

Nakuru County Electricity Access and Clean Cooking Profile



Top opportunities for eCooking in Nakuru County

1. Substantial investment in renewable energy infrastructure (e.g., Menengai Geothermal Power Station) could be leveraged to tackle deforestation in the Mau Forest due to high levels of charcoal consumption in urban areas of Nakuru County.
2. Long history of clean cooking and electricity access interventions, with SCODE leading piloting of off-grid eCooking systems and commercial sale of Electric Pressure Cookers (EPCs).
3. Majority of the population is now connected to the grid, with most of the remainder within reach. Existing expenditures on cooking fuels are relatively high and justify the extension of the grid to unelectrified households by repurposing as expenditures on electricity units after acquiring an electric cooking appliance.

Current energy mix in Nakuru County

- Unrealized potential for eCooking¹: 1,705,977 people
- 0% cooking primarily with electricity, with 79% connected to the grid or off-grid electricity.

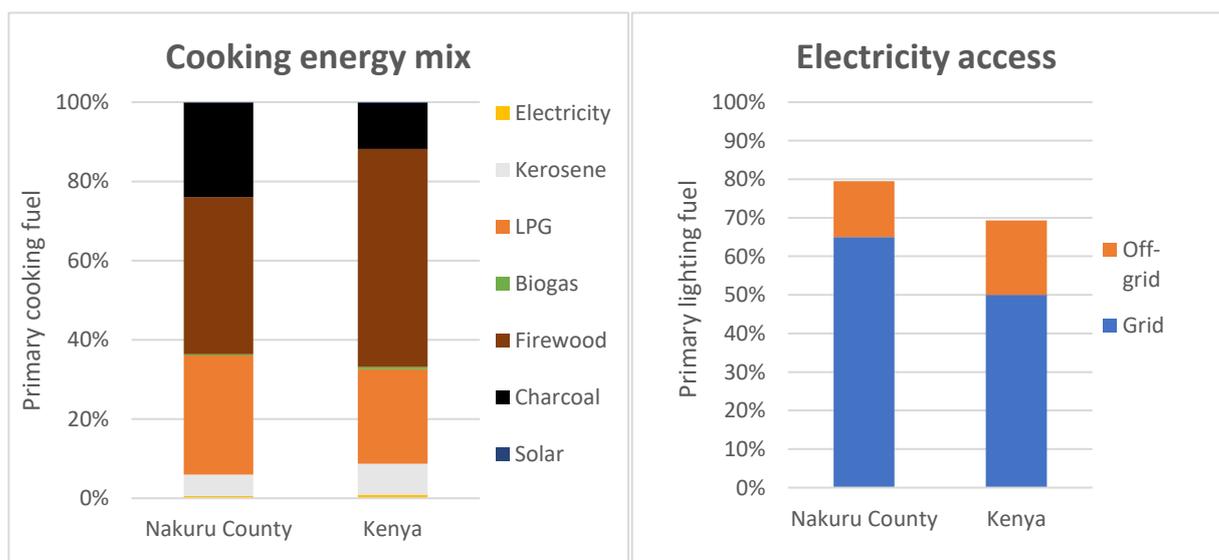


Figure 1: Cooking Fuels and electricity access in Nakuru County; Source: Kenya National Bureau of Statistics: KPHC 2019

¹ Number of people with access to electricity but still primarily cooking with other fuels.

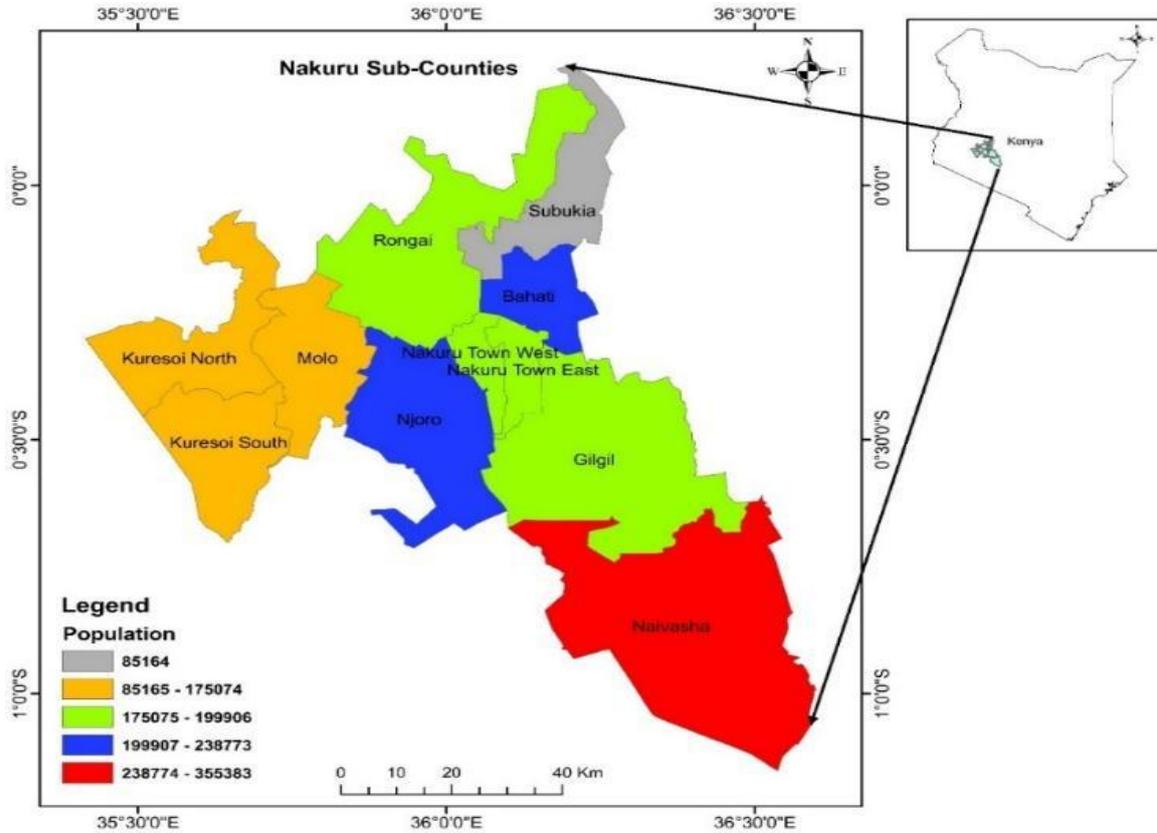


Figure 2: Map of Nakuru County

Background

Nakuru County is a cosmopolitan County hosting approximately 2.16 million according to the 2019 census report (KNBS, 2019). About 54.2% of Nakuru residents live in rural areas, whereas 45.8% live in urban areas. The poverty levels are relatively still high in Nakuru County. Compared to the National poverty level, at 36.1 percent, Nakuru County's general poverty level is relatively below this national rating at 29.1 percent. Nakuru County covers approximately 7,498.8 Km² inland area size and has eleven sub-counties (KNBS, 2019). While playing host to

numerous renewable energy resources such as solar, wind, and geothermal, many residents still rely on biomass for cooking fuels. The major economic activities within Nakuru County are; agribusiness, financial services, and tourism as highlighted in the Nakuru County Integrated Development Plan 2018-2022 (CIDP, 2018). Nakuru's economy is built around agriculture, accounting for approximately 60% of total economic activity. The County's Gross Domestic Product (GDP) is estimated at Kshs. 613 billion (at current prices), accounting for 6.9% of Kenya's GDP (KNBS, 2019).

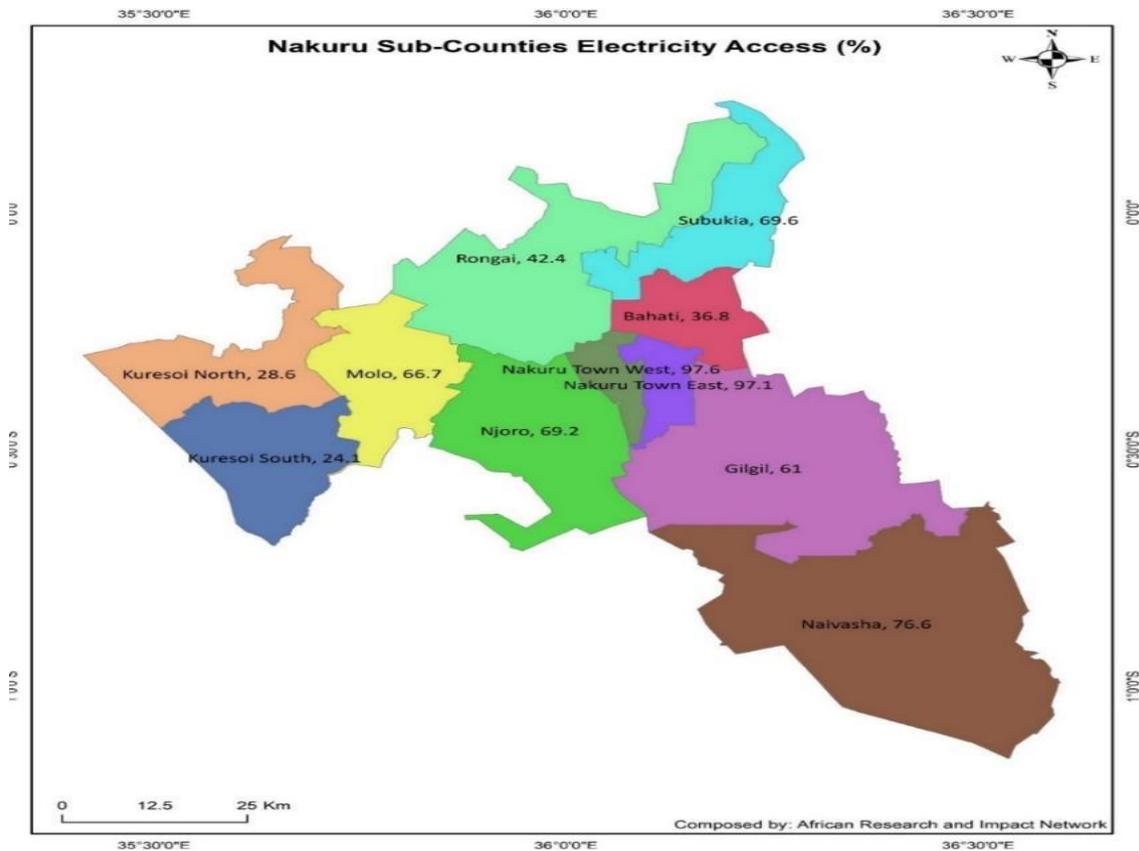


Figure 3: Sub County Electricity access status in Nakuru

Cooking & electrification landscape

The landscape in clean cooking is still dominated by international and national policies with the County's policies slowly emerging (Nakuru County Government, 2018). Guided by the National Energy Act 2019 and the international SDG 7 ambitions, the County Government of Nakuru has developed draft County Energy strategies and plans for 2020 with clean cooking ambitions set to have all residents gaining access to clean cooking energy by 2030.

The rapid population growth and urbanization in Nakuru County is an indication of a rising number of households. Every household uses some form of energy in cooking and it's an opportunity to promote clean cooking options, especially electric cooking. In other words, the rapidly growing population in the County directly implies

increasing cooking energy demands and thus presents an opportunity for the County and stakeholders to invest in clean cooking energy options (KNBS, 2019).

The high rate of electric coverage in Nakuru at 88.5 percent with 64 percent of the households connected to electricity in itself presents an opportunity for electric cooking. A few years ago, the rate of electricity access in Nakuru County was at 34 percent and due to the rapid electrification initiatives in the recent past, the rate of household access to electricity has improved and is targeted to be more than 80 percent shortly and this presents an opportunity to enhance electric energy use in cooking (Nakuru County Government, 2018).

While the use of biomass firewood (46%) is still common in Nakuru County, the use of other fuels in cooking such as LPG (30%), charcoal (23%), and biogas (1%) is also reported by 2020 study conducted under the Sustainable Energy Access

Assessment by GIZ, ICLEI Africa in collaboration with the County government. More generally, the use of unclean cooking energy of firewood and charcoal stands at 69 percent in the County (Ministry of Energy, 2019). However, electricity is generally available in most parts of Nakuru County, with about 88.5 percent of the area covered under the various on-grid and off-grid electrification initiatives. The national grid is the main source of electricity in Nakuru, with about 88 percent of the residents having their meters connected to the national grid (ADF, 2019). While electricity infrastructure is available for most households, only about 64 percent of households are connected and able to use electricity in their households according to the recent energy access assessment under the Sustainable Energy Access and Climate Action Planning (SEACAP, 2020) program in Nakuru. The connected

Energy market for e-cooking

Nakuru County exhibits numerous opportunities for E-cooking development based on the enabling environment being created in terms of technological advancement in clean cooking technologies, research and innovation, partnership, policy development, and electrification opportunities. Based on this preliminary analysis, cooking with electricity could be about 40 percent less expensive than charcoal and LPG. Evidence emerging from other counties in the region belies the common perception that cooking with electricity is expensive. This is without pricing in the additional health benefits, convenience, and time savings associated with electric cooking. Looking at electricity access, supply, and demand data, Nakuru is a good case for promoting e-cook interventions.

households (64%) vary across the eleven (11) sub-counties. Access is generally high in the urban areas such as Nakuru town West (97.6%), Nakuru Town East (97.1%), and Naivasha sub-County (76.6%). Similarly, the Peri-Urban Counties such as Subukia, Njoro, and Molo also have significantly higher electricity access at 69.6 percent, 69.2 percent, and 66.7 percent, respectively. However, the connection is relatively low for rural areas such as Kuresoi South (24.1%) and Kuresoi North (28.6%). This implies that despite the reported increase in electricity access in Nakuru, this access is still unequal, with access mainly concentrated in urban areas while rural areas still have significantly low access (IEA, 2017).

Undoubtedly, more evidence regarding the feasibility of cooking with electricity in Nakuru is needed. Studies like cooking diary studies which gather data on county-specific cooking energy consumption and local cuisines' compatibility in the 47 counties and have been found helpful in many counties in changing perceptions about e-cooking and hence worth exploring. At present, household and market assessments are ongoing to understand household cooking patterns and energy use, and the availability of e-cooking appliances in the market, considering that a robust supply chain is essential to promote adoption and sustain interest in e-cooking.

The Policy Landscape

While Energy resources and management are not wholly devolved to the Counties in Kenya, the County Government of Nakuru, like any other County, has the sole responsibility to formulate the County energy planning and promote initiatives that foster energy access at the sub-national level. The policy landscape in clean cooking is still dominated by international and national policies with the County's policies slowly emerging (Nakuru County Government, 2018). Guided by the National Energy Act 2019 and the international SDG 7 ambitions, the County Government of Nakuru has developed draft County Energy strategies and plans for 2020 with

clean cooking ambitions set to have all residents gaining access to clean cooking energy by 2030. The County has made forth various plans toward achieving the set targets for clean cooking access to all (CIDP, 2018). These plans target the promotion of partnerships, markets, technology, and policies that lead to quality and sustainable energy for all residents of the county (CCEAP 2018-2023) as shown below. Cooking with electricity is the cleanest way to cook (at the point of use), considering the minimal negative impact on the cook's health and household air pollution. Additionally, it offers the opportunity to increase environmental sustainability as more renewable sources of electricity are integrated into the grid, and fewer trees are cut.

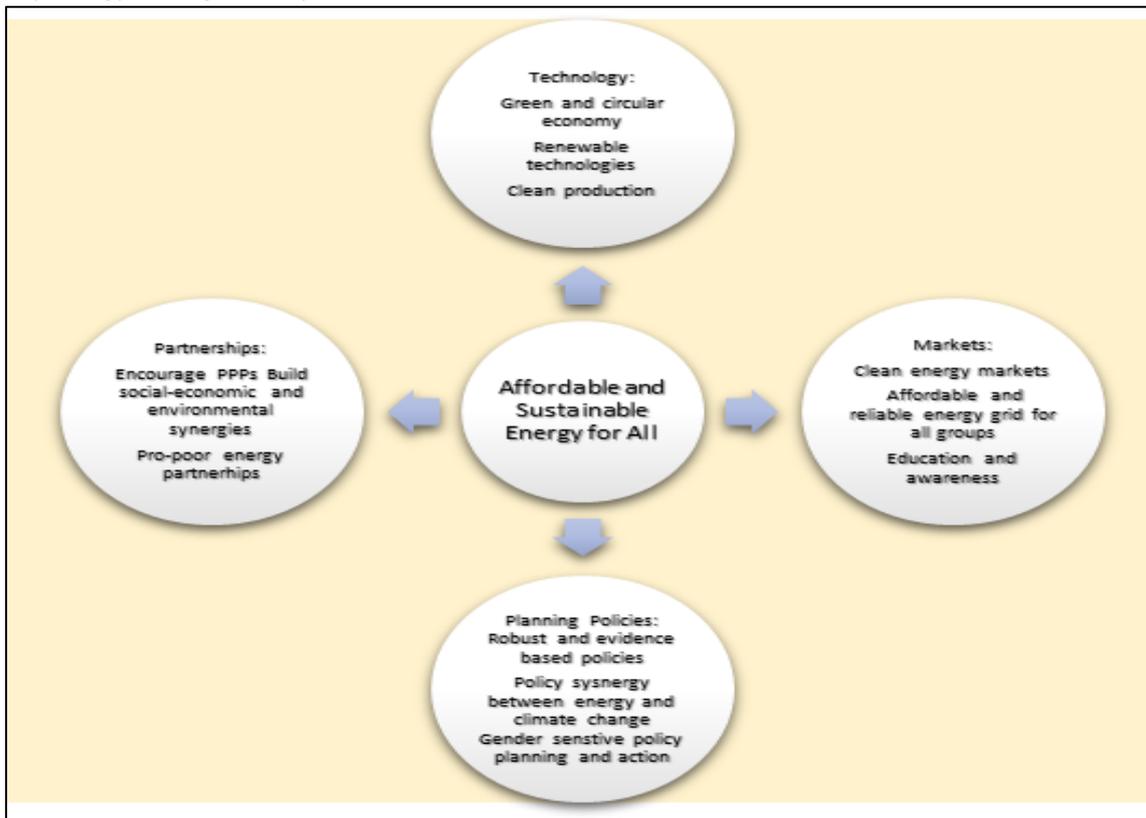


Figure 4: Key strategic actions stipulated by NCG toward energy targets aims

The county further facilitates the energy value chain- creating and licensing affordable and accessible distribution channels for both lighting and cooking enterprises such as the LPG, M-KOPA Solar, etc., in line with the. 2019 energy Act. As part of supporting community-level energy access, several CBOs and private

companies such as the SCODE, World Vision, Clean Cooking Association of Kenya (CCAK), and M-Kopa operate in various sub-counties to promote clean cooking and solar home systems among households and community groups. All these operations are made possible through favorable national and county policies (Strategy,

2018). While clean cooking energy access relies on the other policies in the entire value chain, the County has been a beneficiary of laws and regulations promoting the use of clean energy

and related products. In this regard, the energy policy landscape is summarized in the figure below:

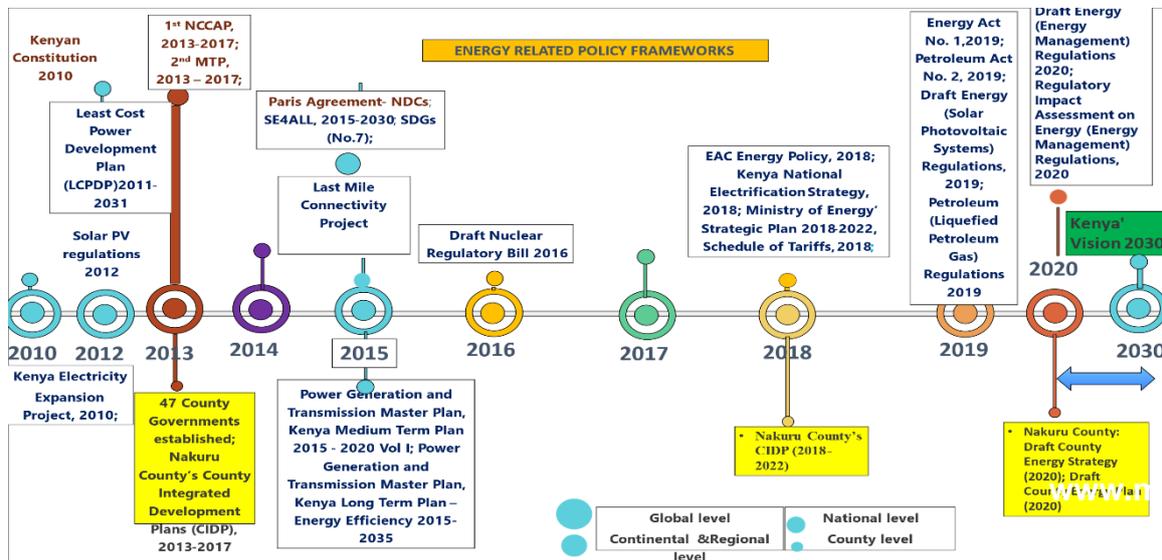


Figure 5: Policy Landscape of Nakuru County

Intervention for e-cooking

Interventions to improve access to clean cooking energy in the past have mostly focused on burning solid fuels more cleanly through improved cookstoves (ICS); more recently the focus has been on cleaner fuels (e.g., biogas, liquefied petroleum gas (LPG), alcohol fuels, and solar cookers). The range of possibilities for cooking with clean modern energy (particularly concerning electricity) is increasing rapidly on a global basis. Electric cooking through specialized electric appliances such as electric kettles, rice cookers, ovens, and microwave ovens, among others is increasing worldwide and Africa has not been left behind.

New opportunities are opening for electric cooking (e-cooking) as a cost-effective, practical,

and desirable solution to the twin global challenges of clean cooking and electrification. Globally, momentum is building behind the transformative potential of e-cooking to achieve a range of environmental and social impacts. However, cooking is a complex, culturally embedded practice, that results in an array of behavioral change challenges that must be understood and overcome for these new opportunities to translate into impact at scale. The Modern Energy Cooking Services (MECS) program was designed to explore this space and pilot innovative new e-cooking services with the potential to rapidly scale. In Nakuru, as in many other communities, women are concerned about higher electricity bills and also the fact that it's hard to cook supper for a family of 10 in a single electric pressure cooker that leads to low uptake of the e-cooking in certain areas. These concerns may undermine efforts in promoting e-cooking.

Challenges of E-cooking in Nakuru County & Potential Interventions

Some of the challenges that many face will include but are not limited to

1. *Uncertainty in supporting policies from National Government:* As the Counties may be striving to promote clean cooking technologies and electrification, they are not in total control of shaping energy dynamics as the national government through the Ministry and semi-autonomous entities have many roles to play. The reintroduction of the once lifted VAT for solar products for instance may reduce their sale and consumption to enhance the off-grid electricity supply in the Country as a whole and therefore also Nakuru County. The issues of safety and standards of for eCooking is also a concern that needs both policy and technical interventions at the national level.
2. *Availability and affordability of electric cooking appliances:* The electric cooking appliances are not readily available and if available are relatively expensive to be afforded by a majority due to high poverty levels. Efforts to have these appliances readily available in various brands, capacities and prices are slowly improving, in particular with the Global LEAP + RBF programme, which facilitated the sale of EPCs in Nakuru County via Von Hotpoint and SCODE. However it still requires a collaborative effort by all stakeholders to ensure that consumer financing is available to break down the high upfront cost and that supply

chains for retail and after sales service extend across the county.

3. *Changing social norms:* While cooking in households is a physical event and practice, they are defined by social beliefs, cultures, and norms of the society. Nakuru County is a cosmopolitan area and thus cooking cultures vary considerably. However, the challenges of electric cooking fitting within the culture to accommodate the quality, quantity, and variety is a concern that has to be addressed. More studies need to be conducted alongside sensitization and capacity building with local partners and communities.
4. *Leaving no-one behind:* Despite numerous interventions, there is still a low awareness and sensitization of the benefits of clean cooking and electrification in the more remote parts of the county. Geographical accessibility especially in areas where there is not connected to the grid in Nakuru has been a challenge. However, off-grid eCooking is now being piloted by SCODE in several rural communities, which has been accompanied by awareness raising campaigns and targeted training for community members.
5. *Mitigating unstable electricity supply:* Electricity fluctuation and blackouts are major challenges in the County. This presents a great challenge to electric cooking, however SCODE are piloting battery-supported eCooking, which uses energy storage to mitigate the instability in electricity supply.

Outlook and Conclusion

Electrification initiatives in Nakuru County have paved the way for the accelerated uptake of electric cooking, with the extension of the grid and initiatives around off-grid energy access. This, coupled with growing interest in interventions around electric cooking in the region, presents opportunities for various consumer groups within the county. There is the growing accessibility of electric cooking appliances for those on the grid with new

entrants into the market introducing innovative and more affordable units for electric cooking enthusiasts across the income spectrum. A different category of entrants into the electric cooking market poses an opportunity for those that are off the grid, with battery-supported electric cooking. All this is underpinned by ongoing measures to create awareness around electric cooking and build the capacity of those various stakeholder categories in this regard.

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