

ENERGY ACCESS IN THE DRC: SERVING THE POOR AND BUILDING A CAPABLE ENERGY SECTOR TO SERVE THEM

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SUMMARY & TABLE OF CONTENTS

CONTENTS

<i>Contents</i>	1
<i>Executive Summary</i>	1
<i>The DRC: Energy Needs & Access</i>	2
<i>ÉLAN RDC's Renewable Energy Programme</i>	2
<i>Finding the right balance: reaching the poor in the Renewable Energy sector</i>	4
<i>ÉLAN RDC's private sector-led energy access approaches</i>	4
<i>Reaching the poor – specific considerations</i>	5
<i>Government & Industry Collaboration</i>	6
<i>Reaching Remote Customers with Solar PV Reaching</i>	6
<i>Remote Customers with Clean Cooking Technology</i>	6
<i>Opportunities to support market development</i>	7
<i>Conclusion: A Pathway towards a Sustainable Energy Sector</i>	9

EXECUTIVE SUMMARY

The energy challenge in the DRC is immense. The country has one of the lowest electrification rates in Sub-Saharan Africa and depends almost exclusively on biomass for cooking.

Development practitioners have an opportunity to accelerate the deployment of modern clean energy products and services in the DRC through collaboration with the private sector. However, this will require a shift in thinking from an exclusive focus on directly serving low income groups to supporting the development of businesses that can serve them. The development sector can help to accelerate adoption of renewable energy technologies in the DRC in the following ways:

Improve investors' market understanding in order to attract investment. It is a challenge to attract international investors to the DRC. PSD programmes could host forums and workshops, and use their position through international trade associations such as GOGLA and GACC. Provision of market information could also increase confidence and encourage greater investment.

Improve availability of quality talent. Development programmes could support training with the aim of attracting talented, young professionals into the sector to ensure its growth.

Work with government to develop supportive fiscal policies. PSD programmes should work with government on policies to stimulate market growth. Government should also be encouraged to lead efforts to inform businesses and households about the benefits of modern energy products and services.

THE DRC: ENERGY NEEDS & ACCESS

The energy challenge in the DRC is immense. The country has one of the lowest electrification rates in Sub-Saharan Africa and depends almost exclusively on biomass for cooking. Combined with a large and growing population and high rate of urbanization, this is placing enormous environmental pressures on its natural resources and forests. As of 2018, approximately 15-20 local clean cooking companies (large and small) and 10 dedicated local solar PV companies are tackling this huge challenge. In 2017, larger international players such as d.light and BBOXX in the lighting and power sector and Burn Manufacturing in the clean cooking sector launched operations in the DRC.

Companies, investors and development practitioners acknowledge the vast potential for modern energy access products in the DRC but are aware that it is not an easy place in which to do business. Complicated tax systems, high duties and import tariffs, political and economic uncertainty, combined with the sheer size of the country make for a challenging test. However, the record high investments seen in the sector point towards mature and sophisticated companies that can meet the challenge, especially in the pay-as-you-go (PAYGO) solar PV segment. In addition, new technologies such as mobile money, and increased awareness from adjacent companies can support the creation of innovative and bespoke business models for the DRC's energy sector.

This paper discusses the role that the development community, especially Private Sector Development (PSD) programmes, can play to support these companies based on the experiences of the ÉLAN RDC programme. It will look at both the global sector and wider development experiences to answer the following questions:

- What models for modern energy access are the best fit for the DRC?
- What issues need to be addressed to ensure that companies are able to serve this market?
- What development approaches best support businesses and the growth of the market?

THE DRC: ENERGY NEEDS & ACCESS

ÉLAN RDC is a market systems and private sector development programme in the DRC that aims to support markets to better serve the poor. Renewable energy is one of its focus sectors and ÉLAN has helped to facilitate the market entry and/or development of several international and local solar PV and clean cooking companies. ÉLAN created a strategy for renewable energy based on the following initial observations:

- The DRC has one of the lowest rates of electrification in the world at just 9%, with 1% in rural areas and 19% in urban areas (USAID, 2018), combined with a low grid reliability with an average of 12.3 outages per month, each lasting 4.9 hrs on average (GOGLA, 2018).
- Biomass, mainly in the form of wood or charcoal, constitutes 94% of primary energy use.
- There is not a supportive enabling environment for access to energy products, with high duties, no fiscal exemptions and high logistics costs driving up the costs of products when compared to neighbouring countries.
- There has been little exposure to high quality alternative energy products and, combined with an influx of low-quality products on the market, consumer awareness of and confidence in alternative energy products is low.

To tackle these challenges, ÉLAN developed the following strategy to facilitate market system improvements through key partnerships:

1. Increase the supply of highly efficient energy technologies in the DRC
2. Support SMEs in implementing innovative communication, marketing and distribution models to reach “Bottom of the Pyramid” (BoP) households
3. Increase access to finance for both SME’s and consumers
4. Support advocacy for a more favourable business environment

The value chain, ÉLAN RDC’s interventions and partners are shown in Figure 1 below.

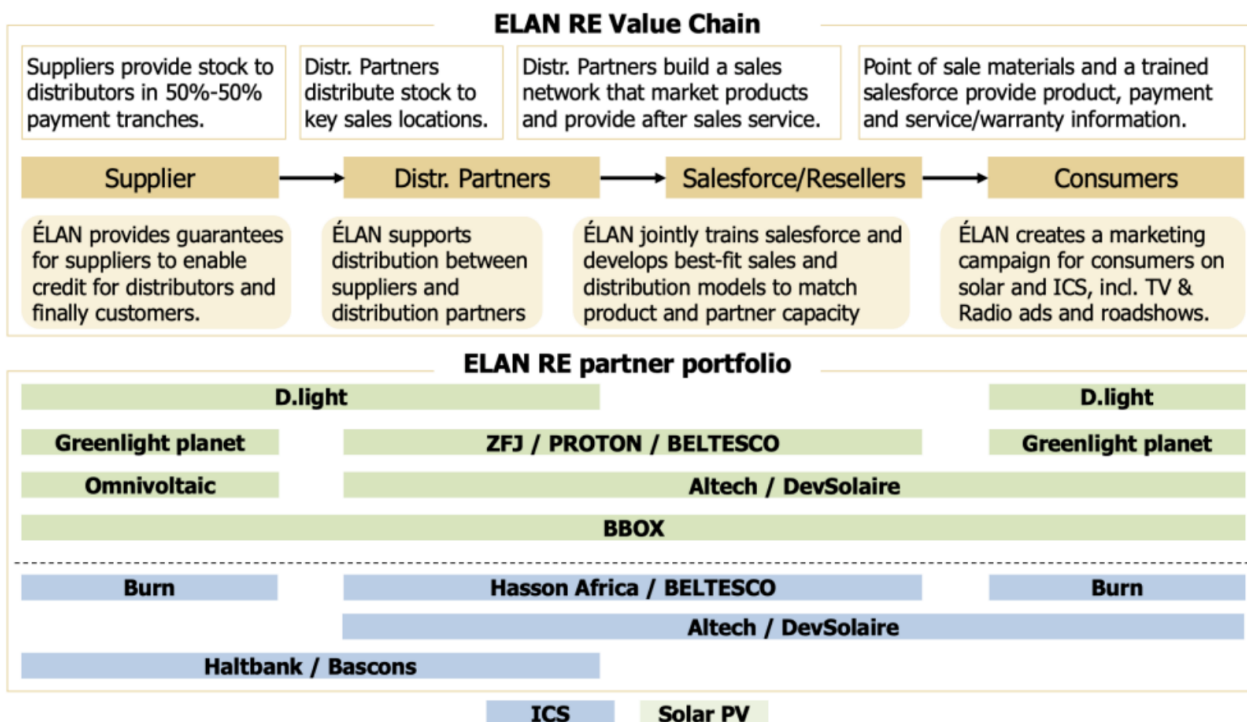


Figure 1. The ÉLAN RDC Renewable Energy Value Chain

The strategy aimed to provide credit along the value chain, i.e. from international supplier to distributor and finally consumer, to support the interactions between suppliers, distributors and retailers, and to increase awareness, both through partners and in a wider brand-agnostic manner. Partners were supported financially and, where necessary, through technical assistance. However, ÉLAN’s main value addition came through playing the objective roles of connector between companies in the DRC and facilitator to companies entering or looking to enter the DRC.

These partnerships have led to more than 100,000 households (by the end of 2018) enjoying the use of modern energy products, ranging from pico solar PV lanterns to full size solar home systems and improved and advanced cookstoves. However, ÉLAN exclusively focuses its results measurement on low-income households. This means that the figure above does not include all sales made as a result of ÉLAN’s activities and support. In addition, this focus also influences the type and direction of the support that ÉLAN provides; ÉLAN interventions must show significant impact for poor households.

Finding the right balance: reaching the poor in the Renewable Energy sector

The experience of the ÉLAN RDC programme as well as the performance of its renewable energy industry partners in DRC can inform future efforts to provide energy access to low-income households. **ÉLAN's results show that it is possible to service these groups. It also highlights, however, an important tension and distinction between private sector development in frontier markets and pro-poor market development.** While the two are not mutually exclusive, there may be a better pathway to support low income energy access: rather than building a modern energy access sector focused solely on serving low-income households, could the sector be built on serving households and businesses that generate the necessary scale at a lower level of complexity and supported to also cater for lower-income households?

This discussion will be framed by first discussing the main approaches that ÉLAN RDC has supported, followed by the specific issues that have arisen and that need to be tackled in order to cater for poorer households. These issues provide the basis on which to discuss opportunities and recommendations to support continued private sector-led modern energy industry performance and growth.

ÉLAN DRC's private sector-led energy access approaches

ÉLAN DRC has supported three approaches that businesses are currently employing in the DRC. Providing continued, mixed support along these lines would help businesses to achieve a stronger commercial foundation that necessarily pre-empts rural, low-income consumer targeting.

1. Traditional wholesale and retail distribution

This is the sale of products (e.g. improved cookstoves and pico and home solar PV systems) through a value chain approach whereby manufacturers/importers of goods sell to distributors in bulk, who in turn sell on to smaller resellers/retailers or have their own physical retail outlets (or both).

This approach requires credit and intense marketing support. Credit needs to be provided at the distributor level and goods have to be provided on consignment, i.e. at high proportion of initial credit with monthly payment terms depending on sales.

Distributors are generally reluctant to take financial risk at this early stage in an unproven market and will need this credit to be able to provide reseller and consumer credit. This should be coupled with multi-channel marketing to highlight the aspirational qualities of the product to target not only poorer consumers, but also more affluent consumers that support sales and have lower perceived risk.

2. Vertically integrated B2C businesses

This is the sale of products from manufacturers/importers of goods directly to consumers, often through credit models such as PAYGO. For both clean cooking and access to electricity markets, this model allows for higher end products (e.g. solar home kits including TV, and advanced cookstoves) to be made available to consumers at affordable rates. Sales are made directly through door-to-door sales teams that raise awareness, market the benefits and close the sales through direct interaction with customers. This

model has been the most successful to date as it directly tackles two key market constraints: the lack of awareness amongst consumers, and the limitations of existing distribution networks. However, scaling such a model to serve millions of households is likely to prove both complex and costly, and the cost of the extensive sales team (including transport, communication and wages/commission) will ultimately have to be borne by the consumer—leading to higher prices—or the companies through longer credit terms or reduced profits—leading to increased risk.

Businesses have had most success to date focusing on urban consumers in Congo's major cities. These consumers provide a base of relatively affluent households to reduce the credit risk while the higher density of households—when compared to rural areas—ease the costs associated with both operational and marketing activities.

Partnerships and co-branding with mobile network operators support this approach by providing a mobile money solution to facilitate pay-as-you-go operation and a known brand name to provide increased consumer confidence.

3. Institutional, commercial and industrial clients

This is the sale of larger electricity solutions—such as large PV arrays including storage— and bulk sales of cookstoves or pico solar PV products to institutions or large businesses. These repeatable projects can support businesses in realizing bulk sales rapidly and efficiently, while representing an opportunity to catch the attention of government and influence policy makers for improved fiscal conditions in the DRC, e.g. duty and tax exemptions. For electricity, these products approach utility scale sizes and can replace costly generators, representing a direct saving to companies/institutions. Cookstoves/LPG can be offered at corporate discounts for staff or cooperative groups: teachers, nurses and other stable salary-based jobs are very popular.

A major barrier here is the lack of any government policy or frameworks. In Rwanda, for example, the Rwandan Utility Regulation Authority (RURA) dictates that systems with an installed capacity under 50kW do not require written authorization from RURA based on a site visit and company history. In the DRC there is currently no regulatory framework and developers are worried that these might be introduced and enforced retroactively.

REACHING THE POOR - SPECIFIC CONSIDERATIONS

In order to serve poorer households in the DRC, the private sector must create a profitable business, develop a base of sales and operations, and integrate efficient strategies to overcome the negative externalities that make poorer households more costly and riskier to service.

Lessons from ÉLAN and from other countries, businesses and programming point to the following factors that should be considered when targeting poorer consumers:

- *Affordability*: products need to be offered at affordable prices or through credit mechanisms that are in line with the lack of consistent income of poorer households
- *Accessibility*: alternative energy products need to be as accessible as the currently ubiquitous products (e.g. candles, kerosene, batteries)
- *Simplicity and alignment*: although mobile money provides many operational advantages over cash, poorer rural households make greater use of cash and the relatively higher transaction costs for smaller payments could be considered prohibitive

- *Information and marketing*: although this demographic presents a higher risk to clean energy businesses, investing very scarce resources in a new type of energy product or service is at least equally risky for poor households. This requires bespoke marketing and awareness raising activities to convey the benefits using the right channel(s)

Government & Industry Collaboration

For solar PV products much experience has been gathered by businesses in other nations to tackle the issues noted above. However, some (notably tax and duty exemptions) will require intervention by the government of the DRC to address affordability issues. In addition, government support for awareness campaigns at national, provincial and local levels to effectively communicate the economic, health and social advantages of these products and services will also be invaluable.

Businesses in the DRC have taken a first significant step towards collective action and advocacy through the creation of the Congolese Renewable and Decentralized Energy Association (ACERD). ACERD advocates for an improved business enabling environment and collaborates with the government to create supportive policies and strategies.

Reaching Remote Customers with Solar PV

To address accessibility and affordability, solar PV businesses are well advised to partner with financial and/or telecom companies that have existing infrastructure in rural areas. Beyond the obvious benefits for marketing and payment systems, there are other logistical advantages such as the likely availability of storage facilities. This can help to keep prices down, as it overcomes some of the logistical challenges that are associated with remote rural areas.

PAYGO solar PV is seen by some as a panacea for increasing energy access at affordable rates for poorer remote households. Unfortunately, the more advanced markets in East Africa show that the market is currently stagnating, with sales figures declining and default rates increasing. In the DRC, the size of the market could present companies with a significant risk that could bring them down, especially as the cost of capital is higher in the DRC. Companies are therefore including this default risk in their pricing, which further increases the price for consumers. If the market is grow, therefore, companies will need to find ways to protect themselves from the risks of default without passing on excessive costs to consumers.

Reaching Remote Customers with Clean Cooking Technology

Clean cooking market penetration is more complex than solar in the DRC because rural households generally do not buy charcoal but instead spend time to collect wood. This negates much of the economic case for investment in improved cookstoves. However, the environmental and health benefits of clean cooking adoption are often higher for this group than for affluent urban households, as the use of three-stone fires is associated with the most deleterious health effects. A national strategy will be required, however, to drive change in this sector: awareness of the existing health effects, benefits of fuel switching and sanctions on chopping trees for cooking. This is a long-term and complex policy initiative.

A more promising focus for clean cooking businesses is poorer households in urban and peri-urban areas. These groups can be targeted similarly to the market for solar PV products (i.e. tax and duty exemptions, consumer credit).

Government & Industry Strategy to Overcome Structural Gaps

ÉLAN RDC has concentrated on urban and peri-urban markets for improved cookstoves, for the reasons alluded to above. If the rural market is to be developed, civil society, international NGOs and the DRC government will have to address the following structural issues:

- **Undefined technology strategy:** there are different technological approaches to clean cooking. The use of improved or advanced cookstoves provides a significant leap in energy efficiency, leading to positive economic and health co-benefits. Fuel switching, e.g. making use of LPG and/or other fuels, provides an alternative to the use of biomass for cooking but must be implemented at a national level and can be costly for nations without fossil fuel reserves. It also fails to address the wider issue of climate change. The absence of any clear policy direction from government serves to discourage innovation in the sector.
- **Coordination between government bodies:** more broadly, the clean cooking discussion touches upon many different issues including forestry, agriculture (land use for biomass or food crops), climate and environment, finance and energy. Hence policy needs to be integrated across several government ministries. Such coordination could provide added impetus for change.
- **Status of the market:** the launch of the Clean Cooking Working Capital Fund highlighted that, despite the best efforts of some stakeholders, there was a mismatch between the perceived need for the fund and the status of the market; many enterprises in the supply chain were simply not ready to absorb commercial debt. Much of this stems from the fact that the clean cooking market is seen as more of an artisanal sector, which has led to the creation of micro enterprises rather than scalable companies (Accenture, 2017).

OPPORTUNITIES TO SUPPORT MARKET DEVELOPMENT

Development practitioners have an opportunity to advance the deployment of modern clean energy products and services in the DRC through the private sector.

Rethink the pathway and metrics for achievement

The ÉLAN programme, like many development programmes, exists for the purpose of improving economic outcomes for the poor. A focus on short-term impact does not necessarily support healthy and sustained business growth over the longer term, however.

Energy businesses that best serve the poor are horizontally integrated, make use of advanced technology, integrate with mobile payment solutions, operate on a large scale to maximize learning effects, and offer improved energy products and services at an affordable price or via a staged payment method. Such businesses typically reach this level of sophistication by first attracting sales from customers that generate higher margins and/or through subsidised support. In time, they are able to hone in on successful, efficient products and models that could profitably serve lower income groups.

Rarely are businesses willing or able to target the poor exclusively or as a priority. Instead, they need to start with more profitable markets, learning and improving efficiency before expanding into lower margin sectors, particularly in difficult markets such as the DRC. The duality of pressures here is a challenge. On the one hand, businesses need time to work their way into new markets. On the other hand, the sources of support in difficult contexts – the ÉLAN programme, for example – have the achievement of sales to low-income groups as a critical performance metric.

Which approach catalyses investment and innovation?

An exclusive focus on serving low income groups can have a negative effect on innovation and technological development. This is made clear by the differences in development and investment in clean cooking versus off-grid solar—and in particular PAYGO solar. For example, in 2017, global investment in the off-grid solar sector reached \$284 million, compared to \$160.8 billion for the global on-grid solar PV sector, of which developing nations (excluding China) accounted for \$28.9 billion.

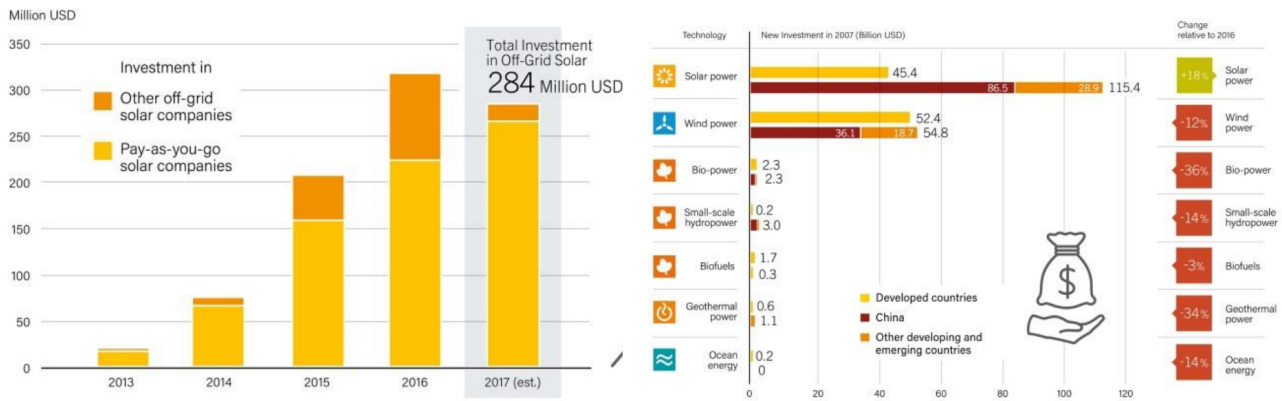


Figure 2: Comparison between global investment in off-grid solar PV companies and global investment in renewable energy by technology in 2017 (source REN21)

This large global investment in both deployment and R&D for on-grid solar has driven innovation and cost reduction of solar modules, storage (batteries) and other system components such that off-grid solar companies can offer affordable products for consumers. In addition, solar PV companies have recently been able to include efficient and low-cost battery powered/DC appliances as a result of the global demand for mobile appliances (e.g. mobile phones) pushing down the costs of lithium batteries and LCD screens.

In contrast, innovation and investment trends in the clean cooking sector, which focuses almost exclusively on low income groups, has not followed a similar trend. Global investment in clean cooking peaked at \$26.5 million in 2013 and then dropped to \$18.1 million in 2017. As a result, costs – and to a degree clean cooking products – have largely remained the same for the past decade and have seen little innovation.

Practitioners and donors should continually reflect on the impact that servicing the BoP market has on businesses and the opportunity cost it represents. This is expressed not only in financial terms but also in time spent by senior management and the pressure it can put on young businesses in a challenging market. Often financial investment is seen as a cost that should be shared equally between a programme and the recipient partner. However, when considering the risky nature of the investment to reach poor and very poor groups, the effect on the business and the market failures that have led to these groups being underserved, it is crucial that PSD programmes rethink support to reach these markets.

For PSD programmes this requires a new set of indicators and frameworks to measure progress and systemic results. Indicators are currently focused on impact through new connections/beneficiaries and expenditure savings. Oddly, there are no indicators that are

attributed to company or market performance beyond sales figures. A company's capacity for growth is a critical set of metrics against which a programme should be measured. This encompasses not just internal metrics critical to any business, but also the risk and fit of the wider environment.

Improve investors' market understanding as a strategy for attracting investment in the DRC.

There is enough capital being invested in the sector, especially solar PV, but it is still very challenging to convince investors to invest in the DRC. PSD programmes could help companies to attract investors by hosting forums, workshops and using their position as "honest brokers" through international trade associations such as GOGLA and GACC. In addition, the commissioning of specific publications, especially market research, would provide additional information to investors, thereby reducing risk and encouraging investment in companies seeking capital.

Improve availability of quality talent. As the level of sophistication of companies working in the sector increases, access to skilled talent is crucial for their continuing development and growth. The DRC presents a challenging business environment. To operate successfully within this environment, businesses need stronger local talent and leadership. Development programmes could support training with the aim of attracting talented, young professionals into the sector.

Work with government to develop supportive fiscal policies. Affordability and consumer awareness are both critically important. Private sector players in a nascent market do not have the capital or position to contribute substantially on these fronts. PSD programmes should work with government to encourage the adoption of fiscal policies to stimulate market growth. This can be through quantitative studies and technical support to help simplify and standardize laws and regulations. In addition, government should be encouraged to take a leading role in informing businesses and households about the individual and national benefits that modern energy products and services can generate. Supporting government in these campaigns can also increase its willingness to improve fiscal conditions due to positive political exposure.

CONCLUSION: A PATHWAY TOWARDS A SUSTAINABLE ENERGY SECTOR

Development practitioners have an opportunity to accelerate the deployment of modern clean energy products and services in the DRC through collaboration with the private sector. However, this will require a shift in thinking from an exclusive focus on directly serving low income groups to supporting the development of businesses that can serve them.

The mobile telecommunications industry offers important lessons here. Initial market development focused on more affluent, urban areas before expanding to lower income, rural areas as the initial markets became saturated. By this time, telecom companies had increased their efficiency and sophistication and were able to operate profitably in the new market segments. Although it is unwise to take the mobile telecom analogy too far, it does provide an empirical example of the difficulties in creating a business from the bottom of the pyramid upwards.

Companies that enter the DRC are faced with a market that requires significant investment to establish a sound footing. There are costs associated with marketing and communication at both a consumer

Lessons from the Telecom Industry

The mobile telecom industry offers a model trajectory. Telecoms first deployed within more condensed, affluent markets before expanding to lower income and rural areas. Doing so enabled the industry to mature and hone its efficiency so as to serve more challenging markets.

and regulatory level, high costs associated with inventory and logistics, and costs associated with developing and applying business models and technologies that mitigate credit risk and address demand efficiently.

The DRC is a very price sensitive market. It is crucial that low-income households can benefit from global R&D to enjoy cost reductions, flexible and best-fit credit models, and innovative techniques to tailor energy products to specific household needs. To achieve this in the DRC, sophisticated and well capitalised companies are needed. For companies to reach this point they need access to local talent and international investment. Moreover, investors must have confidence in the DRC's business environment and the energy regulatory frameworks in place. This challenge needs more attention if private actors are to provide affordable, high-quality products and services to all in the DRC.



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