

Financial Journey After Consumers Pay Their Electricity Bills

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By Aniket Baregama and Rishu Garg

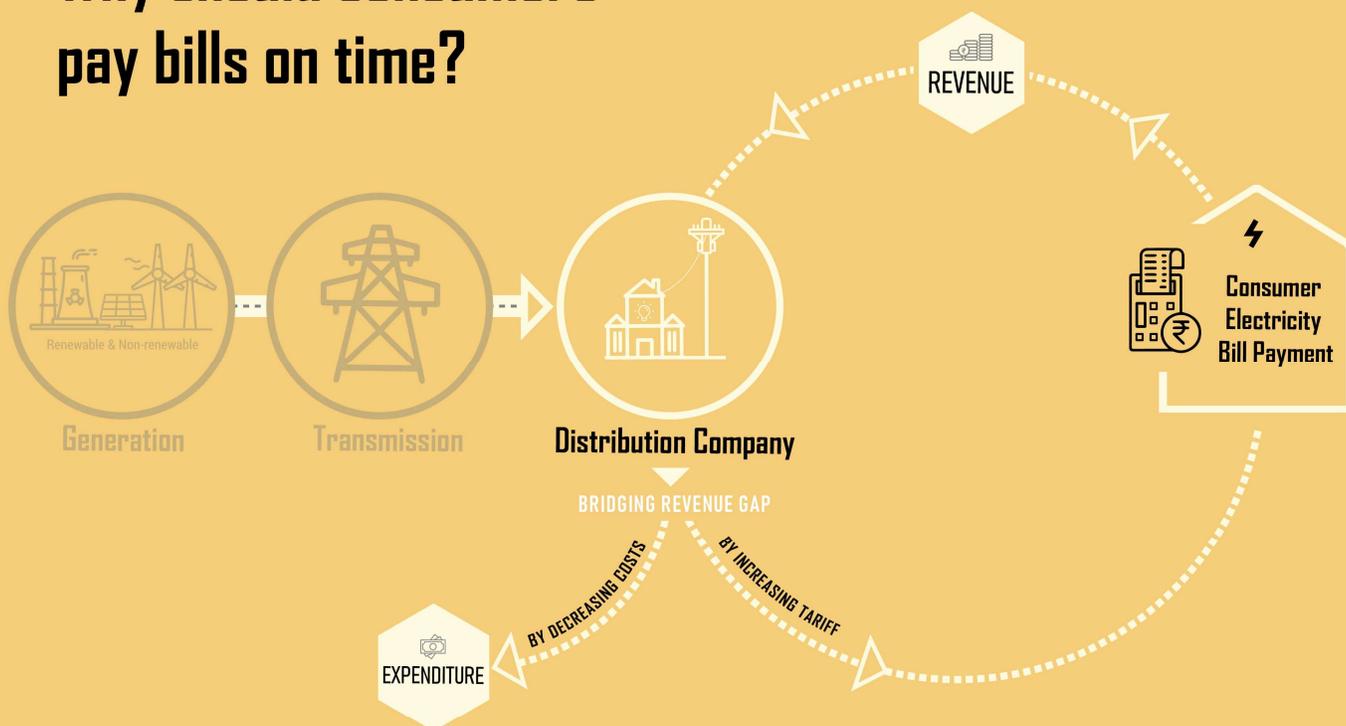
CSTEP launched the Empower series of blog articles to simplify the power sector for non-technical readers. Through the series, we hope to explain how every step of the journey of electricity affects the consumer. In the [first article](#), we introduced you to the many actors involved in the journey of electricity. The [second article](#) of the series explains the costs involved in electricity generation. The [third article](#) simplifies the electricity bills, while detailing the aspects relevant for the consumers, to enable them to understand their bills better. Continuing this informative journey, the fourth segment discusses the various expenses associated with power distribution and explains revenue recovery assessment for distribution companies.

Consumers make their electricity bill payment to their local power distribution company (DISCOM). DISCOMs are responsible for supplying

power to end consumers by procuring power from numerous contracted power plants and distributing it to the consumers. To recover the cost incurred by DISCOMs in supplying power, the consumers are charged a certain tariff based on their category. The revenue earned from the consumer bill payments is then distributed to all the entities in the entire power sector value chain. Thus, cost and revenue recovery by DISCOMs is of utmost importance for the entire power sector.

The efficiency of this recovery is measured by the revenue gap between the average cost of supply (ACS) and average revenue realisation (ARR); termed as 'ACS-ARR gap'. Lower the ACS-ARR gap, more financially stable is the DISCOM. The ACS-ARR gap comprises various components.

Why should consumers pay bills on time?



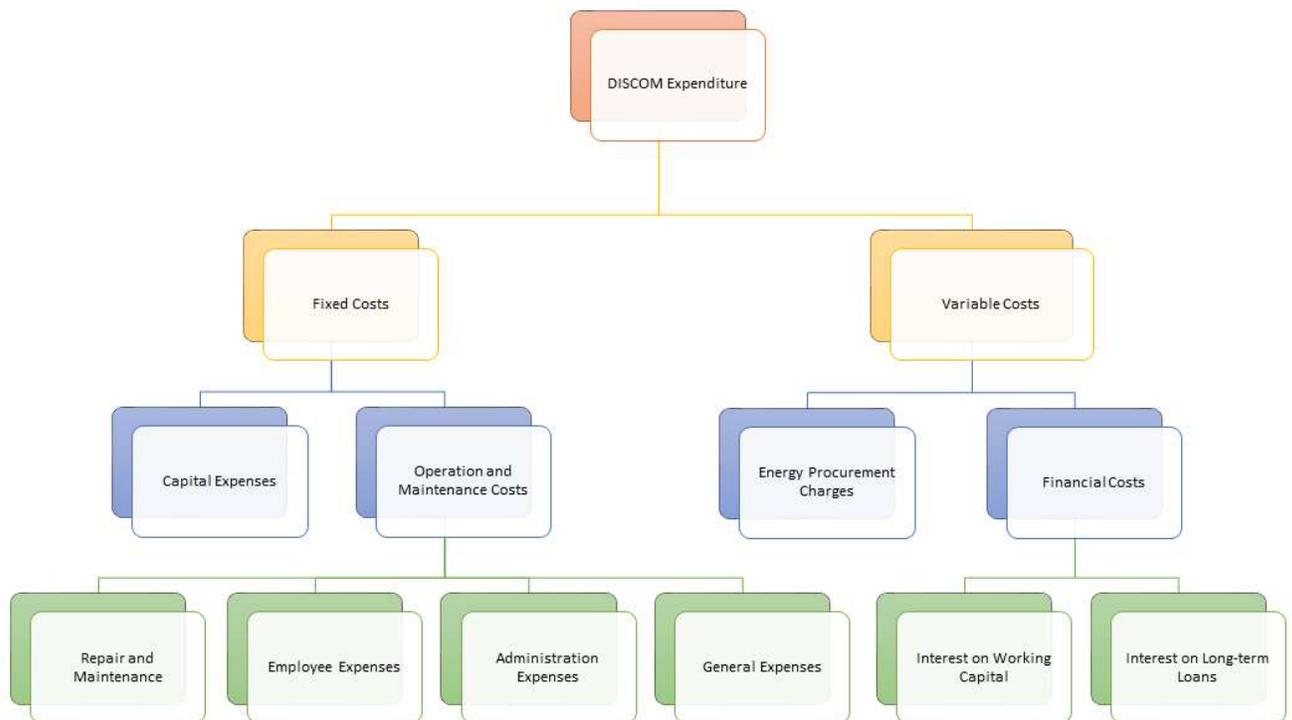
DISCOMs mainly generate revenue from the payments made by their consumers for electricity consumption. (Image: CSTEP)

Average Cost of Supply (ACS)

It is the average cost of electricity (₹/unit) incurred by a DISCOM in supplying power to all consumers. It is calculated by dividing total expenses borne by the DISCOM with the total energy received at the DISCOM's substations.

$$ACS = \frac{\text{Total Expenditure Amount (₹)}}{\text{Total Input Energy (Units)}}$$

Further, the total expenditure by a DISCOM can be segregated into fixed and variable costs.



Fixed Costs

1. Capital Expenses: These involve all investments made by the DISCOM for developing distribution infrastructure. Electrical infrastructure essentially comprises distribution substations, power cables, towers, transformers, control rooms, monitoring sensors, and SCADA (supervisory control and data acquisition). Office buildings and other civil infrastructure costs are also considered capital expenses.

2. Operation and Maintenance (O&M) Costs: To operate and maintain the huge distribution infrastructure, DISCOMs have to bear various O&M costs.

a) *Repair and Maintenance:* Power system infrastructure requires regular maintenance from controllable and natural factors. This includes repairs or replacement of system devices because of wear and tear, ageing, or burned-out damages.

b) *Employee Expenses:* These include fixed monthly salaries of the DISCOM staff (office workers and field operators).

c) *Administration Expenses:* A DISCOM as an institution has its own expenses for operating offices and fulfilling essential needs of HR, accounts, and other internal departments.

d) *General Expenses:* DISCOMs have to pay for some of the rented infrastructure such as land occupied to install electric poles and

distribution transformers in private farms or along the roadsides. Additionally, costs of processes linked to IT systems operations, metering, and billing are considered general expenses.

Variable Costs

1. Energy Procurement Charges: The power purchase cost (PPC) is a major parameter in ACS, accounting for 80–85% of the total cost of supply. The quantity of electricity purchased (in million units) from generation companies is based on the actual electricity demand from end consumers. Therefore, the cost of energy procurement to a DISCOM remains a variable cost.

2. Financial Costs: The following costs constitute financial costs:

a) *Interest on Working Capital:* Working capital is a basic capital amount mostly taken as a bank loan to smoothly manage the operational expenses. It helps DISCOMs to pay their employees on time and sustain administrative expenses, even in bad financial conditions.

b) *Interest on Long-term Loans:* Long-term loans are taken by DISCOMs for building the distribution infrastructure or expanding the existing network under wide-reaching projects. The interest paid on these loans remains a variable cost.

Average Revenue Realised (ARR)

DISCOMs mainly generate revenue from the payments made by their consumers for electricity consumption. Electricity is sold at different tariffs to different end-consumer categories. Agricultural and other economically weaker sections of consumers usually get electricity either very cheap or free of cost. The DISCOMs are paid for such expenses by state governments through subsidy payments.

$$ARR = \frac{\text{Revenue from Sale of Power on Subsidy Recieved Basis + Other Income (₹)}}{\text{Total Input Energy (Units)}}$$

DISCOMs also generate some additional income from the disposal of assets, delayed payment surcharge, meter rents, interest on security deposits, and newsletter advertising. The total revenue collected through consumer bill payments, subsidies, and other incomes are cumulatively used to calculate ARR, as shown in the formula.

Since the ACS–ARR gap represents the efficiency of DISCOMs to generate revenue commensurate with the costs incurred by them, the ACS–

ARR gap should be close to zero. While better operational efficiencies could help DISCOMs optimise some of their distribution costs, ARR can be optimised by accurate meter readings and eradication of billing errors. Consumers should also help DISCOMs by paying their bills fully and on time, thereby improving revenue collection. A reduced ACS–ARR gap and improved revenue collection would enable DISCOMs to realise quality power supply, resulting in consumer satisfaction.

About the authors: Aniket Baregama is Research Engineer and Rishu Garg is Research Scientist working on Regulatory Reforms in the Power Sector. The authors may be contacted on Twitter (@Aniket_2012 & @GARora_Rishu).

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