The $20-25 Billion Smart Metering Opportunity: Execution Needs Acceleration

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Synopsis

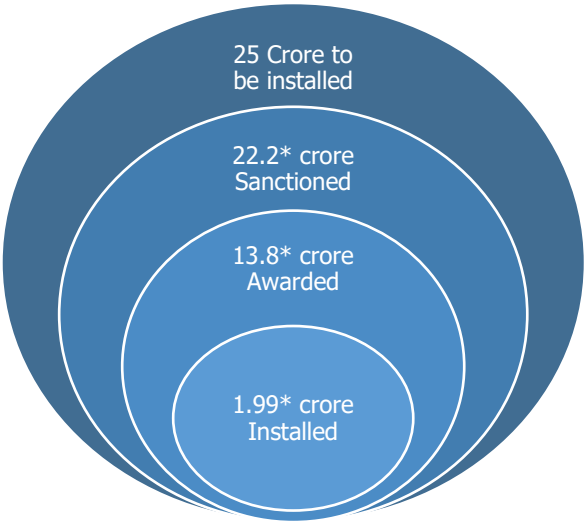
- India's power distribution sector is undergoing a critical transformation with the push towards smart grids. The implementation of Advanced Metering Infrastructure (AMI) has shown positive results. Within two to three years of the RDSS announcement in June 2021, discoms began to see a reduction in Aggregate Technical and Commercial (AT&C) losses. However, challenges persist due to variations across states. The AT&C losses for power distribution companies (discoms) have consistently decreased from 20.73% in FY20 to 17.6% in FY24, primarily driven by improvements in collection efficiency. Billing efficiency increased from 82.5% in FY23 to 83.6% in FY24, while collection efficiency rose from 96.1% to 96.4%. CARE Edge Ratings anticipates further reductions in AT&C losses as the scheme progresses, along with a narrowing of the ACS-ARR gap. However, achieving a zero-loss scenario remains a long-term objective.
- The installation of smart meters has been progressing at a slow pace, with around 2.0 crore meters installed by January 2025. CARE Edge Ratings projects that AMISP project awards will grow at a CAGR of approximately 30-40% in the coming years. However, it is anticipated that smart meter installations will reach only 25% of the target of 25 crore meters by March 2026, falling short of the government's set goal.
- The ambitious target of installing 25 crore smart meters requires a significant investment of Rs 1.25 lakh crore, with Rs 95,000 crore in debt and a 25% equity contribution. CARE Edge Ratings estimates that discoms could generate an additional revenue potential of around Rs 4.0 lakh crore over the next seven years. Should billing and collection efficiencies improve substantially, the financial gains could exceed initial projections, further bolstering the financial health of the power sector.
- The AMI sector has significant potential, as smart metering plays a key role in enhancing power sector efficiency through real-time monitoring, reducing power theft, and improving demand forecasting. However, the rollout of the scheme has been slow due to consumer resistance, operational and maintenance challenges, and delayed budgetary support. As the smart meter rollout gains momentum, timely policy support, financial incentives, and effective collaboration between DISCOMs and technology providers will be essential to install 25 crore smart meters over the next 3-4 years. This will be particularly important after the likely miss of the March 2026 target to fully realise the benefits of smart metering and unlock additional revenue.

Smart Meter Deployment Needs Acceleration

Smart Meter penetration in India, currently at 5-6%, lags behind developed nations like Japan (100%) and the USA (73%), as well as the global average of ~43%, highlighting an urgent need to bridge this gap and enhance energy efficiency. Now, India is making significant strides with its ambitious plan to install 25 crore smart meters over five years, from FY22 to FY26, presenting a $20-25 billion opportunity for the energy sector under the Revamped Distribution Sector Scheme (RDSS), which was launched in 2017. This scheme has an outlay of Rs 3 lakh crore and aims to reduce the AT&C losses to pan-India levels of 12-15% and the ACS-ARR gap to zero. The total investment for 25 crore smart meters is estimated at Rs 1.25 lakh crore to be financed by Rs 95,000 crore in debt and 25% equity contribution. Furthermore, under RDSS, the estimated budgetary support is Rs 97,000 crore, including support of approximately Rs 900 per smart meter, which translates to a budgetary support of Rs 25,000 crore. As

of March 2024, Rs 45,304 crore (including Rs 10,401 crore for smart meters) of Gross Budgetary Support (GBS) has been approved; however, only Rs 3,308 crore (including Rs 5 crore for smart meters) has been disbursed.

RDSS, in its fifth year, however, has seen lower-than-expected implementation, as evidenced by ~2.0 crore installations as of January 25, with various challenges, including delayed government support, developers prioritising IT infrastructure, and consumer resistance to smart meter installations, among others. India's smart meter manufacturing capacity is on track, currently estimated at 10 crore meters per annum and growing rapidly with top 8-9 manufacturers hold around 70-80% of this capacity. However, the timely disbursement of government support will be critical to accelerating the rollout, with installation is already expected to stretch by 2-3 years beyond its target.

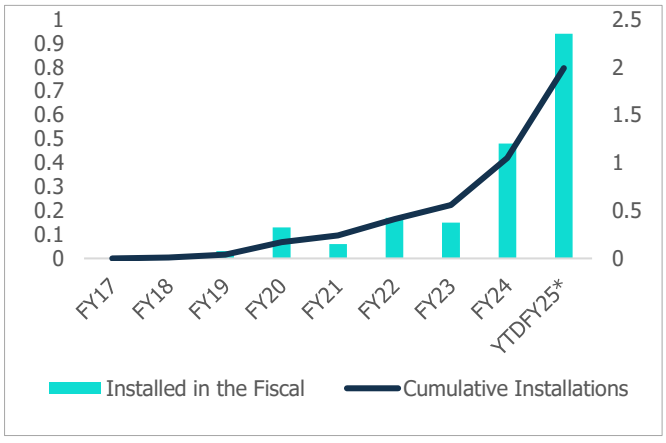


*as on January 22, 2025
Source: NSGM Portal

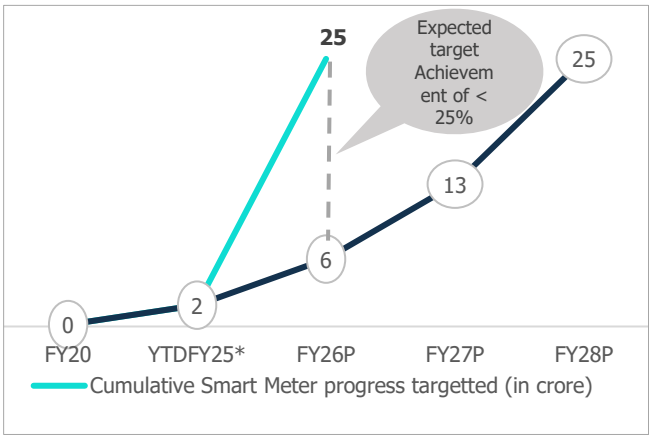
While the installation rate is expected to increase in the next two years with carried forward of momentum picking up in FY24 and FY25 and driven by an anticipated rise in sanctions/awards and greater utilisation of smart meter manufacturing capacity, CareEdge forecasts that the installation will be less than 25% by March 2026, compared to the target of 25 crore smart meters. AMISP project awards are to grow at a CAGR of ~30-40% over the next few years if the target has to be met by FY28

Moving forward, challenges will remain in achieving consistent progress across states and further accelerating delivery while realising the intended sustainability benefits. Although state regulators and the Ministry of Power mandate this transition, discoms must take a proactive role in managing the change, both at the organisational and consumer levels, to ensure a smooth and collaborative implementation. This requires sustained focus on capacity building, timely execution, and effective monitoring to meet the scheme's targets. Through strategic reskilling, clear communication, and increased consumer awareness, discoms can transform these challenges into opportunities, resulting in a more efficient and reliable power distribution system.

Smart Meter Installation (in crore) progress



Smart Meter Deployment Current Status and Schedule



Source: NSGM Portal and CareEdge Ratings

DDF Effectiveness yet to be seen with lower Digital Penetration

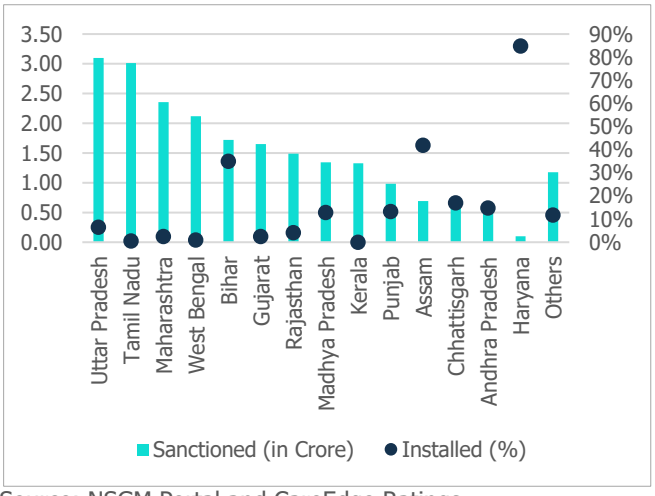
The Direct Debit Facility (DDF) is structured to ensure secure monthly payments to AMISPs with a minimum 5x cover from consumer electricity online payments. However, its effectiveness may be challenged by inconsistent digital penetration across states. While some discoms have achieved high digital collection levels, others still lag, with digital payments accounting for less than 25% of total collections. This disparity could impact the stability of the DDF pool and hinder discoms' ability to maintain the required payment cover. Bridging this gap through targeted digital adoption initiatives will be crucial for the smooth implementation of the DDF mechanism.

States with high AT&C losses will be pivotal in achieving targeted efficiency improvements

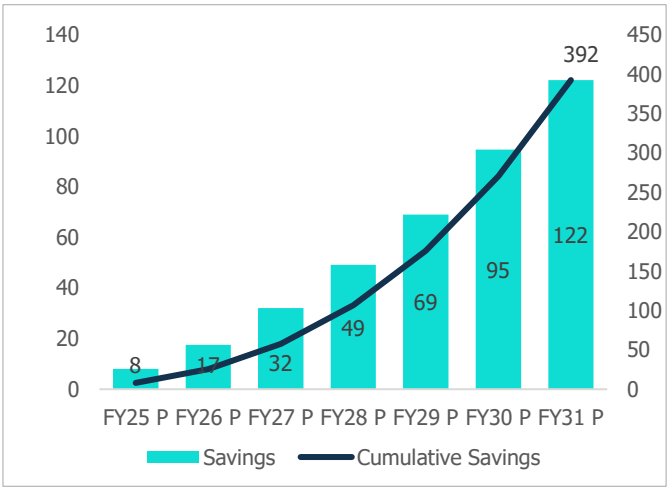
The top eight states have been allocated 16.8 crore meters out of the sanctioned 22.2 crore meters. Of the 13.8 crore meters awarded, their share stands at 78%. However, execution has been lagging post-award. Bihar and Assam together account for 45% of the total installations, with Bihar leading at 60 lakh installations—approximately 30% of India's total. In Bihar, 35% of the sanctioned smart meters have already been installed.

Uttar Pradesh is a key focus area due to its high AT&C losses; although all sanctioned meters have been awarded, but execution is lagging. Maharashtra has received a significant RDSS allocation, with all sanctioned meters already awarded. AT&C loss recovery trends align with smart meter installations, with Bihar achieving the highest recovery between FY16 and FY23. States like Rajasthan, Uttar Pradesh, Bihar, and Haryana have also made notable progress. CareEdge Ratings expects the cumulative additional revenue potential of discoms to be around Rs 4.0 lakh crore over the next 7 years by enhancing billing and collection efficiency through the installation of smart meters. The savings can be higher if the billing and collection efficiency improves significantly beyond the estimated levels.

State-wise installation status



Est Revenue Benefit for Discom (In Rs '000 crore)

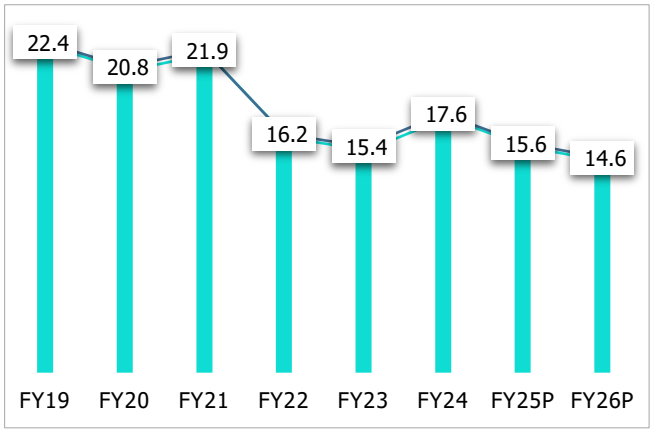


Source: NSGM Portal and CareEdge Ratings

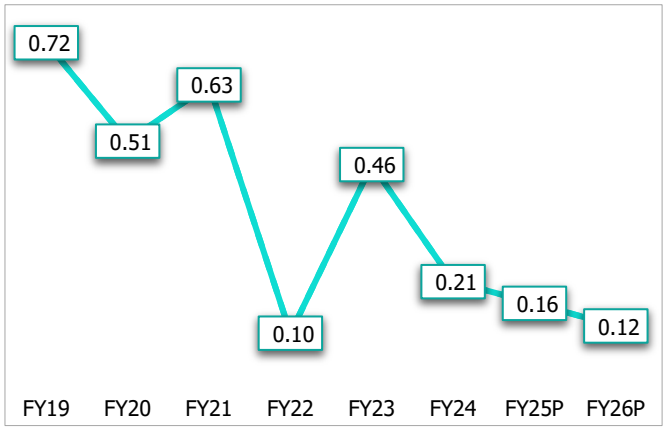
Smart metering implementation and potential savings, as just discussed, will lead to improved financial profiles of discoms, as they will be reflected in reduced AT&C losses and the ACS-ARR gap. While AT&C losses have improved significantly from 30.5% in FY2007, they remain relatively high, especially considering the increasing volumes and higher prices. In FY24, provisional losses stand at 17.6%, reflecting a 2% increase from FY23. However, this still represents a notable improvement compared to the 22.3% losses recorded in FY21. The sector faced considerable challenges last year, with discoms having to manage an exceptionally high demand, compounded by the financial strain of unpaid government dues. Furthermore, rising power purchase costs, limited tariff hikes, and existing debt added to the operational pressures. Despite these challenges, Billing and collection efficiency improved from 82.5%

in FY23 to 83.6% in FY24 and from 96.1% to 96.4%, respectively. Over the years, the ACS-ARR gap has steadily narrowed, from Rs 0.72 per unit in FY19 to Rs 0.21 per unit in FY24. While this reduction is encouraging, closing the gap entirely remains a distant goal. CARE Edge Ratings anticipates a gradual reduction in AT&C losses and further narrowing of the ACS-ARR gap in the coming years, though achieving a zero-gap target seems unlikely in the near term.

All-India AT&C losses (%)



All-India ACS – ARR Gap (INR/kWh)



Source: PFC and CareEdge Ratings

CareEdge Ratings View

While smart metering may not be a complete solution for discoms, it holds significant potential to address operational inefficiencies and create substantial revenue opportunities, especially for discoms that have previously struggled with inadequate billing. The RDSS initiative, designed to address these challenges, is supported by strong financial backing, including a Rs 900 subsidy per meter and a substantial pipeline of 23 crore smart meters yet to be installed. While no major surprises have emerged so far that could severely impact the project's economics, smart meter penetration in India—currently at 5-6%—remains far behind developed nations like Japan (100%) and the USA (73%), as well as the global average of about 43%. This highlights the urgent need for improved energy efficiency. Despite being in its fifth year, the RDSS has seen slower-than-expected progress, with only 2.0 crore meters installed by January 2025. This delay stems from several challenges, including delayed government support, a focus on IT infrastructure by developers, and consumer resistance to the installation of smart meters. India currently sufficient capacity to install around 10 crore meters annually, with the top 8-9 manufacturers accounting for about 80% of the capacity. However, the timely release of government support is crucial to accelerate the rollout, which is now expected to be delayed by 2-3 years beyond the original target. Some challenges can be mitigated through effective customer training, clear communication, and proactive risk management. Ensuring smooth execution, maintaining supply chain stability, and promoting transparency will be crucial for the long-term success of the initiative.

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