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A Political Economy Analysis of the Nigerian Clean-Cooking Energy Sector

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Contents

List of Acronyms

DfID	Department for International Development, UK
ECN	Energy Commission of Nigeria
FMoE	Federal Ministry of Environment
LPG	Liquefied Petroleum Gas
NACC	Nigerian Alliance for Clean Cookstoves
NDCs	Nationally Determined Contributions
NESP	Nigerian Energy Support Programme

KEY MESSAGES AND IMPLICATIONS FOR POLICY

There are strong incentives for influential actors to support LPG expansion, but this is not the case for the poorest household energy users. There is a broad consensus among powerful state, donor and market actors that large-scale private-sector investment in LPG infrastructure is the way to expand clean-cooking access across Nigeria. This consensus is reflective of the prevailing state–market–donor neoliberal complex in development, which relies on the market for the efficient allocation of resources, regardless of whether and how redistribution occurs among those at the bottom of the socio-economic ladder. The political and economic incentives for investing in LPG are clear for these key actors; however, they are less clear for poor households across the country that rely overwhelmingly on biomass to meet their cooking-energy needs. This, therefore, necessitates a parallel policy focus on sustainable biomass use.

The state needs to mediate between investors' expectations of energy markets and the economic realities of poor households. In keeping with the neoliberal complex described above, donor and state actors expect that the benefits of a market-led approach to clean-cooking expansion will trickle down to the poorest households over time, as risks to investors reduce and economies of scale increase. However, learnings from past household-energy interventions globally give reason to question this rationale and advocate a more active role for the state in enabling access by poorer households. Even if full-fledged subsidies for cooking energy will not be politically or economically viable in the context, the onus remains on the state to put mechanisms in place to shield the most vulnerable households from the worst impacts of market failures. This is especially applicable under the current LPG-expansion regime, where the emphasis on industrialisation puts households with lower purchasing power at risk of being marginalised unless proactive measures are taken to cater to their cooking-energy needs.

State institutional capacity needs to be strengthened horizontally – but also vertically, to promote accountability at the local level. In addition to flexible delivery models, strong institutional mechanisms are important for the success of clean-cooking programmes. Capacity needs to be built for collaboration within and among participating institutions at the federal level, but also between these institutions and regional/local government departments that can help to translate national-level policies into contextually viable programmes. This is especially pertinent if households in so-called "last-mile" communities are not to be left behind in the transition to cleaner cooking.

A state-enabled market model that puts local enterprise at the heart of implementation can help bridge the gap to the last mile. The upshot of the vertically integrated institutional mechanisms described above is that they will enable the state to provide technical and administrative support to local businesses and communities that need to adapt clean-cooking technologies and policies to their contexts. In particular, two institutions (one private, the other public) that have been at the fringes of the clean-cooking conversation to date – the Nigerian Alliance for Clean Cookstoves and the Energy Com-

mission of Nigeria – can help to drive this transformation. Both institutions have historically worked in close proximity to communities and are therefore well attuned to the challenges and opportunities that exist for last-mile delivery of clean cooking solutions. Building synergies between these institutions, on the one hand, and civil society actors and community-based organisations, on the other, would further enable the identification and implementation of strategies for creating and sustaining local cookstove markets.

In light of the key findings outlined above, the following actions are recommended:

- **Designate a powerful state actor**, i.e., a well-resourced government institution (new or existing) with high levels of authority and legitimacy to champion the clean-cooking sector in the country.
- **Delegate authority to subnational institutions**, down to the local government level. The frameworks for this already exist in many government departments but they are often underutilised.
- **Dissociate clean-cooking funding from international donor agendas**. This is essential for the continuity of clean-cooking programmes and ownership of the agenda by national and local governments.
- **Establish core funding in national**, state and constituency budgets for clean cooking. This will signal government commitment and prevent the issue from being relegated in favour of other policy priorities.
- **Make private-sector participation conditional on local representation** (for example, by community-based entrepreneurs and civil society organisations), to strengthen the contextual relevance and acceptability of clean-cooking interventions.
- **Elevate the status of the Energy Commission of Nigeria**, including its research centres, in agenda-setting and implementation, given that the institution combines a broad mandate for expanding energy access with a pro-poor development paradigm.

1. BACKGROUND

According to the International Energy Agency (2019, 288), Africa is only very slowly increasing access to clean cooking energy for households, with a 2% increase (from 15 to 17%) recorded in 2018. More progress is projected to take place over the next couple of decades, with 80 million Nigerians expected to gain access to clean-cooking solutions by 2040 (ibid.). However, this progress is predicated on the implementation of policies aimed at moving both urban and rural households from kerosene and biomass to "clean" cooking fuels – chiefly liquefied petroleum gas (LPG), but also electricity. To understand the factors that can drive or impede this transition in a given country context, it is important to understand historical patterns of development in that country's energy sector (Khennas, 2012).

Transitions to cleaner sources of energy are expected to help countries worldwide achieve the emission reductions they have committed to in their nationally determined contributions (NDCs) under the Paris Agreement. In the cooking-energy sector, a pivotal shift has occurred over the last decade from an emphasis on "improved" biomass cookstoves to the avid promotion of LPG and electricity as better ways to satisfy the NDCs as well as public health objectives (Batchelor et al., 2019). The stated aim of donors, working in concert with developing-country governments, is to replace the biomass-centred narrative that held sway in the cooking-energy sector for over four decades with one that aligns better with governments' aspirations towards modernity and sustainability.

For such a shift to occur, however, it is imperative to understand the barriers that have precluded it to date and, as well, the incentives that might make it an attractive proposition for a range of market and state actors. The central role that politics plays in determining whether and what policies are implemented has come to the fore in recent years (Arent et al., 2017; Batchelor, 2020). It is increasingly understood that the outcomes of policy processes are necessarily shaped by the dynamics between less-powerful and more-powerful actors, with the latter often taking precedence over the former (MSSRF & CRT Nepal, 2016). An analysis of the political economy of household energy in Nigeria, one that unpacks motivations and power dynamics within the sector, will yield valuable insights into the underlying causes of the perennially low status of cooking energy in the country as well as viable options for reform. This is what the present study aims to do.

It is well established that the majority of Nigerian households cook with solid biomass fuels, including firewood and charcoal, primarily on inefficient and smoky stoves. This presents a tripartite energy, health and environmental challenge, especially for women who are traditionally responsible for cooking and the children who often accompany them – bringing a distinct gender dimension to the problem. Historically, kerosene has also played a major role in facilitating cooking-energy access in the country, especially for urban households – although usage has decreased significantly with the relatively recent removal of subsidies on the fuel (Ogundari, 2018). The decline in kerosene use has opened up previously suppressed demand for LPG among the poor in some urban centres, but it has also led to some households moving down the so-called "energy ladder" to biomass fuels, threatening to widen the existing energy-access gap even further.

It is apparent that expanding clean-cooking access would bring about gains in multiple sectors and for the most vulnerable segments of the population – yet progress has been stubbornly slow.

It is against this background that the Federal Ministry of Environment is aiming to launch a programme to reach 10 million households with clean-cooking solutions by 2025, notwithstanding the poor track record of previous state-led programmes. A pertinent question to ask at this juncture is: what needs to be done differently this time to overcome the longstanding inertia in the household-energy sector and facilitate a clean-cooking transition for the energy-poor majority? To answer this question, we undertook a political economy analysis of the sector, identifying who the key stakeholders in the sector are; where their interests lie; why they support or resist change; what they stand to gain or lose from the change; and what can be done to forge collective action out of the inherent conflict among them (Atteridge & Weitz, 2017; Barnett et al., 2016). The following sections present the implications of this analysis for policy and proffer alternatives to the status quo in the sector.

2. POLICY MESSAGES

2.1 The market-led approach promoted by donor, state and private-sector actors is not sufficient to drive a universal transition to clean cooking in the country.

The cooking-energy sector has long been the purview of donor and non-governmental organisations globally, with only a few high-profile efforts led by national governments.[1] Nigeria is no exception to the global trend. While the problems associated with solid-biomass use have moved from being designated a predominantly aesthetic issue in the earliest decades of cookstove intervention to becoming an energy-efficiency issue, then a health issue, and now, finally, a climate issue, donor organisations have remained a fixture in the space globally as well as in Nigeria. In the latter, flashes of government interest only began to appear relatively recently and briefly, and without much to show for it by way of results.

The recent spate of state-led efforts in Nigeria began in November 2014, when the Jonathan administration abruptly announced a 9.2 billion-naira[2] programme to distribute improved cookstoves to "poor rural women" around the country. In a remarkable coincidence, the contract was awarded during the campaign for the 2015 general elections. The programme ran into obstacles early on – the most consequential one being a protracted contractual tussle with the firm that had been contracted by the Federal Ministry

[1] Of note here are the national cookstove programmes run by India and China in the 1980s and 1990s.
[2] USD57.5 million at the November 2014 exchange rate.

of Environment (FMoE) to supply the stoves – so that it fizzled out quite curiously, despite civil society attempts to keep the issue in the spotlight. What was remarkable about this programme was that it did not seem to be linked to any of the targets and timelines articulated in existing energy policies, neither was there any apparent strategy to guide its implementation. Its timing did coincide with the conclusion of the DfID-supported Nigerian Clean Cookstoves Market Development Programme, also hosted by the FMoE, although it is not clear whether or how the two were linked.

The current goal of reaching 10 million Nigerian households with clean cookstoves by 2025 is the latest in a string of FMoE efforts to make a decisive impact on the clean-cooking space in the country. The FMoE, therefore, is clearly a leader here; however, as this study goes on to show, the ministry (as well as other government actors) has tended to employ a largely top-down approach to implementation, when the problem at hand would appear to be more amenable to multi-scalar solutions that incorporate a range of local and intermediary actors.

Within the household-energy sector, one of the federal government's most significant donor relationships is with the European Union. The EU is a major contributor to the Nigerian Energy Support Programme (NESP) being implemented by GIZ, the German Agency for International Cooperation. The scale of the NESP itself is significant, with €20 million originally earmarked for the programme and an additional €15 million being planned in an extension. However, clean cooking is only one of six areas of activity under the programme – the other five focus on improving electricity generation and efficiency, which reflects the thrust of government policy and implementation. Moreover, the exclusive focus of the clean-cooking component on promoting energy-efficient institutional stoves means that, even in that sub-sector, the NESP is affecting a much smaller percentage of the population than it would if it targeted household energy users.

The details of the NESP aside, it is apparent that the federal government and its donors are in broad agreement over the delivery mechanism that will be most effective in scaling up energy access in the country. The general consensus between both sets of actors is that the private sector should be properly incentivised to play the leading role in the distribution of clean-cooking stoves and fuels, while the government only needs to attract investment into the sector by putting the right policies and frameworks in place. This alignment of donor and national agendas can be partly attributed to the influence of the global political economy on the issues that recipient countries get to prioritise.[3] However, the consensus on a private-sector-driven approach is also the upshot of decades of privileging a neoliberal path to development – an approach which has become more or less cemented into government policy since the 1980s, when the International Monetary Fund, through its now-infamous Structural Adjustment Programme, stipulated market reforms as a condition for lending to developing countries, with disastrous implications for pro-poor development (McCarthy & Prudham, 2004). Even though the downsides to this approach have been widely acknowledged by international development actors in the decades since, the Nigerian government has largely remained wedded to the market orthodoxy, tending to see potential for development only in large-scale investments and paying little attention to whether and how redistribution occurs further down the socio-economic ladder.

[3] The imperative to reduce greenhouse gas emissions through energy-efficient programmes, for instance, is reflective of the EU's commitment to leading global climate action as expressed in its Green Deal.

The prevailing funding model within the Nigerian household-energy sector is one in which multilateral and bilateral agencies give grants to the government agency responsible for implementing a particular project, and the government then passes on these grants to private investors in the form of capital subsidies for infrastructure development. This is the model that has been largely followed in the development of mini-grids in the electricity sub-sector, led by the Ministry of Power and the Rural Electrification Agency. The logic here is that infrastructure subsidies given to private mini-grid developers will eventually "trickle down" to subscribers by enabling lower tariffs – and that, if this happens for long enough and to a sufficient degree, economies of scale and market maturity will eventually make the service affordable to even the poorest households. This model aligns well with the market orthodoxy described above, and it has broad support among donor, government and market actors in the household-energy sector. The model has become so influential that several actors have proposed taking a similar approach to the expansion of clean cooking fuels – and specifically LPG, which, as will be seen below, is firmly on the agenda of the current administration – across the country. It is worth exercising caution over this model, however, as the extent to which assumptions of a trickle-down mechanism hold in reality remains to be seen. Even if it can be shown that mini-grid tariffs indeed fall to an accessible level for poor households over a period of time, it is worth considering that electricity as an end-use is materially different from cooking energy, and that the latter – for a host of social, cultural and economic reasons – may simply be less amenable to such autonomous market mechanisms than the former.

The embrace of neoliberal orthodoxy in the cookstove sector is, in fact, quite recent, occurring as it did about a decade into the broader movement in international development circles toward market-based solutions. When market logic began dominating donor and government thinking in the 1980s, the cookstove sector was still largely excluded from this general trend. Indeed, the period from the 1980s to the early 1990s saw a huge drive to distribute free or subsidised improved biomass cookstoves to poor households around the world, much as the FMoE programme conceived in the Jonathan era attempted to do. Perhaps the most prominent example of this subsidy-enabled model is the Indian national cookstove programme that subsidised stove costs for poor households to the tune of 50 to 70%, an effort which resulted in the dissemination of 28 million improved cookstoves from 1985 to 2002 (Kishore & Ramana, 1999). This was a significant achievement by any standard, but it was short-lived: when the subsidy regime ended, many households that had benefitted from the programme could not afford to replace their stoves at market price when they inevitably fell apart, thereby short-circuiting the supply chain and wiping out any hopes of building a viable domestic cookstove market. In the event, the programme died a natural death, with little to show in the long term for the heavy upfront investments made by the government. In the aftermath, this high-profile failure was one of the main exhibits held up by donors and development actors as proof that subsidy-led approaches to cookstove dissemination are doomed to failure, so that, by the mid-1990s, the consensus in the sector had largely settled on market-led dissemination as the way to go (Hanbar & Karve, 2002).

As if to buttress the point, another state-led cookstove programme that was implemented at about the same time in another country – China – had taken a largely market-oriented approach and succeeded in disseminating over 100 million stoves within a 10-year period using this model. Indeed, the Chinese programme is still held up in the cookstove sector in contemporary times as irrefutable proof that a market-driven approach trumps the subsidy-led model. This would appear to be the case at first glance, but closer scrutiny of the Chinese programme reveals that such claims overlook two important factors. The first is that, at the time of the programme, China had a considerably higher GDP than India (and, indeed, than many other developing countries) (Smith et al., 1993) – a wealth gap that has continued to widen over successive decades. Secondly, and perhaps more to the point of this analysis, market enthusiasts ignore the role that strong central and local government structures – but particularly the latter – played in the success of the Chinese programme. Local county officials provided crucial technical and administrative support on the ground that essentially translated a national-level plan into context-specific implementation strategies. In the end, these factors appeared to have mattered more for success than the particular mechanism (i.e., whether it was subsidy- or market-based) that was employed in dissemination. A similar example that is perhaps closer to home is that of the Kenya Ceramic Jiko, which was widely disseminated to urban households in Kenya, also from the 1980s onwards, through a combination of grassroots market development and sustained donor support (Kammen, 1995).

Taken together, these cases demonstrate that to focus solely on the market as the path out of energy poverty, as many donors and governments do in the current climate, is to miss the point. Rather, what is essential is that dissemination mechanisms, whether they are subsidy- or market-based, are deployed through strong institutional structures that go all the way down to the level of local communities. Even assuming an *a priori* preference for market mechanisms, donors and governments at all levels will need to provide sustained technical and administrative support that can help local businesses and communities adapt technologies and policies to their particular contexts. This is especially pertinent if the poorest households, which are in the majority in Nigeria, are not to be left behind. As has been shown in the Latin American context, even where energy subsidies have been discontinued on the premise that they are inefficient, governments still need to figure out how to put support mechanisms in place to ensure that the energy needs of the poorest households are met (Schaffitzel et al., 2019).

The nuances highlighted in the discussion here indicate that any policy aimed at increasing households' access to modern energy must recognise the broader context of deprivation within which energy poverty thrives. As has been argued, increasing access to modern energy sources for cooking and other uses may well be a path out of poverty for households in Nigeria and similar contexts, but the prevalence of poverty in those contexts is itself a factor that tends to undermine households' ability to emerge out of energy poverty (Sesan, 2011). Other analysts have raised the possibility of adopting a "public goods" approach towards improving energy access in such contexts, much as has been done for services like immunisation where the benefits to public health outweigh considerations of profit (Bailis et al., 2009). This argument is particularly relevant when we consider the health implications of the widespread use of traditional cooking fuels: near-

ly 100,000 people die annually from exposure to biomass smoke in Nigeria, and millions more suffer from various morbidities as a result, inhibiting productivity and contributing to household and national poverty (Oketola & Adeoye, 2016). This framing of energy access as a public good is one that deserves greater attention from the Nigerian government, especially as it attempts to chart a nationwide transition to LPG – a commercially traded fuel – against the backdrop of widespread poverty and extreme inequality in the country.

2.2 Government interest in LPG has generated a lot of momentum but channelling this energy in the direction of poor households remains a challenge.

Government interest – defined as the set of economic and/or political incentives a government has (or does not have) to prioritise cooking-energy access on the national agenda – is the foundational factor that determines the eventual fate of attempts at reform in the sector (Aklin et al., 2018). A recent analysis highlights how positive government interest in cooking-energy reform has worked to the advantage of citizens in countries like China and Vietnam, and even in regions of India (ibid.). Perhaps the most recent high-profile example of positive government interest leading to decisive energy reform is provided by Indonesia: the state was motivated to reach nearly 70 percent of the population with an LPG-conversion programme within a five-year span largely because the move would reduce the cost to government of subsidising kerosene for households (Thoday et al., 2018). On the contrary, the impetus for incentive-induced performance by organs of the state has been largely absent in Nigeria, due in part to prevailing clientelist state–citizen relations in the country (see Box 1 below for a discussion of the dynamics of government interest in relation to energy-subsidy regimes in the Nigerian context).

Box 1.

The confluence of Government Interest and Cooking Energy Subsidies in Nigeria.

Fuel subsidies were originally introduced in Nigeria in the early 1970s, when government coffers and the broader economy were buoyed by a boom in global oil prices.[1] However, by the late 1970s, a downturn in the country's economic fortunes had prompted the government to slash the fuel subsidy budget, beginning a spate of deregulation attempts that have lasted well into the present.[2]

It is noteworthy that the kerosene subsidy regime was intertwined with subsidies on other fuels, particularly petrol and diesel. As such, it is difficult to extricate the motivations for keeping this regime functioning for as long as it did from those that propped up subsidies for other fuels. According to Balouga (2012), the deregulation of the downstream oil sector started out as a political move aimed at redistributing the country's growing oil wealth, however crudely. That motive, however, soon came to be accompanied by a less egalitarian one: the reality that oil and its various derivatives, including kerosene, generates cheap rents for successive governments bedeviled by corruption, which the political elite routinely divert for their own gain.[3]

As such, while government interest shifts from time to time depending on political and economic factors like those described above, it often coincides with the interests of individual (and sometimes corporate) actors benefitting from the rent-seeking regime enabled by corruption. In general, the prevailing system of patronage between members of the political class and ordinary citizens precludes a direct cause-and-effect relationship between the attainment of a collective good such as improved energy access and the standard mechanisms of accountability (such as the vote) that might be expected in a democratic regime. However, powerful coalitions such as organised labour and petroleum workers' unions have had some success in negotiating the terms of fuel price deregulation with the government over time, with the effect that the issue of fuel subsidy has remained on the political agenda for much longer than would have been the case otherwise.

However, the discourse around deregulation tends to treat fuel subsidies as a monolithic phenomenon, without due regard for the disproportionate impact of household kerosene subsidy removal on the lower- and lower-middle income households that previously relied on the fuel for cooking. In fact, a recent macroeconomic analysis[4] indicates that it is important to differentiate between the impacts of deregulating different kinds of fuels, as an increase in kerosene prices engendered by subsidy removal resulted in a reduction in households' use of kerosene for cooking, whereas the demand for petrol and diesel did not fall as a result of concurrent price increases.

The exacerbation of household energy poverty implied by the deregulation of the market for kerosene in particular is a subject that has been largely glossed over in the debate around fuel subsidies. In a similar vein, the current national LPG industrialisation drive does not do enough to differentiate between various classes of users, including urban poor households who were displaced from kerosene to lower-quality fuels and rural households who will require additional support to transition away from biomass. A key takeaway from the trajectory of the fuel subsidy discourse in Nigeria is the need for clean cooking proponents to advocate for specific government interventions – such as the recent removal of value added tax on locally produced LPG – that are most likely to have a direct impact on the energy sources used for cooking by households.

[1] Balouga, J. (2012). The political economy of oil subsidy in Nigeria. Proceedings of the International Association for Energy Economics.
[2] Osunmuyiwa, O. & Kalfagianni, A. (2017). The Oil Climax: Can Nigeria's fuel subsidy reforms propel energy transitions? Energy Research & Social Science 27, 96-105.
[3] Ibid.
[4] Ogundari, I. O. (2017). Kerosene subsidy and oil deregulation policy development in Nigeria. Journal of Energy, Resources & Development 13, 23-34.

This explication of the relationship between incentives and government interest throws some light on the reasons behind the obscurity of clean-cooking issues in Nigeria (as well as globally) relative to electricity access, as the latter is more obviously linked to economic benefits for energy users, utilities and governments. However, certain changes have occurred in the Nigerian and the broader global economy lately that have launched natural gas – and, by extension, LPG – to the top of the government's agenda. In many ways, LPG is a likely candidate for government attention: unlike biomass, it is commercially traded in formal markets, and it is consistent with the vision of modernity that many African governments have for their countries (Owen et al., 2013). In this sense, LPG may well be the cooking sector's answer to the decades-old trend of privileging electrification in energy-reform initiatives. Therefore, even though it is possible – perhaps even desirable – to take an agnostic stance toward the stoves and fuels to be considered for inclusion in a national clean-cooking campaign, government interest currently lies in LPG, as evidenced by the establishment of a National Gas Policy in 2017 and the launch of a National LPG Expansion Plan under the Office of the Vice-President. This factor alone may be sufficient reason to channel contemporary research and advocacy efforts in the clean-cooking sector toward LPG.

The turn toward gas by the Nigerian government is occasioned by the dire economic circumstances that the country has found itself in: global prices of oil, the state's top revenue earner, have come tumbling down in the face of oversupply and declining demand (Deloitte, n.d.). Moreover, forecasts indicate that oil prices are not likely to return to anywhere near pre-2014 levels for the foreseeable future. Meanwhile, the country has huge reserves of natural gas – even more so than oil – that have gone underexploited for decades. Against this picture of global threat and local opportunity, it is not difficult to see how the government might conceive of gas in all its derivative forms – liquefied natural gas, compressed natural gas, LPG – as a key element of a broad economic regeneration plan. Indeed, the National Gas Policy cited above places a heavy emphasis on gas-based industrialisation, which in itself would be a worthy and welcome achievement, given the climate of high unemployment, shrinking foreign direct investment and de-industrialisation that prevails in the country.

To this end, the National Gas Policy articulates as its vision a commitment to give "primary attention to meeting local gas demand requirements" (FGN, 2017). The language of this vision is all-encompassing; however, the sheer breadth of the gas-based industrialisation plan necessitates specific attention to the LPG component of the policy and, in particular, the sections of it that are directed toward LPG for cooking. This is all the more important given that successive plans and policies to increase the use of LPG for cooking in the country have yielded little fruit to date: per-capita LPG use in Nigeria is still so low that it is surpassed by that of poorer neighbours like Ghana and Cameroon.

As it stands, the focus of the National Gas Policy is overwhelmingly on laying the regulatory, institutional and legal groundwork to attract huge levels of investment from the private sector. This business-as-usual approach, however, increases the risk that provisions specifically aimed at LPG for cooking will get lost in the fray, especially given that significant infrastructure upgrades are required to realise widespread access. Indeed,

the dearth of delivery infrastructure, especially to the so-called "last mile", has proved to be one of the most intractable issues in the quest to expand LPG access in the country. Upstream, the picture is sunnier: LPG is produced in significant quantities domestically, and capacity exists for producing even higher volumes. However, much of the gas produced is currently exported to international markets, partly due to problems with infrastructure mid-stream, but also because local distribution chains are not optimised for efficiency and cost-effectiveness.

In spite of these problems, the National Gas Policy strikes a positive tone, with the objective of realising LPG penetration right down to the poorest segments of the population. The measures outlined for achieving this include demand-side interventions such as behaviour change communication and one-off free cylinder distribution, as well as supply-side incentives such as the creation of a fund to support private investors in the development of infrastructure for LPG delivery and distribution. Overall, the provisions made in the policy for the promotion of LPG for cooking appear to be comprehensive, considering, as they do, the critical dimensions of availability (ensuring supply and delivery upstream); accessibility (enhancing distribution, including to the last mile); acceptability (targeting the perception in many quarters that LPG is unsafe for household use); and affordability (the cost of LPG relative to household incomes as well as the cost of other cooking fuels). Nonetheless, the lessons from past cooking-energy interventions here and elsewhere suggest that these measures may still fall short of reaching the poor majority in the country, especially within the remit of an investor-focused policy. Below, we consider how a context-responsive approach to the development of community-oriented markets for LPG can empower local businesses to serve the last mile and consequently accelerate access to the fuel by households across the country.

2.3 Complementing market-led approaches with bottom-up delivery models is necessary to drive a clean-cooking transition that includes the poorest households.

As has been shown above, the strategy being pursued by the federal government to usher in a domestic gas regime is largely market-led, with financial and fiscal incentives mainly directed at investors on the supply side. The expectation is that the benefits of this top-down strategy will spread to the poorest households over time, as risks to investors reduce and economies of scale increase. In this vision, direct investment by the government is expected to be minimal: according to the National Gas Policy, the realisation of a gas regime in Nigeria is "ultimately up to the private sector to deliver" (FGN, 2017). There is little room in the strategy for more direct engagement with demand-side issues, whether by the government or the private sector. As our interviews with stakeholders directly involved in the vice-presidential LPG initiative revealed, there is certainly no place in the scheme for subsidies aimed at promoting household LPG use: the failures associated with fuel subsidies in Nigeria and elsewhere would appear to preclude that option. The present analysis recognises the validity of these concerns but also challenges the assumptions underlying the government's rationale for an investor-led approach to scaling up access

to LPG for cooking and presents evidence to support a more grassroots-oriented interpretation of market development.

Reflective of the state–market–donor neoliberal complex highlighted above, the investor-led approach to building a national LPG infrastructure has found the greatest support among government ministries and donor agencies. Of the stakeholders interviewed for this analysis, only two stood out as holding a nuanced view of the strategy that will be required to realise widespread LPG uptake at the household level: a senior executive of the Nigerian Alliance for Clean Cookstoves (NACC), a coalition of private-sector actors that work to promote the uptake of clean stoves and fuels, and an official of the Energy Commission of Nigeria (ECN), the apex policymaking institution, which has a broad mandate to promote energy access for Nigerians across geographical and income lines. What the NACC and the ECN appear to have in common is that they (and, by extension, their subsidiaries) work in close proximity to communities, many of them remote, and therefore tend to be more acutely aware of the challenges and opportunities that exist for last-mile delivery of clean-cooking solutions than many other stakeholders. The fact that the two organisations in question operate from opposite ends of the public–private spectrum only makes this proposition more compelling.

It is telling that neither the NACC nor the ECN is represented on the vice-president's National LPG Expansion Initiative, despite the deep experience they have working with affected populations in the cooking-energy sector. This means that the LPG initiative is at risk of losing out on the critical perspectives that both institutions have to offer, particularly on the issue of setting up infrastructure for last-mile delivery. For example, the NACC recognises the necessity of enforcing safety standards for household LPG distribution as stated in the National Gas Policy, but it notes that those standards will only be effective if they are part of a broader suite of supportive regulatory measures that would help small-scale LPG-refill businesses to thrive, given that they are critical links in the supply chain. On the demand side, the NACC sees a potential problem with the focus of the National Gas Policy on replacing the current system of cylinder ownership with a (safer) model of cylinder exchange, namely that it underestimates the attachment to personal cylinders that LPG users countrywide have developed over time.

The ECN recognises that energy subsidies might be contentious but maintains that the government will still need to intervene in the ongoing LPG expansion initiative in ways that will deliver real benefits to poor households. This aligns with the reasoning put forward by analysts in the Latin American context: while they uphold the general argument that energy subsidies tend to be distortionary and regressive, they also acknowledge the benefits – however small – that subsidy regimes enable for the poorest segments of the population (Schaffitzel et al., 2019). This balanced assessment opens up room to proffer alternative redistributive mechanisms that might retain some of those benefits for poor households while avoiding the inefficiencies traditionally associated with full-fledged consumer subsidies. The solutions envisaged by proponents of this approach include the extension of LPG vouchers and cash transfers to the poorest households. These strategies may not be universally applicable, but they do illustrate the potential for providing targeted state support to poor households while keeping market conditions more or less constant. However, the development and administration of such schemes will require effective collaboration among capable state institutions, and between those institutions and local market actors. Based on our analysis, we recommend some strategies for building the required synergies below.

2.3.1 Strengthen institutional capacity and local accountability

As alluded to in the foregoing analysis, the governance of the household energy sector in the country has been concentrated at the centre, i.e., at the federal (and, to a lesser degree, the regional) level. This is counterintuitive for a sector in which there is such a high degree of variation in the energy resources and preferences of local communities. The mandate to promote cooking-energy access, especially in rural areas, originally belonged to the ECN and its research centres, three of which are specifically invested in the development of renewable energy and energy-efficient technologies, including improved biomass cookstoves.[4] Despite the early promise of the ECN, however, ownership has shifted away from it over the past few years and toward the Federal Ministry of Environment. [5] As we have seen above, the latter is now widely regarded among public and private actors as the *de facto* custodian of the clean-cooking agenda in the country. As indicated earlier, the implication of this is that clean cooking has essentially morphed from an energy issue into an environmental one. The consequences of this shift for the effectiveness of government response to the clean-cooking lacuna in the country are not yet clear. Further, whatever the merits of the prevailing institutional arrangement, it is unclear how long it will last, especially given the variable nature of donor commitments to the climate agenda. All this underscores the need to establish a permanent "home", or an institutional base, for clean cooking – much as the Rural Electrification Agency was set up in the mid-2000s to expand electricity access to remote communities in the country.

A couple of alternative institutional arrangements were suggested by the stakeholders interviewed for this study. One option that was put forward is to embed clean-cooking departments within a number of different government ministries and agencies, given that any attempt to institute a standalone agency for clean cooking will likely be drawn out. Another is to establish an inter-ministerial committee such as the one that currently exists for LPG, but that is specifically dedicated to clean cooking. A potential downside of the former option is that existing ministries, including the environment ministry that is currently leading the clean-cooking charge, are already spread out across several areas of work, and there is the danger that adding clean cooking to their array of responsibilities will render it insignificant in the broader scheme of things. What is clear in any case is that this conversation around the most workable model for institutionalising clean cooking in the current political milieu is one that needs to take place urgently among stakeholders.

Related to the above, there is a need to establish autonomous funding mechanisms – i.e., funding that is not tied to external agendas, which can be transient – for state-led clean-cooking interventions. The stakeholders interviewed agreed that the most institutionalised way to achieve this would be to allocate space to clean cooking in federal/state budgets so that funds can be routinely approved for the relevant implementing agency

[4] These are the Sokoto Energy Research Centre at Usman Dan Fodio University, the National Centre for Energy and Conservation at the University of Lagos, and the Centre for Energy Research and Development at the University of Nigeria, Nsukka.

[5] From its original position directly under the Presidency (much like the prominent place given to the current LPG initiative), the ECN has been relegated to relative obscurity, most recently as a unit within the Federal Ministry of Science and Technology.

to spend on projects. Two other potential funding mechanisms were suggested by stakeholders: the first is a Clean Cooking Fund which would build on a model developed by the Sustainable Energy for All initiative but adapt it to local conditions; the second is an arrangement in which federal and state legislators are required to earmark some of the funds they typically spend on so-called "constituency projects" for clean cooking. This latter mechanism has some precedent – constituency funds have been channelled through the ECN in the past to fund community projects such as solar street-lighting and water-pumping applications – but it has been largely done in an ad hoc and unaccountable manner. Institutionalising this practice could help maximise benefits to constituents, as it would provide a powerful political incentive and a route to accountability for legislators, who rely on popular support for re-election. Given the loopholes associated with constituency projects in the past, it is clear that such a system would need to be closely monitored to check corruption and abuse.

2.3.2 Advance a state-enterprise-community model for a bottom-up energy transition

In addition to establishing a robust institutional architecture and core funding for clean cooking, it is essential to establish channels for collaboration, both horizontally (among state actors) and vertically (between state, community and market actors). While it is important to have an institution dedicated to clean cooking, it is also critical that this implementing agency have the capacity to coordinate and collaborate with other state agencies, including the Ministries of Power, Health, Women Affairs and Environment. The FMoE currently performs some of this coordinating function, but there is scope to extend it – especially vertically, as this is where the gaps in collaboration are most apparent.

In this vein, as an alternative to the state–market–donor neoliberal complex critiqued earlier, we propose a different, bottom-up model for implementing clean-cooking programmes in the country: a *state–enterprise–community* model. In this version of a market-driven energy transition, private-sector actors remain a key part of the value chain, but they would operate mainly at the level of enterprise embodied within community-oriented coalitions such as the NACC. This is because, as has been established above, this is the subset of market actors that is most in tune with the needs of last-mile households and communities. "Community" encompasses these end-users as well as civil society actors that have a track record of empowering clean-cooking entrepreneurs to distribute appropriate energy technologies through local networks – a prominent example in the context is Solar Sister Nigeria. Indeed, these enterprise and community actors are critical links in realising the ideal of local accountability: by linking up with state institutions at all levels, they can help to build clean-cooking delivery mechanisms that connect to those at the bottom.

As it stands, the linkages between state actors, on the one hand, and enterprise and community actors on the other, are very weak. The NACC maintains nominal partnerships with institutions such as the FMoE and the ECN, but those partnerships have so far fallen short of tangible commitments on the part of the state to connect with, and amplify, the efforts of clean-cooking entrepreneurs on the ground. This is a missed opportunity for the state because those entrepreneurs have done a lot of work to spur local demand for clean cooking in communities around the country, and they would benefit greatly from the kinds of technical and financial assistance that have traditionally gone to bigger investors. Civil society organisations have led the way in showing what can be achieved by supporting local entrepreneurs: the strategies they have deployed include the co-option of local microfinance institutions and even informal networks such as local cooperatives, women's groups and faith-based organisations to enable access to credit and incremental payment for cooking-energy solutions. Direct state support has tended to be missing in these initiatives, and yet that is what is needed to achieve the kind of scale that would move the needle on clean-cooking access significantly. Beyond the user-focused deployment strategies highlighted above, government support to entrepreneurs could also come in the form of financial and fiscal incentives to spur local manufacturing (for example, of stoves and gas cylinders) and the improvement of infrastructure (notably, in the areas of power and transportation), to drive down the cost of doing business.

It is worth emphasising, especially in light of the prevailing market orthodoxy among key stakeholders, that the state–enterprise–community model being proposed is not antithetical to a market-driven regime; it only redefines who the main market actors would need to be to optimise the delivery of clean-cooking solutions to the majority residing in last-mile territory across the country. Further, the proposed model would not necessarily preclude the involvement of traditional investors in the clean-cooking sector. Indeed, as an interviewee from the ECN suggested, there may be scope to strengthen investor bids by requiring bigger firms with capital to partner with local enterprises and even non-governmental organisations that would contribute the contextual knowledge needed to tailor energy-access interventions to the specificities of local environments and users. Here, the ECN is well-placed to perform a unique oversight function, given its familiarity with the social and cultural aspects of energy use in last-mile communities around the country.

The state–enterprise–community model advocated here presents an opportunity to strengthen local manufacturing capacity at various levels. The failure of the state to catalyse local industry has resulted in a regime of importation in which household energy appliances brought in from elsewhere often outperform locally made products on price and quality. This situation is rendered more problematic by the fact that entrepreneurs have to constantly navigate fluctuating exchange rates while trying to remain profitable and keep costs as low as possible for their customers. Meanwhile, a local industry for the manufacture of products such as improved biomass cookstoves and LPG cylinders already exists, but the businesses involved require financial and fiscal support (such as manufacturing subsidies and tax waivers), as well as broader improvements in infrastructure for production and distribution (notably, power and roads), to be able to compete favourably with imports. It will be critical to direct a substantial part of the N60-billion LPG Availability Gas Intervention Fund proposed in the National Gas Policy towards

the small- and medium-scale enterprises that are most relevant in this model. This would constitute a proactive step on the journey to building a local industry that is able to meet the cooking-energy requirements of households in different classes and geographies across the country, right down to the last mile.

2.3.3 Adopt a more inclusive paradigm of cooking energy access

The foregoing analysis takes government interest in LPG as a given, largely because this is the current policy focus. However, this need not be the case – there is room for much greater creativity and responsiveness by the government to the cooking-energy crisis that continues to affect the poorest households in the country disproportionately. Indeed, starting with an LPG focus would seem to negate the realities of many poor households, especially those in rural areas, for whom modern cooking fuels are neither accessible nor affordable. Instead, they rely on locally available biomass fuels such as wood and crop residue, much of which is freely gathered from surrounding farms and woodlots.

Historically, cooking-energy access initiatives, including those launched by the federal government, have deferred to this reality and promoted "improved" cookstoves designed to burn biomass more cleanly and efficiently. These efforts have, however, been difficult to scale up beyond a few localities, both within Nigeria and globally. More recently, scientific arguments citing the ineffectiveness of these cookstoves, especially from a health perspective, have diminished interest in their promotion. Nonetheless, there is ample evidence that poor households in rural contexts simply have far more incentive to continue using traditional fuels than they do for modern ones – not least of which is the reality that the former is not commercially traded (Eludoyin & Lemaire, 2021). Viewed from this pragmatic perspective, it becomes clear that a more nuanced approach will be required to successfully engage with households in those contexts.

One lesson that can be learned from the ongoing state–market consensus around LPG is that government interest in the fuel itself is enough incentive for private-sector actors to coalesce around it. The National Gas Policy is a natural outgrowth of this interest, and it has been instrumental in creating an investor-friendly framework and catalysing private-sector interest in the industry. This approach to cooking-energy policy is as straightforward as it is narrow: it bypasses other potential solutions, some of which, like improved cookstoves, may be regarded as intermediate but would still represent forward movement for many rural households previously stuck in energy poverty. Beyond biomass, possibilities are growing for the application of modern technologies besides LPG stoves in contexts where they would previously have been thought impractical. A good example of this is the solar-powered induction cookers that are becoming available with increasingly high efficiencies. Renewable energy sources like biogas and other biofuels are also options that have featured little, if at all, in the national conversation around cleaner cooking options.

The scenario that should be avoided by all means is one in which the Nigerian government shuts out prospective solutions *a priori*, which is what it appears to be doing with its single-minded focus on LPG. Much of this may have to do with the fact that, as highlighted above, the domestic LPG drive is only a small component of the government's broader

gas industrialisation plan for the country. If this is the case, then it is incumbent on the government to begin addressing the issue of clean cooking on its own merit, detached from any other agenda. Such an approach would facilitate an in-depth assessment of the nature of the challenge and broaden the scope of intervention to include several "fuel–technology combinations" (Eludoyin & Lemaire, 2021) that can contribute to meeting the cooking-energy needs of the poor. The bottom line is that government interest is required to build and retain stakeholder confidence in alternative energy solutions, as is happening with LPG. The pertinent question to ask, then, is: what constellation of political economy factors would be required to drive government interest in the direction of these solutions? This is a question that would be fruitful to pursue in further research on the subject, especially as it pertains to the quest to deliver energy equity for the world's poorest (Wilson, 2012).

REFERENCES

Aklin, M., Bayer, P., Harish, S.P. & Urpelainen, J. (2018). Escaping the Energy Poverty Trap: When and How Governments Power the Lives of the Poor. Cambridge, MA and London: MIT Press.

Arent, D., Arndt, C., Miller, M., Tarp, F. & Zinaman, O. (Eds). (2017). The Political Economy of Clean Energy Transitions. Oxford University Press. Retrieved from https://library.oapen.org/bitstream/id/33d25f0e-62b8-4074-b973-6f0f6e853170/629602.pdf

Atteridge, A., & Weitz, N. (2017). A political economy perspective on technology innovation in the Kenyan clean cookstove sector. Energy Policy, 110 (July), 303–312. https://doi.org/10.1016/j.enpol.2017.08.029

Bailis, R., Cowan, A., Berrueta, V. & Masera, O. (2009.) Arresting the killer in the kitchen: The promises and pitfalls of commercializing improved cookstoves. World Development, 37(10), 1694-1705.

Barnett, A., Stockbridge, M., & Kingsmill, W. (2016). Political economy of Africa's power sector. The Policy Practice, Policy Practice Brief 10. Retrieved from https://thepolicypractice.com/policy-practice-brief-10-political-economy-africas-power-sector

Batchelor, S. (2020). The political economy of Modern Energy Cooking Services (MECS). Retrieved from https://mecs.org.uk/wp-content/uploads/2020/02/The-political-economy-of-MECS-02022020.pdf

Batchelor, S., Brown, E., Scott, N., & Leary, J. (2019). Two birds, one stone – Reframing cooking energy policies in Africa and Asia. Energies, 12(9), 1–18. https://doi.org/10.3390/en12091591

Deloitte (n.d.). Crude awakening: The impact of plummeting crude oil prices on company finances. Available at: https://www2.deloitte.com/ng/en/pages/energy-and-resources/articles/crude-awakening-the-impact-of-plummeting-crude-oil-prices-on-company-finances.html. Accessed September 2020.

Eludoyin, E.O. & Lemaire, X. (2021). Work, food, rent, television: The role of lifestyles and experiences on household energy behaviour in rural Lagos, Nigeria. Energy Research & Social Science 71, 101820.

Hanbar, R. & Karve, P. (2002). National Programme on Improved Chulha of the Government of India: An Overview. Energy for Sustainable Development 6(2), 49–56.

International Energy Agency. (2019). Africa Energy Outlook 2019 – Analysis Scenarios. World Energy Outlook Special Report, Paris: IEA. Retrieved from https://www.iea.org/reports/africa-energy-outlook-2019#energy-access%0Ahttps://www.iea.org/reports/africa-energy-outlook-2019%23africa-case

Kammen, D. (1995). Cookstoves for the developing world. Scientific American, 273(1), 72–75.

Khennas, S. (2012). Understanding the political economy and key drivers of energy access in addressing national energy access priorities and policies: African Perspective. Energy Policy, 47(SUPPL.1), 21–26.

Kishore, V. & Ramana, P. (1999). Improved cookstoves in rural India: How improved are they? Energy, 27, 47–63.

McCarthy, J. & Prudham, S. (2004). Neoliberal nature and the nature of neoliberalism. Geoforum 35, 275–283.

MSSRF and CRT Nepal (2019). The Gender Factor in Political Economy of Energy Sector Dynamics. Research report RA3, ENERGIA.

Federal Government of Nigeria (FGN). (2017). National Gas Policy. Abuja, Nigeria: Federal Ministry of Petroleum Resources.

Ogundari, I. O. (2018). Kerosene subsidy and oil deregulation policy development in Nigeria. Journal of Resources, Energy & Development, 13, 23–34.

Oketola, D. & Adeoye, G. (2016). Over 470,000 Nigerians die from firewood smoke in five years. Punch, November 26. Retrieved from https://punchng.com/470000-nigerians-die-firewood-smoke-five-years/

Owen, M., Van der Plas, R. & Sepp, S. (2013). Can there be energy policy in Sub-Saharan Africa without biomass? Energy for Sustainable Development, 17(2), 146–152.

Schaffitzel, F., Jakob, M., Soria, R., Vogt-Schilb, A. & Ward, H. (2020). Can government transfers make energy subsidy reform socially acceptable? A case study on Ecuador. Energy Policy, February. https://doi.org/10.1016/j.enpol.2019.111120

Sesan, T. (2011). What's Cooking? Participatory and Market Approaches to Stove Development in Nigeria and Kenya. Unpublished PhD thesis submitted to the University of Nottingham. Available at: http://eprints.nottingham.ac.uk/12042/1/Temilade_Sesan.pdf

Smith, K., Shuhua, G., Kun, H. & Daxiong, Q. (1993). One hundred million improved cookstoves in China: How was it done? World Development, 21(6), 941–961.

Thoday, K., Benjamin, P., Gan, M. & Puzzolo, E. (2018). The mega conversion program from kerosene to LPG in Indonesia: Lessons learned and recommendations for future clean cooking energy expansion. Energy for Sustainable Development, 46, 71–81.

Wilson, E. (2012). Energy equity: Can the UN Sustainable Energy for All initiative make a difference? London: International Institute for Environment and Development. Retrieved from https://www.iied.org/energy-equity-can-un-sustainable-energy-for-all-initiative-make-difference. Accessed February 2021.

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Dr Temilade Sesan is an international development consultant with expertise in the areas of energy, health, agriculture and gender. Her doctoral thesis, titled "What's Cooking? Participatory and Market Approaches to Stove Development in Nigeria and Kenya", investigated international development efforts to promote a particular technology – improved cookstoves – which sits at the nexus of the sustainable development objectives of energy poverty alleviation and climate change mitigation.

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