



POWERING THE SLUM

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IN ACCRA'S INFORMAL
SETTLEMENTS

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INTRODUCTION

Now in its sixth year, the United Nations' Transforming Our World agenda with its 17 Sustainable Development Goals (SDGs), encourages countries and cities to monitor their progress with special attention to local priorities. The 193 UN member states had crafted this agenda as a follow-up to years of economic and social development programs that began with the Decade of Development (1961) and ended with the Millennium Development Goals (2000–2015).

In this version, the nations characterized the work as “a plan of action for people, planet, and prosperity,” aiming to eradicate poverty everywhere in the world within its 15-year timeline. The SDGs represent a consensus aspiration for all countries. They cover topics ranging from health to infrastructure to energy and urban life, with improvements that assist in meeting the aim while supporting sustainability and economic development.

In this regard, many rapidly urbanizing, low-income nations in the Global South are focusing on SDG 7, “Ensure access to affordable, reliable, sustainable and modern energy for all.” It is an especially important goal for low- and moderate-income nations that are not only confronting increasing energy demand and inefficiencies due to population growth but also trying to balance post-COVID recovery and climate change.

To measure the success of the SDGs, the UN developed indicators that nations can use for reporting their progress on all the SDGs to the General Assembly's High-Level Political Forum, convened annually. For SDG 7, two indicators (7.1.1, the proportion

of population with access to electricity, and 7.1.2, primary reliance on clean fuels and technology) are important because they address two UN concerns, dealing with poverty and improving the environment. In an effort to understand the challenges involved in meeting SDG 7, this policy brief will review the baseline conditions in the informal settlements of Accra Metropolitan Assembly (AMA), Ghana.

SITUATION ANALYSIS

Home to a billion people worldwide and increasing, the population in informal settlements, often called slums, is contributing a significant share of urban growth. In Sub-Saharan Africa today, slum dwellers account for 238 million people, nearly a quarter of the global total and 54% of the African urban population (UN 2019; World Bank 2018).

Residents of informal settlements in cities of the Global South are especially needful of affordable and reliable electricity for lighting and cooking, as well as powering household and personal appliances like refrigerators and mobile phone chargers. While these residents lack basic services in general, the absence of reliable electricity serves as a significant barrier to their ability to escape poverty and live safe, healthy, productive lives.

Without reliable power, for example, students struggle to study after dark, workers struggle to perform their jobs (especially informal occupations characteristic of these areas), and everyone faces personal safety threats—with streets and public spaces that are not illuminated at night. The lack of affordable energy leads to reliance on

charcoal, wood, or dung for cooking that contributes to chronic lung disease. In contrast, reliable electricity has positive effects on the lives of informal settlement dwellers including improving their health, education, quality of life, and well-being (Waddams 2000; Desai et al., 2010; Parikh et al., 2012). See Box 1.

Clearly, SDG 7 cannot be achieved without a combination of national and local energy policies (Westphal et al., 2017). The World Bank emphasizes the importance of this observation in *Electricity Access in Sub-Saharan Africa, Uptake, Reliability, and Complementary Factors for Economic Impact* (2019, xv):

Access to reliable electricity is the backbone of any modern economy...If African nations want to see their economies transform, the issue of electricity must be tackled head-on. Access is only the starting point... the problem in Africa is not power but poverty... reliability, affordability, and coordination are the links missing between making utilities viable and expanding their consumer base. Reliability and affordability go hand-in-glove: blackouts and brownouts are common in Africa. Reliable electricity would persuade consumers that electricity is a service worth paying for, and more consumers would bring down the cost of producing electricity.

BOX 1: IMPACT OF ACCESS TO AFFORDABLE, RELIABLE, SUSTAINABLE, AND MODERN ENERGY ON INFORMAL SETTLEMENT HOUSEHOLDS

Direct Effects on Well-Being

Improved access to lighting, heat, and refrigeration
 Savings in the time and effort (due to reduced need to gather biomass and other fuels)
 Improved access to information (through radio, television, and telecommunications)

Direct Effects on Health

Improved indoor air quality through cleaner fuel
 Reduced fire hazard
 Improved quality of health services (through better lighting, equipment, and refrigeration)
 Easier establishment of health centres
 Better education

Direct Effects on Education

Improved access to lighting, allowing more time to study
 Saving in time and effort, releasing time and energy to channel to education

Direct Effects on Economic Opportunities for the Poor

Easier establishment and greater productivity of businesses that employ the poor
 Creation of employment in infrastructure service delivery
 Improved health and education and saving in time and effort, increasing individual productivity

Trickle Down Effect of Increased Productivity

Easier establishment and greater productivity of businesses in general (including through positive impact on the environment)

CURRENT STATE OF ENERGY AFFAIRS

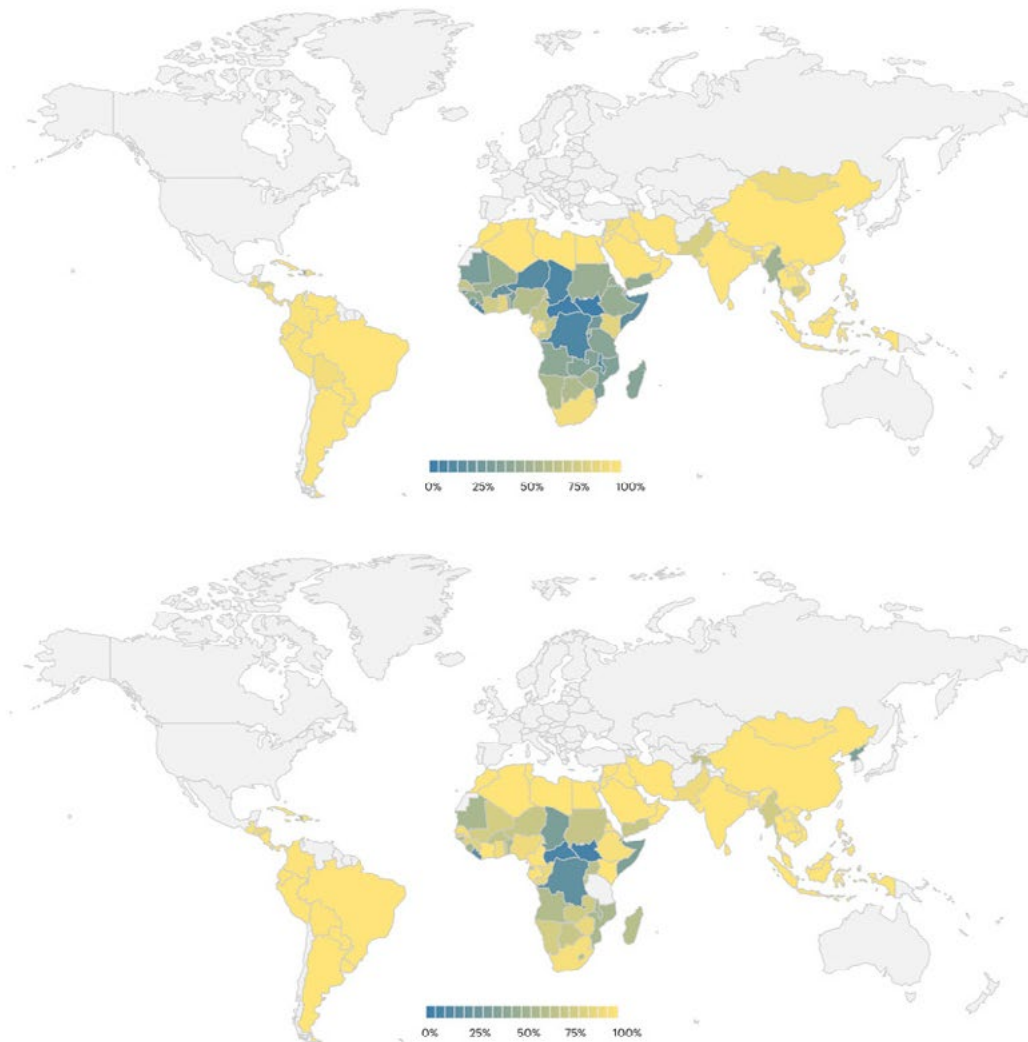
Across the globe, three-quarters of a billion people do not have access to electricity. Some 75% (580 million) live in Sub-Saharan Africa (IEA 2020). Most of the deprived live in rural areas, but as will be described in this policy brief, city dwellers, especially those in informal settlements experience problems. See Figure 1.

Of note, the International Energy Agency (IEA) monitors energy access but its data understate the situation in informal settlements, because accurate enumeration simply does not exist. The IEA is reliant on national and local authorities or utilities for the

information. Governments either rarely count (or severely undercount) the population in informal settlements, because they fear legitimizing them (Lemaire 2015; Desai et al., 2010; GNESD, 2007; Modi et al., 2006).

In addition, utility companies, stretched to capacity while dealing with rapid urbanization, favor new affluent middle-income neighborhoods over informal settlements for ease of installation and the promise of paying customers (Butera 2016). Therefore, UN data that report high rates of energy access in urban areas in Sub-Saharan Africa do not include a large number of households that live in informal settlements, since the local governments for which the UN relies do not count informal settlements regularly.

FIGURE 1: GEOGRAPHY OF ENERGY DEPRIVATION: GLOBAL (TOP) AND URBAN (BOTTOM)



Source: International Energy Agency 2020. (<https://www.iea.org/reports/sdg7-data-and-projections/access-to-electricity>)

ELECTRICITY IN GHANA

Ghana, a country with 31 million inhabitants, is rich in electricity generation infrastructure based on hydro (42%) and thermal (58% using natural gas) sources. In the past decade, Ghana has doubled the capacity, yet this supply is fragile. Droughts and natural gas shortages affect production (Mathematica 2019, 22). Two state-owned utilities, the Electric Company of Ghana (ECG) and the Northern Electricity Distribution Company (NEDCO) distribute electricity in the south and north respectively. ECG services 80% of the power market, including the Greater Accra Region with its

five million inhabitants (Mathematica 2019, 23; Ghana Statistical Service 2020). See Figure 2.

According to Ghana's Voluntary National Review issued to the UN's High-Level Political Forum in 2019, 81% of its population is connected to the national grid, but the distribution is uneven—the south has higher rates. The household connection rate ranges from the lowest in the rural Upper East Region (48%) to the highest in the urbanized Greater Accra Region (95%) (Republic of Ghana 2019, 61). Data from other sources state that 90% of the country's urban population and 67% of its rural population have access to electricity (CIA 2020; Ghana Statistical Service 2019). See Figure 3.

FIGURE 2: ECG AND NEDCO SERVICE AREAS

(a) Greater Accra



Source: Mathematica 2019, Ghana Statistical Service, 2020.

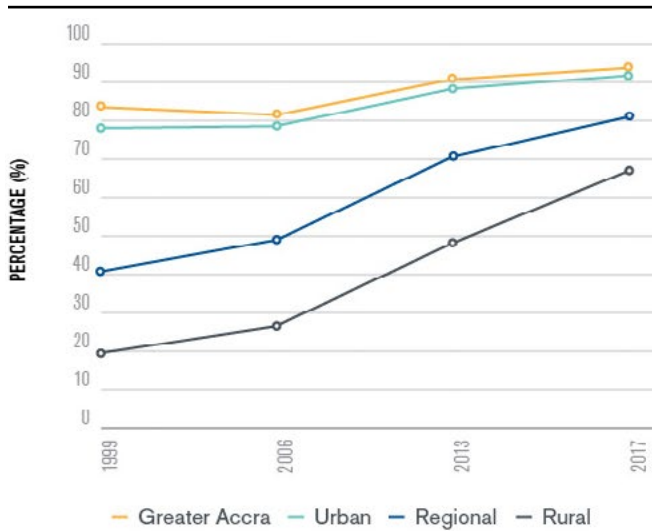
(b) Greater Accra Region Population Distribution

Year	Population
2019	4,943,075
District Name	Population
Accra Metropolis	2,052,341
Ada East	88,321
Ada West	72,880
Adenta Municipal	96,478
Ashaiman Municipal	235,465
Ga Central Municipal	144,521
Ga East Municipal	182,183
Ga South Municipal	507,192
Ga West Municipal	270,989
Kpone Katamanso	135,438
La Dadekotopon Municipal	226,148
La Nkwantanang Madina Municipal	137,975
Ledzokuku Krowor Municipal	280,924
Ningo Prampram	87,393
Shai Osudoku	64,000
Tema Metropolis	360,828

Source: Mathematica 2019, Ghana Statistical Service, 2020.

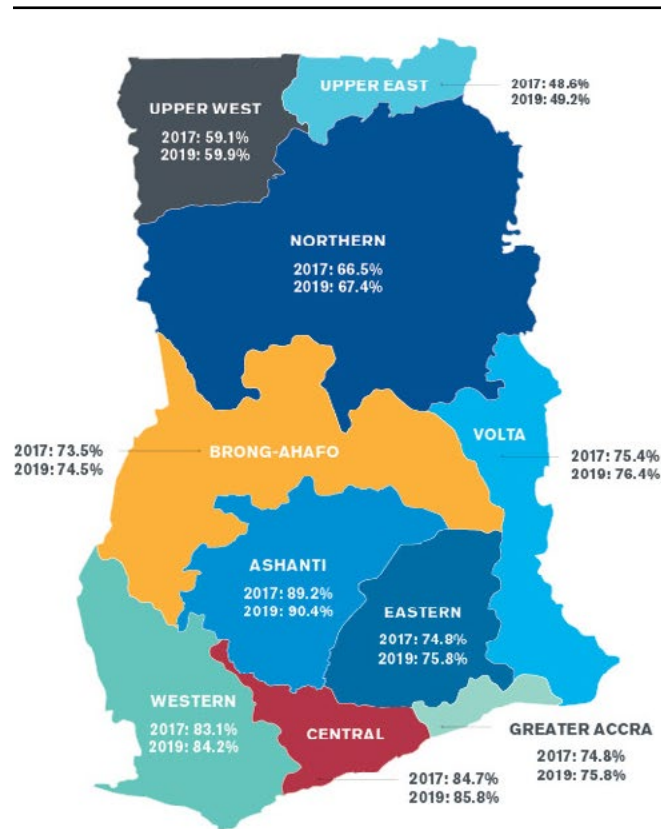
FIGURE 3: GHANA STATISTICAL SERVICE REPORTS 94% OF THE GREATER ACCRA REGION'S POPULATION HAS ACCESS TO ELECTRICITY

(a) Proportion of Population with Access to Electricity



Source: Ministry of Energy, Director RSIM.

(b) Proportion of Households with Access to Electricity



Source: Ghana Statistical Service <https://sustainabledevelopment-ghana.github.io/7-1-1/>; Energy Commission of Ghana 2020 (<http://www.energycom.gov.gh/files/2020%20ENERGY%20STATISTICS-revised.pdf>)

Further, according to a survey of the 265 informal settlements of the AMA, which was undertaken in 2016 by The People’s Dialogue, a nongovernmental organization affiliated with Slum/Shack Dwellers International (SDI), 88% of households had access to electricity. While the report does not detail the nature of the connections (i.e. legal or illegal), it does include an illustration and a comment on the high incidence of fire due to illegal connections. See Figure 4.

On the surface, the data on energy access are impressive. However, a deeper probe of the situation for informal settlements stimulates questions about the nature of the access. In 2007, the most recent date for which this information is available, 54% of all households in the AMA acquired their electricity connection illegally (Ghana Statistical Service 2007). Research for this policy brief reveals that the situation has worsened in the

ensuing years. For example, in the study areas, 75% of the residents have illegal connections.

Explanations for these illegal connections are clear:

- **Poor Service.** ECG has “a long history of poor operational performance and has not adequately invested in “grid maintenance, operations, staff capacity, and customer service”—making it vulnerable to theft as surveillance is weak (Mathematica 2019, 1,21).
- **Tough Requirements.** ECG denies electricity to households that cannot meet requirements for wiring, building codes, and property ownership, again leading to ad hoc and illegal arrangements (Mathematica 2019, 21).
- **High Tariffs.** Even if a household qualifies for a meter, ECG tariffs are very high, offering a further disincentive to connect legally. While in the past five years ECG has widely instituted prepaid meters

FIGURE 4: COMMENTARY FROM THE PEOPLE'S DIALOGUE 2016 INFORMAL SETTLEMENT SURVEY

Fire Incidence

Frequent fire hazard resulting from poor and irregular electricity connection is a plight of the urban poor. In some areas, they experience an average of two (2) fire incidences per year which contributes to increased levels of deprivation and impoverishment.

Plate 1: Fire outbreak and demolition in slum communities



Fire Outbreak

Source: Cities Alliance et al., 2016.



Demolition

(as opposed to credit-pay-by-month meters), it has increased its tariff schedule by 59%. (Most informal settlement households with legal meters have a pre-paid plan.)

- **Steep Pricing.** While ECG has a low “lifeline” fee for minimal service, beyond that point the price per unit rises. And most households need more than the minimal quota.
- **Additional Fees.** In addition, the fee includes other charges beyond the cost of a unit of power (e.g. 5% levy for street lighting; 5% for national electrification programs) (Mensah 2016).

In fact, high levels of energy theft contribute 32% to ECG’s substantial revenue gap—the remaining deficit is attributed to technical (losses in distribution and transmission) and commercial (low collections due to theft) issues (MIDA 2015). For example, in the first six months of 2018, ECG’s deficit was estimated at \$200 million (Akalaare 2018). In addition to the implications for ECG’s business model, the illegal connections have social costs. Illegal connections are massively unsafe,

resulting in high incidences of electrocution and fire outbreaks (Yakubu, Badu, et al., 2018).

While these phenomena have delayed Ghana’s achievement of its National Electrification Scheme goal of providing 100% electrification for all by 2020, the national government is attempting to address these problems through the Ghana Power Project, a multi-year, multi-pronged remedial program instituted in 2016 and currently in force (IEA 2012; MIDA 2020). The Millennium Development Authority (MIDA) a special vehicle created by Parliament, administers the project that is funded by more than a half a billion dollars in grants from the U.S. Millennium Challenge Corporation (Mathematica 2019).

The project’s several programs deal with efficiency, reliability, and access issues. The majority of the funding is dedicated to improving transmission and other system problems to address the technical losses described above. However, it targeted a small amount of the total budget, \$10 million, to support small- and medium-sized enterprises that comprise 40% of the nation’s economy. This fund has a special focus on small businesses

located in markets (Ernst & Young 2019, 11). Here, it is providing legal connections and lighting. It is, in fact, a response to a terrible fire that consumed a major market in Accra in which thousands of traders lost their livelihoods. Included in these upgrades are eight places in the Greater Accra Region; with two in the AMA: the Makola and Agboghloshie Markets.

In a second example, the project is supporting a \$26 million demand management effort to develop standards for energy efficient appliances. And as a first step, the government prohibited the purchase of second-hand European refrigerators that reportedly used 50% of total residential energy consumption prior to the law. However, the project has no focus on improving services to households in informal settlements.

A DEEPER LOOK

The AMA's estimated population of 446,000 lives within its 23 square mile area. Four out of ten residents live in informal settlements of varying maturity and size. These settlements are places where residents lack legal tenure or structures do not comply with local building and housing codes (People's Dialogue 2016; UN Habitat, 2011). The AMA is experiencing rapid urbanization with growth occurring through natural increase and rural-to-urban migration, both putting pressure on existing informal settlements and leading to new ones, all of which need electricity. Another factor fueling the increase in the AMA's demand for electricity is an increase of the middle class, who often remain in informal settlements in spite of their upward mobility because they have either improved their housing over time, cannot afford housing in formal settlements, or have deep personal and employment networks that they want to retain.

To provide detailed information about the nature of energy access in informal settlements, this policy brief examines three informal settlements in the AMA: Agbogloshie (Ashiedu Keteke Subdistrict), Chorkor (Ablekuma South Sub-Metropolitan District), and Avenor (Okakoi South Sub-Metropolitan District). See Figure 5.

FIGURE 5: AMA, ITS SUBDISTRICTS AND THE LOCATION OF AGBOGBLOSHIE, CHOKOR, AND AVENOR



Source: Manny9445, Creative Commons License: https://en.wikipedia.org/wiki/Accra_Metropolitan_District.

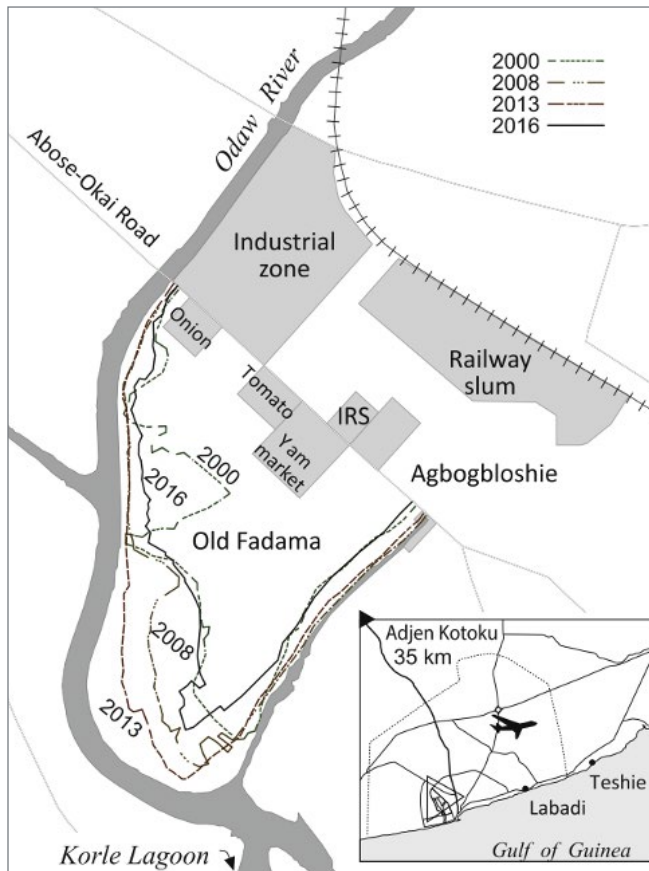
AGBOGBLOSHIE

Agbogloshie occupies 360 acres of wetlands along the Korle Lagoon and is the city's major drainage basin. It is situated about a kilometer from AMA's central business district. Settled by migrants arriving from the north in the 1980s, most of its 80,000 residents do not hold legal title to their land (Oteng-Ababio 2018; Afenah 2012). Presently, the settlement is a hub for a wide range of informal economic activities, most notably a highly polluting and dangerous e-waste recycling industry that processes electronic devices. Its residents also find jobs in the food markets, petty trade, vehicle repair, electronics refurbishment and repair, and transport services (Grant and Oteng-Ababio 2016; Grant and Oteng-Ababio 2019). See Figure 6.

CHORKOR

Chorkor, one of the oldest indigenous communities along the coast of the AMA, is located on the site of an 1820s fishing village. Its 25,000 residents occupy 300 acres. Their jobs in the informal economy center on fishing as well as trading and service activities including the sale of food stuffs, hair dressing, and sewing.

FIGURE 6: MAP OF AGBOBLOSHIE ILLUSTRATING CHANGING BOUNDARIES, THE MARKET AND THE "INDUSTRIAL ZONE OR E-WASTE SITE (LEFT), WORKER ENGAGED IN RECYCLING E-WASTE (RIGHT).



Source: Oteng-Ababioa, Martin, and Richard Grant 2019; Environmental Justice Atlas 2020.

AVENOR

Avenor, an inland settlement dating from the 1970s, has a population of 11,840. The majority of residents own their land according to customary (tribal) law. They have jobs in petty trading, tailoring, shoe repair, hair dressing, food vending, sale of sachet water, vulcanizing, construction, and car repair.

The residents of these three areas are poor. The majority live in dilapidated, overcrowded housing with little tenure security in neighborhoods that lack basic infrastructure (e.g. water, sewer) and services (e.g. education, health, fire protection). They are constantly at risk of eviction,

disease, and violence (The People's Dialogue, 2016). See Figure 7.

Understanding the energy story for these places requires going beyond the official statistics. What follows is a product of the synthesis of secondary and primary data, results from focus group discussions in the three informal settlements, interviews with government and energy officials, household surveys and field observations conducted in the fall of 2019. Dr. James Kwame Mensah, Chief Resilience Advisor in the Accra Metropolitan Assembly and a lecturer at the University of Ghana supervised this work.

FIGURE 7: HOUSING IN AGBOGBLOSHIE SHOWING DWELLINGS THAT ARE TAPPING (LEFT) AND HOUSING WITHOUT ACCESS TO ELECTRICITY (RIGHT)

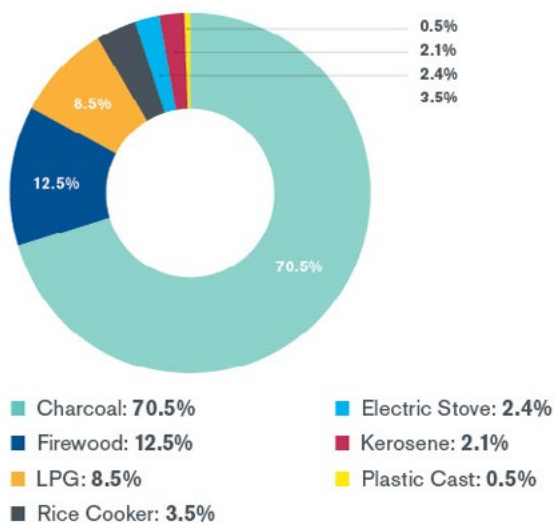


Source: James Mensah

THE REAL ENERGY STORY

Residents in Informal settlement employ a wide range of energy-consuming products in their daily living. They use electricity for lighting, ironing, freezing food, and powering television. Due to the high cost of electricity, they use charcoal and firewood for cooking and commercial activities, a practice that has well-known negative health effects. To deal with the city’s power outages (so frequent that they have a local name, “dumsor,” the Twi word for “on/off”) residents use generators, car batteries, and torchlights (Aidoo and Briggs 2020).

FIGURE 8: SOURCES OF ENERGY FOR COOKING



Source: Focus Group Discussions 2019.

The findings in the three informal settlements revealed that the electricity theft is even worse today than was reported more than a decade ago. Unable to provide required documentation or reluctant to pay the high tariffs associated with legal connection, some 75% of informal settlers in the study areas access electricity illegally. Either they purchase a meter from a middleman, often an ECG employee or a specialized “meter contractor,” at a highly inflated price, or they tap into a neighbor’s meter for a negotiated fee. Sometimes, for a price, ECG workers connect a line directly into the dwelling without installing a meter.

The cost of acquiring a meter legally from ECG is GHC 400 (US\$ 68). The price of securing an illegal one is much more expensive—up to 500% more than the legal rate (US\$ 344). This high price is due to premiums the buyer pays to the middleman. The price often includes the cost of cables and a new utility pole (absent in unplanned informal settlements), which then must be installed by a private contractor.

Other illegal electricity connections (see Figure 9) take various forms of “tapping” into the system:

- **U-Connection.** The “U-connection” bypasses the meter completely. U-connections don’t generate bills, because energy use is behind the meter.
- **Pin-Connection.** The “pin connection” uses a nail to tap electricity from a wire that passes at the back of the wall. See Figure 9.

FIGURE 9: ILLEGAL CONNECTIONS—SEVERAL CABLES CONNECTING TO ONE METER

Source: James Mensah

In the “tapping” system, a major challenge is determining the level and timing (monthly/weekly) of fees. No standard exists. In practice, some meter-holders set a flat fee while others allot the payment according to the number of electric gadgets (light bulbs, refrigerator, TV, electric iron) in the tapping household.

Our focus groups estimated that beyond installation fees, informal settlement dwellers pay 60% more than others for their power—whether using an illegal meter or tapping.

Any attempt to eliminate theft is complicated, likely meeting stiff resistance from many sides. The illegal activities support a variety of actors. For example, income from “tapping” helps the meter-owner survive, as does the extra money (bribes) given the low-paid ECG worker or middlemen providing the illegal meters.

Residents who would not be able to secure electricity due to the rigorous ECG requirements are also beneficiaries of the system. (Of note, and beyond the scope of this brief, electricity theft is widespread in formal settlements as well.) However, the outcome is

clear: illegal connection practices have led to a vicious cycle of poor service, high tariffs, and lack of investment (maintenance and improvements) from the financially strapped ECG.

ENERGY POLICIES IN GHANA

The role of the state in developing an appropriate institutional and policy framework is crucial for achieving Goal 7. Ghana does have one. And multiple agencies are charged with carrying it out. See Figure 10.

The country has a Strategic National Energy Plan (2006–2020); National Energy Policy (2010–2015), Energy for Poverty Reduction Action Plan (2005) SE4ALL Action Agenda (2012, 2016), Renewable Energy Master Plan (2019), and others aimed at providing a sound energy market and securing a reliable energy supply for the nation.

FIGURE 10: NATIONAL ENERGY AUTHORITIES AND THEIR RESPONSIBILITIES IN GHANA

Ministry/Agency	Responsibilities
Ministry of Energy	Policy formulation, monitoring and evaluation, and implementation of government programmes
Utilities	
Volta River Authority (VRA)	Power generation
Bui Power Authority	Power generation
Independent Power Producers (IPPs)	Power generation
Ghana Grid Company (GRIDCo)	Power transmission
Electricity Company of Ghana (ECG)	Power distribution in Southern Ghana
Northern Electricity Distribution Company (NEDCo)	Power distribution in Northern Ghana
Enclave Power Company	Power distribution in parts of Southern Ghana
Bioenergy Sector	
Bulk Oil Storage and Transportation Company (BOST)	Biofuel transportation and storage
Oil Marketing Companies (OMCs)	Biofuel distribution
Public Utilities Regulatory Commission (PURC)	Approval of electricity tariffs; monitoring of quality of service and consumer protection
Energy Commission (EC)	Licensing of operators in the renewable energy sector and setting technical standards for their performance, sector planning and policy advice to Minister of Energy
National Petroleum Authority (NPA)	Determine the proportion and price of biofuel in biofuel blend in accordance with the prescribed petroleum pricing formula
Ghana Standards Authority	Develop standards for renewable energy technologies and biofuel
Forestry Commission	Assist in the development and implementation of programmes to sustain woodfuel production and consumption

Source: Ghana Renewable Energy Master Plan 2019 (<http://www.energycom.gov.gh/files/Renewable-Energy-Masterplan-February-2019.pdf>).

However, some have argued that the lack of attention to informal settlements by national energy authorities has perpetuated the activities: illegal meters and tapping (King et al., 2012). For sure, the issue is larger than energy—at its root is the land tenure question. That is, how to deal with the fact that the residents, as illegal squatters, have no property rights.

At the local level, the AMA does not have any specific policy or regulations related to the provision of electricity in informal settlements. AMA's only role is the issuing of building permits suitable to meet ECG meter acquisition requirements.

RECOMMENDATIONS

The fact that informal settlements are widespread in the AMA and elsewhere in Ghana, calls for dedicated state policy to address energy needs in these areas. Clearly, any such recommendations require negotiating the landscape of Ghana's complex energy policy framework and its administration. Nonetheless, here are four ideas to consider. They range from broad efforts regarding property rights to narrower concerns in the application of ECG practices.

RECOGNIZE INFORMAL SETTLEMENTS

Offer legal recognition to informal settlements, providing the right to basic services including electricity and its associated infrastructure. Some cities have begun to deal with this problem, with solutions that are beyond the scope of this paper. In general, this policy requires undertaking a variety of approaches to secure tenure and undertake slum upgrading programs based on planning and coordination among national and local authorities.

Tied to this approach might be the adaptation of Michael Porter's essay on local economic development, first articulated in an article focused on western slums, "Competitive Advantage of the Inner City," whose principles have relevance for the informal settlements of AMA and indeed, the Global South. The argument is to identify and support niche industries that can move from supplying neighborhoods to supplying wider markets. Such businesses have locational and human resource advantages (Porter 1995).

RELAX REQUIREMENTS FOR ACCESSING ELECTRICITY

Relaxing the rigorous prerequisites for securing meters deserves more study. Appropriate authorities can reform the system, keeping such requirements as building codes, that are necessary for the safe delivery of electricity but eliminating others that have little relevance to energy access. While land ownership may serve as a

proxy for household creditworthiness and ability to pay the bills, other methods such as long-term participation in self-help groups, can be used in parallel with intensified consumer education programs on energy efficiency, the necessity of tariff payments, and so forth.

PROVIDE POSTPAID ELECTRICITY METERS

The ECG's pre-paid electricity meters are burdensome to the consumers in informal settlements. These households often do not have the ability to pay upfront for their energy; they find the prepayment system cumbersome and time-consuming and fear the loss of continuous power or having an inconsistent supply of power. These factors encourage illegal connections. Offering postpaid electricity meters may be one way to reduce theft. In this case, arrangements for payment would have to be standardized and include termination of the service as a last resort.

DEVELOP ALTERNATIVE SOURCES OF ENERGY

There is a need to explore other sources of energy for informal settlement dwellers and not only rely on electricity. Since informal settlement dwellers are very low-income earners, other cheap sources of energy can serve their needs better. There are a lot of off-grid options available that could be explored to the benefit of informal settlement dwellers.

One solution to be explored is waste to energy. Informal settlements generate a lot of waste. For instance, one of the studied communities indicated that they were exploring innovative ways by which waste could be converted into biogas. Similarly, solar energy is another solution to examine. Some work has been done in the area. For example, a student project called Energy for Old Fadama crowdsourced funding to supply solar connections to a few community and commercial structures in that slum in 2013–2014 and later morphed into The Accra Solar Cooperative, which was short-lived (Koshy 2104).

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