Call for Proposal

For collaborative development of Advance Metering Infrastructure solution

1. Introduction

Advanced Metering Infrastructure (AMI) is an integrated system of smart energy meters, communication networks and data management systems that enables bi-directional communication between utilities and customers. Smart Energy Meter is an electronic device having the capability to measure the consumption of electric energy and supports a wired/wireless protocol to communicate the metrological data to the management system for higher layer management, processing and analysis. The Advanced Metering Infrastructure (AMI) is built to enable the DISCOMS for automatic metering and billing system. The metrological data is sent to the Head-end System (HES) for data collection. Processing and analysis of data is performed by the Meter Data Management (MDM) system. It aims to replace the manual process of traditional meter reading methods and enables remote access of these meters by energy provider. The AMI system equips the DISCOMs for better management of metering infrastructure.

USOF/ DOT invites participation from the Indian start-ups/organizations/research and academic institutions in a collaborative project led by USOF/ DOT through IA (Implementation Agency) C-DOT for the development of Smart Energy Meter AMI solution. The potential participants should have demonstrable capability in Smart Energy Meter AMI solution in the form of fully or partially prototyped version, including but not limited to hardware /software /modules /subsystem or end products thereof.

The final outcome of the collaborative development project shall be commercially deployable Smart Energy Meter AMI solution. The project outcome shall be licensed back to interested participants or third parties, capable of its mass production, marketing and deployments for end users, directly or in association with the system integrators.

Through the process of rigorous technical evolution, USOF/ DOT under TTDF framework, shall select participants holding the most promise of delivering commercial grade outcomes as its development partner in the project. The participants shall produce necessary documents in the form of PoC, certifications, field trials, market presence etc. to showcase their product worthiness/level of competence with respect to the detailed statement of work (SOW). Based on the inputs provided by the participants, the TEC (Technical Evaluation Committee) under USOF/DOT would select single or multiple participants for collaborative development. In order to achieve the required goals, USOF/ DOT would prefer to select multiple partners for the same work item wherever feasible, and drive the development & implementation through its IA (Implementation Agency).

C-DOT will prefer the partners who has the expertise in the field of meter deployment in the field and live deployed systems can be demonstrated through their offerings.

2. Project Description

The system shall comply against all the latest published Indian standards (BIS) and development & testing guidelines mandated by REC. It shall also comply against the testing procedures mentioned in RDSS. The project is mainly divided into the following modules/sub-systems -

a. Energy Meter Module
b. Communication Interface Module
c. Head-End System (HES)
d. Meter Data Management System (MDMS)
e. Billing System/Billing Engine
f. Consumer Application (Mobile & Web based) with HES and MDM
g. Installation Application (Mobile based)

2.a Energy Meter Module

Energy Meter module is the basic electronic unit installed closer to the customer premises for measurement of the consumed electrical energy. The energy meter module shall interface with higher layer management interface, HES/MDM using Device Language Message Specification (DLMS). It shall detect the tamper events as specified in the specifications and support end-to-end encryption for the secure message communication with the HES. There shall be robust Firmware Update Over The Air (FOTA) support to cater to the serviceability and upgradability.

High Level Specifications for Whole Current A.C. Single Phase Smart Energy Meter as per IS 16444, which is being developed by C-DOT is as follows -

The Smart Meter shall have the following features-

- •Measurement of electrical energy parameters
- •Bidirectional Communication
- •Integrated Load limiting /connect/disconnect switch
- •Tamper event detection, recording and reporting
- •Power event alarms as per IS 16444 Part 1
- •Remote firmware upgrade
- •Pre-paid features at MDM end (as per IS 15959 Part 2)
- •TOD features
- •Net Metering(kWh) features (optional as per requirement of utility)
- •On demand reading

General standards applicable for meters are as follows :

i. IS 13779 with latest amendments
ii. IS 15884 with latest amendments
iii. IS 16444 Part 1 with latest amendments
iv. IS 15959 Part 1 & Part 2 with latest amendments

2.b Communication Interface Module

High Level Specifications for communication module, which is being developed by C-DOT is as follows -

There shall be pluggable communication interface module that works with the energy meter. The interfacing protocol between the energy meter and communication module shall be universal asynchronous receive and transmit (UART). The communication interface module uses the WAN (*NB-IoT, Wi-SUN, 4G fallback to 2G*), NAN(*RF*) for the data exchanges between the energy meter and the Head-End system. This module shall have the provision for SIM/eSIM to enable the connectivity of energy meter with the communication network.

2.c Head-End System(HES)

Head-End System shall be management entity and interface for remote configuration and update of smart energy meters, periodic collection of metrological data for further processing, analysis and generation of billing by higher layer management systems. The module shall support the functions such as connect and disconnect service, automatic measurement of consumed electrical energy, tampering detection, identification and isolation of outage, voltage monitoring and information collection on the pattern of electricity use.

HES shall support the collection and storage of data as per performance level for at least 10 lacs of Smart Meters. The offered software solution should be scalable in nature so that more than 10 lacs of meters can be accommodated by simply adding the cloud infrastructure.

The HES shall follow the integration protocol established by IS 15959 (DLMS-COSEM) and make use of ACSE and xDLMS services to communicate with southbound field devices (Smart Meters) irrespective of the physical communication layer.

i. High level specification of HES :

a) On power up after installation, Smart Meter shall register itself automatically into the HES alongwith its predefined metering profile. The HES shall store meter profile status by meter type,hardware & software versions, device IDs, logged in / logged out details etc.

b) Upon deployment and establishment of communication, it shall be possible for field level end device nodes (NAN/WAN) like Router/Gateway, Access Point to have self-discovery and registration.

c) Acquisition of meter data on demand & at user selectable periodicity. On demand meter read may be for single meter (unicast) or for a group of meters (multicast).

d) Two-way communication with meter

e) Signals for connect & disconnect of switches present in end points such as meters. This facility shall be provided for both single meter (unicast) as well as for a group of meters (multicast).

f) Audit trail and Event & Alarm Logging

g) Ability to redirect messages including configuration commands from the MDM in order to reach the desired meter

h) Maintain time sync with meter from MDM. Store raw data for defined duration (minimum 3 days). HES shall hold the data before it is transferred to the MDM

j)Handling of Control signals / event messages on priority

k) Manage time distribution to ensure that nodes / meters always have an accurate RTC using NTP servers. The time distribution mechanism shall take into account the network latencies.

l)Setting of Smart Meter configurable parameters as per IS 15959.

m) Critical and non-critical event reporting functionality as per IS 15959.

n) Device management functionality to get periodic updates from devices on health check,hardware & firmware version, location mapping etc.

ii. HES shall facilitate configuration of following AMI parameters:

a) Load profile capture period (15minute, 30 minute and customizable)

b) Demand integration period

c) Setting of parameters for TOU billing

d) Prepaid / post-paid configuration

e) Net metering

f) Billing date / month-to-date for prepaid meters

g) Clock setting/time synchronizations

h) Load curtailment limit

i) Event setting for connect/disconnect

j) Number of auto reconnection attempt

k) Time interval between auto reconnection attempts

l) Lock out period for endpoint (meter) relay

m) Remote firmware update: It shall be possible to update the firmware of the meters in both Unicast (one to one) and in Multicast fashion (Group of meters). It shall be also possible to have remote firmware upgrade for an individual and a group of nodes (NAN/WAN, Routers/Gateways/Access Point.

n) Password setting

o) Push schedule

p) Setting threshold limits for monitored parameters

iii. Communication

The following communication functions with network devices shall be supported:

a) HES shall communicate with access points using WAN technology
b) HES shall encrypt data for secure communication
c) HES shall be able to accept data according to IS 15959 part-2 /part 3 and latest amendments
d) HES shall automatically retry for missed data; the number of retry attempts shall be configurable
e) To receive confirmation on successful execution of a command
f) HES shall ensure data integrity checks, for example, checksum, time check, pulse, overflow, etc. on all metered data

iv. **Monitoring and Reporting Capability**

HES shall have critical and non-critical reporting functionality. The critical & non-critical information generated from this reporting functionality shall be made available to MDM at user configurable periodicity.

v. **Critical Reporting**

HES shall keep record of following events and alarms:

a) Event log for node's (meter) events such as tamper/power failures etc.
b) Data not received from nodes/end points
c) Relay does not operate for connect / disconnect
d) Communication link failure with nodes/end points
e) Network Failure
f) Power Failure

vi. Non-Critical Reporting

HES shall report and keep record of following communication failure events:

a) Retry attempts

b) Missed periodic reading
c) Failure to connect

HES shall support reporting of communication failure history of nodes/routers/access points etc. and give an exception report for nodes/routers/access points not communicating for last 0 – 24 hours (the reporting period shall be on user configurable period).

2.d Meter Data Management System(MDMS)

The MDMS shall perform the long-term data storage and management of meter data. The data consists of the energy usage data and event log information imported from the Head-End System. An MDM system shall import the data, then validate, cleanse and process it before making it available for analysis. The MDMS shall analyse the collected meter data after filtering, for better customer experience through timely update of real-time energy consumption information to the user, better operational efficiency by analysing and predicting the real-time loads. MDM system shall enable the utility provider to understand the overall energy consumption and health of their installed metering systems.

MDM shall support the processing, storage and management of meter data for at least 10 lacs of Smart Meters. The offered software solution should be scalable in nature so that more than 10 lacs of meters can be accommodated by simply adding the cloud infrastructure.

High level specifications of MDM are as follows :

i. Asset Management

a) The MDM shall maintain information and relationships between the current installed meter location (apartment, shop, industry/ address etc.), Consumer information (Name etc.), Consumer account no, Meter ID, Type of Meter (type of consumer, 1 phase/ 3phase, with or without relay, etc.), Meter configuration (Demand integration period, Load profile capture period etc.), GIS supplied information (longitude, latitude, connection with feeder/transformer/ pole etc.) etc.

b) The software should support tracking the status of meters and communication equipment from the date when they are installed in the field. The history of in-service asset location is maintained throughout the device life with start and end dates associated with each in-service location reference.

c) Ability to report and log any damage / deterioration in the meter attributable to consumer / utility.

ii. AMI Installation Support

a) The MDM shall also support device lifecycle management from device registration, installation, provisioning, operations, and maintenance to decommissioning etc. The MDM shall generate exceptions for meter or modules not delivering the correct meter data after installation.

b) The MDM shall provide a reconciliation report that identifies the meters that have been installed but not communicating for a designated (configurable) period. MDM shall generate

reports on the number of meters installed in comparison to the number of meters successfully communicating.

iii. Meter Data

a) The MDM shall accept input, process, store, and analyse Meter data from HES. In case of manual reads, provision should be there to insert associated notes such as assessed energy, etc.

b) The MDM should accept input, process, store, and analyse non-billing meter data such voltage and power quality data (such as under/over voltage, out of band frequency, etc.) as they are available from HES. The MDM should also support schedule and on-demand meter reads and pinging of meter energized states by authorized users and by other utility systems.

c) The MDM shall provide storage and retrieval of all collected Meter Data, events, and alarm. It shall have capacity of storing 05 years data (as required by the utility based on regulatory provisions) via archiving

d) The archiving of data should be done at a frequency of 3 to 5 days and all data older than 3 to 5 days should be archived. AMISP's solution should describe the process of archiving and restoration from the archive.

e) Correctly track & resolve energy usage across meter changes with no loss of individual meterdata.

f) Provide complete history and audit trail for all data collected from meters including commands sent to meters and other devices for 30 days (configurable period).

g) Execute on-demand read processes.

h) Handle special metering configurations such as net metering/pre-paid metering/multiple meters at same premises.

i) The MDM shall have the ability to manage at a minimum 5-minute interval data.

j) The AMISP shall ensure data integrity checks on all metered data received from data collection systems.

iv. **Data Validation,Estimation & Editing (VEE)**

a) The validation and estimation of metered data shall be based on standard estimation methods (such as max/avg. of past three days, max/avg. of past X number of similar weekdays, max/avg. of similar blocks of past X numbers of similar weekdays, etc.). The MDM should also support and maintain following data-

i.Registered Read Data including register reads, daily billing cycle, as well as derived billing determinants such as TOU

ii.Interval Data channels with variable intervals and variable units of measure as per IS-15959.

iii.Calculated Data that is derived or computed such as billing determinants and aggregated loads.

iv.Event data storage of all collected event and alarm data from meters, network equipment, and MDM itself

b) MDM shall flag, alarm, and trigger an estimating process including but not limited to when the following anomalies occur in the cumulative ("CUM") register reads

i.CUM decrements within a billing cycle (except net-metering)

ii.CUM reads increments more than configurable threshold

iii.Future or old read dates

iv.Number of digits exceeds number of meter dials

c) MDM shall detect, flag, alarm and trigger an estimating process including but not limited to when the following anomalies occur in Time of Use (TOU) register reads

i.Register decrements (except net-metering)

ii.Resets (to zero) (except net-metering)

iii.CUM reads increments more than configurable threshold

iv.Future or old read dates

v.Erratic compared to CUM read (sum of TOU reads minus CUM read)

d) MDM shall detect, flag, alarm and trigger an estimating process including but not limited to when the following anomalies occur in Demand register reads

i.Do not reset on cycle

ii.Do not reset coincident with consumer move-out or move-in

iii.Reset off cycle inappropriately

iv.Too high

e) All data shall be transferred to billing system after meter data validation and estimation including transformer / feeder station wise energy audit.

f) MDM shall estimate usage for non-metered service points such as streetlights, farm lights, traffic signals, etc.

g) The MDM shall maintain both, the original received raw data in a non- manipulated state for atleast 06 months, in addition to VEE data. VEE data needs to be kept for 05 years before they can be archived to a secondary storage for a better performance and cost effectiveness.

h) Notwithstanding the latency of data collection via the AMI system, once the MDM receives meter read data, the VEE process occurs in real-time and the post-VEE data is then immediately available to user or external systems.

i) The MDM shall be able to automatically flag data changes from manual edits, VEE(Validating, Editing and Estimating) rules and data source corrections and electronically generate audit trail with timestamps and user-ids.

v. Billing Determinants Calculation

The MDM -

a) Shall allow configuring multiple TOU options (e.g., the number and duration of TOU rate periods) by consumer type, tariffs, and day type (weekend, weekdays, and holidays) and by season.

b) Shall support the processing of interval data into billing determinants to include the following :

i.Total Consumption
ii.Consumption in different time blocks for ToU billing
iii.Maximum Demand (in kW and kVA)
iv.Number of tamper counts
v.Average power factor
vi.Net-Metering data

c) Shall process interval data and frame it into the appropriate TOU periods for consumption and demand; for example, roll up 15/30-minute data intervals into hourly data.

d) Shall have the ability to properly account for special metering situations such as check metering, sub metering, prepaid metering and net metering when calculating billing determinants and sending them to billing and other systems.

e) Shall have the ability to properly account for special situations including, but not limited to, curtailment requests, demand response scenarios when calculating billing determinants and sending them to the billing software.

f) Shall have the ability to facilitate implementation of automatic compensation payments by Utility to consumers for sustained outages when requested. Compensation calculations would require cross checking with billing and consumer balance information to ensure that disconnection is not construed as a no supply event.

vi. Prepaid Functionality

The MDM with the help of the corresponding HES, should be able to switch the Smart Meter between prepaid and post-paid modes by a simple change in configuration of the Smart Meter firmware remotely. The following prepaid functionality shall apply:

a) MDM shall use consumer attributes from Consumer Care System (CCS) and/or Utility Billing system to,

i.enroll and setup new prepaid/ post-paid consumers
ii.migrate existing post-paid consumers to prepaid mode and vice versa

b) An appropriate pre-payment application engine shall support the pre-payment metering capability through the delivered system.

c) The prepayment system shall ensure that payment and connection parameters are stored centrally, and the details are updated to CIS-CRM/MDM through consumer portal/ app. Information required by consumer's Mobile App and web portal are shared in near real time.

d) Prepaid consumers shall be provided facility to recharge their account by logging on to the consumer portal/app.

i.The user interface shall be integrated with the present online payment gateway of the utility. Additional payment gateways shall be implemented if required

ii.The payment gateways shall facilitate payments through on-line banking, credit cards and payment wallets

e) A prepaid mobile application functionality shall be provided as a recharge option for android OS and iOS. The consumer portal/ app, shall enable consumers to recharge as well as view recharge history, existing balance, daily usage etc.

f) In addition to billing determinants, the MDM shall share, consumer recharge and credit updates with the utility Billing system. Any re-conciliation shall be carried out in the Billing System and the same shall be shared with the MDM for use by the prepayment application.

g) The system shall periodically monitor the energy consumption of prepaid consumer and decrease the available credit based on consumption. For this purpose, the MDM shall fetch billing data (kWh/kVAh consumption and MD) at configured intervals from the prepaid meter. The raw billing data shall be subjected to standard VEE rules before being used to update recharge balance with the help of applicable tariff slabs. The credit balance is updated into meter at re-charge time.

h) The prepayment application shall use determinants such as minimum fixed charges, TOU tariffs, slab rates, duties & surcharge while calculating consumer credit/balance. Fixed charge shall be deducted on daily basis irrespective of the consumption, even after disconnection of supply and adjusted in the next transaction.

i) The prepayment application should be able to automatically apply different TOU tariffs for future date lines, while calculating consumer credits.

j) The system should send connect/disconnect command based on available credit as per notified rules & regulations.

k) The system should send low-credit notifications to the consumer when their balance approaches a pre-configured threshold. Alerts shall initiate on every recharge, low credit, and load connection/disconnection. The alerts shall be posted on the consumer web Portal/ App in real time and sent through SMS and email. Consumer should also be alerted through other mechanisms such as one-time alarm / beep from the meter, LED blinking, message, etc.

l) It shall be possible to configure an “emergency” credit limit in INR as well as day terms. This emergency credit shall be used as reserved amount that is consumed when consumer credit is exhausted. The credit amount shall be adjusted in next recharge transaction.

m) It shall be possible to configure certain prepaid consumers where auto-disconnections shall not happen due to negative credit.

n) The pre-payment function MDM shall also have a facility to configure arrear recovery mechanism to recover arrears from a consumer. Some of the indicative mechanism to recover the same can be recovery of [X]% from every recharge amount while the rest goes as charging amount till all the arrears are recovered. Alternately the arrears may be settled in next [X] instalments as decided by utility such that not more than 50% of any instalment shall be adjusted towards arrear.

vii. Net metering

MDM shall flag, alarm, and trigger an estimating process including but not limited to when the following events occur:

a) CUM decrements of forward energy within a billing cycle

b) Register decrements for Time of Use (ToU) of forward energy

c) Power generated(exported) by any net-metering consumer more than the installed capacity of solar PV rooftop system

d) Energy exported in any given day by any net-metering consumer more than the programmable threshold value Like billing for post-paid meters, the billing for net-meters shall take place in the utility Billing server.

viii. Integration with other systems

MDM shall preferably interface with other systems on standard interfaces and the data exchange models and interfaces shall comply with CIM / XML / IEC 61968/IS15959/ Indian Companion Specification/ any other open standard. MDM solution shall be Service Oriented Architecture (SOA) enabled.

a. MDM integration with other systems shall include but not limited to the following:
b. HES for data exchange from other AMI solutions
c. Utility Administration
d. Existing other Data Collection Systems
e. IVR system, CRM, Consumer Portal
f. Billing and collection system
g. GIS Systems integration with CIS and with MDM system
h. Support of interface with HHU or manual reading system etc.

AMI Implementing Agency(AIA) should provide suitable number of HHUs to read and update the data in MDM in case of any communication failure between meter and HES/MDM.

ix. Exception Management

a) Ability to capture and log data exceptions, problems, and failures and to generate management reports, provide trend analysis, automate generation of service requests, and track corrective actions.

b) Ability to group, prioritize, filter, and send system generated alarms and events to predetermined email addresses, cellular text messages to phone numbers/SMS/consumer care etc. Alternatively, these alarms/alerts may be routed to utility's WFMS.

c) Exception Generation - MDM shall generate exceptions based on configurable business rules including but not limited to the following:

i.Meter tamper alerts
ii.Communication module health alerts for meter
iii.If the consumption is less/more than pre-defined average consumption
iv.Negative Consumption (not for net-metering)
v.Power outage indications received from the Smart Meter

x. Service Order

a) The MDM shall generate service orders based on configurable rules for various events and alarms such as stop meter, tampers, problem in communication networks, etc.

b) MDM shall send service orders via SMS, email, etc. with the email addresses / phone numbers being configurable. MDM shall receive feedback on action taken on the service order and track the status of service orders until resolution.

c) Service order tickets could be generated by MDM but processed and closed under jurisdiction of the HES-NMS combine. If the utility already has a separate Workforce Management System (WFM), then the service order tickets can be routed from the MDM and the NMS to the WFM for completion of the tasks and reporting.

xi. Revenue Protection Support

a) Ability to analyse meter tampering flags, power outages, usage trends and usage profiles toidentify potential energy diversion situations, and produce daily reports, monthly reports, and service order requests for investigation.

b) The business rules for revenue protection alerts shall be configurable via a user-friendly interface.

c) The MDM shall filter out revenue protection alerts that may be caused by field activities if the field activity information is provided to the MDM.

The MDM shall support the analytics/investigation (i.e., view current and historical usage patterns) to validate suspected revenue protection issues.

2.e Billing System

The billing system shall generate the billing data for consumers on pre-defined regular intervals. This system shall store the detailed consumption pattern of energy for each consumer and shall provide the details of such data wherever needed. Billing system can either be an integrated module as a part of MDM or it can be provided separately.

The Billing System should support all the meters supported by MDMS and it should also be scalable in nature.

High level specifications of the Billing System :

a) Bill shall be generated in a standardized .xml format.
b) Command from Billing system triggered and send to MDM / HES for collection of Monthly billing Data
c) Disconnection alert sent to consumer from Billing system to MDM
d) Meter reconnect operation command after wallet recharge from Billing system to Prepaid engine
e) Collection of billing profile data for the bill period – Billing period to be decided during test period (as per IS 15959 Part-2) - From 99% of meters within 30 minutes after midnight averaged over the complete period

The basic functionality required in billing system/ CIS system of AMI solution:

a) Meter Installation – Initial Master Data Creation
b) Periodic Meter Reading –
    i. Smart Metering Daily Cyclic Meter Reading
    ii. Billing data Collection
c) Connect Disconnect –
    i. Credit tracking & Disconnection
    ii. Smart Meter Remote Connect & Disconnect
d) Meter Tampering event recording
e) Remote Smart Meter configuration

2.f Consumer Application (Mobile & Web based) with HES and MDM

Consumer Application with the following features shall be supported -

a. Customer self service platform having access to bills, usage graphs and payments etc. to reduce the work load of customer support office.

b. Easy registration and secure login using mobile number and OTP

c. Online payment of bill

d. Alerts for the new bill generation, due date, payments etc.

e. New connection request and services to change any customer information

f. Complaint lodging facility with status update

g. Option for e-bill facility

2.g Installation Application (Mobile based)

The Smart Meter installation are the process which is used to replace the old meter with new meters. This installation shall be fully software controlled Process and installer shall use the Mobile App so that no information is missed out.

The Installation Application shall have the following features -

a. It shall collect the old meter information like last Kwh reading, meter condition etc. and keep photograph of meter and last bill copy for future reference.

b. It shall collect and store new smart meter information like initial reading, SIM details, Sanction load, new meter Seals detail etc.

c. It shall auto capture the meter location having latitude and longitude information.

d. The same application shall be used for the customer survey for those who haven't got the Electrical connection but still using the electricity.

e. The feature for auto commissioning of the meter with HES.

3. Roles & Responsibilities of C-DOT

Meter (2.a) & Communication Module (2.b) will be developed by C-DOT, the R&D wing of DOT and also shall lead the integration of the final solution. It will provide technical development assistance, infrastructure and financial support to the project partners selected through a process of evaluation and due diligence conducted by a committee of subject experts.

Where ever deemed necessary, C-DOT, the R&D wing of DOT, as an Implementation Agency may arrange equipment resources, testing infrastructure, mandatory clearances, statutory permissions, technical consultancy and provide gap funding to the partners in realizing their respective target deliverables.

USOF/ DOT through IA (Implementation Agency) shall license the final solution for mass production and deployment. Royalty proceeds received from licensing shall be distributed amongst all Partners in ratio of the assessed value of each partner's respective contribution determined through mutual discussions while finalizing the product architecture.

USOF/ DOT through IA (Implementation Agency) shall engage with Partners on a non-exclusive basis and shall retain its right to develop similar products / through other developmental programs.

4. Roles & Responsibilities of Participant(s)

Role of the partners is broadly outlined in section 2 except 2a, 2b. Meter & Communication Module will be developed C-DOT, the R&D wing of DOT. The partner shall develop the remaining modules mentioned in section 2 and integrate the developed modules with the metering solution, duly complying with the standards.

The Partner need to inform C-DOT regarding the testing infrastructure requirements at the beginning of the project phase. C-DOT shall arrange the necessary testing infrastructure for testing of the products delivered by the Partner. The Partner shall arrange their own infrasturcture for the PoC purpose.

Delivery schedule of the products and solutions shall be shared by the Partner at the beginning of the project phase. The partner is expected to deliver the solutions within six months or the time period jointly agreed upon by C-DOT and the Partner, from the date of signing of the proposal.

The Partners may build the required module afresh or by modifying pre-existing background technologies available with them.

All concerned Partners shall own the foreground technologies developed by them individually or collectively as the case may be.

The Partners may utilize the available test and infrastructure facilities offered by IA (Implementation Agency, which is C-DOT) with no financial implication for its usage.

The products and solutions shall be tested as per the functionalities and performance levels mentioned in RDSS specification for AMI solution demonstration requirements. The Partner shall demonstrate the solution and prepare test reports against the points mentioned in the table in RDSS specification. The technical committee shall take the final decision on the acceptance of the products.

Participation in the project shall be on non-exclusive basis. All partners shall be required to demonstrate commitment to the project by entering into a formal agreement with USOF/DOT as per the TTDF policy.

5. Ownership of Outcomes

Background technologies and software solutions used in the project shall continue to remain with their respective owners, however for review purpose the partner need to share the source code and all the design documents to the Implementation Agency, which is C-DOT. The Partner need to incorporate the review comments and feedbacks in the developed solution.

New foreground technologies created during the project shall be owned by the respective development partners, individually or collectively as the case may be. Any agreement required for collective ownership shall be settled directly by the concerned partners.

The ownership of the final solution and the requisite IPR shall rest collectively with DOT and all its Partners.

6. Format of Response

Companies / organizations / institutions / individuals developing enabling technologies / modules / components / subsystems / products in the Advanced Metering Infrastructure (AMI) are required to respond with their proposal detailing solutions/proposal with status and funding support requirements by submitting the form online, provided under TTDF on the USOF/DOT website (link address)

7. The Next Steps

On receipt and evaluation of responses, USOF/DOT through a technical evaluation committee, will make an assessment of indigenous technologies available for achieving objectives of the project.

USOF/DOT through Implementation Agency (C-DOT) will internally conduct an analysis on the received proposals.

A Product Requirement Specifications of the final product to be built collaboratively with Partners and evolved through an open process of consultations with all concerned stake holders. A formal Request For Proposal (RFP) shall be issued for selection of collaboration Partners for the project.