

ENERGY EFFICIENCY IN BUILDINGS

NOVEMBER 2018

Kenya

STATUS AND TRENDS

Kenya is the ninth biggest economy in Africa according to IMF rankings, and in recent years has experienced sustained strong economic growth that has seen it move to “lower-middle income” status as defined by the World Bank. As the largest economy in the East African Community and a regional hub for trade, communication, finance and transportation, Kenya is established as an economic force in the region. The country has an equatorial climate with wide variations: it is hot and humid at the coast, temperate inland, and very dry in the north and northeast parts of the country. Nairobi, the country’s capital, has a very pleasant climate throughout the year due to its equatorial location combined with its altitude of 1,600 m.

A young and rapidly growing population, a dynamic economy and the country’s strong commitment to increasing electricity access are key reasons behind increasing building energy consumption and acute supply constraints to the commercial sector. Between 2011 and 2016, Kenya’s installed power capacity rose by around 50% to 1,885 MW and household access to electricity more than doubled over the same period, mainly through expanding grid connections for public facilities and surrounding households, though there is clear evidence to suggest all demand for electricity in Kenya is far from being satisfied currently or in the future (Institute of Economic Affairs, 2015). At the same time, figures for energy intensity point to significant opportunities to make Kenya’s industries and buildings more energy efficient through improving demand-side practices and reducing system losses.

Kenya’s overall building stock in 2018 is estimated at approximately 37 million m², comprised of over 30 million m²



KEY INDICATORS

- 51.0 million people (est. 2018), urban population 25%, annual population growth 2.6%
- Land area: 569.1 thousand km² (comparable to Spain or France)
- GDP, PPP (2017 at constant 2010 USD): \$58.1bn, per capita \$2,993 (approx. 19% of world average)
- Annual GDP growth rate (2016): 5.9%
- Total per capita annual energy consumption (2014): 513.4 kg of oil equivalent (27% of world average)
- Primary energy intensity (MJ/\$2011 PPP GDP): 7.846 (153% of world average)
- Greenhouse Gas Emissions (2014): total 14,287 kt CO₂e (0.04% of global emissions), per capita emissions 0.31t CO₂e (6% of world average)

Source: World Bank (2018)

of residential space, approx. 1.5 million m² of office and retail space, and approx. 5.5 million m² classified as other commercial (Navigant, 2018). This stock is forecast to grow to approx. 47 million m² by 2025 (IFC 2017), with the strongest growth coming from hotel and institutional sub-sectors. These figures do not adequately capture the fact that, according to the World Bank's April 2017 economic update, Kenya faces a housing deficit of over 2 million units, and has nearly 61% of urban households living in slums. This deficit continues to rise due to fundamental constraints on both the demand and supply side and is exacerbated by an urbanization rate of 4.4% annually, equivalent to 0.5 million new city dwellers every year.

Overall residential, commercial and public services energy consumption (broadly representing building sector energy consumption) was 11,521,000 tonnes of oil equivalent in 2015, representing as much as 73% of total final energy consumption (IEA 2015). This high figure is driven by Kenya's high dependence on traditional biomass energy for cooking in the residential setting, with biomass accounting for 68% of total energy supply. Heat and electricity consumption in buildings accounts for as little as 9% of energy use in the country, with buildings using 47% of the available electricity generation capacity (residential buildings 32% and commercial/public service buildings 15%). Ongoing economic growth, supply constraints driven by increasing energy access objectives, and the prevalence of the building sector in national energy use data all point to the critical nature of building energy efficiency to overall energy security and economic productivity objectives in Kenya, as well as to addressing climate change obligations.

INSTITUTIONAL FRAMEWORK

In its first NDC submitted to the UNFCCC, Kenya committed to reducing its GHG emissions by 30% relative to the BAU scenario of 143 MtCO₂eq by 2030. Energy efficiency is an important component of the country's GHG emission reduction strategy, with nominated mitigation actions including enhancement of energy and resource efficiency across different sectors. The SEforALL Action Agenda and Investment Prospectus, finalised in 2015 with support from the SEforALL Africa Hub, has also been an important touchstone for the Kenyan Government in which it has set an ambitious goal of reducing national energy intensity by 2.8% per year, and situates its energy goals within the overall Vision 2030 national development blueprint.

In relation to building energy efficiency, key energy institutions in Kenya are

- The Ministry of Energy: responsible for energy policy formulation, for overseeing national energy planning and for mobilising financial resources for investments in the energy sector. It also is in charge of creating a framework environment which allows for private participation in the energy market. Energy efficiency activities are coordinated under the Renewable Energy Directorate, one of the four technical Directorates of the Ministry.

- The Ministry of Transport, Infrastructure, Housing and Urban Development, which has carriage of overall housing and urban development policy, management of building and construction standards and codes, building research services and oversight of the construction industry.
- Kenya Electricity Generating Company (KenGen) as the main electricity generation company in Kenya that produces approximately 80% of national electricity consumption, while Kenya Power and Lighting Company (KPLC) is the only grid company operating in the market. KPLC purchases electricity from KenGen and other power producers and owns and operates the majority of transmission and distribution systems. The Kenyan government holds 50.1% of KPLC's shares.
- The Energy Regulatory Commission (ERC), which is responsible for regulation of the energy sector. The Energy Act of 2006 established ERC as an independent energy regulatory authority with responsibility for economic and technical regulation of electric power, renewable energy and downstream petroleum sub-sectors, including tariff setting and review, licensing, enforcement, dispute settlement, and approval of power purchase and network service contracts.

Additionally there are several significant arrangements between Government and parastatal/industry organisations that impact on programs for energy efficiency in buildings, including

- The Kenya Association of Manufacturers (KAM) – through an agreement with the Ministry of Energy, since 2006 KAM has hosted the national Centre for Energy Efficiency and Conservation (CEEC) and is involved in program administration on behalf of the Ministry of Energy, notably its program of energy auditing for industrial sites and commercial buildings, as well as training and certification services.
- The Kenya Green Building Society (KGBS) – an independent, non-profit membership based society registered with the World Green Building Council as its Kenya Chapter. KGBS has strong Ministry acknowledgement and is mandated to run certification schemes for the built environment, advocate for green buildings and train green building professionals.
- In terms of subnational government frameworks, Kenya went through a recent process of devolution that saw the creation of 47 'county' governments, geographical units enshrined by the 2010 Constitution as units of devolved government across the country. Counties are empowered with limited responsibilities related to local housing, electricity and gas reticulation and energy regulation. National and county governments have various and sometimes overlapping mandates regarding building energy efficiency interventions, and project proponents need to engage both levels of government when pursuing energy efficiency advancement projects. A Council of Governors was established in 2012 as a mechanism for consultation amongst County Governments, to share information on performance of the counties in execution of their functions, and facilitate capacity building for Governors. The Council has technical committees for infrastructure, energy and urban development issues.



POLICY FRAMEWORK

Kenya's Energy Act (2006) sets up the institutions and framework for the country's energy policy, including (through s.104-106) endowing the Minister with relatively wide-reaching powers to establish energy conservation measures for factories and buildings. The subsequent Energy (Energy Management) Regulations (2012) made under s.110 of the Act impose requirements that all commercial buildings, industrial and institutional facilities consuming >180,000 KWh annually must develop an energy management plan; undertake an energy audit at least every 3 years; prepare an energy investment plan within 6 months after end financial year end for the year the audit was conducted of energy audit; and realize at least 50% of identified and recommended savings by the end of the 3 year period/next audit reporting date, with penalties for non-compliance and non-reporting. Measures were also introduced in 2012 to promote uptake and guide the incorporation of low temperature solar water heating (SWH) systems in industrial, commercial and residential buildings, while the Appliances Energy Performance & Labeling Regulations (2016) put in place minimum energy performance standards (MEPS) for five appliance classes (motors, air conditioners, domestic and commercial refrigerators, and compact fluorescent bulbs and fluorescent tubes).

Building codes in Kenya were previously based on British standards from the late 1960s, and are now transitioning to be fully based on European construction guidelines (Eurocodes) by 2021. Volume 4 (Building Services – Section N) considers energy efficiency, and requires consideration of passive and natural cooling methods; shading of glazed areas; and the use of natural daylight, with a daylight factor of at least 2% for offices or otherwise the use of EE fittings (National Planning and Building Authority. 2009). The

Code specifies that new housing developments should have solar hot water for bathroom use, and should consider PV and wind. Further energy and sustainability measures for residential housing and promotion of green buildings to industry are scheduled for introduction through the Built Environment Bill (2017) and the Housing Bill (2017), when enacted.

In terms of building ratings and performance disclosure, the rating system with the highest growth in use is the contextualised Australian/South-African 'Green Star Africa' program, supported by the Kenya Green Building Society (KGBS) under mentorship via the South Africa Green Building Council; 5 commercial buildings within 2 years are undergoing certification under this standard. KGBS has been active in promoting the EDGE tool of IFC (refer 'International Support') and in signing an MoU with the Climate Bonds Initiative, aiming to stimulate take up of green-certified buildings. The United States Green Building Council's LEED tool is also used in the market with 24 buildings registered for certification since 2000.

UN Habitat is supporting a tool called SHERPA for Sustainable Housing Projects. This is an easy to use self-evaluation tool for project managers, communities, and other stakeholders involved in the planning, design, construction and assessment of housing projects.

There are nascent programs to provide financial incentives for building energy efficiency, such as CFC Stanbic and Cooperative Bank providing \$33 million in green credit lines for energy- and resource-efficiency projects. Major residential lender HF Group has also commenced providing a 'green mortgage' credit facility with support from IFC.

INTERNATIONAL SUPPORT

Energy efficient buildings in Kenya have been the target of support by a number of international agencies, including:

- During 2011-2015, **UN-Habitat** and **UN Environment** implemented a programme “Promoting Energy Efficiency in Buildings in East Africa”. Kenya is among the five countries targeted under this GEF-funded programme. The programme’s main target was to promote the construction of at least 400,000 energy efficient housing units through the provision of technical assistance on the design and implementation of new houses in the region. Other activities under the programme include awareness campaigns, fiscal and financial incentives, and policy changes to change housing policies, building codes and building practices.
- In March 2017, **International Finance Corporation (IFC)** entered into an agreement with the Kenya Green Building Society (KGBS) to promote a greener construction sector in Kenya. Through the agreement, KGBS markets IFC’s EDGE green building software and certification program to the Kenyan property industry and collaborates on future technical trainings. Certification is offered in Kenya by IFC’s global certification service providers. The collaboration between KGBS and IFC will enable more building projects in Kenya to pursue green design and certification and push the property industry towards greater resource efficiency. IFC has also been active in providing intermediary finance to encourage property developers to build more energy efficient homes.
- In 2017 both Kisii County and Nairobi City County joined the **SEforALL Building Energy Efficiency Accelerator**, a global innovative public-private collaboration which provides cities guidance and technical advice on how to speed up the energy efficiency improvement of their buildings.
- The French development agency **AFD** has been a long-standing supporter of energy efficiency in Kenya, active in providing financing for efficient lighting rollout programs as well as credit lines to commercial banks to promote renewable energy and energy efficiency projects in the agri-business and hostelry sectors.
- A number of bilateral agencies have either direct energy efficiency programs in Kenya or broader energy sector programs which target generation and access, but have strong energy efficiency components. Examples of these programs include the Power Africa flagship program of **USAID**; the Programme for Energy Efficiency in Buildings (PEEB) of **GIZ**; the multi-donor Energising Development (EnDev) Kenya project; and direct support to the energy efficiency activities of KAM by **Danida**.
- In collaboration with the Ministry of Industrialization and Enterprise Development and leveraging Global Environment Facility funding, **UNDP** has helped Kenya to introduce minimum energy performance standards and administered comprehensive campaigns aimed at informing retailers and consumers of the need to improve energy efficiency in residential, commercial and industrial sectors.



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