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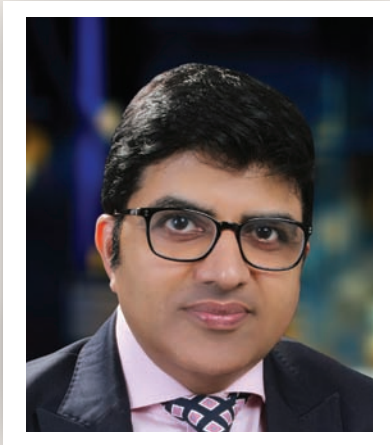
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SMART GRIDS IN INDIA: A REALITY CHECK



Smart Metering Enabling The Smart Grid

India needs to bring huge focus to improve its power distribution sector, which has been incurring billions of dollars of yearly losses for past several years.

Anil Daulani, Chief Executive Officer and Managing Director - India, CyanConnode

Indian DISCOMs need to leapfrog with proven technologies rather than further experimenting as the country has invested several years on examining and verifying the deliverables by various technologies, observes Anil Daulani, Chief Executive Officer and Managing Director - India, CyanConnode. He also provides critical details about how advanced metering intelligence drives a smarter grid.

Why India needs smart grids?

With the vision of making India a 5 trillion-dollar economy and a global economic powerhouse by 2024-25, it is imperative that India's power sector must grow rapidly in next 5 years. Many management reform programmes are being undertaken like smart prepaid meters through a new SBD, inclusion of distribution sub-licensee, and franchisee and many more to synchronise with technological interventions like smart grids to fast track this required growth journey. India needs to bring huge focus to improve its power distribution sector, which has been incurring billions of dollars of yearly losses for past several years.

Smart grid technologies have countless applications and advantages for multiple stakeholders like the utility, consumers, government, and policy makers. It will help to accelerate the curve for transitioning to low carbon footprint, open new opportunities for tech companies and help reduce electricity waste and energy costs.

Though India has made significant investment in implementation of smart grid infrastructure, it continues to make huge AT&C losses. What may be the reason?

As per the CEA estimates the existing generation capacity, along with the power projects to be commissioned, will be adequate to meet the energy demand growth.

Also, in the transmission sector the current pace of implementation of projects of interconnection of regional grid into national grid will further increase the inter transmission capacity. Deployment of smart grid technologies in generation and transmission sector has helped to achieve good outcomes.

Though the results are less visible in distribution sector because of various intertwined structural, financial, and technical issues, many utilities are redressing these issues at different levels. On the technology front, very promising results are achieved where utilities have adopted AMI on a mass level covering entire feeders and cities. The AT&C losses in these utilities have come down and have shown good operational efficiency gain but still a lot of ground needs to be covered. There is a clear need to deploy right communication technology, which can provide 24x7, always 'on' connectivity on IPV6 tunnel between each smart meter and HES (Head End System). Some of Indian consumers keep evolving new techniques to steal energy, which makes DISCOMs to incur heavy commercial losses despite installation of smart meters. There is need to create smart metering monitoring teams fully supported by near real time data acquisition by smart meters and right coordination with vigilance and field teams to work as "one effective team" in DISCOMs for bringing huge operational improvements.

There is need to capture data at source and utilisation of same time frequency by consumer smart meters and distribution transformer (DT) meters, to have near real time DT wise energy balance. Capturing low interval data like 15 minutes IP (Instantaneous Parameters) of consumer smart meters involving neutral current measurement and make MDM systems to have effective analytics capability to strengthen DISCOM teams with effective inputs to reduce commercial leakages. Without IP data collection, smart meters do not realise the actual benefits of such huge investments. It also

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helps consumers to monitor their near real time energy consumption (rather than seeing one day old data), which we can well achieve with right communication technologies.

The ambitious target of converting the existing 25 crore meters to smart meter is still at nascent stage. So Indian DISCOMs need to leapfrog with proven technologies rather than further experimenting as the country has invested several years on examining and verifying the deliverables by various technologies.

What needs to be done to get the best out of smart grid infrastructure?

Effective implementation of right technologies, replication of proven success model and providing the much-needed reforms (structural and financial) are the key to get the maximum benefit out of the technology driven change.

The smart grid infrastructure is in the middle of a transformation, as advanced ICT and modernisation disrupt legacy business models from electricity generation to beyond the meter. The 3 game-changing trends, in particular, are: Electrification of large sectors of the economy such as villages, transport, 24x7 electricity availability; Decentralisation, encourage distributed energy resources (DERs) like distributed storage, distributed generation, demand flexibility and energy efficiency; and Digitalisation of both the electric grid, with smart metering, smart sensors, Artificial Intelligence, and other digital network technologies, and beyond the meter, with the foundation of the Internet of Things (IoT).

Most of the DISCOMs follow the business model which is being implemented in other parts of the world, which may not apply well for Indian field conditions. The government should work on the operational model for smart grid implementation program to involve DISCOMs for their active participation in such a program. Indian market is flooded with many RFPs of smart metering, and meter data management. On ground DISCOMs are not aware of their use cases, they just consider smart metering implementation program as a remote way of billing consumers. Smart metering which is a key component of smart grid plays a vital role beyond remote meter reading. The amount of data received from smart meters in every 15 minutes can be used for various purposes like demand forecasting, demand side management, peak load management, and many more use cases.

For best outcome, it is imperative to work on mindset and processes of DISCOMs to enable them to change from their legacy way of operation.

The center- and state-governments should make a mandate to implement smart grid technologies together and create a robust monitoring to check on benefits and outcomes otherwise many projects are being implemented without generating much benefits to the governments and DISCOMs.

The recommendation for smart grid technology companies is to work collaboratively with DISCOMs, enable active participation by stakeholders, train, and handhold to educate and transfer the technology know how to ensure actual benefits of deployments and investments.

How advanced metering intelligence drives a smarter grid?

Adoption of advanced metering technologies shall enhance the performance of entire distribution network while reducing the losses. There is a need to mandatorily introduce smart meters in all customer segments. This will help DISCOMs manage load better while also reducing metering/billing losses, effective revenue protection measures. Smart prepayment meters will ease the cash flow challenges to a great extent.

Smart meters allow the introduction of a differentiated time-of-day tariff structure and facilitate the deployment of distributed rooftop solar (net meter) and introduction of various demand response programs. The access of the consumption data will give consumers insight to manage his usages, option to choose the tariff/programme to get benefited economically as well ecologically.

The growing deployment of AMI boons opportunities for improving quality of service, monitor voltage sag and swell, consumer load monitoring/meter data. DISCOMs are already achieving substantial value by using remote meter data to improve operations, design new services, catch hold of theft and defaulters, and improve customer relationships.

Brief us about your any success story on smart metering in India.

CyanConnode founded in 2002 is a leader in narrowband RF mesh network for IoT communication. Our standard based Omnimesh platform allows multiple routes to market and caters to multi-application network of smart grid. In last 9 years of operations in India, we undertook projects in various distribution utilities along with reputed meter manufactures and SI partners. Some of the projects which are completed and under support phase includes-UGVCL Ahmedabad, MPWZ Indore, CESC Mysore, Tata Power Mumbai, and APSPDCL- Tirupati. We are currently deploying over 1 million smart meters through our new projects.

Notably all the projects undertaken have yielded the desired results to maximise the system reliability, system efficiency, reducing energy and revenue losses.

In one of the Indian utilities, which deployed the CyanConnode AMI system for 1.20 lakhs consumers, utility has been able to achieve the average billing efficiency of 99.53 percent captured over a period of 20 months. In this case, utility has been able to recover its capex in 24 months' time and moving ahead with larger deployments in 5 new cities. Many Indian and international utilities have witnessed this project and gained insights on its success to improve average revenue to the tune of Rs 550 per meter per bill in just 24 months' time. This project has been well proven as one of the most successful Indian AMI deployment. ⚡