

Going Smart With Energy Audit

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The Indian power ministry recently mandated periodic energy accounting to reduce electricity losses for distribution companies (DISCOMs). This move will help identify areas of high transmission and distribution (T&D) losses and theft and enable corrective action. It will also provide detailed information about electricity consumption by different consumer categories and will make DISCOM officials accountable for any losses and/or thefts falling under their purview. Though it is a step in the right direction, it is essential to ensure that the pre-requisites are in place.

Current process

Typically, an energy audit is carried out by comparing the energy received at the 11kV feeding substations with the energy consumed at the consumer end. The difference between these two figures indicates the loss.

To be effective, energy audit processes have prerequisites such as 100% metering of feeders, distribution transformers (DTs), and consumer installations, along with accurate mapping of each feeder to its respective DTs, and each DT to its respective consumers (known as consumer indexing). Although 100% metering at the feeder level has been achieved, metering at the DT level is far behind (91% in urban and 66% in rural areas), as per the Ujwal DISCOM Assurance Yojna (UDAY) dashboard. No adequate data is currently available to assess the status of consumer metering.

To curb system losses, DISCOMs have taken multiple initiatives. Many states – under the restructured accelerated power development and reforms programme (R-APDRP) – have integrated IT applications and Advanced Distribution Management Systems for meter reading, billing and collection, energy accounting, and auditing to improve operational efficiency. Consumer indexing and Geographical Information Systems

(GIS) mapping were also carried out in select towns for baseline data creation. Yet, most DISCOMs have not reduced losses as implementation was restricted, with no clear plans or skilled resources for large-scale rollout.

However, some states have shown considerable improvement in loss reduction. In Delhi, Tata Power-DDL jurisdictions have shown a steep reduction in their losses to 6.48% in FY21. Similarly, all Gujarat DISCOMs witnessed a significant loss reduction through network improvement investments.

The pandemic was an eye-opener for DISCOMs since consumer meter readings could not be carried out. Due to lockdown restrictions, bills were estimated by considering [average consumption](#) or the previous month's bills. This process poses accuracy concerns for audits. Incomplete and incorrect tagging of feeders to the DT and DT to consumers leads to specious allocation of energy consumption data.

The Ministry of Power ([MOP](#)) has also provided timelines for the replacement of existing meters with smart meters with a prepayment feature. Smart meters confirming relevant information systems would be deployed for all consumers (except agricultural consumers).

Way forward

If DISCOMs continue with primitive energy audits (manual data entry and Excel-based auditing), the mandate may not aid in curbing losses. It is essential to ensure accurate consumer indexing. Field-level officials (including linemen, meter readers led by a junior engineer) should be given the responsibility of GIS mapping within a stipulated timeframe. Continuous updation of the DTs and connected consumers should be an ongoing process. Rotation of JEs for consumer mapping should be considered for validation, compliance, and strict adherence to timelines.

The aggregate technical and commercial (AT&C) losses is a combination of both technical and commercial loss. To segregate energy losses, energy accounting should be mandated at the DT level as well. Feeder-DT-level losses would account for mostly

technical losses in feeder power distribution. DT-consumer losses would be accounted under commercial losses since issues happen at the low-tension (DT to consumer) level. Further, DT-level auditing would also ensure adequate operation and maintenance of DT meters, lack of which is another major reason for erroneous energy accounting.

In conclusion, there is slow uptake of smart meters in DISCOMs due to a lack of clarity on the incremental revenue commensurate to the huge investment required. This can be mitigated by undertaking a cost-benefit analysis (CBA) for smart meters based on the consumer mix and DISCOMs' requirements. Then, a phase-wise rollout of smart metering can be carried out, based on CBA results. This would aid in better operations and accurate energy auditing for DISCOMs.