economic elite. Even though it took a while to lay a stronger foundation for converting more households from kerosene and wood to LPG, the building blocks for such policy is emerging. It is today being led by the vice president.

Despite the strong support for LPG, one in seven households in the country still cook with wood in traditional three-stone fires. In rural areas, more than nine in ten households use fuelwood for cooking. Even in the most optimistic scenario, Nigeria will be unable to move more than half of all rural households away from wood in the next ten years. Deepening poverty and shortages of the resources and infrastructure available to the government and businesses will limit the scope of the transition.

Several stakeholders have realised that a dual policy on cooking energy is necessary. One approach will be LPG access intensification or deepening LPG penetration in urban areas. The second will be increased efficiency in the use of biomass energy in rural areas through the use of ICS.

Agencies like the Federal Ministry of Environment and the Energy Commission of Nigeria already recognise and are working to promote both approaches. But there has always been a persistent pushback by influential actors such as Nigeria LPG Association and some government leaders. In their view, Nigeria is a gas nation and seeks modernisation. Any talk of biomass use – no matter which conversion technology is used – is retrogressive. Unfortunately, these actors' denial has been costly. Over the years, several countries in Africa have converted a greater population of their households to LPG and electricity than Nigeria and have provided rural households with ICS. Ending this denial and narrative is one of Nigeria's greatest policy challenges for clean cooking energy.

A zero-carbon cooking future?

There is no doubt that environmental concerns have propelled policy development on clean cooking. Beyond the health implications, international donors have supported clean cooking as an important measure to address climate change, and proceeds of the carbon market have given additional impetus for market expansion for both LPG and ICS. However, despite technological progress, both release significant greenhouse gas emissions. Many see the two fossil-energy sources and technologies as a bridge to a carbon-neutral future of cooking powered by renewable energy. In that view, the best should not necessarily be the enemy of the good. Stakeholders in Nigeria can continue to promote efficiency in the use of the available fossil sources while working towards a zero-carbon future.

Increased focus on the productive use of cooking energy?

Much of the attention to expanding access to clean cooking in Nigeria has been paid to residential cooking. Even though there are no reliable statistics on the share of cooking-energy fuels that are being used by street restaurants and institutional cooking in schools, hospitals, prisons and others, this could represent a significant segment.

In the design of new policies, there are good arguments for increased attention to productive uses of cooking energy. Donors such as USAID and GIZ have, over the years, made initial efforts to address the gap in technology, strengthen SMEs and create awareness in this area. A study conducted in Nassarawa and Niger States by the International Research Center for Energy and Economic Development (ICEED, 1997) shows that the cost of fuel, especially wood, represents an important component of the cost of doing business for these restaurants. Beyond livelihood and poverty-reduction concerns, cooks in these establishments are also subjected to full days of smoke from the kitchen. The impact on the available forest cover is also certainly substantial.

This is also an area where the government could make an effective first move. For instance, it can commit to providing clean cooking in all its institutions in the next commitment period of the NDCs. Thousands of school, hospital and prison kitchens can be converted to clean cooking using the Green Bond or carbon offset. This represents a potential quick win.

Towards an act of parliament?

Apart from the regulation provided by the Department of Petroleum Resources for the establishment of LPG refill stations, there is virtually no specific legislation to promote and regulate cooking-energy use in Nigeria. Stakeholders may consider taking some of the new initiatives through the National Assembly. A law promoting clean cooking could make it mandatory for stakeholders, including the government at various levels, to take action that accelerates the use of cleaner fuels. Likewise, government agencies like the National Environmental Standards and Regulations Enforcement Agency can make specific regulations governing the use of cooking fuels and technologies.

State-level policies and plans?

If federal initiatives are to be effective, action at state and local levels is important. Some states such as Jigawa, Katsina, Lagos and Niger have developed policies and plans for clean cooking. One option is to provide federal support to states that want to implement activities towards the transition to clean-cooking practices. This support could include technical training, business support to SMEs and resources to promote public awareness.

What are the institutional options?

Institutionally, the clean-cooking industry suffers from being claimed by several agencies but owned by none. A benign narrative is that clean cooking policies and implementation are distributed among several government agencies and other stakeholders as a result of its multidimensionality (World Bank, 2018). But the fact remains that, apart from the LPG sector – where the Department of Petroleum Resources provides licenses and the Pipelines and Products Marketing Company provides supervision – no single agency is specifically charged with other fuels and technologies.

Nigerian stakeholders have deliberated on this institutional conundrum and there seem to be a few options proposed:

- Option 1: Establishment of clean-cooking units in relevant ministries, departments and agencies (MDAs) that have clean-cooking mandates. These units will become a Clean Cooking Subcommittee under the existing Inter-Ministerial Committee on Climate Change. All types of fuels and technologies would be represented.

- Option 2: Establishment of a clean-cooking unit in relevant agencies and the creation of a proposed an Inter-Ministerial Committee on Clean Cooking to be chaired by the Federal Ministry of Environment.

- Option 3: Creation of a Nigerian Clean Cooking Agency that coordinates all clean-cooking activities in the country. The proposed agency will be established by an Act of the National Assembly.

In both Options 1 and 2, the Federal Ministry of Environment will be the champion. Considering the myriad statutory responsibilities of the Ministry, its resource constraints and its level of influence within the National Executive Council, these options are not unproblematic. In Option 3, the creation of a new agency in an already bloated civil service could also be a challenge. Stakeholders will continue to discuss these options with a view to arriving at an institutional solution that is fit for purpose.

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Annex 1: Key stakeholders in Nigeria and their roles in the clean-cooking sector

Category	Key players	Roles in shaping clean-cooking policies and programmes
Government ministries and agencies	**Policy makers** National Assembly Federal Ministries of Budget and National Planning, Education, Environment, Finance, Health, Petroleum Resources, Power (SE4ALL), Women Affairs and Social Development Relevant state ministries of health, environment, women affairs, etc. Energy Commission of Nigeria, Nigerian National Petroleum Corporation	Development of policies that support clean-cooking access Provide fiscal incentives for clean-cooking programmes Coordinate clean-cooking programmes
	Standards, regulation and consumer protection Consumer Protection Council; National Environmental Standards and Regulations Enforcement Agency; Standards Organisation of Nigeria	Develop standards, testing protocols, certification, etc. Monitor implementation and provide institutional support Provide consumer protection
	Information, awareness and capacity building National Bureau of Statistics, National Centre for Women Development, National Orientation Agency	Data collection and storage; information exchange Public awareness Capacity building
Private sector	**Modern biomass stove/fuel producers and suppliers** Avalanche, Baloza Nigeria Company, BannerGas, Bier Collage Ltd, Chanja Datti Recycling, Consistent Energy, Creeds Energy, Deziointe Cooperatives, Double-Link Corporate Ventures, Envirofit International, Geoscience Consulting, Greenado International Ltd, Green Land Fati Gold Services Nigeria Ltd, Greenmatics International, Greenview Network Concepts,	Development of new stove designs Stove production and distribution mainly at the national level Capacity to coordinate programmes, provide education on indoor air pollution

	Hamstring Engineering Company, Khattar Group, Markcillio Engineering Ltd, Methano-green Energy, Mfaminyen Conservation Society, Midas Clean Cook Energy Global Ltd, Multi Global Power Ltd, Nenu Engineering, Prime Global Environmental Services Ltd, Project Gaia, Quintas Renewable Energy Solutions, Real Relief, Roshan Global Services, Schrodinger Limited, Smefunds Capital Ltd, Sosai Renewable Energies Company, Sukuni Renewables Ltd, Talent Integrated Solar Ltd, Tara Agro-Processing, Toyola Energy Group, Xpediant Global Vision Ltd, Zagos Services Ltd, Zenith Agroethanol Nigeria Ltd	Raise awareness, run promotional activities, provide materials to make stoves
	LPG stoves and fuel producers and suppliers Banner Gas, Gas On Wheels, Kay Investments (gas), Khattar Group, Kiakia Gas Ltd, Navgas Ltd (gas), Oando PLC, Techno Oil, Yellowstone Gas	
	Solid biomass fuel vendors Firewood vendors, artisans in states/communities, tree loggers/timber sellers. etc.	
	Coordinating Platforms Climate and Clean Air Coalition (CCAC), Nigerian Alliance for Clean Cookstoves (NACC), Nigeria LPG Association **Financial institutions (Microfinance institutions/banks, carbon financing)** Bank of Industry (BOI), First City Monument Bank (FCMB), Fortis Microfinance Bank, atmosfair, C-Quest Capital	Support commercialisation and sustainability of market Provide support to market players (training, education, dissemination of cookstoves) Develop innovative finance models Provide financing to stove purchasers and suppliers

National and international CBOs/NGOs/CSOs	Action Against Hunger; Africare-Nigeria; Association for Public Policy Analysis; Caritas Nigeria; Centre for Deaf Rights and Empowerment; Christian Aid; Clean Energy and Safe Environment Initiative; TeamCoby Nigeria; Community Excellence and Development Initiative; Community Research & Development Centre; Connected Development (CODE); Consumer Rights Awareness Advancement & Advocacy Initiatives; Danish Refugee Council; Developmental Association for Renewable Energies; Environmental and Rural Mediation Centre (ENVIRUMEDIC); Environmental Rights Action/Friends of the Earth; Nigeria; Friends of the Environment; Gas to Health Initiative; Green Crew Africa Initiative; Greencode; International Centre for Energy, Environment & Development (ICEED); Initiative for Food, Environment & Health Society; Mercy Corps; Michael Adedotun Oke Foundation; Norwegian Refugee Council; Odey Renewable Energy Technology Co. Ltd; Orie Studio for the Arts; Rural Builders Organisation; Micro, Small & Medium Enterprises Advocacy & Support Initiative; Society Against Poverty and Hunger; Solar Sister; Women Environmental Programme; Women Initiative for Sustainable Environment; Young Volunteers for the Environment	Support commercialisation and sustainability of market Provide support to market players (training, education, dissemination of cookstoves)
Multilateral and Bilateral Institutions	**Donors** African Development Bank, Australian High Commission, Christian Aid, DFID, ECREEE (ECOWAS), European Union, GIZ, UNDP, USAID, World Bank and others	Provide funding
	Implementers UN World Food Programme, UN Food and Agriculture Organization, UN Development Programme	Develop programmes and support implementation
Academia	Centre for Renewable Energy, UMYU Katsina; ICEED Clean Cookstoves Development and Testing Centre; National Biotechnology Development Agency; National Centre for	Research and development

	Energy and Environment, University of Benin; National Centre for Energy Efficiency & Conservation; National Centre for Energy Research and Development, University of Nigeria, Nsukka; Samaru College of Agriculture, ABU Zaria; Sokoto Energy Research Centre; Tropical Research and Conservation Centre	Stove testing in lab and field Conduct market studies, monitoring and evaluation
Media	Africasti.com, AIT News, Authority, Business Day, Channels Television, Daily Trust, Dotunroy.com, The Guardian, Leadership, News Agency of Nigeria, Nigeria Info FM, Nigerian Tribune, Nigerian Television Authority (NTA), Radio Nigeria, TVC News	Awareness raising and advocacy
Other key institutions not yet active in the clean-cooking industry: Association of Local Governments of Nigeria, Association of Non-Bank Microfinance Institution of Nigeria, Central Bank of Nigeria, Federal Ministry of Agriculture, Federal Ministry of Finance, National Agency for the Great Green Wall, National Bureau of Statistics, Nigeria Governors' Forum, Office of the Secretary to the Government of the Federation, Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) and others		

Source: Nigerian Alliance for Clean Cookstoves member database

Annex 2: List of organisations consulted

S/N	ORGANISATION
1	Federal Ministry of Environment
2	Federal Ministry of Power
3	Federal Ministry of Women Affairs and Social Development
4	Energy Commission of Nigeria
5	Standards Organisation of Nigeria
6	Consumer Protection Council
7	National Orientation Agency
8	Federal Ministry of Finance
9	Ministry of Budget and National Planning
10	National Biotechnology Development Agency
11	National Centre for Energy Research and Development, University of Nigeria, Nsukka
12	National Centre for Energy Efficiency & Conservation, University of Lagos
13	Nigerian Alliance for Clean Cookstoves
14	Climate and Clean Air Coalition
15	Envirofit International Nigeria Limited
16	Development Association of Renewable Energy
17	Women Initiative for Sustainable Environment
18	Nenu Engineering Limited
19	Roshan Global Services Limited
20	Methano Green Energy
21	Solar Sister
22	Office of the Vice President (National LPG Expansion Programme)
23	Techno Oil Ltd
24	Kiakia Gas Ltd
25	Clean Cooking Alliance

26	European Union
27	GIZ
28	Clean Cooking Alliance, Uganda and Kenya

Annex 3: Country comparison of institutions responsible for clean-cooking strategy, 2017

Countries	Institutions responsible for (A) setting, (B) monitoring, (C) enforcement/tracking of adoption of clean-cooking strategy					
	Ministry of Energy	Ministry of Health	Ministry of Agriculture/ Forestry	Bureau of Standards	Non-governmental organisation	Other ministries & government institutions
China		B	A, B, C	B	A	A, B
Ghana	A, C					B
Guatemala	A			C		C
Haiti	A		A			
India	A, B, C			C	B	B
Indonesia	A, B ,C			C	A	C
Kenya	A, C			B	A	
Lao PDR	A, B	A, B	A, B	C	A, B	A, B
Madagascar	A	C	C			B, C
Nepal	A				A	A, B, C
Rwanda				C	A	C
Uganda	A, B, C			B		

Source: World Bank, RISE, 2018

Author's Bio

Precious Onuvae is currently completing a PhD in Economics at the University of Abuja. Her focus is on the economics of clean cooking. She has over ten years of experience working in research, monitoring and evaluation, project management, administrative and organisational development for the World Bank and others. Precious has strong quantitative skills and leads baseline assessments at the International Centre for Energy, Environment and Development Foundation. She managed over 100 partners of the Nigerian Alliance for Clean Cookstoves, a public-private partnership that aims to save lives, improve livelihood, empower women and combat climate change.

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