



Sharing Odisha Experience

On

Smart Prepaid System

On BOT Model

JnJ Powercom Systems Ltd

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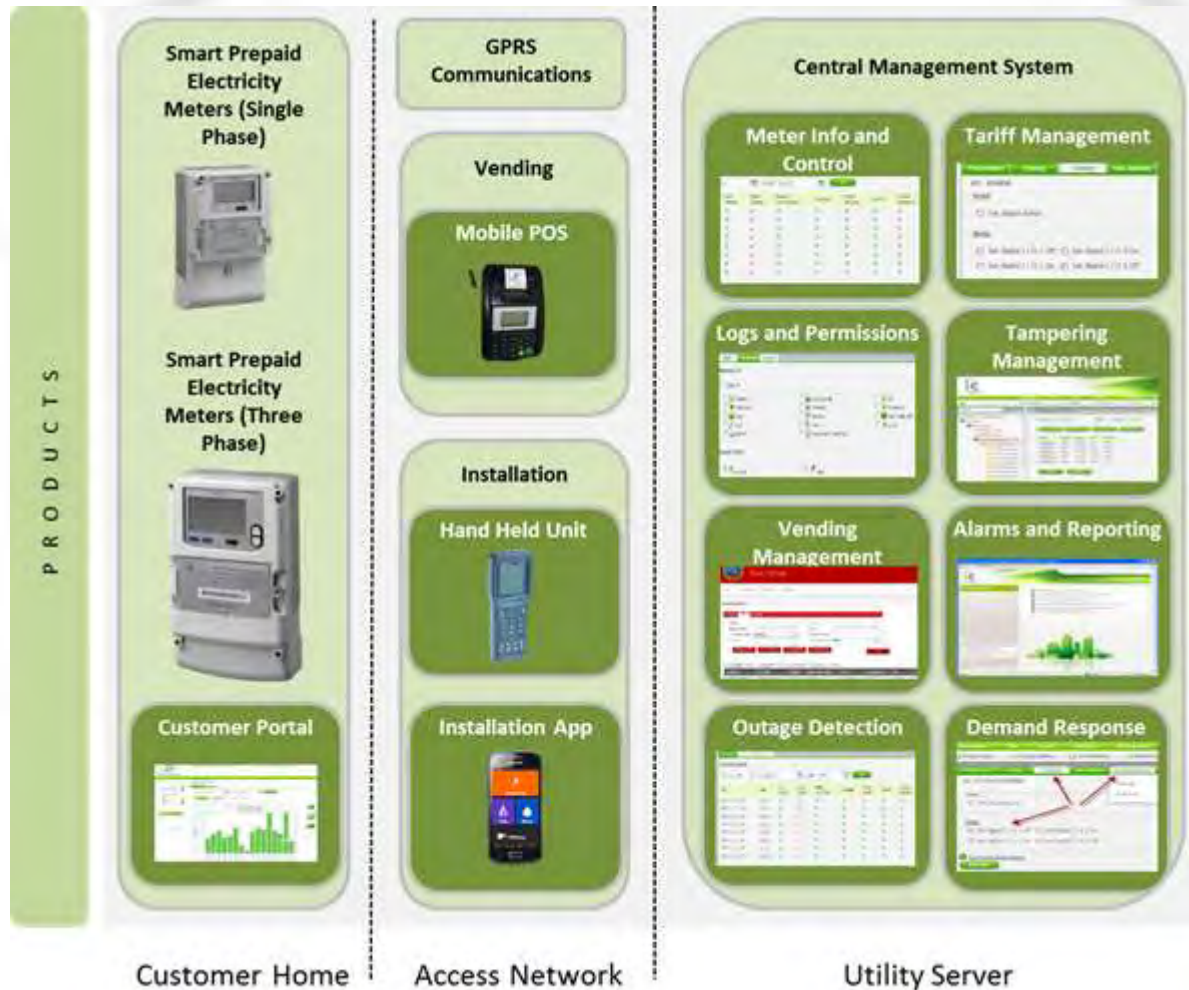
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JnJ SMART PREPAID METERING



HIGHLIGHTS

- Government of Odisha as well as OERC emphasize on installation of Prepaid Meters in Government / PSU Consumers
- Initially about 20,000 Government Consumers were to be covered.
- Pursuant to that a tenders was called & tech bid opened on 16.5.2013.
- Concept & methodology established through series of presentations ,demo & sample installations
- Board decided to installed prepaid meters **on lease basis for a term of 4 years** & asset transferred to DISCOM thereafter

SMART PREPAID METERING ON BOOT MODEL -ODISHA DISCOMS

CUSTOMER/UTILITY	FULL TENDER QUANTITY OF SMART PREPAID METERS			FIRST PHASE-ORDER QUANTITY OF SMART PREPAID METERS			REMARKS
	SINGLE PHASE	THREE PHASE	TOTAL	SINGLE PHASE	THREE PHASE	TOTAL	
North Eastern Electricity Supply Company of Odisha Limited (NESCO), Balasore-756019	3728	2037	5765	1654	495	2149	Scattered consumers-GPRS communication
Southern Electricity Supply Company of Odisha Limited (SOUTHCO), Berhampur-760 004	2329	4726	7055	197	733	930	Scattered consumers-GPRS communication
Western Electricity Supply Company of Odisha Limited (WESCO), Sambalpur-768 017	2718	2307	5025	650	307	957	Scattered consumers-GPRS communication
Central Electricity Supply Utility (CESU)	153	48	201	153	48	201	Clusters in PLC communication with DCU
Total	8928	9118	18046	2654	1583	4237	

SMART PREPAID SYSTEM

The Project Implementation Agency (PIA) has provided the following as part of Prepaid System

- Smart Prepaid Meter with Consumer Interface Unit
- Communication System- through PLCC /GPRS
- Vending Zone –Physical Desk at Discom Customer Care Center and also by providing a Toll Free number for Recharge requests.
- MDM & Prepayment Service on Cloud through its own Remote Server
- Provides the manpower, spare parts & all others requirements for implementation of Prepaid metering system.
- Interaction with all Consumers, educates them on the new Prepaid System, carried out installation.
- Complete Operations are handled by PIA
- DISCOMs are providing all the necessary support for implementation in Project area.

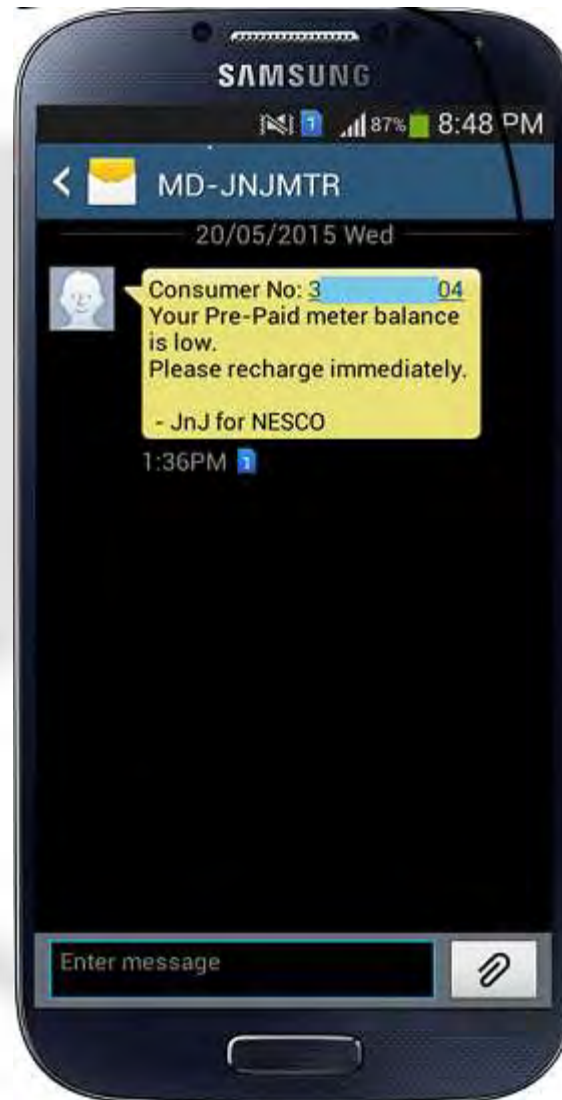
EMPOWERING CONSUMER- CONSUMER INTERFACE UNIT (CIU)- IN HOME DISPLAY

Display Description	Display Code Instruction
Test displays	#002#
Accumulated energy consumed	#004#
Max power limit	#007#
Available credit	#009#
Instantaneous power	#050#
Energy cost (current billing month) — import	#070#
Energy cost (previous interval) — import	#071#
Interval energy consumption(current month)	#072#
Interval energy consumption (previous interval)	#085#
Energy unit cost	#194#
Value of last credit token entered	#200#
Date of last token entered	#250#

CIU placed In Home



SMART PREPAID SYSTEM AT ODISHA- EMPOWERING CONSUMER



SMART METERING ADVANTAGE

- The Metering is a Full Smart Metering System by default.
- All Meters are full Smart- apart from offering Prepayment feature, they offer full smart metering functionalities such as:

Field swappable communications Modems –PLC/GPRS

Full anti Tamper system & Theft monitoring. Tamper alerts by SMS/Email to Discom.

Remote Disconnection/Reconnection

Remote Time of use & all Tariff updating

Two way communication for real time access of Meter data & communications to customers

Remotely operate Load Limitation/Control- Limit consumers upto their Contract Demand



SMART METERING ADVANTAGE

RENEWABLE INTEGRATION- NET METERING

- Smart Prepaid meters also are able to measure and record Positive (Import) Active Energy (+A) and Negative (Export) Active Energy (-A).
- In consumer generated energy generation installations, with both Import and Export of Active Energy, the meter will calculate and produce billing with +A and – A individually.

SMART METERING ADVANTAGE ADOPT EXISTING STEP TARIFF SYSTEM

- Smart Prepaid Metering System adopted the existing Odisha Step Tariff System (already approved by OERC for all the Odisha Discoms for post paid consumers)
- So there was no need for changing the tariff or announce a separate single tariff system as is done by certain Discoms to enable prepaid system
- Tariff revision was updated to Meters remotely from server through a single command from remote server and scheduled to take effect from a specific date. Helps to update tariff on Meters exactly on the date of revision unlike the Standalone Prepaid Meters

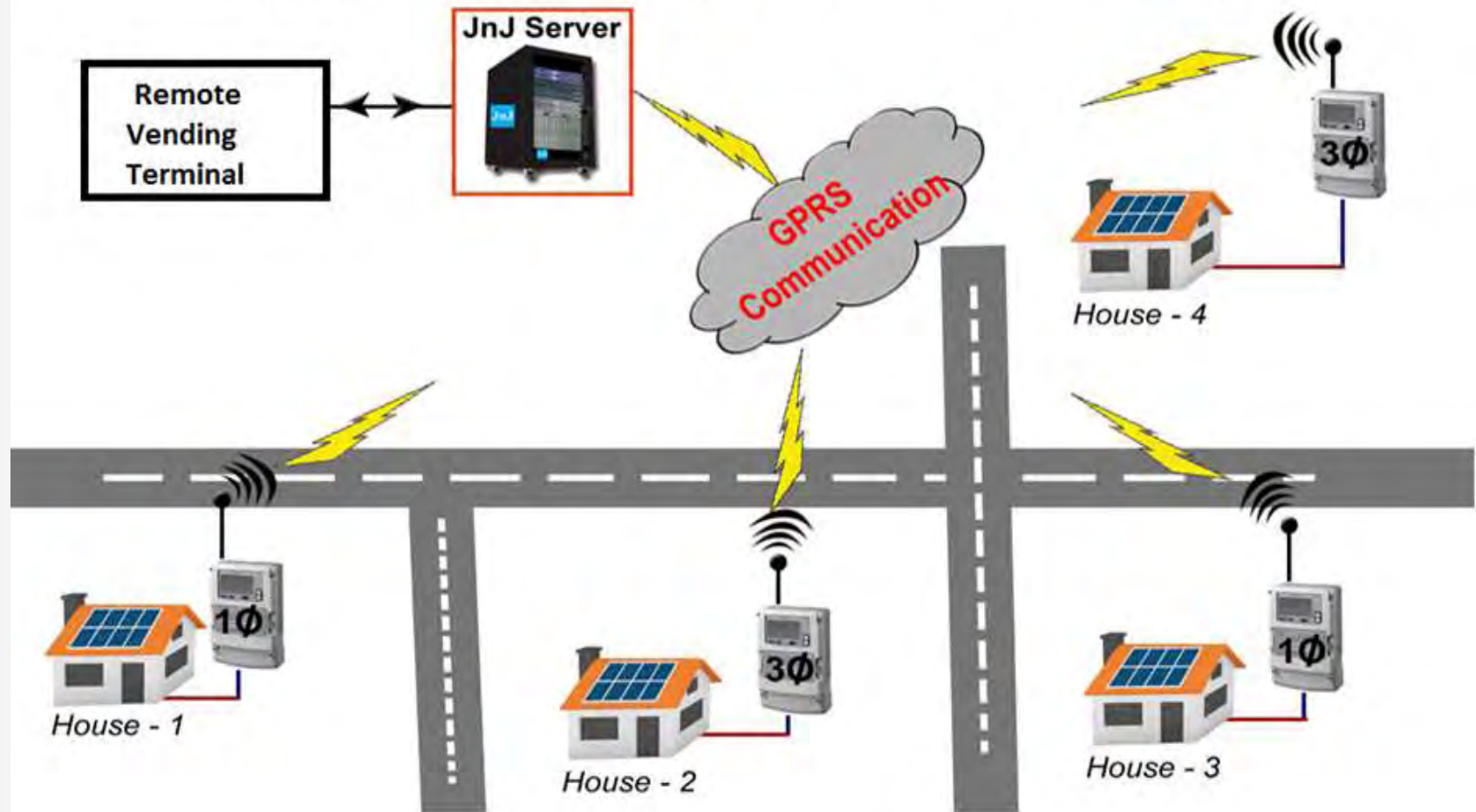
COMMUNICATION SYSTEMS DEPLOYED

Two type of communication technologies based on the geographical area

- i) Scattered Deployment- Use GPRS communication Meter to Server
- ii) Clustered Deployment – Use PLCC Communication Meter to DCU. And GPRS from DCU to Server

Solution as per the site requirement given in next slide

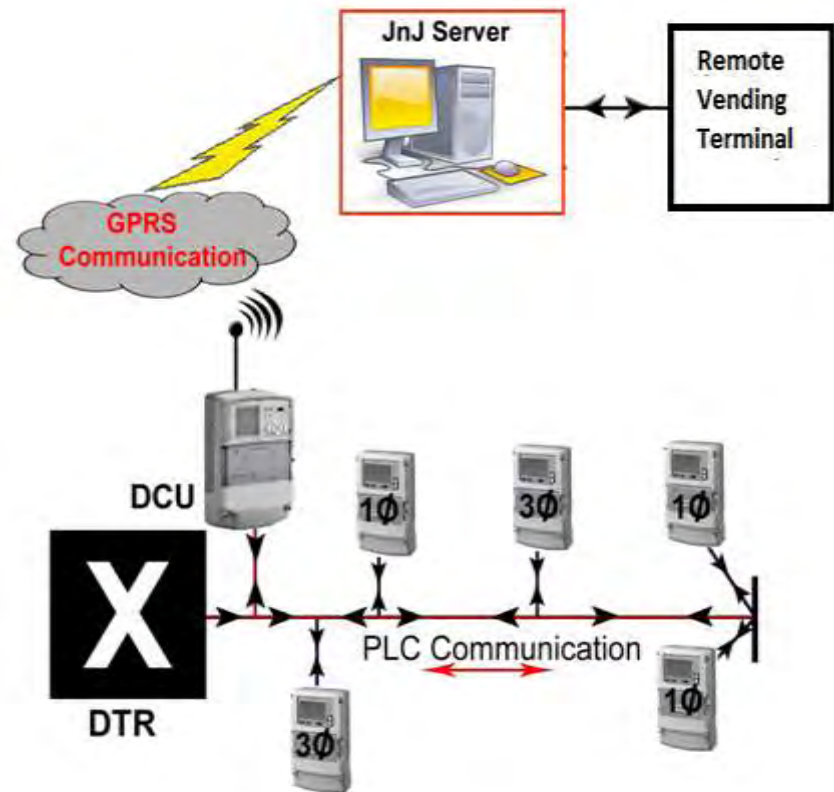
METERING ARCHITECTURE - SCATTERED



CLUSTERED DEPLOYMENT – CESU BHUBHANESWAR & CUTTACK

- In case of CESU, Since there are a big number of consumers catered to by one Distribution Transformer (DTR) decided to cluster them with PLC communication with the Data Concentrator (DCU) installed under the DTR.
- One Master Meter-LT CT Meter is also installed at DTR which communicates with DCU through PLC
- This Metering architecture enabled low cost communications with server and also enable theft control and LT energy loss reduction exercise. The loss reduction due to Daily Energy Loss Monitoring has been proved.

METERING ARCHITECTURE-CLUSTERED



ANALYSIS OF ELECTRICAL LOSSES AND THEFT – CLUSTERED METERS



1000 Kwh

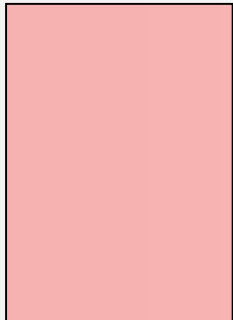
IEC 61038 2006

800pulse/kWh

Analyzing Instant Line Loss
Completed:.....
Meters: ~~100~~ Kwh
Total Loss : 5 %



Master Meter



100 Kwh



150 Kwh



150 Kwh



180 Kwh



230 Kwh



140 Kwh

SMART PREPAID METERING-RECHARGING METHODS



1. Online:

A. Discom Cash Counter:

- i) Consumer pays at discoms cash counter
- ii) Respective office sends E mail/SMS (through authorised phone number/Mail ID) to the executive at vendor's customer care centre
- iii) Customer Care Executive recharges meter through server.

B. Through Vending zone:

- i) Consumer pays at M/s JnJ Vending Station
- ii) Recharge the meter through server.

C. Recharging through POS:

- i) Consumer to call at customer care center on toll free number.
- ii) Vending executive will reach to consumer with POS
- iii) Recharge the meter through server

D. Other online option (yet to carry out)

- Through ATM Credit/Debit card.
- Internet Banking

2 . Offline

A. Recharging through keypad :

- i) After payment made by the consumer,token will be generated
- ii) Same token number will be punched through keypad for recharging

B. POS

PREPAYMENT SYSTEM – PAYMENT METHODS FOR FUTURE- ONLINE PAYMENTS

- Designed to support online payments received through the web portal
- Can be enabled through Customer portal
- The payments are made online through Debit/Credit Cards or Net banking and the Prepayment token is issued to the consumer
- The Consumer either punches the token himself on the CIU or the MDM sends the token remotely to the Meter.



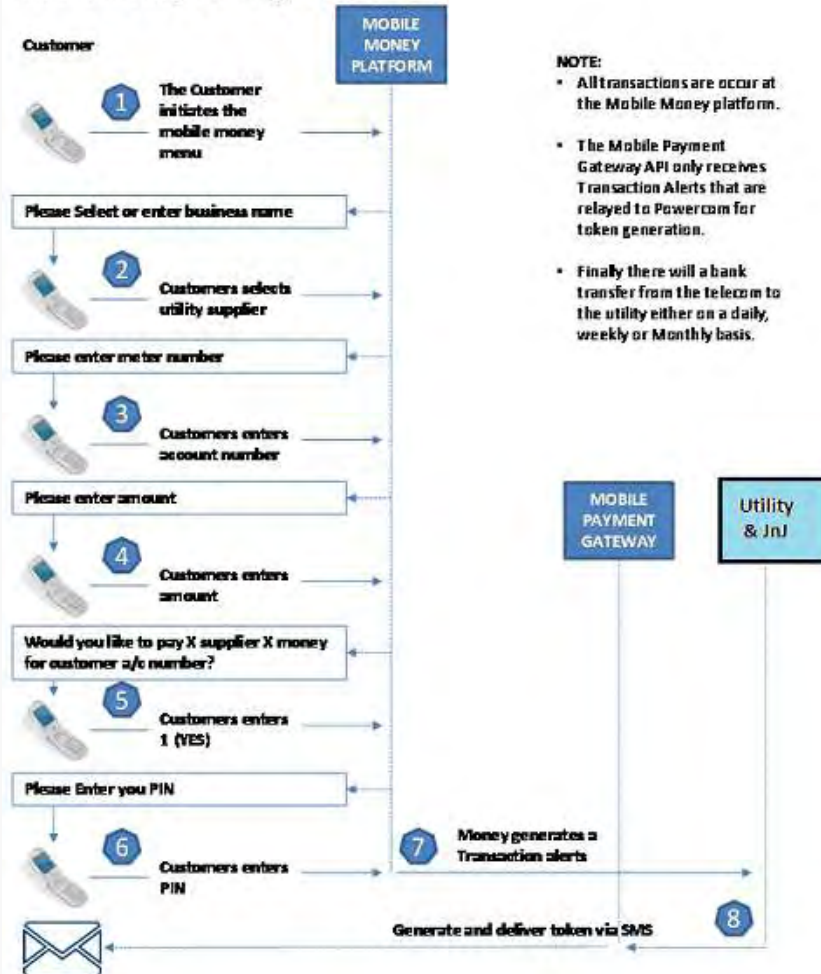
PREPAYMENT SYSTEM – PAYMENT METHODS FOR FUTURE-CELL PHONE VENDING

- Designed to support authorized third party systems that provide facilities for cell phone vending.
- These systems provide selected and approved vendors with a cell phone and a small lump sum of money, the opportunity of becoming a registered reseller of electricity to consumers.
- The integration of these cell phone vending systems provides electricity Utility/Supplier with substantial advantages.
- Utility/Supplier have centralized control over their vendors via the GSM cellular phone network, there are no infrastructure costs such as leased lines, investment in buildings or kiosks and virtually no maintenance costs.



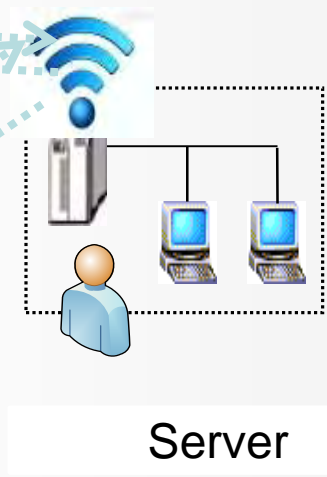
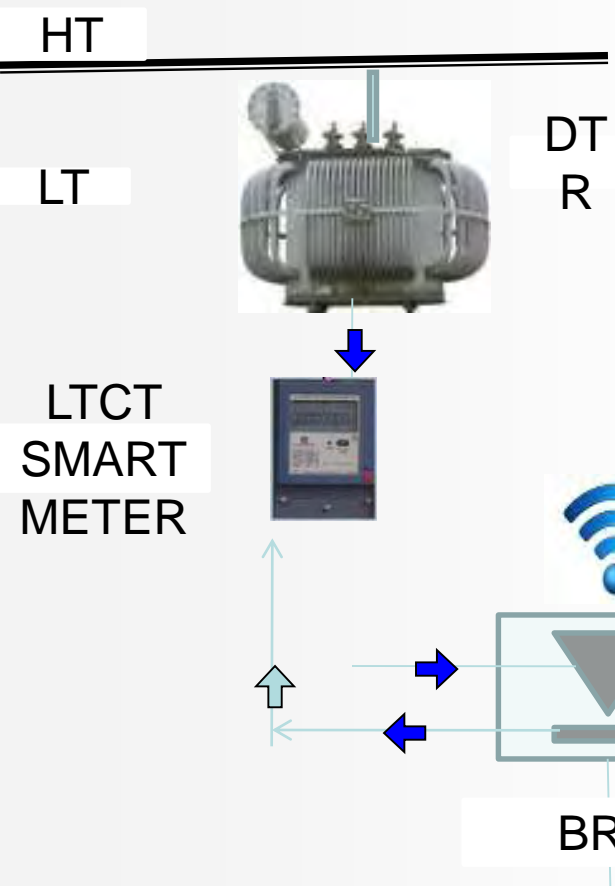
PREPAYMENT SYSTEM – PAYMENT METHODS FOR FUTURE-MOBILE MONEY

Mobile Money Vending Process Flow

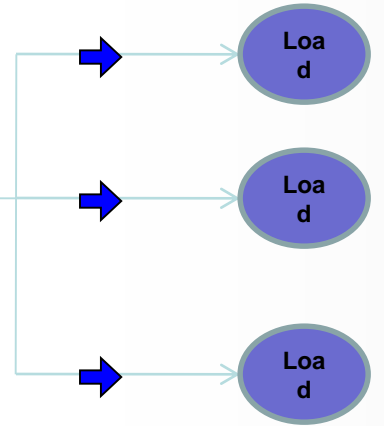




DISCOM



GPRS



Temporary connection

COMPETENCY FOR PREPAID TEMPORARY CONNECTIONS, C& I CONSUMERS



BENEFITS OF THE SMART PREPAID SYSTEM ON BOOT MODEL AT ODISHA

- The Smart Prepaid Metering project encountered a lot of resistance from the consumers initially
- However, a year long perseverance and good effort helped to convince the consumers the goodness of Prepaid Metering. Now the most critical Water Works departments are also cooperating and substantial payments come from these departments.
- For around just 2500 Consumers, the monthly recharges are Rs.70 lakhs or above. We expect that if all 20,000 Consumers are covered by Prepaid Metering , then easily Rs.25-30 lakhs per day could be collected from these few consumers alone. This means a huge cash flow comfort for Discoms.



SMART PREPAID SYSTEM AT ODISHA- COMMERCIAL MODEL

The Metering , Billing & Collection (MBC) is done on BOOT Model. However , the Collection is done into Utility Account directly. The period of engagement is for a period of 48 months.

Meter Leasing Charges-Per Meter/Month- for a period of 48 months after which the Metering assets are transferred to the Discom

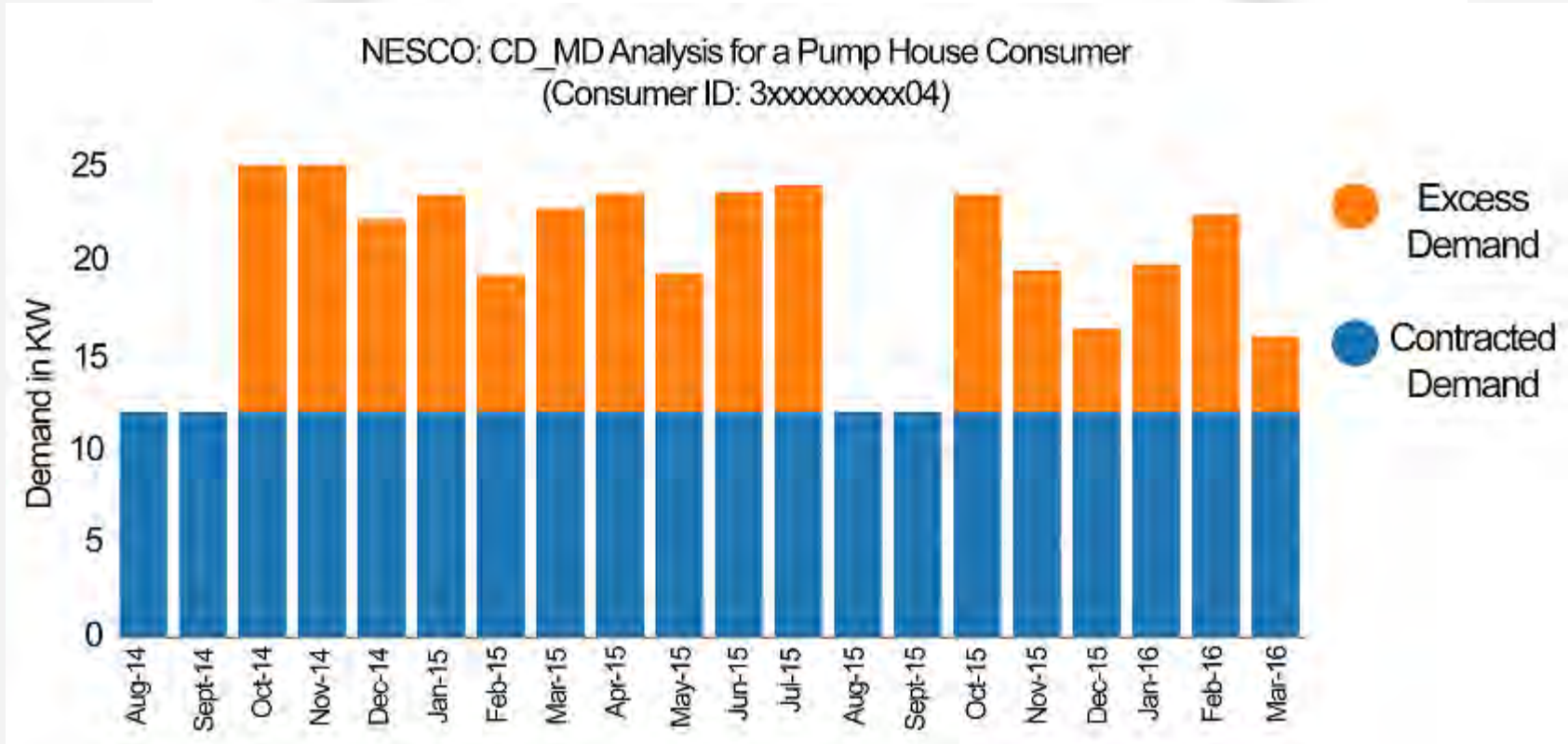
Vending Service Charges-Per Meter/Month- for a period of 48 months after which the Discom has the option of extending the service contract.

Presently there is no Triparty Agreement between the Funding Agency (Bankers) , JnJ & Discom. If such an arrangement is possible, a large scale deployments in this model would be possible.

SMART PREPAID SYSTEM AT ODISHA- COMMERCIAL MODEL LIMITATIONS OF GETTING FULL SMART METERING BENEFITS

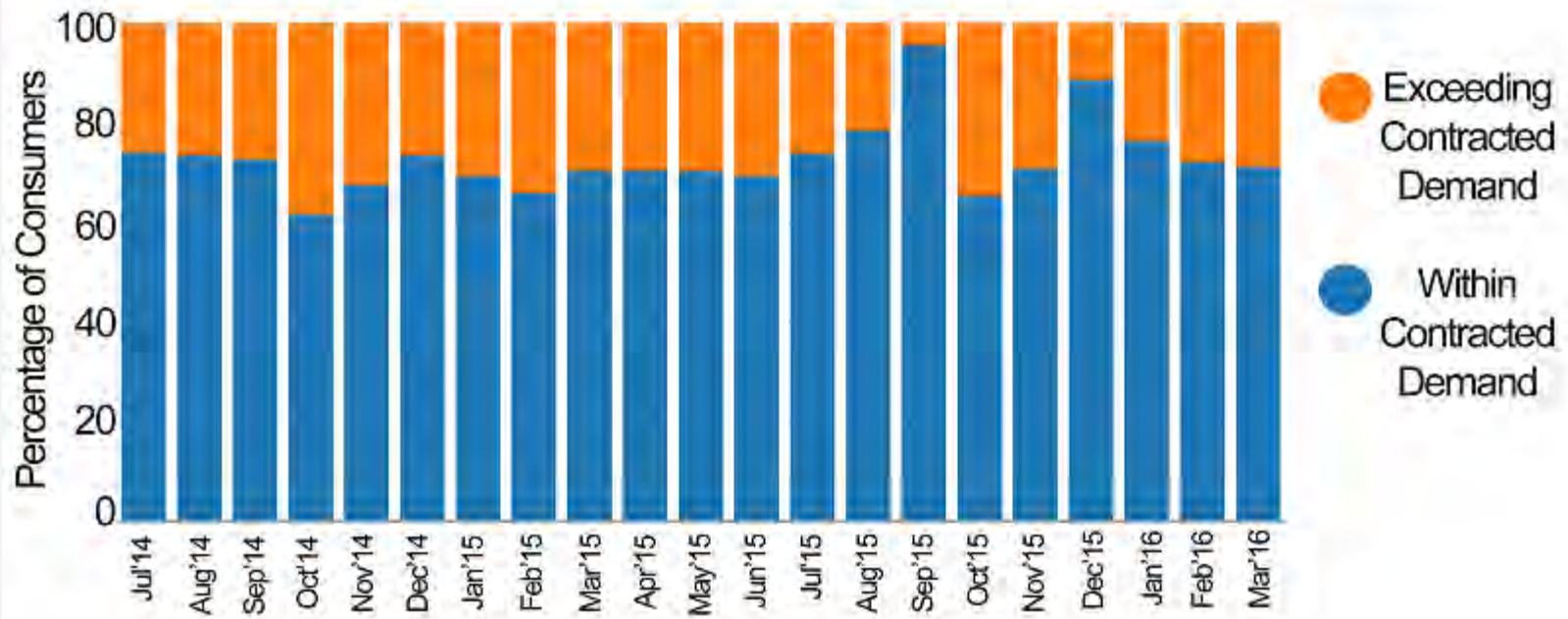
- The smart Prepaid Metering deployment is done on scattered Govt consumers. Therefore the benefits of automatic energy loss measurement leading to Energy Loss reduction is not derived.
- The large energy consumers such as Commercial & Industrial Consumers inclusion into the project would have brought tremendous cash flow comfort to Discoms.
- Even the C&I consumers can be covered with smart prepaid metering on a BOOT Model or a Franchisee Model.

SMART PREPAID SYSTEM AT ODISHA- BENEFITS OF RECOVERING HIGHER FIXED CHARGES DUE TO EXCEEDING CONTRACT DEMAND



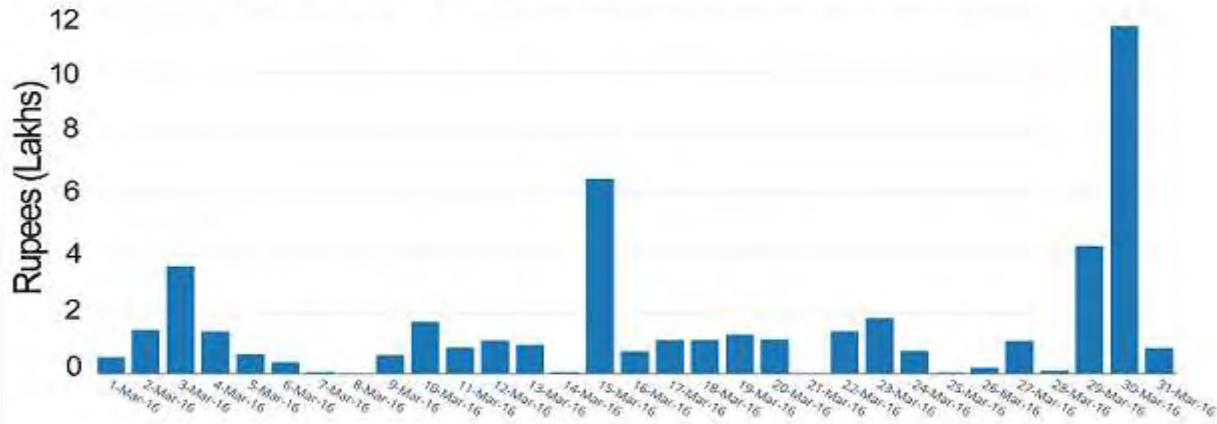
SMART PREPAID SYSTEM AT ODISHA-BENEFIT OF LOAD LIMITATION FEATURE

Percentage of Consumers Exceeding Their Contracted Demand



SMART PREPAID SYSTEM AT ODISHA- CASH FLOWS

NESCO: Daily Prepaid Recharge Collection (Mar'16)

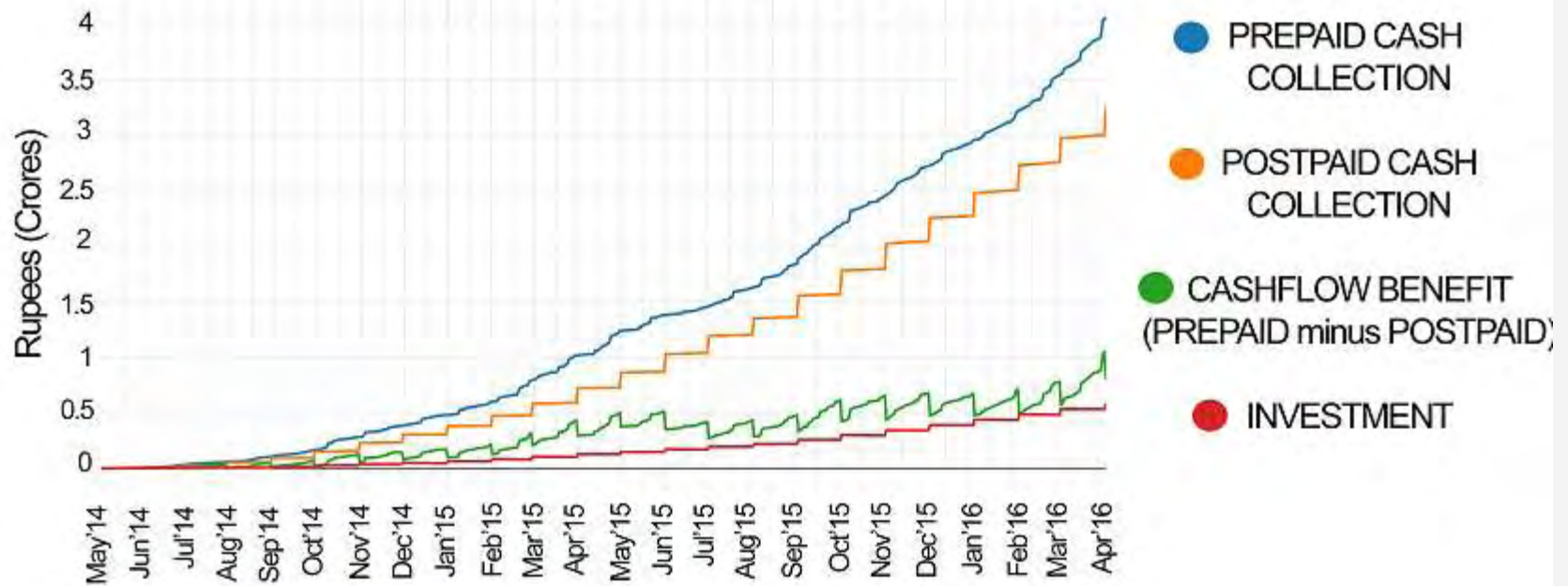


NESCO: Daily Cumulative Prepaid Recharge Collection (Mar'16)



SMART PREPAID SYSTEM AT ODISHA- CASH FLOW BENEFITS

Cashflow Benefit of a Prepaid Metering System
NESCO (May-14 to Mar-16)





SMART METERING SYSTEM PROPOSED COMMERCIAL MODEL

- The Smart Metering deployment done in Odisha has given proven benefits and return on investment.
- The BOOT/Investment Model works provided the Investor has payment tied up in Triparty agreement- Utility-Project Developer- Funding Agency
- The Model could be Franchisee Model on Input Basis- but limited only to MBC- Metering, Billing & Collection. The Utility will take care of Maintenance of physical layer of Distribution network.
- The Franchisee arrangement could be at Feeder/Division/Circle level.
- The engagement period has to be a minimum of 10 years.



THANK YOU