

FEATURE: INDIA SMART METER



Metering India smartly

India is estimated to install 130 million smart meters by 2021 but progress could be stalled by significant infrastructural development and capacity building issues.

Smart meters are becoming the meter of choice in many countries such as Italy, Sweden, Australia, Canada and UK but is India ready for this advanced technology?

According to recent industry reports, distribution utilities globally are expected to spend US\$ 378 billion in smart grid technologies by 2030 where India is estimated to install 130 million smart meters by 2021. Sweden-based analyst firm Berg Insight says that penetration rates for smart metering technology will grow to around 50% in Europe and North America, and to over 75% in the Asia-Pacific region from just around 15% to 25%, respectively, today. And by 2020, it estimates that penetration rates for smart meters are expected to approach 100% in most developed countries, with massive rollouts also taking place in new smart meter territories such as Latin America, India and the Middle East.

Unlike developed countries however, India has not introduced smart metering in a large scale until now, said Suman Ghorai, senior manager in Energy and Utility practice of PricewaterhouseCoopers, India.

The ministry of power unveiled eight

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smart grid pilot projects last year which are set to be rolled out shortly. The ministry is also going to finalize these eight projects of worth 500 crores (US\$9.69 million) on smart grid implementation, which uses a combination of smart metering and various technologies to improve the efficiency and reliability power system for sustainable growth.

To initiate this process, 14 utilities, which manages the power distribution across India will be invited to submit the proposal for the eight pilot projects. The selected proposals will receive funding of around 50 to 60 crore.

The pilots will focus on addressing three key issues: 1) Reduction of aggregate technical and commercial (AT & C) losses, 2) Peak load management, and 3) Integration of renewable energy like wind and solar into the grid. The pilots are expected to be completed within 12 to 18 months.

It is proposed that 50% of the total project cost will be borne by the Ministry of Power and the remaining 50% by selected utilities.

Initial steps of smart metering in India is so far encouraging with the market for electricity meter both for static and elec-

tromagnetic witnessing rapid expansion of 32% between 2008-09 and 2010-2011, said Prima Madan of consultancy firm Emergent Ventures. This growth rate, she said can be largely attributed to government mandates and policies.

Madan noted that the Central Electricity Authority (CEA) guidelines, which have mandated the use of static meters, have seen the Indian energy meter market shift largely to static meters from earlier electromechanical meters.

With a maturing status of metering in the country and growing government interest and support, she believes that adoption of smart metering technologies is emerging to be the most relevant next step - a move that is highly anticipated to help reduce India's peak power deficit which reaches 12-15% in major cities.

“Reduction in commercial losses is one of the principal advantages of using smart metering, particularly of relevance for India, which arguably has the highest AT & C losses in the world at about 28%,” said Madan.

Government initiatives

Certain government initiatives are leading the way towards metering smartly in the country.

The India Smart Grid Task Force (ISGTF) an inter-ministerial group initiated by the Ministry of Power, has been serving as a government focal point for all activities related to smart grid. Under the ISGTF, in March 2011, a Smart Meter

Task Group was formed to discuss the development of cost-effective metering solutions that can be applied within the Indian context.

The ISGTF plans to come up with 12 smart grid pilots in the country by next year, with specific inclusion of smart meters. These it envisages as a stepping stone to a large-scale rollout in the following years based on the learning of the pilots.

Smart meter

In countries such as Italy, Sweden, Australia, Canada and UK etc., where smart meters have been deployed, the prime motive was to improve the frequency of meter reading as costs were very high. In India, C.P.Jain, chairman of Indian Electrical and Electronics Manufacturers' Association (IEEMA) meter division, boasts that the directions are there for reading all the meters at least once a month and hence, the meter reading costs are not so high as in the other countries mentioned.

"The metering technology available in India is quite advanced and in fact as per the regulations of March 2006, only advanced digital meters with communication are to be used for all tariff-metering applications. Presently, the meters being used in India are already smart with lot of smart features built in especially for prevention of theft of electricity and are suitable for advance functions like AMR and Prepayment."

Smart meter issues

Maharashtra State Electricity Distribution Co. plans to start prepaid metering for 10 cities in Maharashtra.

Though there are some progress in smart metering across utilities at pilot level, PwC's Ghorai noted that there are however significant infrastructural development and capacity building issues which need to be addressed before planning a large-scale implementation of the project.

"Our recent studies show that few utilities have initiated Automatic Meter Reading (AMR) through GSM and through Infra Red (IR), however, in spite of more than 50% consumers are having such smart technology most of the meters are read manually.

Thus the benefits of such a huge investment are not realized. Therefore, there is a need for quick feasibility study to understand the technical and managerial issues and need to develop a plan to address those issues before deployment of smart meters."

Ghorai added that another significant issue in smart metering is the quality of HT and LT infrastructure.

Though there are some improvements in urban power distribution system due to implementation of APDRP/R-APDER projects, where there are substantial infra-

structure developments in metering and HT/LT system through AMR & IR static metering and ABC cabling, utilization of benefits is yet to be realized, said Ghorai. This, he said, is due to lack of knowledge sharing and communication between employees; absence of associated infrastructure for meter data analysis and necessary action for pilferage reduction; Insufficient regulatory focus and policy on smart metering; and lack of system modification to enable the benefits of existing intellectual meter; lack of consumer awareness on Smart Grid concepts, such as how they will be benefited through Smart metering.

According to Ghorai, unless the above issues are addressed properly, large-scale investment for smart metering will be an additional burden without realizing the benefits of revenue enhancement. The policy makers and regulators have to implement a robust incentive model framework to attract more and more private investments assuring the rate of return.

What's next?

It is expected that implementation of smart meters will touch every aspect of the power sector value chain and will bring value to the entire country but there are certainly barriers to smart meter implementation.

Emergent Ventures' Madan has suggested some of the potential steps forward should include first developing a robust policy and regulatory framework; developing an institutional structure to ensure effective implementation in a way which brings together all stakeholders and ensure appropriate allocation of

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responsibility; identifying the right meter specifications; and building technological capacity and expertise since smart meters manufactured in the country rely heavily on imported components.

Madan noted that development of domestic capacity to produce meter components can go a long way in reducing per meter costs for the country.

Madan also emphasized the importance of training the needed manpower and enhancing their skill set as well as the design of effective demand side management programmes based on meters in a way which ensures adoption of energy efficiency measures across consumer segments.

Lastly, Madan stressed the need to conduct pilots. "It is widely felt that conducting pilots and testing the waters in terms of technology, consumer segments, etc. is important before a large-scale rollout. Though smart meters do form part of the currently planned 12 smart grid pilots under the ISGTF, inclusion of right DSM components in these pilots is required."

PwC's Ghorai, meanwhile, suggests for a collaborative approach through vendor partnership. He also said an economics of scale needs to be worked out before the roll out of this technology.

"Till then the existing metering system should be strengthened commercial loss reduction and focus should be given on metering efficiency, utilization of existing data for theft & pilferage protection, accurate energy accounting & auditing and revisiting the accountability of the personnel / feeder managers responsible for improvement of the metering operational efficiency," he said.

