



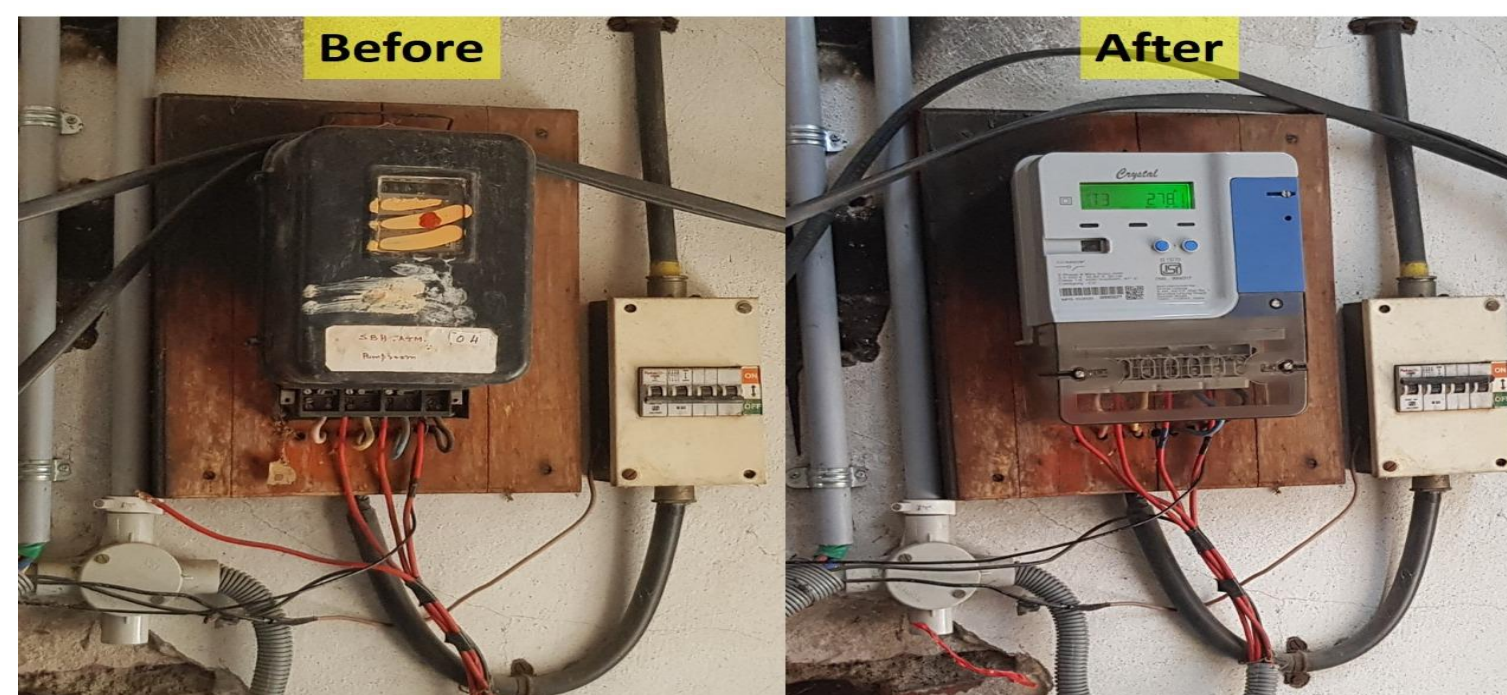
LoRaWAN for Smart Energy Meters

Introduction

- In the quest for sustainable clean energy utilization, efficiency and reliability are as crucial as the transition from fossil fuels.
- A viable solution is the induction of Internet of Things (IoT), which offers a dynamic stochastic energy management system imparting capabilities such as real-time monitoring, situational awareness and security.
- Smart meters are primed to replace the outdated architecture and projected to reach 250 million deployments in the next few years in India.
- Major advantages are dynamic pricing, meter-to-cash services, remote control, better outage management and elimination of electric theft.
- LoRaWAN emerges as an interesting prospect in this context, owing to its low-power, long-range and multi-path resistant capabilities.

LoRa and LoRaWAN

- LoRa is a proprietary modulation technique owned by Semtech, based on Chirp Spread Spectrum (CSS) modulation.
- LoRaWAN is a cloud-based Medium Access Control (MAC) layer protocol implemented on top of the physical layer.
- LoRaWAN defines the communication protocol and system architecture for the network. It is deployed in a star topology.



Challenges and Solutions

- IS16444 compatibility. Stringent requirements such as large load-survey data, tamper proofing and large billing data to the server. Results in large packet sizes and restrictions on Spreading Factors (SF).
- Viable solutions are processing the IS16444 packet at the end node, or fragmentation of the packet before transmission.
- Processing at the end node adds high complexity over LoRaWAN stack whereas fragmentation requires confirmation packets and error correction.

