

ENERGY LOSS MANAGEMENT SOLUTION USED TO IMPROVE REVENUE PROTECTION MANAGEMENT BEST PRACTICE



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CHALLENGES IN REVENUE MANAGEMENT & ELECTRICITY THEFT





In Sub Saharan Africa (SSA), on average, only **50%** of electricity generated is paid for. * Source: World Bank Report 2011.

In SSA on average, Non technical losses estimated at 30%







WHERE DO THE LOSSES OCCUR?



BACKOFFICE & POINT OF SALE

- Poor Business Processors or Policies: Vendor policy, Cash Management, Debt Management
- Software & IT: Lack of Controls
- Unsecure H/W in the field (Vending Security Modules, PC's passwords)



TECHNICAL LOSSES (TL)



NETWORK + METERS (NTL)

- Illegal Network Connections
- Installation Bypass
- Meter Fraud.





ELECTRICITY THEFT MITIGATIONS (NTL)





METER FRAUD

- Move to Split Metering
- More anti tamper features

INSTALLATION BYPASS

- Split Metering
- Secure Meter Kiosks
- Migrate to "AMR"
- Data Mining/Analysis

STRONG BY-LAWS AND PROSECUTION FOR THEFT

ILLEGAL CONNECTIONS

- Energy Balancing
- Data Mining/Analysis





ENERGY BALANCING APPROACH/METHODOLOGY



Energy Diversion Detection

- Primary Energy Balancing
 - Compare upstream energy to downstream service points.
 - Check Energy received (kWh) vs Energy Supplied (kWh)
- Secondary Energy Balancing
 - Compare transformer measured energy to service points downstream
- Report by magnitude or percent difference
- Identify problem AREAS/REGIONS and focus on fixing those areas first.

Tamper Analysis

- Interpret complex meter exceptions
- Identify diversion patterns
- Prioritize and present in concise format
- Enable analysts to launch field investigation or monitor
- Identify problem CUSTOMERS and focus on monitoring those CUSTOMERS







PILOT ON ENERGY BALANCING (LOW INCOME RESIDENTIAL ZONE)



- Municipality in Gauteng
- Residential/Township Area with Prepayment low/middle income customers.
- Some Commercial Customers .
- Ring fenced Area
 - 19 Transfomer Zones.
 - 1792 Customers.
- Baseline Revenue (July 2012): Loss of R100,000 per month
- Baseline kWh Losses (July 2012): Losses of 40%

10 MONTHS LATER INTO PROJECT

- Revenue (Apr 2013): +5% per month
- Baseline kWh Losses (Apr 2013): Losses down from 40% to 18%





REAL WORLD CHALLENGES



- Where's is the Revenue Protection Team that will help us with this project ?
 - The process cuts a wide path though the organization, which requires mature coordination.
 - Companies do not devote / do not have the necessary resources to minimize losses.
- **Data quality** in the operational systems hampers progress.
 - Requires accurate and upto date data between Technical Systems (metering, GIS, Network planning, etc) and Customer/Financial systems (billing prepayment, Call centers, etc).
- **Technology constraints** in the field: network equipment, communications infrastructure, Meter configurations, interoperability, enclosures space, etc.
- A holistic view requires **integration** between multiple systems.
- Overcoming an **entrenched culture** of non-payment for services.
 - Not understanding the role of staff and community awareness / Social Marketing

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KEY FINDINGS



FINDINGS IN THE FIELD - METERING

- Faulty meters
- Meter bypassed.
- No meters installed
- Meters Disconnected
- Illegal Connections
- Meters OK



DATA ISSUES

- Customer records incorrect (Customer name, Address, meter number)
- Incorrect Network data of customer supply points and linked to transformers.







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INTEGRATED END TO END SOLUTION KNOWLEDGE APPLICATION/DASHBOARD



- Financial view of technical and non technical losses. (\$)
- Technical view of technical and non technical losses. (kWh)
- Identification and possible meter tampering
- Identification of partial bypasses
- Identification of ghost vending
- Trigger of Targeted inspections
- Spatial view and drill down capability

NEED SKILLED RESOURCES

- Data analyst that understand the data in front of them,
- Meter technicians to up their skill level (AMR elements, communication skills, GIS tools etc)





WHERE TO NEXT? CENTRALISED METERING SYSTEM (CMS)



- CMS can provides direct feedback of individual meter consumption, token acceptance and alarms.
- Compliments high end smart meter initiatives to get a full view of losses on your meter installed base.
- Compliment Statistical Metering and Network loss management Initiatives
- Used with Business Intelligence solutions to enhance knowledge of field conditions and where losses are occurring





MAKING WHAT YOU HAVE INSTALLED (PREPAYMENT) SMARTER



- Provide an add-on AMR capability for your STS prepayment meters.
- Enables advanced Revenue Assurance for Utilities.
- Multiple meters connected via serial bus to a centralised communicating device.
- Add-on remote communication for split meter to extend functionality.
- Affordable alternative to full blown AMI/Smart metering Solution.

Make Space Provision in your Meters boxes/Kiosks NOW for communication equipment that may be installed later.







KEY TAKE-AWAYS



- Losses (Financial and Technical) are significant challenges to African utilities NTL + TLs
- Nobody, short of the CFO & CTO, has overall responsibility for the combined losses number.
- \$Mill invested in Basic STS keypad based prepayment in Africa We can leverage on this.
- Smart Metering has its place but not all your customer segments qualify for and require a complex smart meter.
- Upgrading basic prepayment to split metering and allowing a migration path now to upgrade to an AMR type solution can assist with identifying & curbing losses.
- Solutions exists today and technology is an enabler to solve these problems.
- The solution is NOT in the meters or the technology, it lies in the approach and the end to end solution.
- There is no substitute for sound management and good business processors.
- As the CEO/CTO, you need to know exactly where you loosing Revenue (\$) and Energy (kWh's)





THANK YOU





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