

Transition from Electricity Post paid system to Prepayment: From Consumer to Customer

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Prelude

Prepayment in electricity as a technology is a stable system available for implementation. The industry has been witness to successful implementations in South Africa and The United Kingdom in the earlier decade and then the spread of this technology from South Africa to the majority of African countries and from United Kingdom to the other parts of the globe. Various country specific solutions have come up in different countries using the base from the pioneering nations.

Prepayment system have migrated from the simple flat rate card based tariff implementations to systems suitable for more complex and prevalent tariff structures like the time of day, multiple slabs, fixed charge and tax implementations. State of art systems now offer connectivity to the banking system in providing direct connectivity to the ATM networks, internet and mobile solution for vending the electricity tokens.

The advantages of cash flow improvement, elimination of arrears and reduction in manpower in the revenue collection cycle are often cited as the key drivers for the utility to migrate from a post paid revenue collection cycle to prepayment electricity. But the utilities that have implemented pilot / roll outs of prepayment electricity are well aware that besides these operation and commercial benefits to the utility there are intangible benefits that are more important; most important of them being the brand value that is delivered by the prepayment electricity system. The consumer now connects to the utility more often, the system is transparent hence the level of trust amongst the consumers increase many folds. The consumers can now control / budget electricity consumptions. Over an above these benefits the system also delivers energy conservation by the innovative method of empowering the consumer with accurate information on the consumption of electricity in consumer friendly manner in his premise.

Indian context

Indian utilities are actively pursuing migration from the present post paid revenue cycle management system to the prepayment electricity based system. The distribution companies in restructured electricity market have done pilots and field trials to access the acceptability of the system on small consumer base. After the success

of these pilots the utilities are in position to work out blue print of a roll out of the technology.

Technical Implementation

While implementing the system the utilities in India have mapped the present tariff structure to the prepayment system. The system has been tested in domestic category of customer where slab based tariff structure is prevalent. Hence the utilities have opted a RTC based meter that can tract the start and end of month. At the start of the month the special meter shall account for energy consumption as per the first slab, as soon as the consumption by the consumer exceeds the first slab limit the rate of deduction changes to the next slab, this process goes on until either the month is over or the consumption has reached the highest value.

As in the slab based prepayment system the vending system does not know the final consumption of the consumer it can not predict the slab wise rates at the time of vending, hence the best way to manage slab tariffs is to transfer the calculations to the meter. Thus utilities in India have adapted currency transfer mechanism as against the unit transfer mechanism.

Using the currency transfer mechanism of prepayment in electricity the utilities convert the money paid by the customer into a 20 digit encrypted code, this code is taken to the meter by the customer who enters the code into the meter. The meter accepts the code, decrypts it and increments the account value in the meter. This account value is decremented when the consumer consumes electricity, the electricity rates (Tariff) is available in the meter for logically deducting the account value.

Any change in tariff is conveyed to the meter by the electricity token.

The entire system is centrally controlled.

Customer convenience

As opposed to the post paid revenue collection system in prepayment the electricity consumer has to be informed about the receipt of money by the meter, present tariff structure, and present account value. More over the consumer has to be informed of the low credit value so that the consumer can buy electricity in time and avoid disconnection.

In order to provide the consumer with this facility the utilities have used an in-home display device that is connected to the main electricity meter using a telephone like cable.

The electricity meter is installed at the place of the present metering device and the cable is connected from the meter to the display device installed in the consumer premise.

Consumer to customer

The fact that a separate device is provided with the meter, specifically for providing better and timely information to the consumer; the utilities can now use enhance brand value using the new system. This is what has been done by the utilities who have implemented prepayment trials in India.

Besides the easy information flow the utilities have also acknowledged the fact that the system is installed to help utilities solve the revenue collection problem hence it should not be an inconvenience to the consumers. In all the trials in India these aspects are specifically taken care.

For example the meters are programmed not to disconnect during odd hours, i.e. from 5pm in after noon to 10 am in the morning the meters do not disconnect supplies even if there is no money left in the consumer account. Similarly the meter does not disconnect during Sundays and on specified holidays.

In order to enhance the customer satisfaction the utilities have also extended an emergency credit facility where in the customer can avail electricity equivalent to an additional amount in case the customer has run out of credit.

Customer acceptance

In order to gain the customer acceptance for the prepayment electricity system, the Indian utilities have recognized the importance of creating a brand image for the solution offered, hence the utilities have created brand names for the projects, “Value Power” and “Easy Power” are well recognized brands used by NDPL and WBSEB for the prepayment energy pilots in respective area of electricity distribution.

Poster and brochures designed based on creating the brand are available from the utilities.

Besides the message through branding both the utilities organized customer camps and road shows to take the customer in confidence. Average attendance in these road shows is 50 numbers; the utility representatives organize live product demonstrations during the road show. The road shows are kept on weekend (Especially Sundays) to ensure maximum attendance. These road shows are very successful and attract consent from the customer for deployment of prepayment electricity system.

The option to migrate to prepayment electricity is optional for the customer, only when the consent form is signed off the system is installed on the customer premise.

During the installation process special care is taken to ensure customer convenience; suitable time is taken from the customer; team visits site only on confirmation. The internal wiring is thoroughly checked by the installation team so that the problem of neutral looping is eliminated on first instance itself.

Message of “Control” and “Convenience” have been central to the theme of prepayment electricity branding campaign. Using the system the consumer is delivered control over electricity consumption, control over payment mechanism, quantum of purchase and frequency of purchase. While giving all these control systems the prepayment electricity system is also convenient to use. The utilities in India have invariably selected keypad based prepayment metering system that is more suited for the available payment methods of ATM vending, Internet vending and mobile vending.

These implementations are covered extensively by the national media (TV channels); thus the brand building is strengthened.

Migration from Legacy post paid to prepayment

During the pilots it has been identified that when a prepayment electricity system is adapted which is more suited to customer convenience factors; the utilities will have to have re-look at the current processes that are tailored for post paid metering systems.

Starting from the very basic, the traditional meter read exercise is not necessary for prepayment electricity implementation; in fact all the trials in India so far have been on prepayment systems that do not bring back the meter reading.

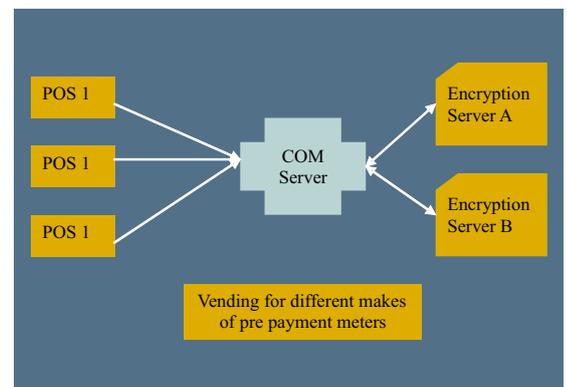
The accounting process of utilities has to be reworked under this situation. Utilities have worked out a truing up process for accounting of these cases. Sales history of each of the consumer on prepayment is available from the vending system on on-line basis. A system of statistical analysis of these records is worked out by the utility; all monthly data is available from this analysis. At the end of the year, the prepayment meters are read manually, these manual readings are used to find out the deviation in the estimate reads and the actual consumption. The estimates are hence matched with the actual consumption in the truing up process.

TRUING up process is one of the most innovative applications that are devised by the utilities to ensure that the consumer is not subject to monthly / bimonthly visits by the utility staff for regular meter reads.

Interfaces and retail tie ups for consumer convenience

In order to provide the consumer convenience of making payment in denomination of choice, choice of time of payment and type of payment, the piloted payment solution in India have laid specific emphasis on connectivity with the available retail networks in the country.

The architecture that has been implemented is as under:



This system provides for interoperability for vending system from different manufactures while providing options for interface with retailers

The detailed interoperable process is as under:

1. It is recognized that each point of sale terminal will send a message with identification of the meter make to the communication server. The communication server will be a set of program that will serve as intermediate between the point of sale and the encryption server; where encryption server shall be the program that encrypts data into a 20 digit code.

2. Each meter manufacture shall have its own encryption server with appropriate programming done to ensure that the data is encrypted proper ensuring that
 - a. The code shall be generated for specific meter
 - b. Code generated for one meter should not be interpreted by the other meter
 - c. All relevant information required for encryption shall be available at the encryption server.
3. The communication server shall identify the make of meter using meter serial number or consumer name or consumer address.
4. Once the make of meter is identified the communication server should route the message with request to appropriate encryption server and receive message from that server.
5. The point of sale terminal shall print the 20 digit code after receiving the message from the server.
6. In case there is a tariff change, the same should be notified using encrypted code of appropriate length along with the credit transfer information.

This concept will deliver retail network interfaces with retailers and banks, in roll out stage the consumer can walk into a bank ATM and get the vend coupon from the ATM machine. The same consumer can get the token from petrol pumps or Oxigen / Easy Bill outlets. It shall be possible to get the vend codes on mobile phones or on internet.

Existing solutions piloted by the utilities in India offer all the above flexibility and the associated convenience to the customer.