Productive use of Energy

TOWARDS UNIVERSAL ELECTRIFICATION

Kenya Last Mile Connectivity Project

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Kenya’s Electricity Sector Overview
Summary of Key Statistics
Electrification Plan
Connectivity Projects
Energy Consumption Growth Trends
Last Mile Consumption Patterns & Behavior
Kenya’s Electricity Sector

Policy
Republic of Kenya

Regulation
Energy Regulatory Commission

Power Generation
- Hydro
- Geothermal
- Thermal
- Wind

Transmission

Distribution
- Control Sub-station

Retail

IPPs

KenGen

GDC Geothermal Development Company

KETRACO
Kenya Electricity Transmission Co. Ltd.

Kenya Power

REA Rural Electrification Authority

IPPs

Kenya Power
**GENERATION CAPACITY**
- Installed capacity: 2,712 MW
- Effective capacity: 2,638 MW
- Interconnected effective capacity: 2,616 MW

**ELECTRICITY DEMAND**
- Electricity peak demand: 1,882 MW

**CUSTOMER BASE**
- Total number of customers: 7.1 Million

**ELECTRICITY GENERATION & SALES**
- Electricity generation: 10,702 GWh
- Electricity sales: 8,459 GWh

**Installed Generation by Type**
- 826.23 MW
- 663.00 MW
- 807.73 MW
- 336.05 MW
- 50.94 MW
- 28.00 MW
Kenya's Electrification Plan

The country’s electrification strategy is outlined in the National Electrification Plan of 2017 and is in line with our Vision 2030.

The strategy is geared towards universal electrification by 2022.

The national electrification strategy is supported by:

- Least Cost Power Development Plan - 20 years plan
- Distribution Master Plan – 10 years plan
- Rural Electrification Master Plan – 10 years plan
Government introduced last mile program that has more than doubled the number of households connected to electricity

This was through;

i. Global Partnership on Output-Based Aid. (GPOBA) – Informal Settlements

ii. Last Mile Project – Households under grid or within reach of grid network

These projects are implemented by KPLC & REA

- Ambitious target of universal access by 2022
• Kenya has a target of achieving universal electricity access by 2022.

**Off-grid Zone**
Targeted for off-grid Mini grid electrification program

7.5 M Customers Connected. Over 0.5 M New customers to be connected annually.

**Examples of Off-grid Power Stations with mini grids**

**Universal electricity access by 2022 through connecting 1.2 million new customers yearly**

**Last Mile Project**
- Funded by the Government with support from various development partners
- Targets customers living in rural and peri-urban areas Mobile
- Government has secured funding from development partners totaling KShs 65 billion.

**KOSAP Project**
- Supports development of solar hybrid power supply complemented by water projects in 14 least electrified counties.
- Target Population is about 430,000 households within off grid regions
- The project is being financed by the World Bank to the tune of KShs.16 billion

- Targeting connection of 1.2 million customers over the next three years.
- Last Mile Connectivity Program aims to provide 75-85% of Kenyans with electricity

- It's estimated that about 1.5 million households will be served by off-grid mini grids
- 120 potential mini and micro-grid sites (>100 structures per site) with roughly 28,000 customers targeted for phase 1.
## 1. Last Mile Project

Transformer maximization funding and targets to connect about 1.2 million new customers

<table>
<thead>
<tr>
<th>No</th>
<th>Project</th>
<th>No. of transformers/schemes</th>
<th>Target no. of customers</th>
<th>Total Cost Ksh. Billion</th>
<th>Status</th>
<th>Target Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AfDB (phase 1)</td>
<td>5,320</td>
<td>243,682</td>
<td>15</td>
<td>110,234 Connected (49%)</td>
<td>Sept 2019</td>
</tr>
<tr>
<td>2</td>
<td>AfDB (phase 2)</td>
<td>4,763</td>
<td>266,000</td>
<td>15</td>
<td>Procurement of materials in progress</td>
<td>Oct 2019</td>
</tr>
<tr>
<td>3</td>
<td>WB</td>
<td>4,200</td>
<td>253,919</td>
<td>15</td>
<td>Design, procurement of materials</td>
<td>Oct 2019</td>
</tr>
<tr>
<td>4</td>
<td>AFD/EU/EIB</td>
<td>4,948</td>
<td>296,649</td>
<td>18</td>
<td>Design, and tendering of works in progress</td>
<td>Oct 2021</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>19,784</strong></td>
<td><strong>1,137,849</strong></td>
<td><strong>63</strong></td>
<td></td>
<td></td>
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</tbody>
</table>

• $150 million World Bank Funded Project to the 14 Counties identified by the Commission of Revenue Allocation (2013) as marginalized.

• National Government project with County Government partnership: Counties involved in project concept development and implementation.

• Comprises of:
  • About 120 Minigrids to be developed (KPLC, REA)
  • Stand alone solar solutions for institutions (KPLC)
  • Solar water pumping
  • Stand alone solar for households
  • Energy saving Jikos (Turkana, Marsabit, West Pokot and Samburu Counties)
  • Requisite capacity building for Counties.

<table>
<thead>
<tr>
<th>Lot #</th>
<th>Number of mini-grids</th>
<th>Customers in year 1</th>
<th>Consumption MWh/year</th>
<th>Peak demand MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>26</td>
<td>6,708</td>
<td>1,792</td>
<td>0.70</td>
</tr>
<tr>
<td>2</td>
<td>29</td>
<td>7,364</td>
<td>1,892</td>
<td>0.74</td>
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<tr>
<td>3</td>
<td>32</td>
<td>5,729</td>
<td>1,679</td>
<td>0.66</td>
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<tr>
<td>4</td>
<td>23</td>
<td>5,056</td>
<td>1,383</td>
<td>0.54</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>643</td>
<td>173</td>
<td>0.07</td>
</tr>
<tr>
<td>6</td>
<td>10</td>
<td>2,020</td>
<td>552</td>
<td>0.22</td>
</tr>
<tr>
<td>Total</td>
<td>121</td>
<td>27,520</td>
<td>7,473</td>
<td>2.93</td>
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</tbody>
</table>
The average per capita consumption for domestic customers is declining with increased connections.

- The average cumulative consumption has increased with the new connections
- Average per capita consumption within this category dropped from 764 Kwh to around 412 Kwh
• Median monthly electricity consumption during the first decade of access, by urbanization level.

• Customers exhibit lower growth rates in electricity consumption over time compared with those customers who were self-sponsored and those living in cities and other urban areas.

• Customers achieve a lower steady consumption levels that are arrived faster than the other customers.
The results:

- The customers peak faster and earlier than expected explaining the lower consumption levels registered by the groups.

- A consumption of between 8-13kWh per month compared to between 40-50kWh for the urban households.

Challenge Now

- How to increase demand among the last mile customers to make it viable and as well improve the customers well being.
Thank you