



KENYA



NDC Private Sector Engagement Project

Engaging private sector in NDC implementation - Assessment of private sector investment potential in the energy sector

EXECUTIVE SUMMARY

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EXECUTIVE SUMMARY

Transforming Nationally Determined Contributions (NDCs) into tangible actions that lead to long-term, zero-carbon and climate-resilient development requires financing. Access to finance is fundamental to realize the objectives set by the NDCs. However, countries continue to face challenges in securing the financial resources needed to achieve their NDC targets. A significant share of the financing required is expected to be provided by the private sector.

To increase private investments in NDC targets, it is important to identify the private sector stakeholders engaged in markets and industries to understand the business environment, the current market as well as the investment potential in specific sectors.

This report estimates the private sector investment potential for delivering NDC sectoral targets for Kenya's energy sector by assessing the NDC targets, the enabling environment, the current market, and the investment potential.

GREENHOUSE GAS EMISSIONS AND CLIMATE TARGETS

Kenya's contribution to global climate change is relatively low, with its GHG emissions representing less than 1 percent of total global emissions. However, Kenya is highly vulnerable to the impacts of climate change and its economy is dependent on climate-sensitive sectors, such as agriculture, energy and tourism. Its GHG emissions are also projected to increase as a result of population and economic growth. The combined total GHG emissions from all sectors is expected to grow to 100 and 143 million tonnes of carbon dioxide equivalent (MtCO₂e), by 2022 and 2030, respectively. In 2010, the agriculture sector had the most GHG emissions, accounting for over 60 percent of the total. However, by 2030, the energy sector is expected to produce the most GHG, followed by the agriculture and land-use change and forestry (LULUCF) sectors. The energy sector is thus an important sector for Kenya in reaching its climate mitigation goals.

Kenya originally submitted its Intended Nationally Determined Contribution (INDC) to the UNFCCC as its first NDC in July 2015 and resubmitted it in December 2016. The NDC contains both adaptation and mitigation components, while recognizing that adaptation is the priority. Kenya aims to reduce GHG emissions by 30 percent relative to a business-as-usual (BAU) scenario emission of 143 MtCO₂e by 2030, which translates to a net reduction of 42.9 MtCO₂e. Achievement of Kenya's NDC is subject to international support in the form of finance, investment, technology development and transfer, and capacity building.

The Government of Kenya prepared a sectoral analysis of the NDC detailing the share of emissions reduction required from the energy sector to meet the NDC target. This was set at 15.4 MtCO₂e, with 9.32 MtCO₂e from electricity generation and 6.09 MtCO₂e from energy demand, respectively. To achieve this goal, the following actions in the energy sector have been identified, with development of additional grid-connected renewable electricity generation and distribution of clean cookstoves being the priority actions for the sector:

SUBSECTOR	NDC POLICY ACTIONS	PROGRAMME OF ACTION
ELECTRICITY GENERATION	Expansion in geothermal, solar, and wind energy production, other renewables and clean energy options	Develop 2,405 MW of grid-connected renewable electricity generation and retire three thermal plants by 2022
	Expand solar and renewables and clean energy options	Distribute 30 MW of solar off-grid and mini-grids by 2022
ENERGY DEMAND	Enhance energy and resource efficiency across the different sectors	Promote sustainable energy sources for industrial heating processes
		Increase the number of companies participating in energy efficiency initiatives by 1,000 and increase the number of energy audits by 1,000 by 2022
		Develop Minimum Energy Performance Standards (MEPs) for five more appliances and upscale the existing testing facilities to include these five appliances
	Make progress towards achieving a tree cover of at least 10 percent of Kenya's land area	Develop and distribute 4 million improved biomass stoves by 2022 (2 million charcoal stoves and 2 million biomass stoves)
	Clean energy technologies to reduce overreliance on wood fuels	Develop and distribute 1 million clean energy stoves by 2022 (LPG, biogas and ethanol stoves)

These targets are detailed in Kenya's NDC implementation plan, also known as the National Climate Change Action Plan (NCCAP) 2018–2022. Achieving these objectives will require significant private sector investment.

ENABLING ENVIRONMENT

The existence of an enabling policy environment, including related legislation, laws, programmes and plans are crucial in achieving the sustainable development targets in any country. In Kenya, the overall development policy is governed by a long-term vision to 2030, and medium-term development plans, under which sectoral policies are developed.

CLIMATE CHANGE-RELATED POLICIES

Kenya's climate policies and climate action documents include the Climate Change Act, the National Climate Change Action Plan (NCCA), the NDC (2015), as well as Kenya's communications to the UNFCCC, namely its second national communication.

Both the Climate Change Act and NCCA are aligned with the NDC, and recognize the role of the private sector in addressing climate change. They highlight the need for private sector investment to guide Kenya's transition towards a low-carbon, climate-resilient development pathway. In the energy sector, geothermal, solar PV, wind power, and clean cookstoves, among others, have been identified as potential technologies for investment.

ENERGY-RELATED POLICIES

Kenya has developed a number of policies related to the energy sector in general that guide the sector's development. These policies include the National Energy Policy (2018) and the Energy Act (2019). The National Energy Policy sets out strategies for the energy sector in Kenya to achieve its vision to 2030. The Energy Act, newly enacted in 2019, offers additional private sector investment opportunity in the sector as it introduces net metering in Kenya.

In the renewable energy subsector, the establishment of feed-in-tariffs promotes private sector investment in electricity generation. Based on this, the government has developed feed-in tariff rates for electricity generated from renewable energy sources, such as wind, biomass, hydro, geothermal, biogas and solar, to further provide support to the development of the sector.

POLICIES RELATED TO PRIVATE SECTOR ENGAGEMENT AND INVESTMENT

The Economic Recovery Strategy, the Investment Promotion Act, the Privatization Act, the Constitution of Kenya and the Vision 2030 all promote creating an enabling environment for private sector investment. Over the years, Kenya has undertaken tremendous political, structural and economic reforms to attract private sector investment. The government has also developed the Public Private Partnerships (PPP) Act in 2013, which supports private sector participation in key economic sectors, including the energy sector.

OVERALL BUSINESS ENVIRONMENT

As for most countries since the COVID-19 pandemic began, Kenya's macroeconomic situation has worsened in 2020. Despite strong performance in recent years, with annual growth projected of an estimated 6 percent, Kenya is expected to enter recession in 2020, its first since 1992. The government expects revenues to decrease significantly, while spending needs will rise to sustain the economy during the crisis. Kenya receives support from the International Monetary Fund (IMF) and the World Bank. The economy is expected to slowly recover starting in 2021 with a more pronounced rebound from 2022 to 2024.

The ease of doing business and the enabling environment for cross-border and foreign investments are also important factors in investment decisions. Overall, the regulatory environment for foreign investments in Kenya is supportive. There are no specific constraints identified for the payment of dividends to foreign investors, including in foreign currency, as per the regulations related to foreign exchange and the general framework for investment provided by the Investment Promotion Act. It is also possible to borrow and repay capital from abroad.

Although the economic outlook is not favourable, Kenya developed a number of policies supporting the development of private investment in the energy sector over the past decade. The availability of policies supporting feed-in tariffs and Kenya's stance towards PPP schemes is encouraging for private sector engagement in the energy sector and its subsectors. The regulatory framework also supports investment in the energy sector, providing favourable conditions for foreign direct investment and cross-border investment in the sector.

CHALLENGES, RECOMMENDATIONS AND POTENTIAL FOR PRIVATE SECTOR INVESTMENTS IN THE ENERGY SECTOR

Investments in Kenya's energy sector are constrained by a number of barriers and challenges. The sector is divided among several ecosystems, composed of different value chains.

RENEWABLE ENERGY

The renewable energy ecosystem focuses on on-grid utility-scale power generation, commercial and industry (C&I) customers and solar home PV (SHS market).

IPPs and developers have already made significant investments in on-grid utility-scale power generation. However, it is constrained by the energy supply excess, low electrification rates, and limited electricity transmission and distribution infrastructure. Electrical outages are common and frequent, affecting nearly 90 percent of businesses. Poor reliability and supply quality are a result of the country's small electricity distribution network. The government has in place a considerable expansion, reinforcement and rehabilitation plan for generation and transmission; however, there is a possibility that implementation of the plan could be delayed and under construction could last for a long time.

To date, Kenya has the greatest deployed capacity of off-grid solar photovoltaic (PV) in sub-Saharan Africa. There is significant potential for additional private sector participation in mini-grid deployment to achieve the universal electrification goal. To further promote such participation in the market, specific regulations are expected to be developed, which was planned to be introduced in 2019. However, delays in the introduction and implementation of these have slowed the market as many private sector players are waiting for the new regulations to be introduced before starting development work.

The development of the off-grid and mini-grid market is constrained primarily by the following gaps and challenges:

UNCERTAINTY IN THE MINI-GRID MARKET

Over the years, the Government of Kenya has developed strategies and projects to deliver access to electricity to the population. However, some of these projects overlapped with private sector activity as they involved developing mini-grids in areas that already included private sector-owned mini-grids. This poses a risk of competing with or crowding out the private sector. The government is also introducing a new regulation related to the development of new mini-grids, as significant potential exists for private sector participation in achieving the goal of universal electrification. The market has slowed in anticipation of the new regulation, as many private sector players are waiting for it to be introduced before starting development work.

RECOMMENDATION AND POINT OF ENTRY 1

Establish stable market conditions for private sector mini-grid development through timely introduction of the regulation and improved coordination

The Government of Kenya should introduce the regulation to implement the new Energy Act, 2019 to allow the private sector to understand the changes coming to the market and the opportunities those changes are expected to bring. The new regulation will drive private sector actors interested in providing electricity to consumers in rural areas who lack access to it. It is thus particularly important to improve coordination between the public and private sectors to avoid overlapping mini-grid development.

POTENTIAL FOR PRIVATE SECTOR INVESTMENT IN RENEWABLE ENERGY

The on-grid power generation subsector faces barriers related to an electricity surplus resulting from low consumer demand because of high connection charges. This will need to be addressed to justify further private sector investment in electricity generation. However, forecasts do show demand increasing, driven by factors including demographic growth and electrification. This will help to justify increased investment and market development. The investment potential for on-grid energy is estimated at \$6.5 billion to develop new capacity of 2,405 MW from renewable energy sources.

Based on the considerable potential for private sector participation in achieving the goal of universal electrification, there appears to be potential for investment for off-grid/mini-grid energy. Specific regulations are expected to be developed and implemented in coming years to support this opportunity, which will further promote private sector participation in the market. Approximately 10 percent of the population, or 3.520 million Kenyans, will receive electricity via an estimated 8,000 solar mini-grids by 2023.

ENERGY EFFICIENCY

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The energy efficiency ecosystem for commercial, industrial and household use in Kenya is still nascent. There are no local manufacturers, so lights and appliances are imported. Demand appears to be limited in the current environment. At household level, lack of awareness, lack of demand for energy efficient appliances and products, high cost of energy efficient technologies, and limited availability of financial mechanisms are factors limiting growth in the sector.

RECOMMENDATION AND POINT OF ENTRY 2

Establish an enabling environment for energy efficiency

Policies and regulations – Existing policies do not capture aspects such as capacity building and awareness campaigns. This only worsens the lack of awareness within the market.

Awareness campaign – Lack of awareness presents a major barrier to scaling up the energy efficiency subsector on both the demand and supply sides. Consumers often lack the information they need to make informed decisions on energy efficiency solutions, while distributors lack information on the full benefit of solutions they are offering. This results in a lack of demand for energy efficient products and solutions.

Appliance labelling – Energy efficiency labelling facilitates decision-making for end users, who can then consider energy efficiency performance factors when purchasing an appliance.

RECOMMENDATION AND POINT OF ENTRY 3

Provide energy efficient appliances and products at an affordable price

To encourage households to replace their appliances with more energy efficient equipment and products, they must have access to efficient appliances that are affordable. This can be achieved by further leveraging asset-based lending for appliances, such as refrigerators and air conditioning, thereby reducing the initial cost of investment. In Kenya, the sale of appliances has grown significantly, primarily through the pay-as-you-go model of asset-based lending. Improving affordability can also be achieved by working with companies that provide renewable energy products. In the long term, this can lead to local manufacturing of energy efficient products and appliances, contributing to efficient development and distribution of such products locally, further lowering their price.

CLEAN COOKING

Priority actions in Kenya's clean cooking subsector are related to the development and distribution of improved cooking stoves. Specifically, actions focus on developing and distributing 4 million improved biomass stoves, including 2 million charcoal stoves and 2 million biomass stoves. Priority actions also include developing and distributing 1 million clean energy stoves using liquefied petroleum gas (LPG), biogas and ethanol by 2022. Stakeholders involved in the clean cooking ecosystem and value chain in Kenya include cookstove manufacturers, fuel producers, distributors, retailers and end users.

The lack of distribution channels for efficient cookstoves and fuels, coupled with the lack of trained and professional manufacturers to scale up distribution of clean cookstoves, are the significant challenges for the development of the sector. Most Kenyan producers do not have the capacity to reach rural markets and must rely on rural artisans (franchise system) as the sector is dominated by artisanal manufacturers. However, their technical capacity is often limited. This limits the diffusion of the technology where it is most needed, in rural areas. Fuel producers experience a similar issue. This is also a major bottleneck for businesses to scale-up and to receive financing.

RECOMMENDATION AND POINT OF ENTRY 4

Implement market-based solutions by developing hubs or “energy productivity zones” (EPZs)

Achieving scale is crucial for investors to be more interested in projects and enterprises involved in the clean cooking ecosystem. The private sector should thus examine models that will generate greater revenue by increasing the number of customers or reducing production costs. Some models to be explored include those that integrate stoves and associated fuels (tool and fuel models). These business models have a stronger revenue stream from fuel sales and could use the linkages between the stove and improved fuel to reduce the upfront cost of stoves.

RECOMMENDATION AND POINT OF ENTRY 5

Repurpose existing distribution network to expand distribution capacity of cookstoves and efficient fuels

The distribution of cookstoves and efficient fuels can be expanded without developing a new distribution network. Instead, manufacturers and distributors can rely on an existing distribution network previously used for another purpose and repurpose it to sell improved cookstoves and efficient fuels.

POTENTIAL FOR PRIVATE SECTOR INVESTMENT IN CLEAN COOKING

Potential private investment in clean cooking in developing and distributing improved biomass stoves in Kenya totals \$12.1 million. The investment opportunity in developing and distributing of 1 million improved cookstoves totals \$157.2 million. This total can be broken down into \$400,000 to develop and distribute 50,000 units of ethanol/bioethanol stoves, \$130.5 million to develop and distribute 900,000 units of LPG cookstoves, and approximately \$26.3 million to develop and distribute biogas stoves. The largest opportunity is in the LPG stove market.

The private sector investment potential is estimated at \$6.51 billion, most of which will be leveraged from electricity generation. Private sector investment potential in NDC target is summarized in the following table:

Table Investment potential in the energy sector

SUB-SECTOR	INVESTMENT POTENTIAL (USD)	PERIOD
RENEWABLE ENERGY On-grid	6.5 billion	Long term
CLEAN COOKING	169.3 million	Short to medium term
TOTAL	6.67 billion	N/A

ACCESS TO FINANCE

Multiple financial institutions provide green financing and financing to the energy sector in Kenya, offering services to SMEs and consumer finance. The commercial banking sector in Kenya is not an active player in lending to on-grid and off-grid energy companies. This is mainly driven by the high cost of capital and perceived high risk. Interest rates are prohibitive for most private sector stakeholders. Kenya has the largest concentration of impact investors in East Africa, including venture capital (VC) and corporate venture capital (CVC) investors that are foreign-based. They invest in companies based in Kenya, including in the on-grid and off-grid markets.

Overall, the development of the energy subsectors is limited by the financial sector, which has high perceptions of risk regarding renewable energy and energy efficiency. Typically, its commercial interest rates are high and loans are of limited tenor for all activities. The lack of long-term financing, such as long-term debt and equity, is another important limiting factor, specifically for infrastructure projects, such as on-grid utility-scale projects.

Providing capital at affordable conditions for blending and derisking in commercial finance

Commercial banks in Kenya cannot access affordable capital to lend to borrowers whose overhead costs are high. Therefore, they provide less favourable financing conditions to the private energy sector. However, commercial banks have shown an interest in partnering with international organizations to provide products at an improved interest rate.

Blended finance may offer an option for the country's commercial banks by addressing the risks that investors perceive, such as macroeconomic and technical risks. Blended finance offers de-risking options for emerging markets and developing countries through the use of instruments such as guarantees, direct investments and concessional financing for lines of credit. These instruments could reduce current interest rates, thereby lowering the barrier to finance for private sector stakeholders.

Direct investment could target significant infrastructure investments in the energy sector and increase the confidence of other investors. Credit lines may support commercial banks to target specific segments of the energy sector, such as SMEs in the SHS and clean cooking space. Importantly, guarantees could provide the security needed for a loan recipient to cover a loss in case of failure.

REPORTING FRAMEWORK TO ALIGN BUSINESS OPPORTUNITIES WITH NDC IMPACT TARGETS IN THE ENERGY SECTOR IN KENYA

Governments and international organizations engage the private sector to leverage stakeholders' investments in a country's NDC. The NDC can offer additional business opportunities to the private sector. However, the sector is often unaware of the opportunities that the NDC offers. It is therefore important to highlight and translate them into clear reporting frameworks, which the private sector can then leverage to enhance its understanding of the added value that climate investments bring.

A clear understanding of this alignment, or the extent to which the private sector can align with NDC actions, offers potential merits. First, it enables the private sector to clearly identify actionable actions, which can be translated into business opportunities. The NDC and SDGs have been chosen as the main reporting frameworks for this report. Business opportunities in the energy sector identified in this report are linked to NDC objectives and SDG targets. A summary of the business opportunities and the corresponding climate and SDG frameworks are provided below (direct benefits in green, co-benefits in orange).

BUSINESS OPPORTUNITY	NDC/NREAP TARGET	SDG FRAMEWORK
RENEWABLE ENERGY		
Developing on-grid renewable energy power generation plants (IPPs)	Expand geothermal, solar and wind energy production, other renewables and clean energy options	7 – Sustainable energy 13 – Climate action 3 – Good health 4 – Quality education
Providing solar PV solutions to commercial, industrial, SMEs and households	Expand solar and renewables and clean energy options	7 – Sustainable energy 1 – No poverty 9 – Innovation and infrastructure 2 – No hunger 13 – Climate action 3 – Good health 4 – Quality education 5 – Gender equality
Illustrative metrics	Reduced cost of energy (US\$); reduced need for diesel generators (litres of diesel used); # and value of deals (US\$), # and value of loans (US\$) provided by local financing organizations; direct carbon reduction achieved through installation of renewable energy capacity (tCO ₂ e)	

BUSINESS OPPORTUNITY	NDC/NREAP TARGET	SDG FRAMEWORK
ENERGY EFFICIENCY/APPLIANCES		
Distributing efficient equipment	Enhance energy and resource efficiency across the different sectors	7 – Sustainable energy
Providing energy audits and energy management systems		9 – Innovation and infrastructure 13 – Climate action 1 – No poverty 3 – Good health
Illustrative metrics	# of LEDs deployed; # of efficient refrigerators deployed, amount of energy savings realized due to the products/services provided (MWh); direct carbon reduction achieved through the use of efficient appliances (tCO ₂ e); # and value of loans (US\$) developed directly by DESCOs (households and SMEs)	
CLEAN COOKING		
Manufacturing improved cook-stoves	Make progress towards achieving a tree cover of at least 10 percent of Kenya's land area	7 – Sustainable energy 13 – Climate action
Manufacturing LPG cookstoves	Clean energy technologies to reduce overreliance on wood fuels	15 – Life on land
Manufacturing efficient fuels		1 – No poverty 3 – Good health 5 – Gender equality 4 – Quality education
Illustrative metrics	# of efficient stoves deployed; # of LPG stoves deployed; # of households serviced in rural areas for efficient fuel; decrease in volume of wood fuel/inefficient charcoal used for cooking (tons); # and value of loans (US\$) (asset financing) developed directly by clean cooking solution providers (households)	

*Additional SDG targets are developed for these opportunities in the main report.

ASSESSMENT RESULTS AND CONCLUSION

The Government of Kenya has developed the overall enabling environment and targets for investment in the country's energy sector. Although the macroeconomic outlook is less favourable due to the impact of the COVID-19 pandemic, there appears to be potential in on-grid electricity generation and clean cooking in Kenya. The total private sector investment potential in the energy sector is estimated to total \$ 6.67 billion, most of which will be leveraged from electricity generation. The off-grid/mini-grid market also appears to offer additional investment opportunities, as a new regulation is being drafted that will promote new private actors in the market.

The financial sector should strong support private sector investment. Local financing is characterized by high interest rates and relatively short tenors. Venture capital and impact investing activities are highly active in Kenya. However, their investment in the energy sector is still limited as the sector has fewer dealers compared to the agriculture or financial services sectors, which represent more than 40 percent of all deals in Kenya. Providing better financing conditions by leveraging blended finance, with instruments such as guarantees, credit lines and concessional financing, could be an option for local banks and critical for scaling up private sector finance in investments in the energy sector.

UNDP NDC SUPPORT PROGRAMME

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