

## BRIEF ON SMART GRID PILOT PROJECT

The Government of India, Ministry of Power, has taken up the task of establishing SMART GRIDS in India with an objective of achieving most efficient management of Distribution system and to deliver best possible services to the consumers, using the latest developments in Distribution and communication technologies through Pilot Projects.

The Pilot projects are being implemented across the country by 14 Distribution utilities and the Electricity Department, Pondicherry is one among them. The Ministry of Power after scrutinizing the project report approved the implementation of the project, at a cost of Rs. 46.11 Crs, excluding maintenance of the infrastructure after the project period. The proposal has also been approved by the Cabinet Committee on Economic Affairs. The Government of India, Ministry of Power shall finance 50% of cost and the remaining 50%, is to be arranged by the State Government.

Under this Pilot Project, it is planned to develop a Consumer-Utility interactive Smart Grid, which will cover Smart metering & control through Advanced Metering Infrastructure (AMI), and have additional features like Peak Load Management, Net metering, etc.,

A Memorandum of Understanding was entered with M/s Power Grid Corporation of India Limited, wherein M/s PGCIL along with their associates / collaborators jointly with the Electricity Department, would be responsible for the establishment of a pilot smart grid in the distribution area of Puducherry city. As per the MoU, the State Government's portion of the project cost was to have been met by M/s PGCIL and its associates / collaborators. However M/s PGCIL, contrary to the provisions of the MoU, had expressed its inability to fund the pilot project and had made a request to the Government of Puducherry to fund the State Government's share, in order to complete the pilot project. In view of the financial constraints prevailing in the Union Territory, the Government could not finance the State Government's share of the project, upfront. It was then a proposal was submitted to the Government seeking its approval to select an investor cum service provider to fund the State Government's share of the project and to retain M/s PGCIL as a Consultant in the Project.

Accordingly, approval of the Government of Puducherry has been obtained vide G.O. Ms. No. 2 dated 28.04.2015

- a. to select an Investor cum Service Provider to fund the State Government's share of the Project and to execute the Project, and
- b. to retain M/s Power Grid Corporation of India Limited as Consultant in the Project.

Accordingly, Open tenders were placed through e- tendering process for selecting the Investor cum Service Provider. The Tender Evaluation Committee constituted

for the purpose, under the Chairmanship of the Secretary to Government (Power) has shortlisted M/s Dongfang Electronics Co. Limited; China as the top scorer, who had quoted Rs. 43.91 Crores, to invest, supply, install, test, commission and maintain the Project, as against the approved Project Cost of Rs 46.11 Crs. The project period is 18 months from the date of award of work. This being a new technology and since the intention is to extend the infrastructure of Smart grid to other areas of Puducherry in a phased manner, Operation & Maintenance of the created infrastructure was added as an integral part of the tender. M/s Power Grid Corporation has been retained as the Consultant and an agreement to this effect was signed on 04.06.2015. The estimate has since been revised to Rs. 33.83 Crores.

The repayment of capital investment to the investor cum service provider is proposed to be made as under:

- a. The total project cost will be shared by Ministry of Power (Government of India) and the Investor. The Ministry of Power share will be 50% of the project cost with ceiling limits of Rs. 25 Crores, whichever is lower.
- b. Since the proposed project is investor model, the bidder has to initiate and carry on the project with their own fund.
- c. The MoP Share will be released to the Investor and to the Consultant, by the Department, on completion of each milestone stated by Ministry of Power.

Thus, on successful completion of milestones and after Operational Acceptance of the Project, by the Department, the entire MoP share (50% of the project cost or Rs. 25 Crores whichever is lower) would have been paid to the contractor.

Balance project cost apart from MoP share has to be borne upfront by the Investor. Repayment to the Investor of their investment will be done in Equated Monthly Installments for 60 months by the Department over a period of 5 years after Operational Acceptance.

The monthly pay out to the Investor towards the investment made in the Smart Grid Pilot Project would be repaid from the revenue receipts head of account

Implementation of the Project is expected to result in considerable savings to the Department as detailed below which is expected to meet the additional out flow of funds.

- a. The billing efficiency in the project area shall be 100% contributing to the decrease in commercial loss.
- b. The collection efficiency in the project area shall be 100 % as against the present level of 93%
- c. There will be no human interfacing in taking the monthly readings of the consumers in the Project area since the readings will be directly

downloaded in the Control Centre. Disconnection of defaulters and reconnection of services can be done from the control room. Hence reduction in manpower would result in additional savings.

- d. Error in billing will be negligible leading to considerable improvement in consumer satisfaction which cannot be measured in terms of money.
- e. Easy payment of bills through online.
- f. The present level of around 25% of stuck up meters would be replaced with accurate Smart meters.

These identified benefits will help the Department to meet the repayment to the Investor cum service provider on one hand and reduce the AT&C losses on the other.

The approval of the Government was obtained for the award of work and the Contract Agreement with M/s Dongfang Electronics Co. Ltd was signed on 06.07.2016.

As for the allegation that the energy consumption recorded by the Smart meters are high compared to previous consumption, it is to state that prior to 2005 only electro-mechanical meters were used. These meters have several moving parts and so become sluggish over a period of time therefore recording less than the actual consumption of the consumer. Further recording of these meters can easily be influenced through magnetic interferences and the recording can be tampered by just strongly tapping the meter thereby disturbing its moving parts. These meters were less accurate and did not have measuring elements on the neutral side. Hence current flowing in the neutral was not detected by the meter. The meter could thus be easily tampered by interchanging the phase and neutral wires.

To overcome the shortcomings Electronic static Meters were introduced as per the Regulations framed by the Central Electricity Authority in 2005. These meters as the name suggests, do not have any moving parts. They are more accurate than the electro-mechanical meters. Measuring element has also been introduced as an anti-tampering measure. These meters are manufactured as per IS 13779. From 2005 onwards, the electro-mechanical meters are being replaced with Electronic Static.

The Smart Meters introduced in the pilot project in Puducherry are essentially Electronic Static Meters conforming to IS 13779 with two additional features, namely a communication module to communicate the electrical data to the control centre and a relay to enable disconnection and reconnection of supply from the control centre. Both the communication module and the relay are tested as per standards prescribed in the Tender document. Therefore there is no difference in the recording of the smart meters now being deployed and the earlier used Electronic Static Meters. After receipt of the complaints of inflated bills, 40 of these meters have once again been put to test in the Department Laboratory and each one of them have been found to be recording the energy consumed satisfactorily and within limits of permissible error.

Therefore the higher reading compared to previous months cannot be attributed to the correctness of the meters being deployed under the smart grid pilot project. The field officers have to analyse the complaints on a case by case basis and find out the reason for the inflated bills, as alleged by the consumers. The inflated bills could be for any one of the following reasons or a combination of them:

- a. Old sluggish electro-mechanical meters, recording much less than the actual consumption being replaced by new accurate smart meters
- b. Old electronic meters that have exceeded the warranty period, recording much less than the actual consumption being replaced by new accurate smart meters
- c. Increase in Tariff with effect from 1<sup>st</sup> of April, 2018.
- d. Monthly readings being taken beyond 30 days
- e. Human error in meter readings
- f. Due to improper wiring like, common neutral, old worn out wiring, unbalanced load etc.
- g. If all the above reasons are ruled out, then the meter is a suspect and can be once again subjected to accuracy test in our laboratory as per normal procedure, to clear any doubt on the recording of the meters.

For this purpose a Committee of senior officials have been formed to look into each and every petition received from the Public/consumers. So far over 22500 meters have been received and the complaints received is less than from 2% of the consumers. A total of 466 complaints received and all the complaints have been resolved.

The meter deployed in the Project thought manufactured in China confirm to Indian Standards namely IS 13779. The Meters have been subjected to rigorous tests at NABL accredited laboratory in Kolkata by the Bureau of Indian Standards (BIS) and have been certified to confirm to Indian standards. Based on the same BIS has given its approval to stamp the ISI mark on the meters. These meters have also been tested for accuracy in the Department Laboratory and at site and have found to be functioning normally. Further to this the meters have also been evaluated by the Puducherry Engineering Collage and found to be in order.