Appendix 9: Requirements from PLC/Hybrid PLC (RF+PLC) Solution providers

1. Scope of Work

1. BYPL intends to deploy new AMI technology like PLC / PLC Hybrid solution (PLC+RF) on its 15,000 end points. PLC Solution Providers meeting the below mention qualifications and technical requirements can participate as sole bidder in this tender. This system will be commissioned in phase -1 of the project and in case the system is acceptable as per the laid down service levels in the tender, BYPL at its sole discretion can increase the end points at same discovered rates for Phase – II.
2. Bidder can use the technical / financial credential of its parent / group company to meet qualifying criteria. However in that case bidder to provide the consent letter from the parent / group company for utilisation of their credentials and participation in this tender.
3. Bidder to Supply and commission the complete PLC/Hybrid system within 12 months from the date of LOI/LOA issued by BYPL. Bidder shall be responsible to maintain the system for the contract period.
4. Bidder to provide the PLC compliant BIS 16444 for its Smart Meter within 3 months from the date of LOI/LOA issued by BYPL.
5. Billing and Payment terms shall be same for PLC system, as applicable for the RF system under both option i.e., Option I and Option II.

2. PLC System - Solution Requirement

1. The selected Bidder shall implement a reliable PLC / PLC Hybrid (PLC+RF) based communication network to create coverage to connect smart meters in the project area.
2. The PLC Communication Service provider shall Design, Supply, Install, Test, and Commission a PLC Communication Infrastructure for seamless data transfer from Smart Meters to backend AMI system.
3. Bidder shall provide details of Cyber Security and data integrity features for the solution. The PLC solution shall manage end to end security and data encryption with AES128/256 encryption. It shall support for provision of a unique certificate/ key for each node for mutual authentication with back-end system and have provision to send/ receive IPv6 and IPv4 traffic between Gateway/Routers and Head-end System.
4. Successful Bidder shall provide a test setup comprising of all the elements such as gateway/ router, mesh terminals, software for testing the system during technical evaluation. The FAT and SAT testing of all the network elements shall be demonstrated by the Bidder to the satisfaction of the BYPL.
5. The Bidder shall ensure that the solution offered is designed to have 100% success rate in case of OTA firmware up-gradation on bulk smart meters simultaneously and the Gateway/Access points shall have more than adequate memory capacity for the Firmware

upgrades and revert back to previous firmware version in case of failure without any loss of meter data.

6. The quality of installation of the various equipment & power supply wiring to all field equipment shall be as per standards/ regulations/prevailing practices of the BYPL. The supply of electricity needed for operation and maintenance of entire Communication system shall be the provided by BYPL
7. The communication network shall be based on suitable standards from ITU/IEC/IEEE/CEN/CENELEC/ETSI for NAN Technology.
8. The Backhaul Infrastructure and SIM cards (4G / NBIOT) shall be provided by BYPL from leading Service Provider along with aggregated Bandwidth at Cloud Data Centre (DC & DR) and SMOC.
9. Bidder shall provide future ready and Low Life Cycle Cost communication modules for PLC solution and the network element equipment must have built-in reserve capacity to allow memory and processes to be upgraded with new functionality over time.
10. Bidder shall provide High Level Technical design/ deployment architecture of their application and database including Compute, Memory, Storage, Network, security and other requirement for deployment Infrastructure (Production, Test/development) in a Private Cloud Infrastructure (BYPL's Cloud service provider). Recovery Point objective (RPO) shall be less than or equal to 2 hours and Recovery Time Objective (RTO) shall be less than or equal to 4 hours.
11. Bidder shall ensure that the application shall be scalable both vertically and horizontally to support higher number of meters and users without compromising performance using additional hardware.
12. The HES/NMS solution shall be suitable to support the collection and storage of Billing profile, Daily Profile, Event data along with 15-minute interval data for defined number of smart meters in the project area for upto 35 days. Bidder shall provide sizing of their system in staggered manner.
13. Bidder shall ensure that the backend application supports user management, authorization and audit trail functionality for managing and storing all the transactions.

3. Advanced Functionality Requirements from PLC Network system

1. PLC system should be self-configuring. PLC devices shall utilize the automatic topology management (ATM) feature of the system, by which data concentrators automatically discover those meters and other devices with which they can communicate and report this list to the HES and utility applications.
2. Solution shall provide the phase wiring across the low-voltage, Detect and alarm on events like phase imbalances, transformer under or over utilization, meter wiring connection issues etc.
3. It shall be possible to automatically shift between frequencies when noise or attenuation blocks one of them, Determine best path and perform dynamic consumer indexing.

4. Solution shall have algorithms to be upgraded over time to detect multiple paths for data transmission, shall have advanced digital signal processing to support Impulse noise cancellation, Total noise rejection and Corrects channel distortion effects.
5. Bidder for PLC/Hybrid Communication service provider shall tune / readjust the location of the field devices to get best performance and coverage if required at their own cost.
6. The Bidder shall provide HES developed on open platform based on distributed architecture with provision of cloud deployment which is suitable to support the collection, storage of data, configuration of parameters, auto discovery & registration of meters, event reporting & configuring, MIS reports, security features, user management and audit trail and scalable with facility of future expansion as per the requirement specified in this document and comply with SLAs. HES shall interface with UHES (Provided by BYPL). It shall be possible in HES to identify data received through which communication medium in case of Hybrid. Bidder shall ensure that it shall be possible to provide grid mapping for meters, transformer associations and feeder and record in the system.
7. All the equipments supplied shall have low power consumption, Guarantee of 120 months, perform without degradation on field, RTC accurate to ±0.5 second per day etc.
8. Field equipment/device must be protected against ingress of water/moisture/dust/insect and weather conditions and shall comply with IP67 or better.
9. Bidders may refer the RFP to understand and comply with requirements and functionality in HES, Smart meters and total solution as per section 14.