Prepayment metering system strategies and implementation challenges

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How does Prepayment system work?

1. Electricity bought in advance
2. Amount as per convenience
3. To buy electricity go to Vending Counter: place where electricity is sold
4. Receipt is provided with a unique number printed on it
5. Enter the number into your keypad
6. Electricity credited into meter in Rupees
7. Enjoy Electricity
Elements of Prepayment System

- Meter with inbuilt disconnecting device
- Tokens - for information transfer
- Vending center - place where electricity is sold
Prepayment in Electricity!

- Paying before consumption
  Is it NEW to us?

- What about essential commodities like:
  - Petrol/Diesel
  - Cooking gas
  - Dish TV
  - Mobile prepaid cash cards
The Sociology of prepayment

- Prepayment is not just a technology. It has a social impact.
- In the past Prepayment has been used as a tool for debt recovery.
- Initial reaction to change has been cautious.
- However, people have opted for prepayment, as they see the benefits.
- Introduction must be planned.
- A prepayment system trial is essential to understand the technology and its sociology.
- A well planned introduction can make it the technology of choice for the customers.
The Challenge is to make prepayment system a WIN-WIN solution for both utilities and consumers.
What the consumer is looking for in a prepayment system?

- Convenience of making payment
- Monetary Information and being in control
- Confidence in the cost of consumption
- Budgeting
- Energy conservation
What an Utility is looking for in a prepayment system?

- Upfront revenue collection
- No debts and means of debt recovery
- Reduce billing costs and eliminate billing complaints
- Eliminate hassles of disconnection and reconnection
- Demand side management
- Provide better customer services
- Better customer engagement and energy conservation
Issues to address

- Regulatory support
- Government support
- Consumer issues
- Identification of smart prepayment system
- Utility organisation
- Steps to move forward
Role of regulators

- A vital role in implementation
- Active support needed
- Rebate on energy charges and meter rent
- Implementation of Complex Tariffs
  - Slab rate for energy and demand
  - TOU
  - Minimum charge
  - Demand based charges
  - Simplification needed for Retrospective tariffs – Fuel surcharge, next slab rate applicable for previous slab, special energy charge
  - Implementation of Energy auditing through sales data
Government support

- Support required for
  - Policies for implementing prepayment
    - Govt connections
    - Temporary connection
  - Funding prepayment system
  - Taxes
    - Simplification of tax structure
What parameters to consider?

Identify Smart prepayment system

✓ Coverage of target customers
✓ Customer profile
✓ Customer convenience
✓ Revenue collection and control
✓ Tamper and Fraud prevention
✓ Flexible tariff administration
✓ Load management and control
✓ Appropriate vending architecture
Convenience of payment | multiple vending options

- Merchant / shop
- Third party service providers
- Merchant / shop
- Bank ATM
- Kiosk
- Bank Website
- Utility Website
- Bank Website
- Utility Website
- Bank Website
- Utility Website

- 24 hr Call Centre
- SMS
- VISA
- MasterCard

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**Metering India**

**Billing/CRM India**
Cost information & involvement

Cost of current load being used based on tariff price

Cost of previous day, week and month consumption

Cost of previous 12 months consumption (month-by-month)

<table>
<thead>
<tr>
<th>KW LOAD</th>
<th>PREV DAY</th>
<th>Rs. 1,200</th>
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<tbody>
<tr>
<td>KW 19-00</td>
<td>PREV WEEK</td>
<td>Rs. 7,700</td>
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<tr>
<td>LOAD COST</td>
<td>PREV MNTH</td>
<td>Rs. 32,000</td>
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<tr>
<td>Rs. 102.60/HR</td>
<td>FEB</td>
<td>Rs. 33,000</td>
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<tr>
<td></td>
<td>JAN</td>
<td>Rs. 28,000</td>
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<tr>
<td></td>
<td>DEC</td>
<td>Rs. 27,000</td>
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<tr>
<td></td>
<td>NOV</td>
<td>Rs. 25,500</td>
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</table>
Special Features

• User friendly interface
• Display in Rupees
• Set Alarm levels
• Friendly credit hours (5pm-10am)
• Friendly credit days (Sun/Holiday)
• Emergency credits
The prepayment electricity tariff

- Flat tariff
- Step tariff
- Time of use tariff
- Tariffs as per customer type
- Standing Charges
- Taxes
- Debt Recovery

There is a need to rationalize tariffs for prepayment
Flexible Tariff capability

- Liberty Prepayment Meter can store 8 defined ‘SLAB’ tariffs

First 100 kWh at 2.34 Rs/kWh

Second 300 kWh at 2.90 Rs/kWh

Above 300 kWh’s at 3.30 Rs/kWh

Minimum charges Rs 100 per month

Monthly Billing period

Next Month

Slab reset
Flexible Tariff capability

- Support 8 ‘Step’ tariffs and store 8 defined ‘Time of Day’ (Peak-Off Peak) tariffs.
- ‘Time of Day’ (Peak-Off Peak) tariffs is possible due to the presence of inbuilt RTC.

Max Demand based monthly charges for Peak period Rs 12 per KW
Load Limiting—Demand side management

- 100A
- 80A
- Alarm
- Disconnection
- Demand Profile
The Economics of prepayment

- Prepayment meters are more expensive compared to conventional energy meters
- Trade-off between cost of incremental investment against the tangible and intangible benefits

Tangibles:
- Up front cash collection
- No meter reading, billing and bill distribution

Intangibles:
- Customer Satisfaction
- Better load management
Utility organisation

Creating organisation within utility
- IT
- Finance
- Meter management
- User group
- Regulatory, customer helpline
- …and a dedicated cross functional project team for prepayment implementation
implementation

- Surveys
- Pilots
- PR campaign
- Consumer education
- Vending infrastructure
- Branding
Utility experiences ... using Prepayment system
Operational Cost Savings
Northern Ireland Electricity UK
Liberty Project
Northern Ireland Electricity (NIE) Home Energy Direct Project

Over 220,000 meters installed

- 50% reduction in billing costs
- 73% reduction in meter reading costs
- 14% reduction in call handling
- 45% reduction in debt management costs
- Debtor days reduced by 20%
- 95% of tariff changes effected within two weeks

Figures courtesy of NIE
System Loss Reductions
Bangladesh Power Development Board
Liberty Project
Comparison of Feeder System Loss Oct-06/Oct-07 after implementation of Liberty Prepayment System at Chittagong

<table>
<thead>
<tr>
<th>Energy Record Month</th>
<th>No. of Consumers</th>
<th>Feeder Number</th>
<th>Energy Import by Feeder MU</th>
<th>Total Energy Sold MU</th>
<th>System Loss (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 06</td>
<td>4332</td>
<td>H-03</td>
<td>22.56</td>
<td>17.6</td>
<td>21.99</td>
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<td>October 07</td>
<td>4338</td>
<td>H-03</td>
<td>19.44</td>
<td>18.10</td>
<td>6.85</td>
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Revenue improvement is approx 30%
Energy Saved is approx. 15.14%
& Peak demand has been reduced by 16.38%
(Energy Conservation)
West Bengal State Electricity Board
Liberty Project
Energy Conservation at Greenwood Park, Kolkata

- Dec '05: 17364 units (100%)
- Jan '06: 10724 units (62%)
- Feb '06: 8833 units (51%)
- Mar '06: 8906 units (51%)
- Apr '06: 7986 units (46%)

Monthly Consumption in kWh

% consumption (units) ref Dec 05
Thanking you