Kenya’s National Prepayment Metering and Billing pilot programme

Eng. Johnson Ole Nchoe, Chief Manager, IT & Telecommunications,

Kenya Power & lighting Company Ltd,
Nairobi, Kenya

18 - 22 May 2009
CTICC, Cape Town, SOUTH AFRICA
OUTLINE

• Kenya
• Energy Sector in Kenya
• Kenya Power & Lighting Company
• Prepayment Metering Project
• Conclusion
• Kenya has a GDP of $29.3 Billion

• Per capita income is $771

• Population – About 38 million

• Has exotic wildlife reserves with thousands of animal species.
PEOPLE OF KENYA

- Currently there are more than 40 different ethnic groups
- Main groups are:
  - Bantus
  - Nilotes
  - Hamites
UNIQUE FEATURES IN KENYA

- Wildebeest migration
UNIQUE FEATURES IN KENYA

- Mt. Kenya
UNIQUE FEATURES IN KENYA

• The Great Rift Valley
ENERGY SECTOR IN KENYA

Ministry of Energy

KenGen
IPPs

ERB
KPLC
REA
Retail Customers

18 – 22 May 2009, CTICC, Cape Town, SOUTH AFRICA
KPLC CUSTOMER BASE

• KPLC has over 1.2 million customers

• Figure is expected to double in the next five years.

• Customers are metered and billed based on a credit (postpaid) metering system
KPLC CAPACITY

- Operating profit of $47 Million in 2007/2008
- Gross turnover of $558 Million
- Installed power capacity is 1310 MW
- Peak demand is 1044 MW.
TRANSMISSION NETWORK

Transmission Lines
- 220 KV Transmission Lines
- 132 KV
- 66 KV

Distribution Lines
- 33 KV etc
KPLC – WAN CONNECTIVITY

- All KPLC systems are online
- WAN Connectivity via various channels
- Currently laying Fibre-optic cable over the transmission network for internal use
- Excess capacity will be leased out
KPLC – WAN CONNECTIVITY

[Map of Kenya showing various locations and connectivity details]
POSTPAID REVENUE COLLECTION CYCLE

1. CONSUME ELECTRICITY
   - RECONNECT CUSTOMER
   - PDC'S LAWYERS
   - PAYMENT BY CUSTOMER
   - FINALISE ACCOUNT
   - DISCONNECT DEFAULTERS

2. BILL PAID??
   - YES
     - TAKE & DOWNLOAD METER READINGS
     - RESOLUTION OF ANOMALIES
       - GENERATE BILLS
       - DISPATCH BILLS
   - NO
     - BILL PAID??
POSTPAID METERING CHALLENGES

- Low customer satisfaction levels
- Reduction of losses from the current 18.78% to 15% within the next 3 financial years
POSTPAID METERING CHALLENGES

- Accurate reading of over 1.2 Million meters every month
- Costs of generation and dispatch of customer bills – $2.5 Million annually
- Long queues and data capture errors
FUTURE?

- Challenges will increase with projected connection of 1 Million new customers in 5 years
CUSTOMER SERVICE INNOVATIONS

- Ebill for querying customer bills using SMS and e-mail
- MPESA & ZAP to facilitate mobile phone payment of customer bills
- Stima loan – customers financing
- Electricity Prepayment on a pilot basis.
ELECTRICITY PREPAYMENT

- Prepayment refers to the payment of services to the utility or any other Company before those services are rendered.

- Prepayment as a concept has been firmly introduced in Kenya, in the Telecommunications sector.

- Total number of customers on prepayment in the mobile telephony is over 15 Million.
PREPAYMENT IN OTHER COUNTRIES

- Electricity prepayment used in:

**AFRICA:** South Africa, Sudan, Mozambique, Angola, Namibia, Zambia, Tanzania, Rwanda, Nigeria, Zanzibar, Niger, Egypt, Mali etc

**OUTSIDE AFRICA:** China, Britain, Greece, USA etc
VISITS AND STUDIES FROM OTHER UTILITIES

- KPLC has been studying Electricity prepayment since 1998
- Visits to other utilities with prepayment have been done
## UTILITIES VISITED

<table>
<thead>
<tr>
<th>Country</th>
<th>Technology Employed</th>
<th>IEC Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Africa</td>
<td>STS Keypad (numeric)</td>
<td>IEC 62055-41</td>
</tr>
<tr>
<td>Sudan</td>
<td>STS Keypad (numeric)</td>
<td>IEC 62055-41</td>
</tr>
<tr>
<td>Mozambique</td>
<td>STS Keypad (numeric)</td>
<td>IEC 62055-41</td>
</tr>
<tr>
<td>Angola</td>
<td>STS Keypad (numeric)</td>
<td>IEC 62055-41</td>
</tr>
<tr>
<td>Namibia</td>
<td>STS Keypad (numeric)</td>
<td>IEC 62055-41</td>
</tr>
<tr>
<td>Zambia</td>
<td>STS Keypad (numeric)</td>
<td>IEC 62055-41</td>
</tr>
<tr>
<td>Tanzania</td>
<td>STS Keypad (numeric)</td>
<td>IEC 62055-41</td>
</tr>
<tr>
<td>Rwanda</td>
<td>STS Keypad (numeric)</td>
<td>IEC 62055-41</td>
</tr>
<tr>
<td>Mali</td>
<td>STS Keypad (numeric)</td>
<td>IEC 62055-41</td>
</tr>
<tr>
<td>Zanzibar</td>
<td>STS Keypad (numeric)</td>
<td>IEC 62055-41</td>
</tr>
<tr>
<td>Ghana</td>
<td>STS / Smart Card</td>
<td>None</td>
</tr>
<tr>
<td>Nigeria</td>
<td>STS / Smart Card</td>
<td>None</td>
</tr>
<tr>
<td>Egypt</td>
<td>Smart Card</td>
<td>None</td>
</tr>
</tbody>
</table>
• The STS technology proved to be the technology of choice to the company as it ensures interoperability between different equipment from different manufactures.

• Based on this, KPLC chose to use the STS Keypad (numeric) technology for a pilot project of 25,000 meters to be installed in Nairobi.
PILOT PROJECT SCOPE

• 25,000 Din Rail Split Prepayment Meters
• 25 Vending Stations
• 10 different locations in Nairobi
• Project preparation & Start Feb 2009
• Expected completion date Aug 2009
KPLC PILOT PROJECT

- Feasibility, benchmarking
- Tender for Pilot Project - 25,000 meters
- Evaluation & Award
- Choosing of Pilot Areas
- Formation of steering and implementation committees
- IT Infrastructure preparation
- Customer Communication
- Evaluation of the pilot project
- Commencement of pilot project
- Continuous Improvement
HOW PREPAYMENT WORKS

• Customer purchases a token of a certain monetary Value
• Loads the purchased credit into the meter and receives service
• When credit is depleted, customer purchases new token
• If no new token is purchased, supply is disconnected.
PREPAYMENT REVENUE COLLECTION PROCESS

1. CONSUME ELECTRICITY
2. AUTOMATIC RECONNECTION
3. PURCHASE OF CREDIT
4. AUTOMATIC DISCONNECT ION
5. TOP UP OF CREDIT
6. YES
7. NO

Flowchart showing the process of prepayment revenue collection.
BENEFITS

Customers:

- Convenience of purchase
- Customers manage their own budget
- Visible credit and consumption indication on the meter. Solves landlord problems
BENEFITS

Customers:

- Privacy (meter readers do not enter the premises)
- Improved relationship with customers (no wrong reading, no disconnections and no reconnection fees)
- Managed electricity consumption
BENEFITS

Company:

- Decongestion of Banking halls
- Payment in advance (improved collection)
- Zero customer debt (no arrears)
Company:

- Simpler revenue collection cycle
- Cheaper revenue collection cycle
- Reduced operational costs
BENEFITS

Company:

- Commercial losses reduced
- No more Bills & Debt accumulation
BENEFITS

Economy:

• Employment Creation: Sales outlets
CHALLENGES

• Change management. New way of doing business for Customers and staff.

• Training in the new system.
CHALLENGES

Split Metering has possible points of failure:

• The communications cable and connectors,

• Customer Interface Unit (CIU),

• Measurement Interface unit (MIU).
CONCLUSION

Prepayment is an excellent customer service tool since it ensures customer budget their own consumption while ensuring improved cash flows for the utility.
- Questions -