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PLC for AMI – Indian Perspective

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Advanced Metering Infrastructure (AMI)

- AMI is the system with smart meter and associated software for acquiring energy meter consumption details along with other electrical parameters remotely & data analytics.
- AMI provides consumers to have prepaid system or post paid system for energy consumption charges with greater insight on the pattern of energy consumption so that consumer can have better control of their energy consumption.
- AMI system provides a better control to utilities to monitor the consumers smart meters and to detect quickly any tampering in a near real time and provides quick action on defaulters for disconnection of electricity.
- The prepaid option provides a better financial control for both consumers and utilities.
- For a successful AMI system deployment, a reliable and cost effective communication system is essential.

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Role of PLC in AMI

- Early experiments of AMI begun with Power Line Communication (PLC)
- PLC is widely used for AMI application in Europe.
- Low cost – low Capex and no Opex as PLC is owned by utility
- Simple installation and maintenance
- Modern power sector has a improved distribution network making PLC as a prime candidate for the communication channel

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Indian Scenario of AMI

- Early experiments / field trail using PLC started way back 2000-2010.
- Advancement in communication technology and semiconductor chips are providing new outlook to PLC system for multiple electric utility applications including AMI.
- Now in India, the quality of distribution system has improved lot including good quality wring of LV network and residential wiring.
- New township areas, rural areas under rural electrification scheme and through other schemes like R-APDRP, IPDS, RDSS etc., the distribution network of both urban and rural areas has improved lot making it suitable for large scale use of PLC based AMI system.
- Most of present AMI system rollout is happening through 4G mobile communications and 4G is going to be outdated soon and support from communication service providers for 4G is will be limited.
- 4G / 5G communications systems may not be available at all geographic locations especially in rural areas.
- The PLC has advantage of protecting over obsolescence atleast for next 5 to 8 years from the commissioning of AMI systems and which is completely under the utility control
- PLC has also an option to use in extending communication beyond distribution transformer for connecting to utility energy management centre through RF , 4G or MV PLC (11kV).

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CPRI PLC Based AMR Prototype energy meters in field

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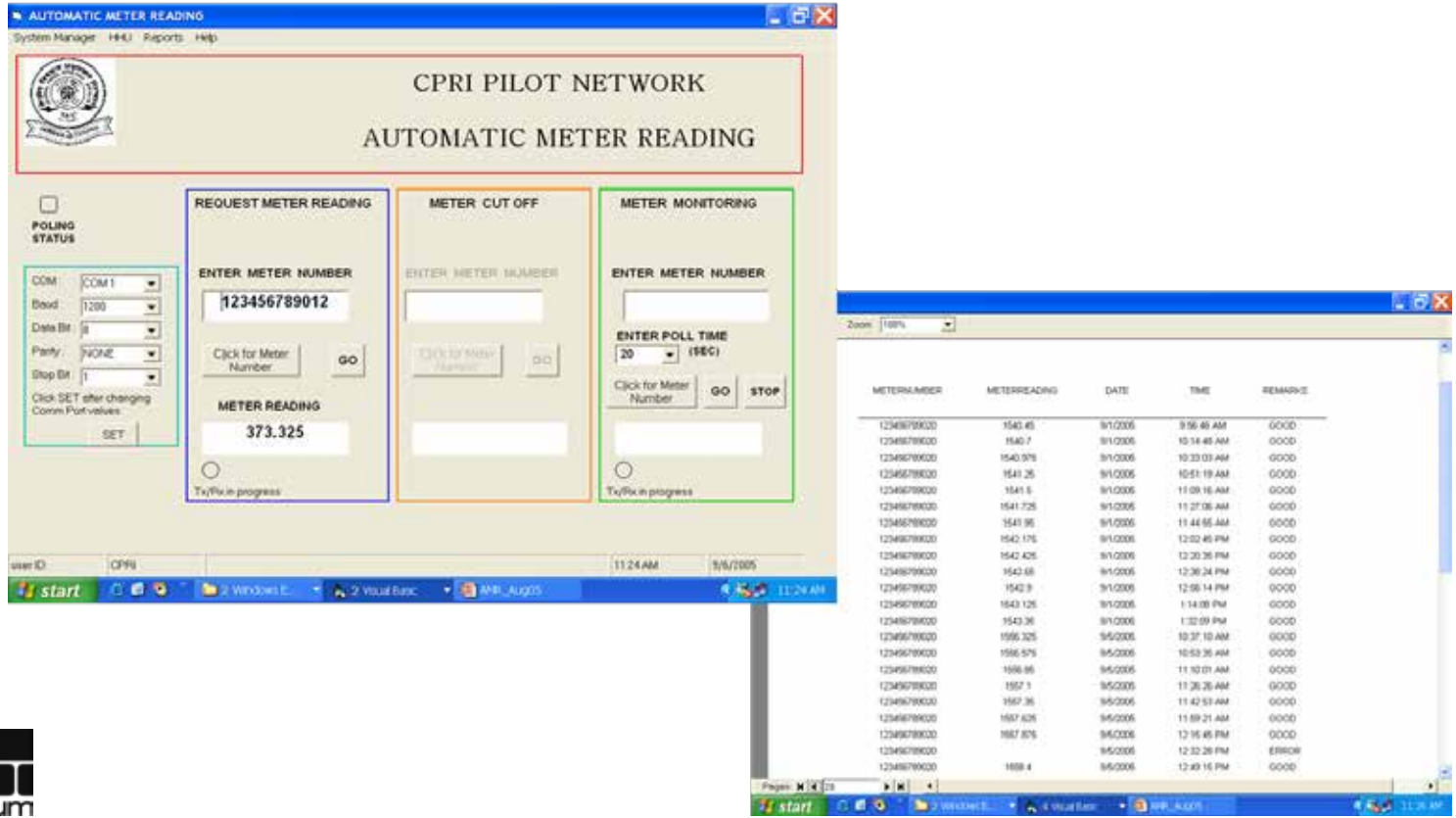
AMR Control Centre – User Interface Screen



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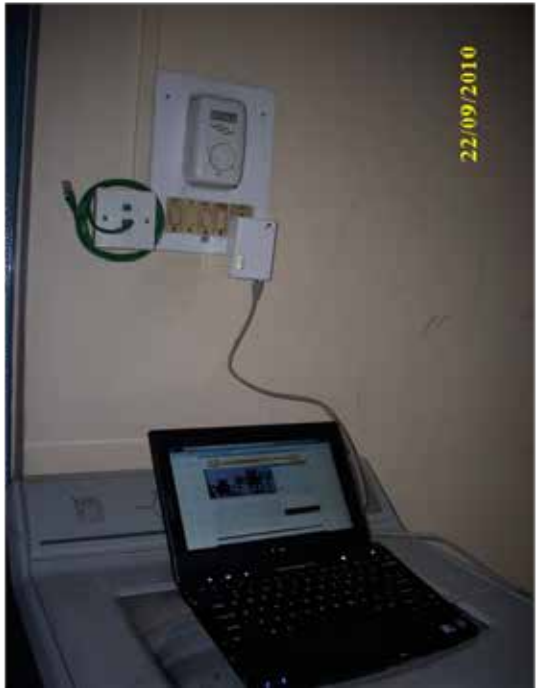
BPL – Head End Equipment and CPE



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AMI under RDSS

- Government of India launched **Revamped Distribution Sector Scheme (RDSS),** in July 2021 and earmarked Rs. 97,631 crore (GBS) for prepaid smart meters (total outlay of Rs. 3,03,758 Crore over 5 years).
- Under RDSS, Government has initiated mass rollout of AMI systems – expected to Install 250 million smart meters by FY 2027-28.
- Under RDSS, utility has the option to choose any communication technology including **PLC.**
- **Potential opportunity exists for AMI service provider to opt for PLC for AMI in upcoming tenders.**

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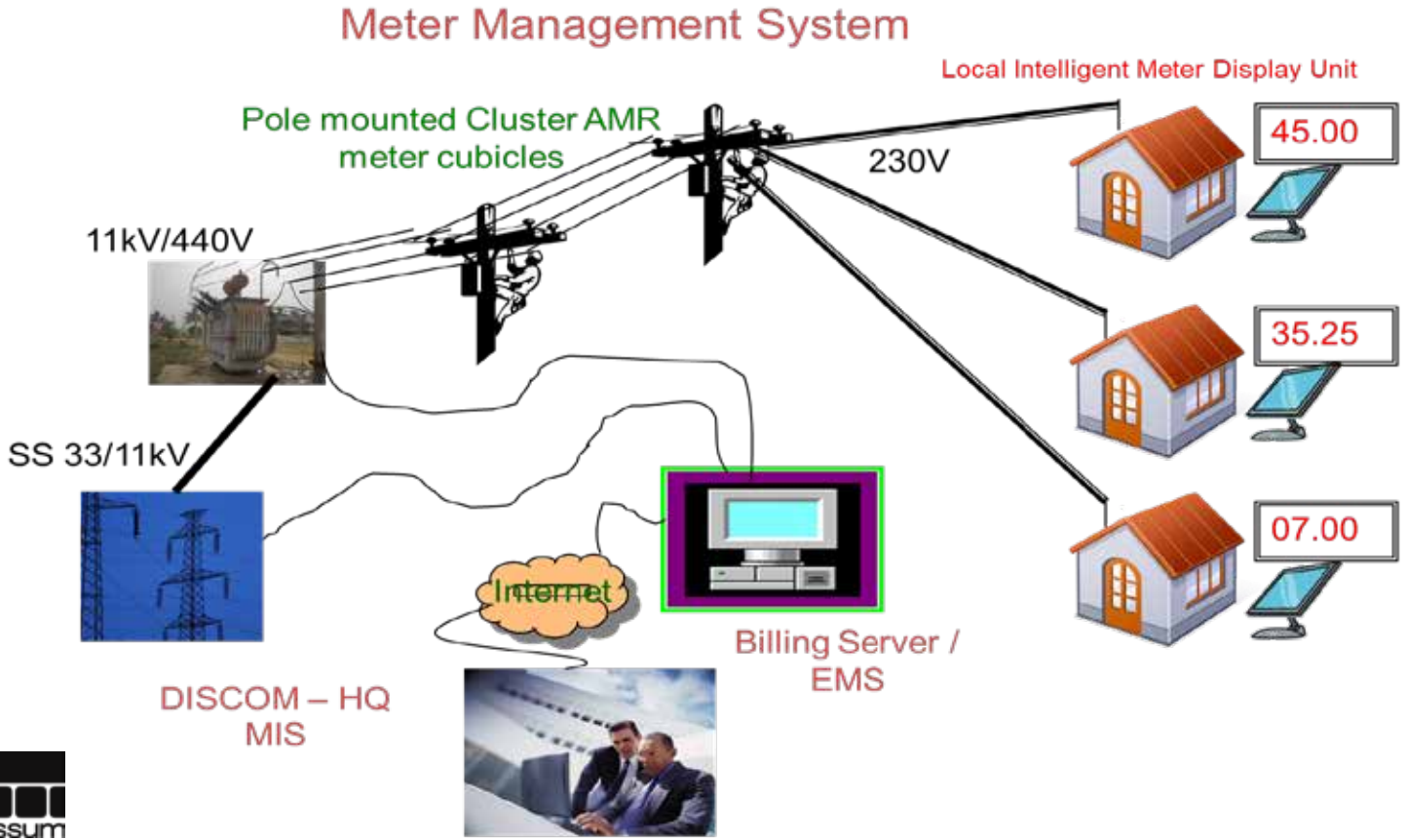
Advanced Metering Infrastructure (AMI)



Conclusion

- PLC is a potential candidate for communication channel for AMI application.
- Industry need to explore the opportunity.
- Government is supporting for Prepaid smart metering for both urban and rural areas.
- **Large scale PLC based AMI pilots provides confidence among the utilities, consumers and policy makers.**
- **Awareness among utilities needs to be created for PLC application for AMI and other areas like streetlight control etc.**
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