

City Level Business Model for DISCOM Jaipur and Udaipur



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Executive Summary

India's rooftop solar sector is growing rapidly, yet distribution companies (DISCOMs) in Rajasthan have been slow to embrace it — largely because the prevailing deployment model erodes their revenues. This study asks whether alternative business models can turn rooftop solar from a financial liability into a source of value for DISCOMs, using Jaipur and Udaipur as focal cities.

Rajasthan's cumulative rooftop solar capacity reached approximately 2,074 MW by February 2026, a significant increase but still only about 5–6 per cent of the state's total solar installed base. Under the PM Surya Ghar and Mukhya Mantri Nishulk Bijli Yojana schemes, application volumes are high, but the conversion from registration to installation remains a persistent bottleneck. About 1.04 crore of the state's 1.55 crore domestic consumers are on tariff subsidy, with roughly 32 lakh receiving zero electricity bills — leaving them with little financial incentive to adopt rooftop solar on their own. These structural gaps make the case that DISCOM-led deployment models are not optional but essential.

The study evaluates three business models from the DISCOM's financial perspective, each analysed through a 25-year cost-benefit framework benchmarked to 1 MW of aggregated domestic rooftop capacity:

The **CAPEX (Net Metering) model**, where the consumer owns the system and the DISCOM plays a passive facilitating role, yields a **negative NPV of ₹32 lakhs per MW** for the DISCOM. Revenue loss from self-consumption at high telescopic tariff slabs far exceeds the savings the DISCOM earns from avoided power purchase. Cumulative breakeven is not achieved within the system's 25-year life.

The **RESCO/PPA model**, where the DISCOM acts as a Super-RESCO or onboards a third-party developer under a long-term power purchase agreement, yields a **positive NPV of ₹1,271 lakhs per MW**. The DISCOM earns PPA revenue on every unit generated and retains the consumer relationship, while the consumer receives solar power below the retail tariff with no upfront cost. This model is best suited for high-consumption households (above 200 units per month) and generates positive returns from Year 1 onward.

The **EPC–Annuity (Hybrid Annuity) model**, where the DISCOM directly invests in the system (net of MNRE subsidy and a modest consumer contribution) and pays the EPC developer through deferred annuity instalments, yields a **positive NPV of ₹555 lakhs per MW**. The DISCOM owns the asset outright and captures value through avoided procurement at a levelised generation cost of just ₹2.13 per kWh. This model targets lower-consumption households (200 units or below) who would not adopt rooftop solar on their own.

The central finding is that the DISCOM's financial outcome is not determined by solar economics it is determined by the degree of DISCOM agency in the business model. The same 1 MW of rooftop capacity produces a loss when the DISCOM is a passive bystander and a substantial gain when it is an active participant. The three models are not competing alternatives they are complementary instruments. RESCO serves as the model protecting revenue from high-value consumers which might have eroded due to self-consumption under net metering. EPC–Annuity serves as a model which extends rooftop solar to the broader residential base that the market would not reach on its own.

At the city level, Jaipur (served by JVNVL) is Rajasthan's most advanced rooftop solar market, with over 15,900 PM Surya Ghar installations. Its challenge is one of scaling and infrastructure readiness, particularly distribution transformer capacity in high-adoption areas. Udaipur (served by AVVNL) is at an earlier stage, with approximately 5,800 installations. Its challenge is market creation: building the vendor ecosystem, strengthening grid infrastructure, and leveraging the city's 40 MW supply deficit as a rationale for treating rooftop solar as a supply-side resource. Both cities are part of the MNRE's City Accelerator Programme, providing an institutional platform for implementing these recommendations.

The study concludes that Rajasthan's DISCOMs can convert rooftop solar deployment into a revenue-positive activity by transitioning from passive net metering facilitators to active participants through RESCO procurement and EPC investment models. A layered strategy — deploying RESCO for high-consumption segments and EPC–Annuity for the broader residential base — would cover the full spectrum of domestic consumers and eliminate the default reliance on CAPEX model.

1. Introduction

1.1. Background and Rationale

India's solar energy transition has been one of the most consequential energy policy stories of the past decade. Against a national target of 500 GW of non-fossil fuel capacity by 2030, solar power has emerged as the primary vehicle of change, with rooftop solar occupying a strategically distinct position within this broader effort. Unlike utility-scale ground-mounted projects, rooftop solar generates power at the point of consumption, reduces transmission losses, and enables households, commercial establishments, and government buildings to become active participants in the energy system. India added approximately 7.1 GW of rooftop solar capacity in 2025 alone — a 123 percent increase over the previous year — bringing cumulative rooftop installations to 20.8 GW by December 2025.¹

Rajasthan stands at the forefront of India's solar ambition. Endowed with over 325 days of sunshine annually and some of the highest global horizontal irradiance (GHI) levels in the country the state has already surpassed 33 GW of total installed solar capacity as of mid-2025. The state's Integrated Clean Energy Policy 2024 has set an even more ambitious target of 125 GW of renewable energy capacity by 2029–30, with solar accounting for 90 GW of this total.²

Despite this leadership in large-scale solar deployment, rooftop solar remains a significantly underutilised resource in Rajasthan. While ground-mounted installations account for approximately 87 percent of the state's solar capacity, rooftop solar contributes only around 6.1 percent — a stark contrast given the state's resource endowment and the size of its consumer base. Rajasthan's three state-owned distribution companies (DISCOMs) — Jaipur Vidyut Vitran Nigam Limited (JVVNL), Ajmer Vidyut Vitran Nigam Limited (AVVNL), and Jodhpur Vidyut Vitran Nigam Limited (JdVVNL) — together serve a cumulative Low Tension (LT) consumer base of over 13 million connections, which consume more than 30 percent of the state's total energy. The potential for rooftop solar to serve this consumer base remains largely untapped.³

A central reason for this gap is the ambiguous and often adversarial relationship between rooftop solar adoption and DISCOM financial health. Under prevailing net metering frameworks, as higher-paying consumers reduce their grid purchases through self-generation, DISCOMs face direct revenue erosion and disruption to the cross-subsidy structures that underpin affordable electricity for lower-income segments.^{4,5} This

1 MERCOM India – 2025 Annual Rooftop Solar Market Report

2 Government of Rajasthan. Integrated Clean Energy Policy 2024. Jaipur: Department of Energy, Government of Rajasthan, 2024

3 Research Triangle Institute International India. "Rooftop Solar Potential: Rajasthan Offers a Huge Untapped Market Opportunity." Renewable Watch, March 2024.

4 Mercom India. India Rooftop Solar Market Report 2024

5 Shakti Sustainable Energy Foundation, Solar Rooftop: Perspective of DISCOMs. New Delhi, Shakti Foundation, 2019

tension has translated into institutional resistance such as the cases of DISCOMs delaying or denying net metering approvals, slowing adoption well below national targets.⁶

Yet this framing of rooftop solar as a threat to DISCOMs is neither inevitable nor accurate. Evidence from Kerala and Gujarat demonstrates that utility-led rooftop solar deployment models can generate new revenue streams, reduce peak procurement costs, support Renewable Purchase Obligation (RPO) compliance, and modernize distribution infrastructure.⁷ The challenge, then, is not whether DISCOMs should engage with rooftop solar, but how business models can be structured to make such engagement financially viable and operationally scalable.

It is against this backdrop that this study has been undertaken. The launch of PM Surya Ghar: Muft Bijli Yojana (PMSGY) in 2024 and on similar line Mumukhya Mantri Nishulk Bijli Yojana (MMNBY) has created a policy window that demands a commensurate institutional response at the city and DISCOM level. The question of which business models can drive rapid, city-level rooftop solar adoption while preserving DISCOM financial sustainability has therefore emerged as one of the most pressing questions in Rajasthan's energy policy landscape.

1.2. Scope and Objectives

This study examines business models for solar rooftop deployment at the city level, with Jaipur and Udaipur selected as the focal geographies. The two cities represent distinct urban profiles within Rajasthan. Jaipur as the state capital and a large metropolitan centre served by JVVNL, and Udaipur as a mid-sized heritage and tourism city served by AVVNL, making them instructive cases for understanding how rooftop solar strategies may need to be adapted to local demand patterns, grid conditions, and institutional contexts. Each city is analysed independently, allowing for city-specific findings and recommendations, while cross-cutting themes and comparisons are drawn at the study level.

The central objective of this study is to identify and evaluate the business models through which DISCOMs can take an active and enabling role in accelerating rooftop solar adoption at the city level, while simultaneously protecting and, where possible, enhancing their own financial position. This dual objective of accelerating deployment and safeguarding DISCOM revenues is treated not as a trade-off to be managed, but as a design challenge to be resolved through appropriate model selection, risk allocation, and policy support.

Specifically, the study evaluates three principal business model archetypes:

⁶ Centre for Social and Economic Progress (CSEP), Rooftop Solar: A Trade-off Between Consumer Benefit and Discom Finances, Working Paper, July 2025

⁷ Rocky Mountain Institute (RMI), How Distributed Solar Can Reinvigorate India's Electricity Distribution Companies, May 2024

- i. Capital Expenditure (CAPEX) model
- ii. Renewable Energy Service Company (RESCO)/Power Purchase Agreement (PPA) model
- iii. Engineering, Procurement, and Construction (EPC) model under a public procurement framework

The study is informed by secondary desk research, drawing on national and state policy documents, DISCOM regulatory filings, published financial analyses, and existing literature on rooftop solar business models in comparable Indian contexts. Financial viability is assessed through Net Present Value (NPV) modelling. The study does not cover utility-scale solar, open access arrangements, or off-grid installations, and is focused exclusively on grid-connected rooftop systems within the residential segments.

The recommendations arising from this study are directed at state government and DISCOM responsible for designing and implementing rooftop solar programmes in Rajasthan's urban centres. The intent is to provide an evidence-based framework that can guide both the selection of appropriate business models for different consumer segments and the regulatory and institutional reforms needed to make these models operationally effective.

2. Methodology

The study evaluates three structurally distinct utility-led business models for RTS deployment each representing a different allocation of capital risk, ownership, and financial benefit between the DISCOM, the consumer, and in the RESCO case, a private developer.

For each model, the framework computes the financial outcome from the DISCOMs perspectives over a 25-year project life. The analysis is conducted at a 1 MW aggregated scale for all three models, which serves as a replicable unit-economics reference for programme planning at any scale.

All financial outcomes are expressed in present-value terms using a Weighted Average Cost of Capital (WACC) of 10.5%.

2.1. Model Parameters and Data Sources

The CAPEX, EPC, and RESCO model is organised around three sets of input parameters. Each parameter set captures a different dimension of the rooftop solar programme, physical characteristics of the solar deployment, tariff and pricing environment, and financial structure of each model. The values adopted for all parameters are sourced from RERC tariff orders, DISCOM ARR filings for FY 2025–26, and MNRE programme guidelines. The full parameter set for each model is presented in **Annexure A**, **Annexure C**, and **Annexure G** respectively.

The generation profile underpinning all three models is identical. Annual generation starts at 1.752 MU for a 1 MW aggregated system at 20% CUF and declines each year at a deration rate of 0.75%. The deration formula applied is:

$$\begin{aligned} \text{Deration Loss (Year } n) &= \text{Gross Generation} \times [1 - (1 - 0.75\%)^{(n-1)}] \\ \text{Net Generation (Year } n) &= \text{Gross Generation} - \text{Deration Loss} \end{aligned}$$

2.2. Levelized Cost of Energy (LCOE)

LCOE represents the average cost of generating one unit of electricity over the entire 25-year project life, expressed in ₹ per kWh. It represents the cost of each kWh for the investor, accounting for everything spent over the project's lifetime.

$$LCOE = \frac{\sum [Annual\ Cost(n) \times DF(n)]}{\sum [Net\ Generation(n) \times DF(n)]}$$

LCOE is not applicable to the Consumer CAPEX model, since the consumer owns and funds the system entirely. In the EPC and RESCO model, the LCOE is computed on DISCOMs net invested capital after including the MNRE subsidy and consumer contribution based on the model's specification.

2.3. Cost Benefit Analysis Framework

Cost-Benefit Analysis (CBA) is adopted as the primary evaluation framework because RTS deployment generates financial consequences that extend across a 25-year horizon, involve multiple stakeholders, and cannot be adequately captured by a single-year snapshot. CBA converts all future cash flows into a NPV using a discount rate, making consistent and comparable assessment across the models. However, given the scope of this analysis only DISCOM's CBA is discussed. The annual net benefit in each year is calculated with difference between what the DISCOM gains and what it foregoes or spends as a result of RTS generation within its network

The general DISCOM CBA formula applicable across all three models is:

$$\begin{aligned} \text{Net Benefit to DISCOM} = & \text{Annual Generation} \times ([\text{APPC incl. T\&D losses}] + [\text{REC price}] - \\ & [\text{Consumer retail tariff on self-consumed units}] - [\text{FiT payment on surplus exported units}]) + \\ & [\text{MNRE performance incentive}] - \text{Year 1 only} - [\text{State subsidy outflow per kWp}] - \text{Year 1 only} \end{aligned}$$

Following is the business model specific CBA structure adopted for the analysis -

2.3.1. Model 1 — Consumer CAPEX

Under the Consumer CAPEX model, DISCOMs invest no capital. The benefit and cost structure follows the general framework directly; avoided power purchase, avoided REC, and MNRE incentive on the benefit side, revenue loss on self-consumed units and FiT payments on exported surplus on the cost side. The consumption pattern of a typical domestic household is represented in the 40:60 ratio. 40% is self-consumed and 60% is exported to grid. The state subsidy disbursement through CM Muft Bijli Yojana grant on behalf of the state government, is treated as a pass-through recovered in instalments and does not permanently affect the model's net financial position. For description of the model, please refer to **Annexure B**.

2.3.2. Model 2 — EPC-Annuity

Under the EPC-Annuity model, DISCOMs invest their own capital — net of the MNRE subsidy and consumer contribution of ₹5,000/kWp — and bear the full cost of generation as computed through the LCOE model. An additional cost specific to this model is the EPC annuity payment, where 33.33% of the net DISCOM capital is deferred and paid to the EPC developer in equal annual instalments over Years 1 to 5, after which this obligation ceases entirely. The net benefit follows a two-phase profile — lower in Years 1 to 5 when the annuity obligation is active, and higher from Year 6 onwards when it ends, with a further step-up in Year 14 when the loan is fully repaid. For description of the model, please refer to **Annexure E**.

2.3.3. Model 3 — RESCO

Under the RESCO model, the DISCOM takes an active position — either by onboarding a third-party RESCO developer who invests in, owns, and operates the RTS system on the consumer's premises, or by acting as a Super-RESCO itself and directly funding the deployment. In both variants, the consumer signs a long-term Power Purchase Agreement and pays a fixed PPA tariff set at a discount to the prevailing retail tariff, while the DISCOM retains control over the consumer relationship and billing.

For this analysis, the model is evaluated under the third-party developer arrangement. The developer bears the full capital cost, recovered through PPA revenues over 25 years, and the DISCOM's benefit flows from avoided power purchase savings and avoided REC costs without any capital commitment. The LCOE in this model represents the developer's cost floor and sets the minimum viable PPA tariff. For description of the model, please refer to **Annexure H**.

2.4. Limitations

The analytical framework, while comprehensive, operates within a defined set of boundaries that should be acknowledged when interpreting results.

- Due to the model's limitations, we used only JVVNL's tariff structure for the indicative assessment—JVVNL also has the highest T&D losses among the two DISCOMs, making it the ideal case for testing whether DRE adoption reduces T&D losses and yields long-run DISCOM benefits
- The analysis is conducted at a 1 MW project level and does not capture portfolio-level effects on the DISCOM's fixed cost recovery or ARR balance at full programme scale.
- Uniform 2% escalation is applied to both APPC and retail tariff. In practice, these rates escalate at different speeds, and divergence would materially alter the net benefit trajectory.
- The Feed-in Tariff is held constant at ₹3.26/kWh throughout 25 years. RERC FiT revisions — upward or downward — would alter the DISCOM's cost obligation significantly.
- The 40:60 self-consumption to export ratio is applied uniformly. Actual ratios vary by household, season, and time of day, introducing averaging error at the individual consumer level.
- Grid integration costs — metering infrastructure, network upgrades, and monitoring systems — are outside the scope of this project-level CBA but are real costs at programme scale.
- The EPC-Annuity model assumes all three parties honour their contractual obligations throughout the project life. Counterparty risk across 333 consumers is not modelled.
- The RESCO model assumes a creditworthy developer is willing to invest at the assumed PPA discount rate for 25 years. Developer appetite for domestic rooftop PPA contracts in Rajasthan at this scale is currently limited.

3. Rooftop Solar Market Size and Growth Trajectory

As of May 2025, Rajasthan's cumulative rooftop solar installed capacity stood at 1,590 MW.⁸ The most recent MNRE state-wise data, as on 28 February 2026, places the figure at 2,074.3 MW, a substantial addition of approximately 480 MW in the nine months between May 2025 and February 2026.⁹ Rooftop solar represents approximately 5.4 percent of the state's total solar installed base.

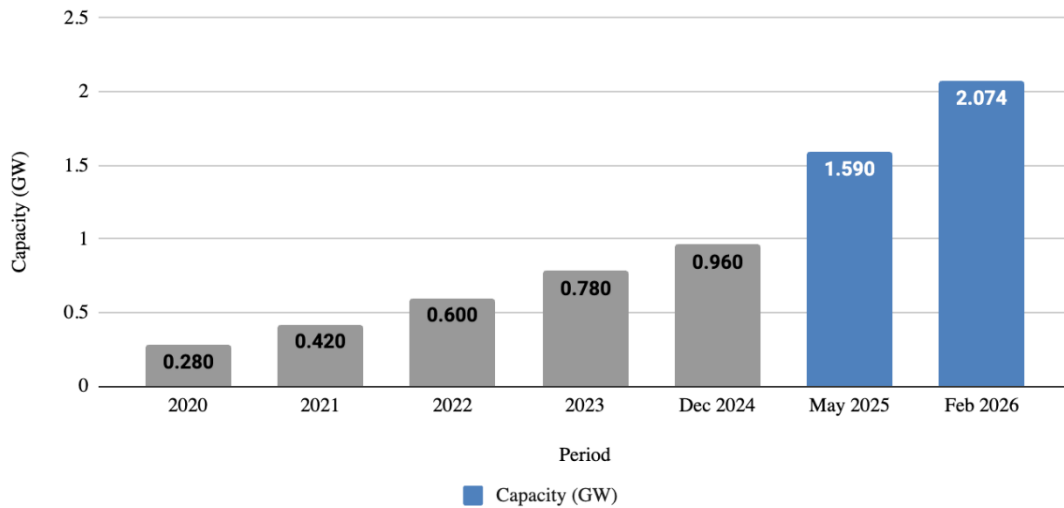


Figure 1: Rajasthan rooftop solar cumulative installed capacity.

Source - Values for May 2025 (1.59 GW) and February 2026 (2.07 GW) are confirmed by MNRE state-wise data. Earlier values (2020–2024) are estimates derived from national share data and are marked accordingly.

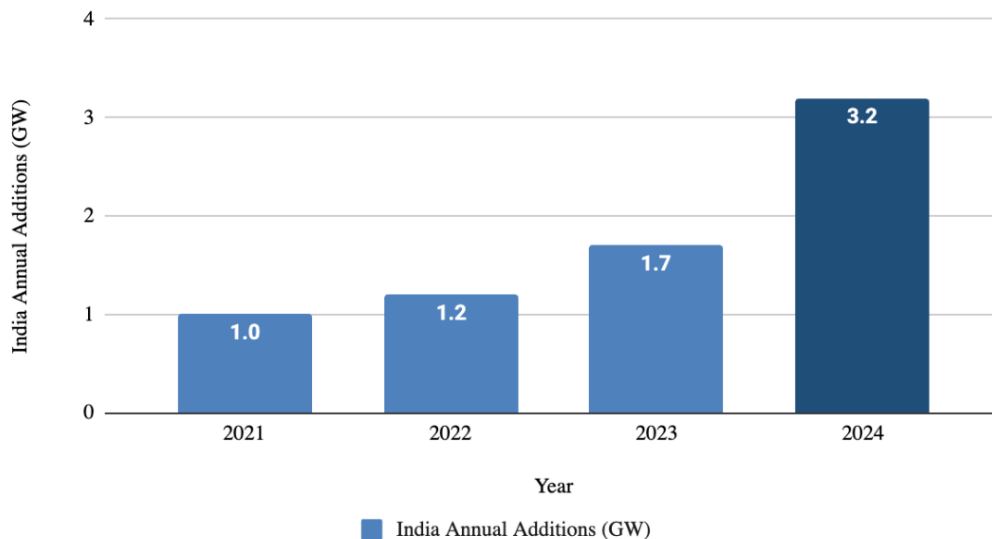


Figure 2: India annual rooftop solar additions (2021–2024); Source:- MNRE

This acceleration has been shaped by two converging levers. First, PMSGY, augmented by state top-up of ₹17,000 per system under Rajasthan's state-level 150-unit MMNBY,

⁸ Ministry of New and Renewable Energy (MNRE), Government of India, 'State-wise Rooftop Solar Installations,' May 2025

⁹ Ministry of New and Renewable Energy (MNRE), Government of India, 'State-wise Rooftop Solar Installations,' Feb 2026

has made rooftop solar cost effective for eligible households. Second, RERC’s revised export tariff updated in October 2025 to ₹3.26/kWh under net metering and ₹3.65/kWh under net billing, representing a 20–25 percent increase over the February 2024 tariff which has improved the financial return for rooftop solar owners.¹⁰

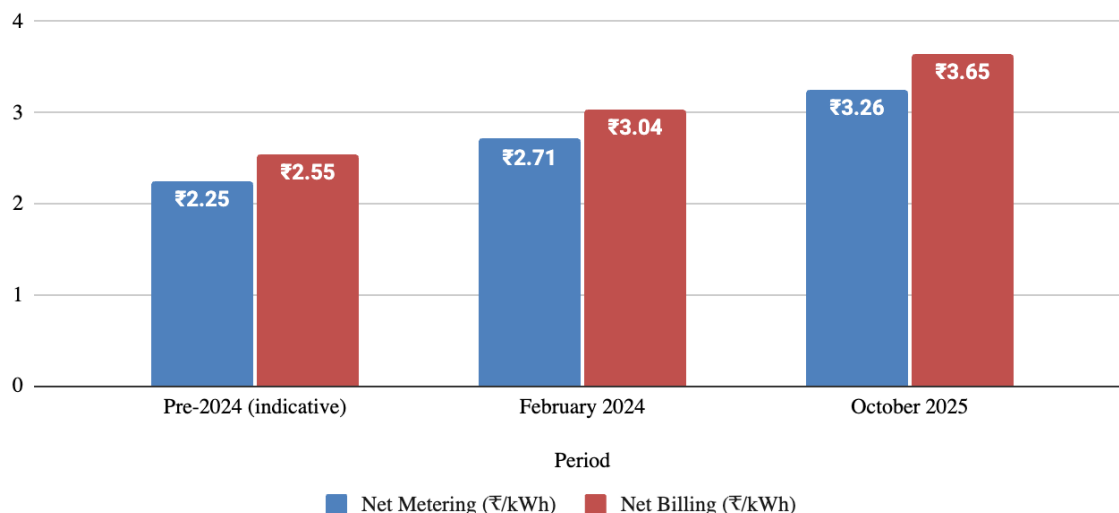


Figure 3: JVNL FiT for domestic rooftop solar consumers; Source:- RERC

Despite these gains, execution continues to lag registration intent significantly. Under the 150-unit Nishulk Bijli Yojana 2,77,448 consumers registered by 7 January 2026, yet only 7,322 installations had been completed with cumulative installed capacity of 26.2 MW. Given this there could be possible three principal reasons for this gap:

- i. **The zero-bill disincentive** - Approximately 1.04 crore consumers are on tariff subsidy, with around 32 lakhs receiving zero electricity bills, making the financial benefit of rooftop solar negligible for them
- ii. **Lack of Utility-Led Aggregation Model** - Although there is increased adoption in high-paying consumers, the financing and behavioural constraints are restricting the adoption for low consumption households. Hence a ULA model will lead to increased penetration and greater awareness to accelerate adoption of rooftop solar
- iii. **Bank financing eligibility constraints** - Approximately 57,000 consumers who applied for loans, only around 27,000 were found eligible indicating the issue of accessibility of loans

3.1. Residential Consumer Segment Overview

The rooftop solar market in Rajasthan, as in the rest of India, is currently dominated by the residential segment. Nationally, approximately 74 percent of rooftop solar additions by capacity in 2024 were in the residential category, a share sustained through the first nine months of 2025. Rajasthan's pattern broadly mirrors this national profile, with residential adoption the primary driver of recent growth acceleration.

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MMNBY plans to target 1.04 crore registered consumers, structured across two implementation models:

- i. **Model 1** - Covers 26 lakh consumers with average monthly consumption above 150 units, each to install a 1.1 kW individual rooftop system in CAPEX mode through empanelled PM Surya Ghar vendors
- ii. **Model 2** - Covers 77 lakh consumers with average monthly consumption above 150 units, for which ULA model will be used to install 1.1 Kw of RTS system. Also, a similar model will be used to set up community solar of 1MW to provide free electricity to households with no roof space

Approximately 1.04 crore of Rajasthan's 1.55 crore domestic consumers are currently on tariff subsidy, with around 32 lakhs receiving zero electricity bills. For these households, the incremental bill savings from rooftop solar are minimal, weakening the self-motivated case for installation. This structural factor helps explain why Rajasthan ranks fifth nationally in PM Surya Ghar installations despite being among the top three states in total installed solar capacity, and underscores why DISCOM-structured delivery models are essential rather than optional.

3.2. DISCOM-wise Market Distribution

Rajasthan's electricity distribution is divided among three DISCOMs: JVVNL (Jaipur and eastern districts), AVVNL (Ajmer and southern districts including Udaipur), and JdVVNL (Jodhpur and western districts). Each operates as an independent distribution licensee under RERC and is individually responsible for rooftop solar programme implementation within its service area. All three jointly petitioned RERC in early 2025 for regulatory accommodations to support PM Surya Ghar implementation¹¹.

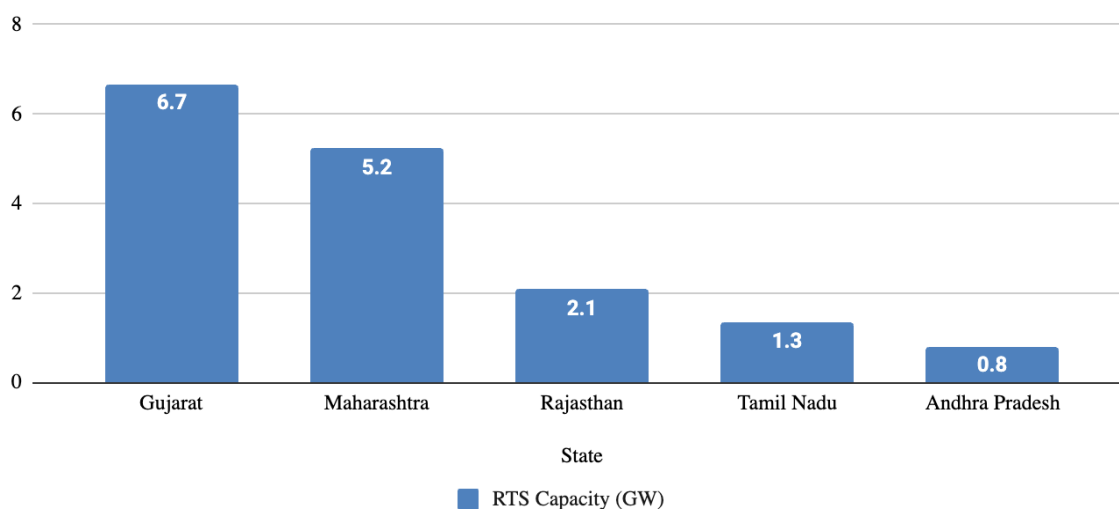


Figure 4: Top five states by cumulative rooftop solar installed capacity; Source:- MNRE

11 [Joint petition between JVVNL, AVVNL and JdVVNL by RERC JAIPUR.](#)

3.2.1. JVVNL (Jaipur Discom)

JVVNL is the largest of the three Rajasthan DISCOMs by urban consumer base and has been the most proactive in rooftop solar facilitation. As early as February 2024, it set an internal target of approximately 1,000 rooftop installations in Jaipur by March 2024, with empanelled vendors committing to around 2,000 systems.¹² Under PM Surya Ghar, JVVNL has received 85,144 applications till January 2026, of which 42,091 plants totalling 180.3 MW have been installed, representing a conversion rate of approximately 49 percent. Within the City Accelerator Programme, Jaipur leads Rajasthan's four CAP cities with 25,736 installations (113.61 MW) against 8,84,430 domestic connections — a penetration rate of approximately 2.9 percent.

3.2.2. AVVNL (Ajmer Discom)

AVVNL serves Ajmer and southern districts, including Udaipur. Under PMSGY, AVVNL received 85,206 applications of which 42,225 plants totalling 160.5 MW have been installed, a conversion rate of approximately 50 percent. Within the CAP cities, Udaipur has 6,438 installations (25.93 MW) against 1,75,044 domestic connections — a penetration rate of approximately 3.7 percent, the highest of the four CAP cities. This figure must be read in context, as Udaipur's smaller total consumer base means the absolute volume of remaining potential is narrower than Jaipur's, while the city's tourism-anchored economy and heritage-constrained built environment present distinct structural challenges for scale-up that are specific to the city's urban morphology.

3.2.3. JdVVNL (Jodhpur Discom)

JdVVNL covers western Rajasthan which is predominantly rural in character and more geographically dispersed. Despite serving a larger territorial area, its PM Surya Ghar application volume of 87,121 is closely comparable to the two relatively urban-focused

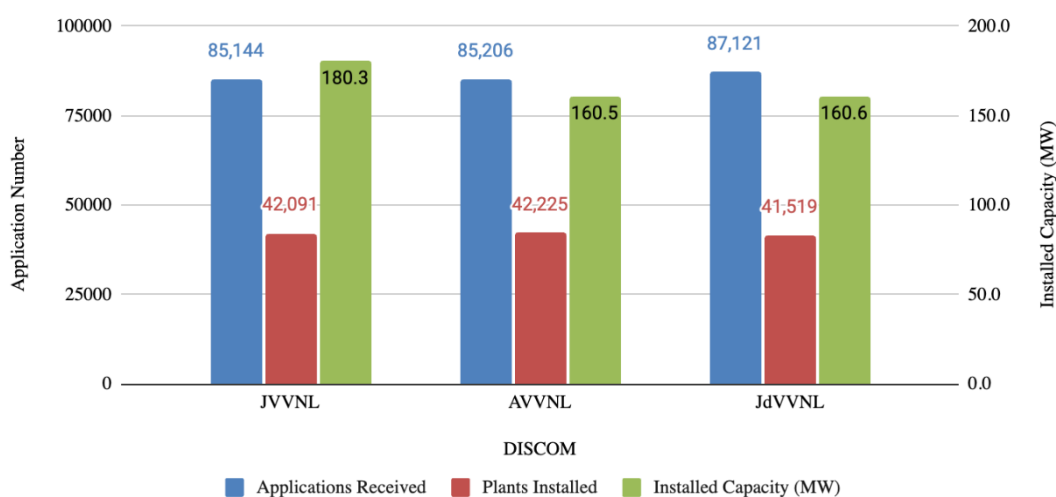


Figure 5: Figure 6: PM Surya Ghar progress by DISCOM (as of 9 January 2026)

12 [JVVNL Unveils Roadmap for Rooftop Solar Installation](#)

DISCOMs, with 41,519 plants totalling 160.6 MW installed. High-volume circles such as Sri Ganganagar and Hanumangarh account for a significant proportion of JdVVNL's applications. JdVVNL is not a focal DISCOM for this study but is included here to contextualize the state-level aggregates.

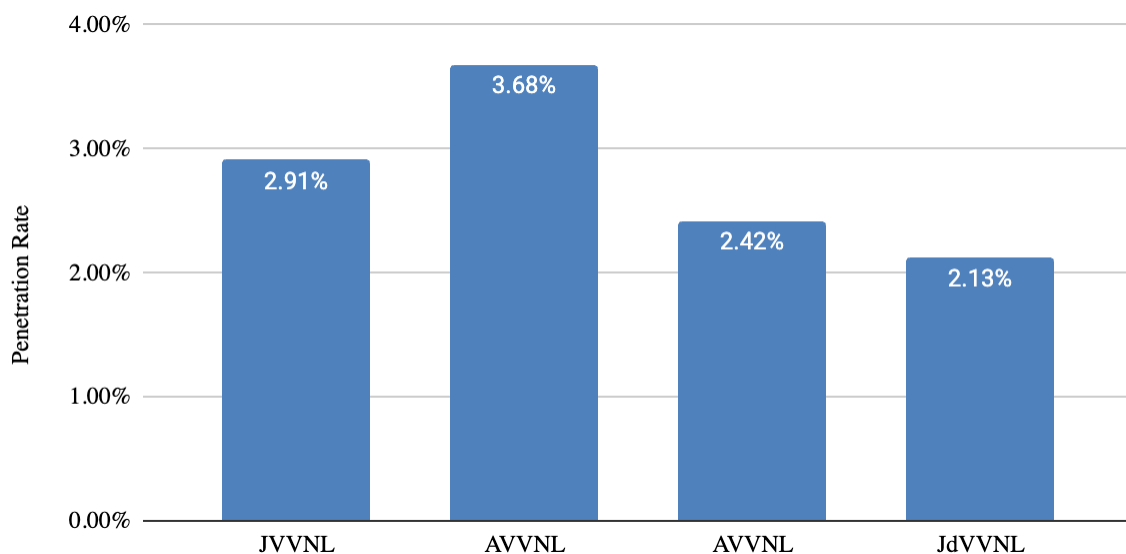


Figure 6: PM Surya Ghar installations and penetration rates across four DISCOMs (as of 9 January 2026)

3.3. Market Outlook and Remaining Potential

Rajasthan's rooftop solar market has transitioned from early-stage adoption to active scale-up. State's Integrated Clean Energy Policy 2024's target of 90 GW total solar capacity by 2029–30, rooftop solar's current contribution of 2.07 GW remains proportionally limited.

Two structural constraints moderate the near-term outlook. First, the zero-bill disincentive dampens consumer-led demand across more than a crore household currently on tariff subsidy, for whom rooftop solar generates negligible incremental savings. Second, execution infrastructure is uneven: despite strong aggregate application volumes state-wide (2,57,471 applications), the application-to-installation conversion rate of approximately 49 percent leaves a substantial backlog, and the 150-unit scheme's conversion rate of under 3 percent is significantly lower still.

These constraints define the core business model design challenge addressed in Section 5. The question is not whether Rajasthan's rooftop solar market will continue to grow but whether DISCOMs in Jaipur and Udaipur can be positioned to actively structure and drive that growth in a manner that generates institutional benefit rather than only administrative burden.

4. Business Model Analysis – Findings

4.1. CAPEX Domestic Model (Net Metering)

Under the CAPEX model, the domestic consumer owns the rooftop system outright and the DISCOM's role is limited to net metering facilitation and provide energy credits for surplus energy. The CBA for a 1 MW aggregated capacity (333 households, 3 kW each) reveals a net negative outcome for the DISCOM, driven fundamentally by the interaction between rooftop solar and Rajasthan's telescopic tariff structure.

Most of the Indian state's residential tariff architecture is telescopic such that higher-consumption households pay progressively higher per-unit rates embedding cross-subsidy surcharges that fund below-cost supply to lower-consumption consumers. When these high-consumption households adopt RTS, they displace grid purchases from the upper tariff slabs, reducing contributions to the cross-subsidy pool.¹³ As Shanbog, Rao & Tongia (2025) demonstrate across four Indian states, this creates a structural tension: the consumer's gain from slab displacement is precisely the DISCOM's loss, because DISCOMs recover most fixed and cross-subsidy costs through volumetric energy charges rather than fixed charges.

In the Rajasthan context, the gap is stark. A domestic consumer in the 151–300 unit slab pays ₹7.35/kWh, while the DISCOM's marginal avoided cost (APPC inclusive of T&D losses) is only ₹4.09/kWh.¹⁴ Every unit self-consumed from rooftop solar thus costs the DISCOM ₹3.16/kWh in unrealized revenue—the spread between what it would have billed and what it actually saves. On surplus energy injected into the grid, the DISCOM fares better: it pays the FiT of ₹3.26/kWh but avoids procurement at ₹4.09/kWh, yielding a modest gain of ₹0.83/kWh. However, even at the assumed 40:60 self-consumption to surplus ratio, the self-consumption loss overwhelms the surplus gain.

4.1.1. Key Findings

Table 1: DISCOM CBA Summary — CAPEX Domestic Model (Per 1 MW Aggregated Capacity)

Parameter	Value
25-Year NPV of Net Benefit to DISCOM	₹ (32.) Lakhs
Benefit-Cost Ratio	0.96
Levelized Net Benefit per kWh	₹ (0.22)/kWh
Year 1 Net Loss to DISCOM	₹4.95 Lakhs
Year Annual Net Benefit Turns Positive	Year 17

¹³ Shanbog, N., Rao, S., & Tongia, R. (2025). Rooftop Solar: A Trade-off Between Consumer Benefit and Discom Finances. CSEP Working Paper, July 2025.

¹⁴ The 151–300 unit domestic slab carries a retail tariff of ₹7.35/kWh (RERC FY25), which embeds cross-subsidy surcharges and fixed cost contributions far exceeding the DISCOM's marginal power procurement cost of ₹4.09/kWh (APPC incl. T&D losses, JVVNL ARR FY25).

Cumulative Breakeven	Not achieved (within 25 years)
Total Benefits (NPV)	₹738.0 Lakhs
Total Costs (NPV)	₹770.7 Lakhs

The 25-year NPV of the net benefit to the DISCOM is **negative ₹32 lakhs per MW** at a discount rate of 10.5%.¹⁵ For every rupee of benefit the DISCOM derives it bears ₹1.04 in costs, yielding a benefit-cost ratio of 0.96. The cumulative deficit peaks at approximately ₹60 lakhs (undiscounted) in Year 16 before beginning to narrow but is never recovered within the plant life.

4.1.2. Benefit-Cost Decomposition

Table 2: Benefit-Cost Decomposition — CAPEX Domestic Model

Component	Year 1 (₹ Lakhs)	Year 25 (₹ Lakhs)	Share of NPV
BENEFITS	80.1	101.1	
Avoided Power Purchase Cost	71.6	96.1	~89%
Avoided REC/RPO Cost	6.0	5.0	~7%
MNRE Administrative Benefit	2.6	—	~3%
COSTS	85.1	96.8	
Revenue Loss (Self-Consumption)	50.8	68.2	~60%
FiT Payment (Surplus Export)	34.3	28.6	~40%
NET BENEFIT TO DISCOM	5.0	4.3	₹35.0L

Revenue loss from self-consumption is the dominant cost, constituting approximately 60% of total costs. This is the direct expression of the telescopic tariff problem in which the DISCOM forgoes billing at the high retail rate while avoiding procurement at a much lower APPC. On the surplus channel, the DISCOM actually benefits—the FiT energy credits falls progressively below the rising APPC. This is why the FiT payment share of costs *declines* from ₹34.3 lakhs to ₹28.6 lakhs over the plant life, and why the annual net position gradually improves, turning positive in Year 17.

4.1.3. Temporal Dynamics

The annual deficit narrows steadily from ₹7.0 lakhs (Year 2) widens to positive ₹4.3 lakhs by Year 25. This convergence arises because total benefits grow at approximately 1.1% per annum while total costs grow at only 0.5%—the fixed FiT acts as an anchor on cost growth, even as escalating APPC drives benefit growth. However, 16 years of accumulated deficit (₹60 lakhs cumulative) is too deep to recover as the nine years of

¹⁵ NPV computed at WACC of 8.5%. Detailed assumptions and year-wise computations are provided in the accompanying CBA workbook (Model 2: CAPEX Domestic).

positive returns generate only about ₹20 lakhs, leaving the DISCOM with a cumulative undiscounted loss of ₹40 lakhs at the end of Year 25.

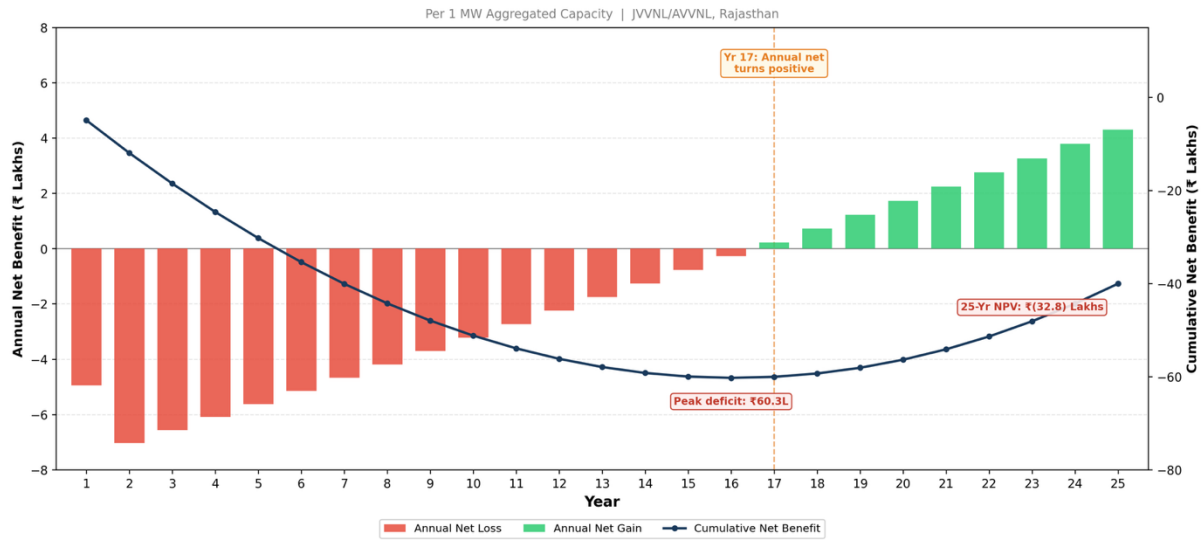


Figure 7: DISCOM Net Benefit Trajectory - CAPEX Domestic (Net Metering)

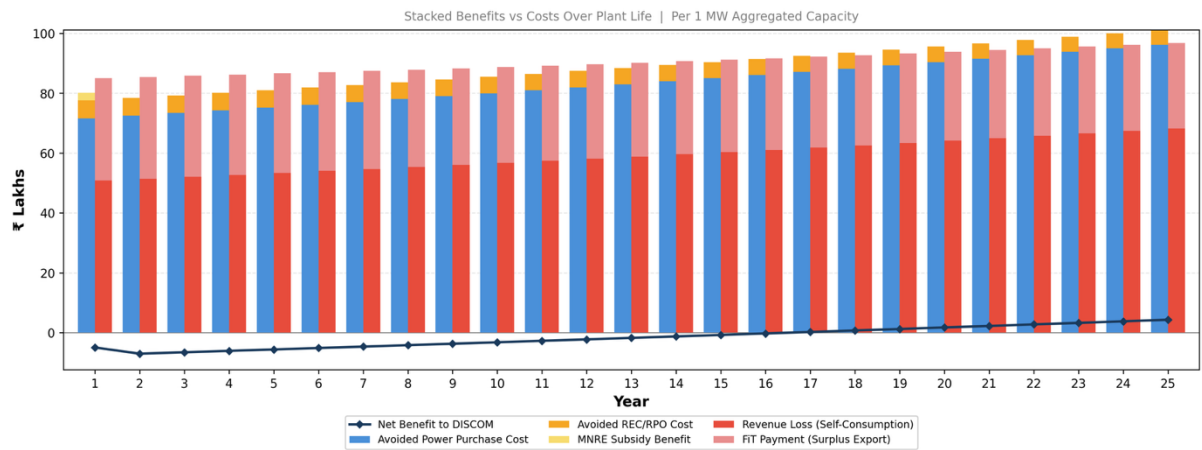


Figure 8: DISCOM Benefit- Cost Structure - CAPEX Domestic (Net Metering)

4.1.4. The System-Sizing Paradox

A critical insight from the CSEP study is that right-sized¹⁶ systems impose net losses on DISCOMs.¹⁷ This is because the financial harm to DISCOMs does not arise from oversized systems exporting surplus; it arises from the displacement of high-tariff slab consumption, which occurs regardless of system sizing. In Rajasthan’s telescopic tariff structure, a consumer moving from the 151–300 unit slab to effectively lower slabs remove precisely the units that carried the one of the highest per-unit cross-subsidy contribution. Slight under-sizing or over-sizing of the system relative to consumption eases the DISCOM’s loss only marginally. The CSEP study further notes that even under the Ministry of Power’s June 2023 Time-of-Day (ToD) tariff rules (–20% during solar hours,

¹⁶ Right size system is RTS installed capacity which is equal to the household’s sanctioned load

¹⁷ Shanbog, Rao & Tongia (2025) demonstrate that even “right-sized” systems maximise consumer benefit but still impose net losses on DISCOMs, because the revenue erosion from telescopic slab displacement exceeds the avoided power purchase cost.

+20% during peak), DISCOM losses are only partly offset, because the telescopic slab effect remains the dominant driver of revenue erosion.

4.1.5. Implications for DISCOM Strategy

The negative CBA explains the institutional reluctance of DISCOMs toward actively promoting residential RTS. As the ADB guidebook on utility-led business models observes, DISCOMs stand to benefit from RTS deployment through facilitation fees, deferred network investment, and RPO compliance but these gains require the DISCOM to move beyond a passive net metering role into an active facilitation or investment posture.¹⁸ The CAPEX model, as currently structured, offers the DISCOM none of these additional revenue streams.

Specific interventions that could shift the DISCOM CBA include: a transition from net metering to net billing (valuing self-consumption at APPC rather than retail tariff); allowing a grid services or facilitation fee; restructuring fixed charge recovery to reduce reliance on volumetric energy charges; and incorporating non-monetised benefits such as deferred distribution infrastructure and reduced peak demand. The comparative economics under the RESCO/PPA and EPC models, examined in the following subsections, provide further insight into which business model configurations can narrow or close this gap.

4.2. RESCO/PPA Model (DISCOM as Super-RESCO)

Under the RESCO model, the DISCOM becomes an active participant in rooftop solar deployment. The DISCOM either onboards a third-party RESCO developer or acts as a Super-RESCO itself by aggregating consumer demand, procuring or investing in rooftop systems, and selling solar power under a long-term Power Purchase Agreement (PPA).

This model is best suited for **high-consumption domestic consumers** which are the households with sustained monthly consumption above 200 units, typically in the upper tariff slabs with an Average Billing Rate (ABR) ranging from ₹7.35/kWh to ₹7.95/kWh.¹⁹ These consumers have the strongest financial incentive to switch to solar, reliable roof access, and represent the segment most likely to adopt RTS independently. Assuming a flat PPA tariff of ₹5.16/kWh offers an immediate and sustained reduction in electricity cost with no upfront investment, no maintenance responsibility, and no technology risk. From the DISCOM's perspective, proactively engaging this segment through the RESCO route allows the utility to retain a revenue rather than lose these consumers to self-consumption under net metering.

¹⁸ ADB & Idam Infrastructure Advisory (2022). Guidebook for Utilities-Led Business Models: Way Forward for Rooftop Solar in India. Asian Development Bank.

¹⁹ ABR of ₹7.95/kWh reflects the average billing rate for high-consumption domestic consumers (JVVNL ARR FY25). PPA tariff of ₹4.50/kWh is fixed (flat, no escalation) for the 25-year PPA tenure.

4.2.1. Key Findings

Table 3: DISCOM & RESCO Summary — RESCO/PPA Model (Per 1 MW Aggregated Capacity)

Parameter	Value
25-Year NPV of DISCOM Net Benefit	+₹1271 Lakhs
NPV of Average Net Benefit per kWh	₹5.08/kWh
RESCO LCOE (Levelized)	₹2.39/kWh
RESCO Project IRR (Equity)	15.4%
RESCO Viability	✓ Viable (IRR > 14% hurdle)

The RESCO model yields a **positive 25-year NPV of ₹12.71 crores per MW** from the DISCOM’s perspective, with an average net benefit of ₹5.08 per kWh of solar generation.²⁰ The DISCOM earns positive net benefit from Year 1 itself, and the annual net benefit remains positive throughout the 25-year plant life.

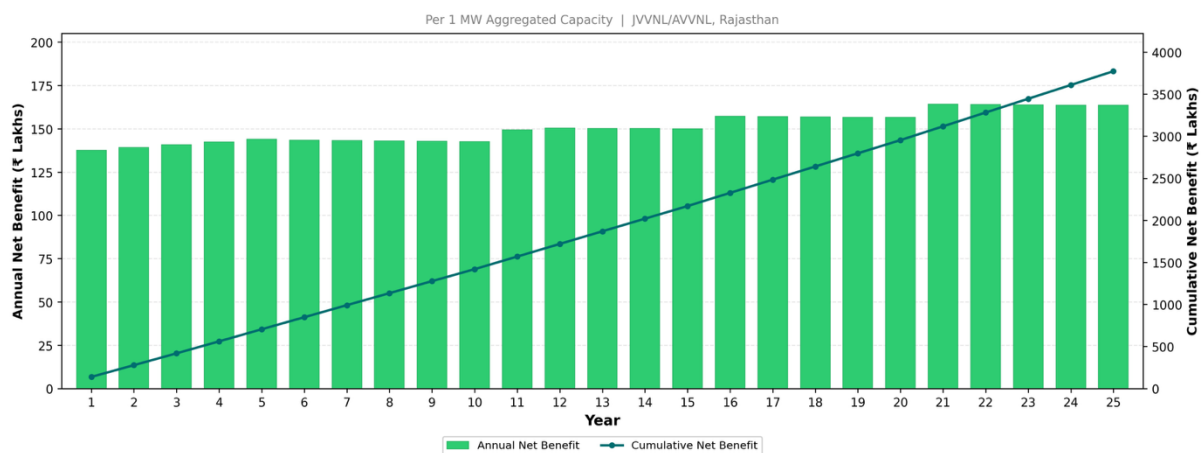


Figure 9: DISCOM Net Benefit Trajectory - RESCO/PPA Model

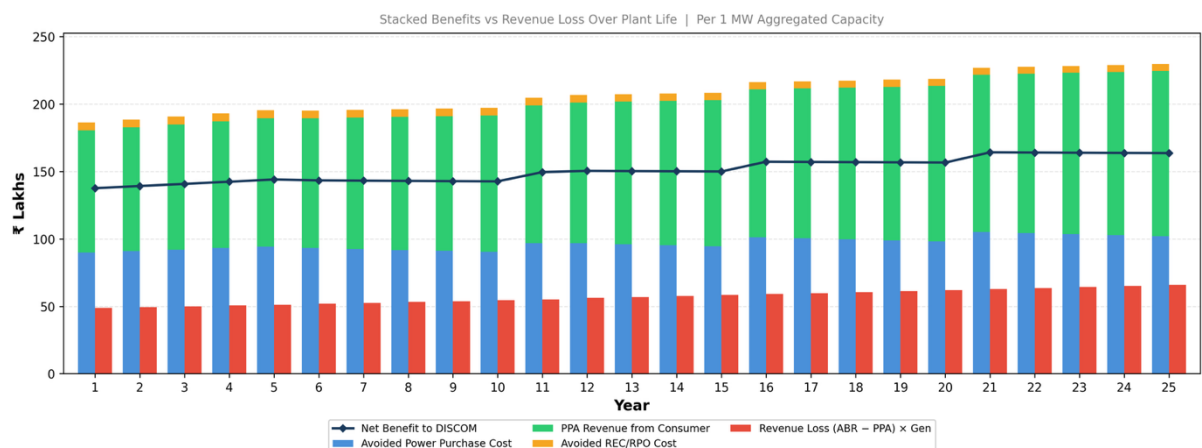


Figure 10: DISCOM Benefit- Cost Structure - RESCO/PPA Model

20 NPV computed at WACC of 10.5%. APCC of ₹4.10/kWh (base) grossed up for T&D losses declining from 20% (Years 1–5) to 12% (Years 21–25). Detailed year-wise computations in the accompanying workbook.

4.2.2. Benefit-Cost Decomposition

Table 4: Benefit-Cost Decomposition — RESCO Model (DISCOM Perspective)

Component	Year 1 (₹ Lakh)	Year 25 (₹ Lakh)	Share
BENEFITS	186.2	229.4	
Avoided Power Purchase Cost	89.7	102.0	~46%
PPA Revenue from Consumer	90.5	122.4	~51%
Avoided REC/RPO Cost	5.9	5.0	~3%
COSTS	48.7	65.9	100%
Revenue Loss (ABR – PPA) × Gen	48.7	65.9	100%
NET BENEFIT TO DISCOM	+137.5	+163.5	NPV: ₹1271

The DISCOM's benefit structure rests on two near-equal pillars: the Avoided Power Purchase Cost (~46% of benefits) and PPA Revenue from the consumer (~51%). This dual-revenue structure is the defining feature of the RESCO model—instead of passively absorbing lost retail revenue, the DISCOM earns a direct income stream from the PPA on every unit generated. The sole cost is the gap between the full ABR and the flat PPA tariff, applied to total generation. Since the PPA tariff (₹4.50/kWh) sits below the APPC inclusive of T&D losses (₹5.13/kWh), the DISCOM earns a positive spread on every unit even before accounting for avoided REC/RPO costs.

4.2.3. Temporal Dynamics

Because the PPA tariff is flat at ₹5.17/kWh while the ABR escalates at 2% annually, the revenue loss to the DISCOM *widens* over time from ₹48 Lakhs in Year 1 to ₹65.9 Lakhs by Year 25. This means the DISCOM's net benefit *declines* gradually, from ₹124.4 lakhs in Year 1 to ₹13 lakhs by Year 25. However, even at Year 25 the net benefit remains comfortably positive, because the growing avoided power purchase cost (driven by APPC escalation and declining T&D losses) partially offsets the widening revenue gap.

4.2.4. RESCO Developer Economics

The model is simultaneously viable for the RESCO developer. The levelized cost of energy works out to **₹2.39/kWh** over 25 years,²¹ comfortably below the PPA tariff of ₹5.17/kWh. Year-wise, the cost of generation declines from ₹2.83/kWh in Year 1 to ₹1.61/kWh by Year 25 as debt is retired by Year 13 and O&M remains the sole ongoing cost. The project equity IRR is 15.2%. These indicative returns shows that the model is attractive for both third-party RESCOs and for DISCOMs considering direct investment under the Super-RESCO variant.

21 LCOE computed using CERC normative parameters: capital cost ₹41,640/kWp, 70:30 debt-equity, 10% interest, 13-year loan tenor, post-tax ROE 14%, O&M ₹6 lakh/MW/year escalating at 2%.

The RESCO/PPA model thus transforms rooftop solar from a revenue-erosion risk into a revenue-positive proposition for the DISCOM. By shifting to an active posture the DISCOM retains the consumer relationship, earns PPA revenue on every unit generated, and benefits from avoided power purchase costs. The model creates value for all three stakeholders wherein consumers receive a lower tariff with zero upfront cost; the RESCO developer earns strong returns against a LCOE well below the PPA rate; and the DISCOM maintains a positive net benefit across all 25 years of the plant life. The case study of BSES Rajdhani’s hybrid model²² emphasis on utility-led facilitation and investment approaches and lend further credibility to the viability of this approach in the Rajasthan context.

4.3. EPC–Annuity Model (Hybrid Annuity)

The EPC–Annuity model adapts the **Hybrid Annuity Model (HAM)** to rooftop solar deployment. Under this structure, the DISCOM directly commissions an EPC developer to install rooftop systems on consumer premises, with the project cost shared across three parties: the **MNRE subsidy covers 40%** of the benchmark capital cost, the **consumer contributes ₹5,000 per kWp** at commissioning, and the **DISCOM finances the balance**—paying 40% its share upfront and deferring the remaining as annuity payments to the developer over five years. This model is identified as a shared-investment approach that distributes risk and capital burden across all stakeholders.

This model targets **lower-consumption domestic consumers**—households with monthly consumption of 200 kWh or below, falling in the lower tariff slabs with an ABR ranging from ₹4.75/kWh to ₹6.00/kWh.²³ These are consumers who would typically *not adopt RTS on their own* due to limited savings potential and capital constraints. The DISCOM’s rationale is different from the RESCO model: rather than pre-empting high-value consumer defection, it deploys RTS across a broader residential base to capture avoided procurement savings and RPO compliance benefits from a segment that would otherwise remain fully grid-dependent. This is also a segment which is highly subsidized through state’s free electricity scheme and cross subsidized by high paying consumers.

4.3.1. Key Findings

Table 5: DISCOM CBA Summary — EPC–Annuity Model (Per 1 MW Aggregated Capacity)

Parameter	Value
25-Year NPV of DISCOM Net Benefit	+₹555 Lakhs
Average Net Benefit per kWh	₹4.70/kWh
Annual Net Benefit	Positive in all 25 years

²² BSES Rajdhani Power Limited adopted a hybrid anchored procurement and payment assurance model under the USAID PACE-D TA Programme.

²³ ABR of ₹6.00/kWh for domestic consumers ≤200 kWh/month (JVNL ARR FY25). APCC ₹4.32/kWh grossed up for T&D losses yields ₹5.40/kWh in Year 1. NPV at WACC of 10.5%.

DISCOM LCOE	₹2.13/kWh
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The EPC–Annuity model yields a **positive 25-year NPV of ₹555 lakhs per MW** from the DISCOM’s perspective, with an average net benefit of ₹4.70/kWh over the plant life. The net benefit is positive from Year 1 and remains so throughout all 25 years. The DISCOM’s levelized cost of generation is ₹2.13/kWh—significantly below the APPC inclusive of T&D losses, confirming that rooftop solar is cost-competitive from the DISCOM’s own procurement perspective, independent of consumer tariff dynamics.

4.3.2. Benefit-Cost Decomposition

Table 6: Benefit-Cost Decomposition — EPC–Annuity Model (DISCOM Perspective)

Component	Year 1 (₹ Lakh)	Year 25 (₹ Lakh)	Share
BENEFITS	107.9	112.5	
Avoided Power Purchase Cost	94.6	107.5	~94%
Avoided REC/RPO Cost	6.0	5.0	~5%
MNRE Incentive + Consumer Contribution	7.3	—	~1%
COSTS	59.3	23.0	
Cost of Generation (LCOE × Gen)	44.3	23.0	~75%
EPC Annuity Payment (Yrs 1–5 only)	15.0	—	~25%
NET BENEFIT TO DISCOM	+48.6	+89.5	NPV: ₹555L

Avoided power purchase cost is the dominant benefit at approximately 94% of total benefits—the DISCOM avoids procuring from the grid at ₹5.40/kWh (APPC inclusive of T&D losses) for every unit of rooftop generation. Unlike the RESCO model, there is no PPA revenue stream; the DISCOM owns the system outright and captures value entirely through avoided procurement and RPO compliance. One-time inflows—the MNRE performance incentive and consumer capital contribution—together provide ₹7.3 lakhs in Year 1.

The distinctive feature of this model’s cost structure is the annuity obligation. During Years 1–5, the DISCOM services the deferred EPC payment of approximately ₹149 Lakhs per year alongside the ongoing cost of generation. From Year 6 onward, this obligation drops away entirely, reducing annual costs by roughly 25% and materially improving the net benefit. The cost of generation itself declines steadily as debt is retired by Year 13— from ₹2.49/kWh in Year 1 to ₹1.56/kWh by Year 25—leaving only O&M and equity returns.

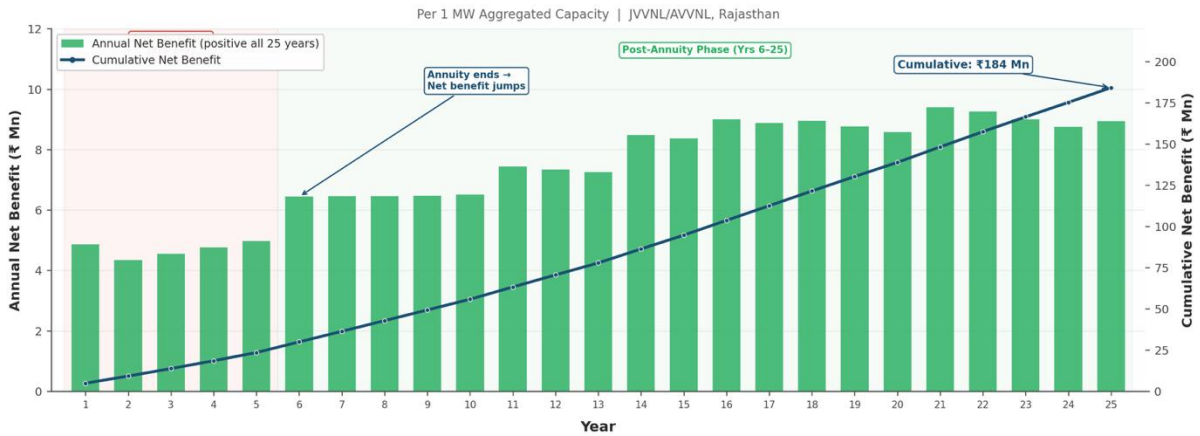


Figure 11: DISCOM Net Benefit Trajectory - EPC-Annuity Model

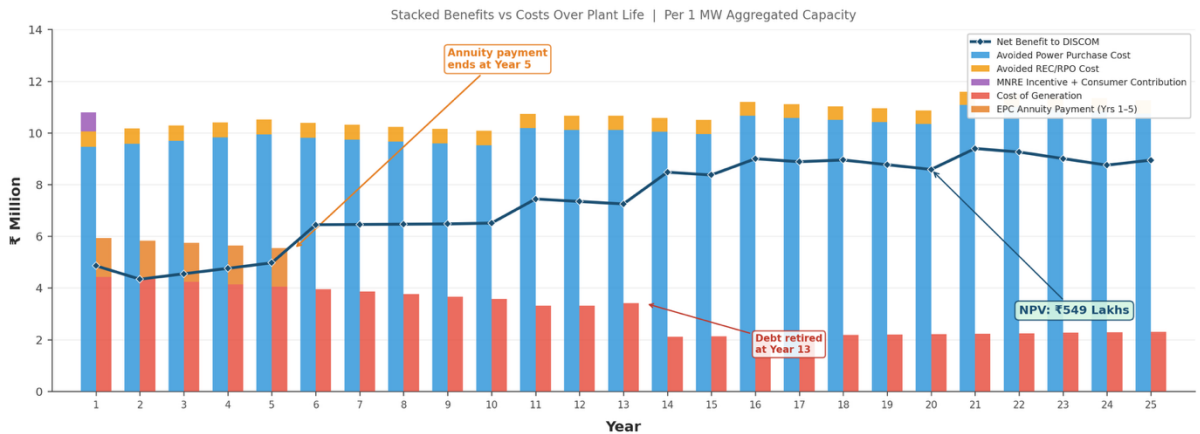


Figure 12: DISCOM Benefit-Cost Structure - EPC-Annuity Model

4.3.3. Temporal Dynamics

The trajectory shows a step-up at Year 6 when the annuity obligation ends, and further gains at each T&D loss reduction milestone (Years 11, 16, 21), when the grossed-up APPC recalibrates. The net benefit per kWh more than doubles over the plant life—from ₹2.80 in Year 1 to ₹6.11 by Year 25—driven by the combined effect of annuity cessation, debt retirement, and rising avoided procurement cost.

4.3.4. EPC Developer Economics

The EPC developer’s engagement under this model is simpler and lower risk than under the RESCO route. The developer receives two-thirds of the DISCOM’s capital contribution at commissioning and the remaining third as fixed annuity payments over five years. There is no 25-year operational exposure—the developer’s obligation ends once the annuity period concludes. This makes the model accessible to a wider range of developers, including smaller regional EPC firms who may lack the balance sheet for RESCO-scale project finance. The DISCOM retains system ownership and manages O&M directly or through a contracted service provider.

The EPC–Annuity model demonstrates that utility-led RTS investment can generate positive returns even when targeting the lower-tariff domestic segment (₹6.00/kWh ABR), where the margin over APPC is thinner than for high-consumption consumers. The HAM structure—borrowed from India’s highway PPP experience—manages the DISCOM’s upfront capital burden while allowing it to begin earning avoided-cost benefits immediately. With a LCOE of ₹2.13/kWh against an APPC of ₹5.40/kWh, rooftop solar under this model is decisively cheaper than conventional grid procurement, providing the DISCOM with a sustained economic rationale for deploying RTS across a broad residential base.

4.4. Comparative Assessment

The three business models examined in Sections 3.1–3.3 represent three distinct postures a DISCOM can adopt toward residential rooftop solar: passive facilitation (CAPEX), active intermediation (RESCO), and direct investment (EPC–Annuity). The DISCOM’s financial outcome varies dramatically across these postures, ranging from a net loss of ₹35 lakhs per MW under CAPEX to net gains of ₹841 lakhs (RESCO) and ₹549 lakhs (EPC–Annuity). This section draws together the findings to identify which model works best, for whom, and under what conditions.

4.4.1. Headline Comparison

Table 7: Comparative Assessment — DISCOM CBA Across Three Business Models (Per 1 MW)

	CAPEX (Net Metering)	RESCO/PPA (Super-RESCO)	EPC–Annuity (Hybrid Annuity)
DISCOM’s Role	Passive facilitator	Active intermediary	Direct investor
Target Consumer	151–300-unit slab (₹7.35/kWh)	High consumption >200 units (₹7.95/kWh)	Low consumption ≤200 units (₹6.00/kWh)
25-Year NPV	₹ (32) Lakhs	+₹1271 Lakhs	+₹555 Lakhs
Benefit-Cost Ratio	0.96	3.6	3.2
Net Benefit per kWh (avg.)	₹ (0.23)	₹9.40	₹4.70
Net Benefit Trajectory	Negative → Positive (Year 17 crossover)	Positive but declining (flat PPA vs rising ABR)	Positive and rising (annuity drop + debt exit)
DISCOM Revenue Stream	Effectively None — absorbs revenue loss + pays FiT	PPA revenue on 100% of generation	Avoided procurement on 100% of generation
System Ownership	Consumer	RESCO developer (or DISCOM)	DISCOM
Capital Outlay by DISCOM	None	None (if third- party) or full (if Super-RESCO)	Partial — net of MNRE subsidy + consumer contribution

Developer Risk Exposure	n/a	25-year operational	Construction + 5-year annuity only
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4.4.2. The Core Insight: DISCOM Agency Determines the Outcome

The single most important finding across the three models is that the DISCOM’s financial outcome under residential rooftop solar is not determined by solar economics—it is determined by the **degree of DISCOM agency** in the deployment model. The same 1 MW of rooftop capacity, deployed in the same geography with the same solar resource, produces a loss when the DISCOM is a passive bystander (CAPEX) and a substantial gain when the DISCOM is an active participant (RESCO, EPC–Annuity). The technology is identical; what changes is the business model.

Under CAPEX net metering, the DISCOM has no control over the transaction. The consumer self-consumes at the retail tariff, eroding the cross-subsidy base, and exports surplus at a fixed FiT—the DISCOM absorbs both the revenue loss and the FiT obligation. Under the RESCO and EPC models, by contrast, the DISCOM either earns PPA revenue on every unit generated or captures the full avoided procurement cost by owning the system outright. The shift from a *tariff-loss model* (CAPEX) to a *procurement-savings model* (RESCO, EPC) is what reverses the economics.

4.4.3. Matching Models to Consumer Segments

The three models are not competing alternatives—they are **complementary instruments** designed for different segments of the residential consumer base. Each targets a distinct consumption profile and serves a different strategic purpose for the DISCOM:

RESCO/PPA for high-consumption consumers (>200 units/month, ABR ₹7.35–₹7.95/kWh). These are the consumers most likely to adopt RTS independently under the CAPEX route, and their defection would inflict the greatest revenue loss on the DISCOM. The RESCO model allows the DISCOM to *pre-empt this defection* by offering an attractive PPA tariff (₹5.17/kWh) that undercuts the retail rate while preserving a revenue relationship. The DISCOM earns the highest NPV (₹1271 lakhs) from this segment because the high ABR creates the widest margin between what the DISCOM would have earned and what it now pays in avoided procurement. This is the *defensive* play—protect the most valuable consumers before they leave the grid.

EPC–Annuity for lower-consumption consumers (≤200 units/month, ABR ₹6.00/kWh). These consumers have weaker incentives to adopt RTS on their own and would likely remain fully grid-dependent without DISCOM intervention. The EPC–Annuity model enables the DISCOM to *expand its solar footprint* into this segment through a managed investment programme, capturing avoided procurement savings at ₹5.40/kWh (APPC) against a generation cost of just ₹2.13/kWh (LCOE). The NPV of ₹555 lakhs is lower than RESCO’s because the thinner ABR-APPC margin limits the benefit, but the

economics are unambiguously positive. This is the *offensive* play—extend RTS to consumers the market would not reach on its own.

CAPEX net metering as the baseline counterfactual. The CAPEX model is not a strategy the DISCOM would voluntarily pursue—it is what happens *in the absence* of DISCOM action, when consumers adopt RTS independently under the prevailing net metering framework. The negative NPV of ₹32 lakhs quantifies the cost of DISCOM passivity. As Shanbog, Rao & Tongia (2025) observe, this cost is structural: it arises from the telescopic tariff architecture and volumetric cost recovery model, not from any deficiency in solar economics.²⁴ The CAPEX CBA thus serves not as a viable model for DISCOM strategy but as a *benchmark of the revenue erosion risk* that the RESCO and EPC models are designed to mitigate.

4.4.4. Strategic Implications for Rajasthan DISCOMs

The evidence from these three models suggests a clear strategic direction. Rather than passively accommodating residential RTS Rajasthan’s utilities can convert solar deployment into a revenue-positive activity by moving into facilitation and investment roles. The general understanding regarding the DISCOMs that they should transition from passive net metering facilitators to active participants through models like Super-RESCO, anchored procurement, and EPC–Annuity is validated by these findings.

A practical deployment strategy could layer both active models across the residential base: RESCO/PPA for the top-tier consumption segment where the DISCOM’s revenue protection motive is strongest, and EPC–Annuity for the broader base of lower-consumption households where the avoided-cost economics are compelling but the consumer’s own incentive to go solar is weak. Together, these two models cover the full spectrum of domestic consumers—leaving no segment where the DISCOM’s default posture is the value-destroying CAPEX net metering counterfactual.

²⁴ Shanbog, N., Rao, S., & Tongia, R. (2025). Rooftop Solar: A Trade-off Between Consumer Benefit and Discom Finances. CSEP Working Paper.

5. City Profiles: Jaipur and Udaipur

The preceding sections established the financial viability and operational characteristics of three rooftop solar business models—CAPEX, RESCO, and EPC—for DISCOMs in Rajasthan, benchmarked to 1 MW of aggregated domestic capacity. This section grounds those findings in the specific deployment contexts of Jaipur and Udaipur, the two cities under focus in this study. Rather than replicating the cost-benefit analysis, the discussion here examines how local conditions—consumer base composition, grid infrastructure, adoption patterns, and institutional readiness—shape the practical prospects for each model in each city. Table 8 provides a comparative snapshot of the two cities.

Table 8: City Comparison Snapshot

Parameter	Jaipur	Udaipur
Population (est.)	~4 million	~600,000–700,000
DISCOM	JVVNL	AVVNL
GHI (kWh/m ² /day)	5.5–5.8	5.3–5.6
PM Surya Ghar Installations	15,932	5,794
City Accelerator Programme	Selected	Selected
Primary Constraint	DT capacity; scaling depth	Vendor ecosystem; market creation

Source: Compiled by authors from Global Solar Atlas, SolarQuarter (December 2025), RERC tariff orders, and Udaipur Times (May 2024). PM Surya Ghar installation figures are as reported by JVVNL and AVVNL.

Table 9 maps the suitability of each business model to the principal consumer segments relevant to residential and near-residential rooftop solar deployment in Rajasthan. These assessments draw on the viability conclusions established in Section 5 and are referenced in the city-specific discussions that follow.

Table 9: Business Model–Consumer Segment Suitability

Consumer Segment	CAPEX	RESCO	EPC
High-consumption domestic (>300 units/month)	Strong	Limited	Strong
Low-to-mid consumption domestic (<300 units/month)	Limited	Limited	Moderate
Group housing / multi-storey residential	Moderate	Strong	Strong
Institutional / government buildings	Moderate	Strong	Moderate
Commercial / tourism & hospitality	Strong	Strong	Moderate

Note: Suitability reflects model–consumer fit based on financial viability, operational requirements, and consumer characteristics established in Section 5. “Strong” = model well-suited to segment; “Moderate” = viable under favourable conditions; “Limited” = significant structural constraints.

5.1. Jaipur

5.1.1. City and Solar Resource Context

Jaipur as the largest urban centre in the state, has an estimated population exceeding four million. The city's geography—flat terrain, arid climate, and minimal cloud cover for most of the year—makes it one of the most favourable locations for solar energy deployment in India. According to the Global Solar Atlas, Jaipur receives an annual average global horizontal irradiance (GHI) of approximately 5.5–5.8 kWh/m²/day, with peak daily irradiance exceeding 7 kWh/m²/day during the spring months (March–May).²⁵ The city receives approximately 300–325 sunny days per year. Hence, the solar resource, accordingly, is not a binding constraint on rooftop solar deployment in Jaipur.

Jaipur falls under the jurisdiction of the JVVNL, the largest of Rajasthan's three state-owned DISCOMs. JVVNL serves twelve districts, with Jaipur city constituting its largest urban consumer base. For domestic consumers, the prevailing slab-based tariff ranges from ₹4.75/kWh for the first 50 units to ₹7.95/kWh for consumption above 500 units per month.²⁶ The feed-in tariff for surplus rooftop solar energy exported to the grid was revised upward in October 2025 to ₹3.26/kWh under the net metering regime and ₹3.65/kWh under net billing.²⁷ Rajasthan currently operates under a net metering framework, with the net metering capacity cap raised to 1 MW in February 2024. The RERC has also recently approved virtual net metering (VNM) and group net metering (GNM), which expand the addressable consumer base to include those without suitable individual rooftop space.

In terms of rooftop solar adoption, Jaipur leads Rajasthan. As of December 2025, approximately 15,932 rooftop solar systems had been installed in the Jaipur district under the PM Surya Ghar: Muft Bijli Yojana, the highest among all districts in the state.²⁸ Jaipur is also one of four Rajasthan cities—alongside Jodhpur, Ajmer, and Udaipur—selected for the MNRE's City Accelerator Programme, launched in June 2025 to provide technical assistance to urban local bodies and DISCOMs for accelerating residential rooftop solar deployment.²⁹ Despite this relative lead, rooftop solar installations in Rajasthan remain heavily concentrated: an RTI International field survey found that 60–70 per cent of all rooftop installations in the state are located in just four districts, including Jaipur.³⁰ This concentration underscores both the early-mover advantage of urban centres and the depth of the untapped market beyond them.

25 Global Solar Atlas 2.0, World Bank Group/Solargis. Data accessed for Jaipur coordinates (26.95°N, 75.71°E)

26 ARR Filing of 2025-26 of AVVNL & JVVNL

27 JVVNL Order dated 27 October 2025, revising feed-in tariff for domestic rooftop solar under net metering and net billing regimes

28 SolarQuarter, "Rajasthan Promotes Rooftop Solar with City Accelerator Program under PM Suryaghar Scheme," 8 December 2025, citing DISCOM Chairperson Ms. Aarti Dogra.

29 Ministry of New and Renewable Energy, Press Information Bureau, "Launch of the City Accelerator Program to Boost Rooftop Solar Adoption in Indian Cities," 23 June 2025.

30 Gaurav Patel and Manan Thapar, "Rooftop Solar Potential: Rajasthan Offers a Huge Untapped Market Opportunity," Renewable Watch, 2 March 2024, based on RTI International India field survey.

5.1.2. Deployment Landscape by Business Model

CAPEX Model. The consumer-owned CAPEX model is the most straightforward pathway for rooftop solar deployment and is the model under which the majority of existing installations in Jaipur have been executed. The model is best suited to domestic consumers with monthly consumption in the higher tariff slabs (above 300 units), where the gap between the grid tariff paid and the effective cost of self-consumed solar generation is widest. Jaipur’s urban domestic consumer base includes a significant proportion of such higher-consumption households, particularly in established residential colonies and newer planned developments. The principal barriers remain rooftop suitability constraints in older, denser parts of the city and the upfront capital cost for consumers who do not qualify for or are unaware of subsidy and financing options with a statewide survey indicating that approximately 80 per cent of DTs require upgrades to accommodate increased renewable energy loading at the LT level.³¹

RESCO Model. In Jaipur, the RESCO model has natural applicability for institutional consumers—government buildings, public housing complexes, educational campuses—where aggregated rooftop capacity can achieve scale economies and where the consumer entity may lack capital or institutional appetite for asset ownership. Group housing societies and multi-storey residential complexes are also a relevant segment, particularly with the recent approval of VNM and GNM, which allow a single RESCO installation to serve multiple consumer accounts. The barriers to RESCO deployment in Jaipur are primarily structural because the model requires a creditworthy offtaker or a DISCOM-backed procurement mechanism; PPA tariff negotiations must balance developer returns against DISCOM cost-of-supply benchmarks and the consumer protection and performance guarantee frameworks for long-duration PPAs remain underdeveloped at the state level.

EPC Model. This model reduces transaction costs for individual consumers and can improve installation quality through DISCOM oversight. In Jaipur, the EPC model is particularly relevant for the large pool of potential CAPEX adopters who are deterred not by capital constraints per se but by the complexity of navigating vendor selection, technical specifications, net metering applications, and subsidy disbursement. The City Accelerator Programme, with its emphasis on vendor training and consumer facilitation, provides an institutional support for scaling this model. The DISCOM’s role as facilitator also positions it to steer deployment toward grid-friendly configurations and priority feeders, addressing DT loading concerns proactively rather than reactively.

Table 10 summarises the deployment readiness of each business model in Jaipur across five key dimensions.

³¹ Joshi, A. (2024, December 9). *Rajasthan’s clean energy policy targets 125 GW renewable energy capacity by 2030*. Mercomindia.com. <https://www.mercomindia.com/rajasthan-clean-energy-policy-2030>

Table 10: Jaipur — Deployment Readiness by Business Model

Readiness Dimension	CAPEX	RESCO	EPC
Consumer base depth	Strong	Moderate	Strong
Vendor ecosystem maturity	Strong	Moderate	Strong
Grid infrastructure readiness	Moderate	Moderate	Moderate
Institutional & policy support	Strong	Moderate	Strong
Financing access	Moderate	Moderate	Strong

Assessment: Authors' assessment based on available data and field evidence. Green = strong readiness; Yellow = moderate, with identifiable gaps; Red = limited, requiring significant intervention.

5.1.3. City-Specific Policy Recommendations

Jaipur's relatively advanced position in rooftop solar adoption means that the policy challenge is one of scaling and deepening, not market creation. The following recommendations are specific to Jaipur's deployment context.

1. JVVNL should prioritise DT capacity mapping and upgrade planning in Jaipur's high-adoption wards and residential colonies. The current concentration of installations in a small number of districts and feeders risks localised grid constraints that could slow future approvals. A proactive DT upgrade roadmap, aligned with projected rooftop solar growth under PM Surya Ghar targets, would prevent infrastructure bottlenecks from becoming a binding constraint on deployment.
2. City Accelerator Programme should be leveraged to operationalise the EPC facilitation model at scale in Jaipur. This means moving beyond awareness campaigns to establishing a structured DISCOM-mediated procurement channel such as having a single-window process that integrates subsidy application, net metering approval, and installation commissioning.
3. Approval of VNM and GNM should be accompanied by targeted pilot deployments in Jaipur's group housing societies and multi-storey residential complexes, where individual rooftop access is limited but aggregate demand is substantial. These pilots would test the commercial and regulatory mechanics of shared metering arrangements and generate replicable models for other cities in Rajasthan.
4. Consumer financing remains a significant barrier despite the availability of subsidised loans under PMSGY. JVVNL, in coordination with empanelled financial institutions, should explore on-bill financing mechanisms that allow consumers to repay solar installation costs through their electricity bills, reducing the perceived risk and administrative burden of standalone solar loans.

5.2. Udaipur

5.2.1. City and Solar Resource Context

Udaipur, located in southern Rajasthan, is a city with an estimated population of approximately 6,00,000–7,00,000. Unlike Jaipur’s flat terrain, Udaipur’s geography includes undulating hills, lakes, and a more compact urban core, which has implications for both rooftop availability and system design. The city’s economy is significantly shaped by tourism and hospitality, which constitutes a distinctive consumer segment for rooftop solar. According to the Global Solar Atlas, Udaipur receives an annual average GHI of approximately 5.3–5.6 kWh/m²/day,³² marginally lower than Jaipur but well within the range that supports commercially viable rooftop solar generation.

However, Udaipur faces a supply-side constraint unlike Jaipur. As of May 2024, the district’s daily electricity demand was approximately 350 MW, against a supply of only 310 MW—a shortfall of 40 MW that caused the 220 kV transmission lines to operate in an overloaded state.³³ This supply deficit, while a challenge for consumers, strengthens the economic case for distributed rooftop solar from the DISCOM’s perspective as every unit of rooftop generation that displaces grid demand reduces the strain on constrained transmission infrastructure and defers costly capacity additions.

Rooftop solar adoption in Udaipur lags behind Jaipur significantly. As of December 2025, approximately 5,794 rooftop solar systems had been installed in the Udaipur district under PM Surya Ghar, placing it third in Rajasthan after Jaipur and Jodhpur.³⁴ Udaipur is, however, among the four Rajasthan cities selected for the MNRE’s City Accelerator Programme,³⁵ which provides an institutional platform for accelerating adoption.

5.2.2. Deployment Landscape by Business Model

CAPEX Model. The smaller urban footprint and more compact built environment mean that the pool of residential consumers with suitable, unshaded rooftop space may be proportionally smaller. However, the tourism and hospitality sector represents a distinctive consumer segment with increasing commercial incentive to adopt visible sustainability measures. For domestic consumers, the same tariff-driven economics apply as in Jaipur, but lower consumer awareness and a less mature vendor ecosystem may slow adoption relative to the state capital. The statewide finding that 55 per cent of surveyed households expressed interest in rooftop solar but felt constrained by lack of knowledge and awareness of financing options is likely more pronounced in Udaipur than in Jaipur.³⁶

³² Global Solar Atlas 2.0, World Bank Group/Solargis. Data accessed for Udaipur coordinates

³³ Udaipur Times, “Power Cuts Troubles Udaipur’s Residents Amid Scorching Heat,” 20 May 2024, citing electricity department officials.

³⁴ SolarQuarter, 8 December 2025.

³⁵ Udaipur Times, “Udaipur Among 100 Cities Selected for Rooftop Solar Boost,” 6 December 2025.

³⁶ Renewable Watch, 2 March 2024.

RESCO Model. The RESCO model has particular relevance in Udaipur for two reasons. First, the supply deficit creates a direct DISCOM interest in procuring distributed generation capacity, which could be structured through RESCO agreements where the developer installs systems on consumer rooftops and sells power to AVVNL. This effectively turns rooftop solar into a supply-side resource for a supply-constrained DISCOM. Second, institutional and government buildings in Udaipur offer aggregated rooftop capacity that is well suited to the RESCO model’s scale requirements. The barriers mirror those in Jaipur (PPA framework maturity, counterparty creditworthiness) but are compounded by the smaller market size, which may make Udaipur less attractive to RESCO developers focused on larger urban markets.

EPC Model. The EPC facilitation model is arguably more important in Udaipur than in Jaipur, precisely because the vendor ecosystem is less mature. In a market where consumers have fewer trusted installation options and less familiarity with the technology, DISCOM-mediated procurement—with standardised specifications, vetted vendors, and integrated approvals—reduces the barriers to adoption more significantly than in a market where these intermediaries already exist commercially. The City Accelerator Programme, if effectively implemented, could serve as the vehicle for establishing this facilitation infrastructure in Udaipur.

Table 11 summarises the deployment readiness of each business model in Udaipur.

Table 11: Udaipur — Deployment Readiness by Business Model

Readiness Dimension	CAPEX	RESCO	EPC
Consumer base depth	Moderate	Moderate	Moderate
Vendor ecosystem maturity	Limited	Limited	Limited
Grid infrastructure readiness	Limited	Limited	Limited
Institutional & policy support	Moderate	Moderate	Strong
Financing access	Limited	Limited	Moderate

Assessment: Authors’ assessment based on available data and field evidence. Green = strong readiness; Yellow = moderate, with identifiable gaps; Red = limited, requiring significant intervention.

The contrast between the two scorecards is instructive. Jaipur’s readiness profile is broadly favourable across all three models, with grid infrastructure as the common constraint. Udaipur’s profile is weaker across most dimensions, but the institutional support for EPC represents a concrete entry point. The implication for DISCOM strategy is that Jaipur can absorb multiple models simultaneously, while Udaipur requires a sequenced approach: building the vendor and infrastructure base first (through EPC facilitation), before conditions are ripe for RESCO procurement or unassisted CAPEX uptake.

5.2.3. City-Specific Policy Recommendations

Udaipur's deployment context is fundamentally different from Jaipur's: the challenge is market creation and institutional capacity building, not scaling an already-active market. The following recommendations reflect this distinction:

1. AVVNL should explicitly integrate rooftop solar into its supply-side planning for the Udaipur district. The documented 40 MW supply shortfall and the overloading of 220 kV transmission infrastructure provide a concrete, quantifiable rationale for treating distributed rooftop generation as a grid resource, not merely a consumer amenity. This framing would support DISCOM-initiated RESCO procurement and justify public investment in enabling infrastructure (DT upgrades, net metering readiness) as avoided transmission and generation costs.
2. Second, a targeted rooftop solar programme for the tourism and hospitality sector in Udaipur should be designed, potentially as a public-private partnership between AVVNL, the Rajasthan Tourism Department, and empanelled RESCO developers. Hotels and heritage properties with high daytime loads and commercial interest in sustainability branding represent a high-impact, high-visibility segment that could catalyse broader adoption.
3. Accelerator Programme in Udaipur should prioritise building the local vendor and installation ecosystem. Unlike Jaipur, where the immediate constraint is DT infrastructure, Udaipur's binding constraint is the availability of trained, reliable installation vendors. The programme's vendor training component should be front-loaded and tied to a DISCOM empanelment process that provides quality assurance to consumers.
4. Given Udaipur's hilly terrain and compact urban form, the recently approved VNM and GNM provisions are particularly important. AVVNL should identify suitable locations for community-scale solar installations that can serve multiple consumer accounts in areas where individual rooftop installations are infeasible due to structural or spatial constraints. Pilot projects in densely built residential areas would generate evidence for wider replication across similar geographies in Rajasthan.

6. Conclusion

This study set out to answer a question that has become central to Rajasthan's energy policy landscape: whether rooftop solar deployment can be structured in ways that serve both the national imperative of rapid adoption and the institutional imperative of DISCOM financial sustainability. The evidence assembled across the preceding sections suggests that it can but only if DISCOMs move beyond the passive, regulatory posture that has characterised their engagement with rooftop solar to date.

The cost-benefit analysis of three business models demonstrates that the financial outcome for DISCOMs is not a function of solar economics per se, but of the degree of institutional agency the DISCOM exercises in the deployment model. The same 1 MW of aggregated rooftop capacity, deployed in the same geography with identical solar resource conditions, produces a net loss under the CAPEX route (NPV of ₹32 lakhs) and substantial net gains under the RESCO (NPV of ₹1,271 lakhs) and EPC–Annuity (NPV of

₹555 lakhs) models. The technology does not change, instead what changes is the business model and with it, the DISCOM's position in the value chain.

This finding carries a specific strategic implication. The three models are not competing alternatives to be ranked and selected, they are complementary instruments designed for distinct segments of the residential consumer base. The RESCO model serves as a lucrative strategy, protecting the revenue from high-consumption consumers whose independent CAPEX adoption would inflict the revenue erosion on DISCOMs. The EPC–Annuity model serves model which extends rooftop solar to lower-consumption households where consumer incentives for independent adoption are weak but the avoided-cost economics remain compelling. Together, these two models cover the full spectrum of domestic consumers, leaving no segment where the DISCOM's default posture is the CAPEX net metering counterfactual.

The city profiles of Jaipur and Udaipur ground these findings in the practical realities of deployment. Jaipur, with its relatively mature adoption base and strong vendor ecosystem, faces a challenge of scaling and deepening—upgrading distribution transformer capacity, operationalising the EPC facilitation model through structured DISCOM-mediated procurement, and piloting virtual and group net metering in multi-storey residential complexes. Udaipur, by contrast, faces a challenge of market creation: building the local vendor ecosystem, addressing a documented 40 MW supply deficit that strengthens the case for distributed generation as a grid resource, and leveraging the tourism and hospitality sector as a high-visibility entry point for rooftop solar adoption. The contrast between the two cities underscores that a uniform statewide deployment strategy is unlikely to be effective; model selection and sequencing must be calibrated to local conditions of consumer base composition, grid infrastructure readiness, and institutional capacity.

The policy window for acting on these findings is open. The launch of PM Surya Ghar: Muft Bijli Yojana and the state-level Mukhya Mantri Nishulk Bijli Yojana have created both the fiscal architecture and the public mandate for accelerated rooftop solar deployment. The MNRE's City Accelerator Programme, in which both Jaipur and Udaipur have been selected, provides an institutional platform for translating model-level findings into operational programmes. What remains is the institutional decision by Rajasthan's DISCOMs to move from a posture of regulatory accommodation to one of strategic participation. Hence, structuring RESCO procurement for high-value consumer segments, establishing EPC facilitation channels for the broader residential base, and investing in the distribution infrastructure upgrades that are a precondition for deployment at scale are need of hour.

The broader significance of this study extends beyond Rajasthan. Across India, the prevailing narrative frames rooftop solar and DISCOM financial health as inherently adversarial. The evidence presented here challenges that framing. It demonstrates that with appropriate business model design, DISCOMs can convert rooftop solar from a

source of revenue erosion into a revenue-positive activity, while simultaneously advancing national clean energy targets. The question is no longer whether this is possible; the question is whether utilities will act on the evidence.

ANNEXURES

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Annexure A — CAPEX Model: Assumptions & Parameter Tables

Parameter	Value	Unit	Source / Remarks
A. SYSTEM PARAMETERS			
Aggregated RTS Capacity	1,000	kW	1 MW = 1000 kW
Individual System Size	3	kW	Typical domestic system
Number of Consumers	333	Nos	Capacity / System Size
Capacity Utilization Factor (CUF)	20%	—	20% for Rajasthan
Annual Hours	8,760	hrs	365 × 24
Annual Generation (Year 1)	17,52,000	kWh	CUF × Hours × Capacity
Degradation Rate	0.75%	per year	Annual panel deration
Plant Life	25	Years	Standard project life
Self-Consumption Share	40%	—	Of annual generation
Surplus to Grid Share	60%	—	Of annual generation
B. TARIFF & PRICING PARAMETERS			
Consumer Retail Tariff (151–300 kWh slab)	₹7.25	Rs/kWh	RERC Tariff Order FY 2025–26
Tariff Annual Escalation	2%	per year	Historical average
Feed-in Tariff (FiT)	₹3.26	Rs/kWh	Constant over 25 years — RERC
APPC (Variable)	₹3.27	Rs/kWh	ARR FY 2025–26
T&D Losses	20%	—	Benchmark
APPC incl. T&D Losses	₹4.09	Rs/kWh	APPC / (1 – T&D%)
APPC Annual Escalation	2%	per year	Benchmark
REC Floor Price	₹0.34	Rs/kWh	Constant — IEX floor
C. SUBSIDY & COST PARAMETERS			
Capital Cost per kW	₹50,000	Rs/kW	MNRE Benchmark 2025–26
Total Capital Cost (1 MW)	₹5,00,00,000	Rs	Capital Cost × Capacity
PM Surya Ghar Subsidy per 3 kW system	₹78,000	Rs	₹30,000 × 2 kW + ₹18,000 × 1 kW
State Subsidy per Consumer (CM Muft Bijli)	₹17,000	Rs/consumer	Capped at ₹17,000
Total State Subsidy Outflow (1 MW)	₹56,61,000	Rs	State Subsidy × 333 consumers
State Subsidy Recovery Period	10	Years	Recovered from Govt in instalments
D. FINANCIAL EVALUATION			
Discount Rate (WACC)	10.50%	—	WACC
MNRE Incentive for DISCOM	5%	—	For >10% above base target

Annexure B — CAPEX Model: DISCOM CBA (25-Year)

Parameter	Unit	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	
I. GENERATION PROFILE																											
Annual Generation	kWh	1,752,000	1,738,860	1,725,819	1,712,875	1,700,028	1,687,278	1,674,624	1,662,064	1,649,598	1,637,226	1,624,947	1,612,760	1,600,664	1,588,659	1,576,744	1,564,919	1,553,182	1,541,533	1,529,972	1,518,497	1,507,108	1,495,805	1,484,586	1,473,452	1,462,401	
Self-Consumed Energy (40%)	kWh	700,800	695,544	690,327	685,150	680,011	674,911	669,849	664,826	659,839	654,891	649,979	645,104	640,266	635,464	630,698	625,968	621,273	616,613	611,989	607,399	602,843	598,322	593,835	589,381	584,960	
Surplus Exported to Grid (60%)	kWh	1,051,200	1,043,316	1,035,491	1,027,725	1,020,017	1,012,367	1,004,774	997,238	989,759	982,336	974,968	967,656	960,399	953,196	946,047	938,951	931,909	924,920	917,983	911,098	904,265	897,483	890,752	884,071	877,441	
Cumulative Generation	kWh	1,752,000	3,490,860	5,216,679	6,929,553	8,629,582	10,316,860	11,991,483	13,653,547	15,303,146	16,940,372	18,565,319	20,178,079	21,778,744	23,367,403	24,944,148	26,509,067	28,062,249	29,603,782	31,133,753	32,652,250	34,159,358	35,655,163	37,139,750	38,613,201	40,075,602	
II. APPLICABLE RATES (Escalated)																											
APPC incl. T&D Losses	Rs/kWh	4.09	4.17	4.25	4.34	4.42	4.51	4.60	4.70	4.79	4.88	4.98	5.08	5.18	5.29	5.39	5.50	5.61	5.72	5.84	5.95	6.07	6.20	6.32	6.45	6.57	
Consumer Retail Tariff	Rs/kWh	7.25	7.40	7.54	7.69	7.85	8.00	8.16	8.33	8.49	8.66	8.84	9.01	9.19	9.38	9.57	9.76	9.95	10.15	10.35	10.56	10.77	10.99	11.21	11.43	11.66	
Feed-in Tariff (FiT)	Rs/kWh	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	
REC Floor Price	Rs/kWh	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	
Discount Factor		0.9050	0.8190	0.7412	0.6707	0.6070	0.5493	0.4971	0.4499	0.4071	0.3684	0.3334	0.3018	0.2731	0.2471	0.2236	0.2024	0.1832	0.1658	0.1500	0.1358	0.1229	0.1112	0.1006	0.0911	0.0824	
III. BENEFITS TO DISCOM																											
1. Avoided Power Purchase Cost	Rs	7,161,300	7,249,742	7,339,276	7,429,916	7,521,676	7,614,569	7,708,609	7,803,810	7,900,187	7,997,754	8,096,526	8,196,519	8,297,746	8,400,223	8,503,965	8,608,989	8,715,310	8,822,945	8,931,908	9,042,217	9,153,888	9,266,939	9,381,386	9,497,246	9,614,537	
2. MNRE Benefit		255500																									

3. Avoided REC/RP O Cost	Rs	595,680	591,212	586,778	582,377	578,010	573,675	569,372	565,102	560,863	556,657	552,482	548,338	544,226	540,144	536,093	532,072	528,082	524,121	520,190	516,289	512,417	508,574	504,759	500,974	497,216	
TOTAL BENEFITS (A)	Rs	8,012,480	7,840,954	7,926,055	8,012,294	8,099,686	8,188,243	8,277,981	8,368,912	8,461,050	8,554,411	8,649,009	8,744,857	8,841,971	8,940,367	9,040,059	9,141,062	9,243,392	9,347,066	9,452,098	9,558,506	9,666,305	9,775,513	9,886,145	9,998,219	10,111,753	
IV. COSTS TO DISCOM																											
3. Revenue Loss (Self-Consumption)	Rs	5,080,800	5,143,548	5,207,071	5,271,378	5,336,480	5,402,385	5,469,105	5,536,648	5,605,026	5,674,248	5,744,325	5,815,267	5,887,086	5,959,791	6,033,394	6,107,907	6,183,340	6,259,704	6,337,011	6,415,273	6,494,502	6,574,709	6,655,907	6,738,107	6,821,323	
4. FIT Payment for Surplus Energy	Rs	3,426,912	3,401,210	3,375,701	3,350,383	3,325,255	3,300,316	3,275,564	3,250,997	3,226,614	3,202,415	3,178,397	3,154,559	3,130,900	3,107,418	3,084,112	3,060,981	3,038,024	3,015,239	2,992,625	2,970,180	2,947,903	2,925,794	2,903,851	2,882,072	2,860,456	
5. State Subsidy Outflow (Net)	Rs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTAL COSTS (B)	Rs	8,507,712	8,544,758	8,582,772	8,621,761	8,661,735	8,702,701	8,744,668	8,787,645	8,831,640	8,876,662	8,922,721	8,969,826	9,017,985	9,067,209	9,117,507	9,168,888	9,221,364	9,274,943	9,329,636	9,385,453	9,442,405	9,500,503	9,559,757	9,620,179	9,681,779	
V. NET BENEFIT TO DISCOM																											
NET BENEFIT (A - B)	Rs	-495,232	-703,804	-656,717	-609,467	-562,049	-514,458	-466,688	-418,733	-370,590	-322,251	-273,713	-224,969	-176,014	-126,842	-77,448	-27,826	22,029	72,123	122,463	173,053	223,900	275,009	326,388	378,040	429,974	
Cumulative Net Benefit	Rs	-495,232	1,199,036	1,855,753	2,465,220	3,027,270	3,541,728	4,008,415	4,427,149	4,797,738	5,119,989	5,393,702	5,618,671	5,794,685	5,921,527	5,998,975	6,026,801	6,004,772	5,932,649	5,810,186	5,637,134	5,413,234	5,138,224	4,811,837	4,433,796	4,003,822	
Net Benefit per kWh	Rs/kWh	-0.28	-0.40	-0.38	-0.36	-0.33	-0.30	-0.28	-0.25	-0.22	-0.20	-0.17	-0.14	-0.11	-0.08	-0.05	-0.02	0.01	0.05	0.08	0.11	0.15	0.18	0.22	0.26	0.29	

Annexure C — EPC-Annuity Model: Assumptions & Parameter Tables

Parameter	Value	Unit	Source / Remarks
A. PROJECT IDENTIFICATION			
DISCOM Name	JVNL/AVNL	—	Jaipur Vidyut Vitran Nigam Limited / Ajmer Vidyut Vitran Nigam Limited
State	Rajasthan	—	State of operation
Project Capacity	1 MW	MW	Total aggregated RTS capacity
Target Consumer Category	Domestic	—	≤200 kWh/month
Project Start Year (COD)	2025	Year	Commercial Operation Date
B. GENERATION PARAMETERS			
Capacity Utilization Factor (CUF)	20%	%	Rajasthan benchmark
Deration Rate Year 1–11	0.75%	%	Benchmark
Deration Rate Year 12–25	0.75%	%	Benchmark
Auxiliary Consumption	0%	%	Zero for rooftop PV
Plant Life	25	Years	Standard
C. CAPITAL COST (ADB 2022 Benchmarks)			
Capital Cost — 1 kWp system	₹51,100	₹/kWp	Benchmark
Capital Cost — 2–3 kWp (Active Tier)	₹45,760	₹/kWp	Used for 3 kWp domestic
MNRE Subsidy Rate (≤3 kWp)	40%	%	Central subsidy
D. EPC ANNUITY PARAMETERS			
Consumer Contribution per kWp	₹5,000	₹/kWp	5% of benchmark cost
EPC Upfront Payment	66.67%	%	Paid at commissioning
EPC Deferred / Annuity Payment	33.33%	%	Paid over 5 years post COD
Annuity Period	5	Years	Equal annual instalments
Consumer Rebate	0%	%	Of net generation at ABR
E. FINANCING PARAMETERS			
Debt Ratio	70%	%	Benchmark
Equity Ratio	30%	%	Benchmark
Interest Rate on Debt	9%	%	MCLR + 40 bps
Loan Repayment Period	13	Years	Benchmark
Post-tax ROE	14%	%	CERC normative
Pre-tax ROE — MAT years (1–10)	16.90%	%	14% / (1 – 17.16%)
Pre-tax ROE — IT years (11–25)	18.71%	%	14% / (1 – 25.17%)
F. TAX PARAMETERS			
Income Tax Rate	25.17%	%	22% + surcharge + cess
MAT Rate	17.16%	%	15% + surcharge + cess
MAT Credit Period	10	Years	First 10 years
G. O&M PARAMETERS			
O&M Cost	₹0.60	₹ Mn/MW	₹6,00,000/MW/year — Benchmark
O&M Escalation	2%	%	Per year
Interest on Working Capital	11%	%	MCLR + 140 bps
Working Capital Months	1	Months	1 month O&M buffer

H. T&D LOSS TRAJECTORY & DISCOM TARIFF			
T&D Loss — Years 1–5	20%	%	JVN/AVVN current level
T&D Loss — Years 6–10	18%	%	Improving
T&D Loss — Years 11–15	16%	%	—
T&D Loss — Years 16–20	14%	%	—
T&D Loss — Years 21–25	12%	%	Target efficiency
ABR – Domestic Tariff Year 1	₹6.00	₹/kWh	From ARR 2025-26
ABR – Domestic Tariff Year 1			
Discount Rate / WACC	10.5%	%	WACC
MNRE Incentive for DISCOM	5%	%	For >10% above base target
REC Floor Price	₹1.00	₹/kWh	SERC / IEX floor

Annexure D — EPC-Annuity Model: LCOE Model (25-Year)

Parameter	Unit	Formula / Note	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Yr 11	Yr 12	Yr 13	Yr 14	Yr 15	Yr 16	Yr 17	Yr 18	Yr 19	Yr 20	Yr 21	Yr 22	Yr 23	Yr 24	Yr 25	
SECTION 1 – ENERGY GENERATION (Million Units)																												
Gross Generation (MU)	MU	$CUF \times 24 \times 365 \times Cap (kW) / 1e6$	1.75 20	1.75 20	1.75 20	1.75 20	1.75 20	1.75 20	1.75 20	1.75 20	1.75 20	1.75 20	1.75 20	1.75 20	1.75 20	1.75 20	1.75 20	1.75 20	1.75 20	1.75 20	1.75 20	1.75 20	1.75 20	1.75 20	1.75 20	1.75 20	1.75 20	1.75 20
Auxiliary Consumption (MU)	MU	$Aux\% \times Gross Gen$	0.00 00	0.00 00	0.00 00	0.00 00	0.00 00	0.00 00	0.00 00	0.00 00	0.00 00	0.00 00	0.00 00	0.00 00	0.00 00	0.00 00	0.00 00	0.00 00	0.00 00	0.00 00	0.00 00	0.00 00	0.00 00	0.00 00	0.00 00	0.00 00	0.00 00	0.00 00
Deration Loss (MU)	MU	<i>Cumulative module degradation</i>	0.00 00	0.01 31	0.02 62	0.03 91	0.05 20	0.06 47	0.07 74	0.08 99	0.10 24	0.11 48	0.12 71	0.13 92	0.13 92	0.15 13	0.16 33	0.17 53	0.18 71	0.19 88	0.21 05	0.22 20	0.23 35	0.24 49	0.25 62	0.26 74	0.27 85	
Net Generation (MU)	MU	$Gross - Aux - Deration$	1.75 20	1.73 89	1.72 58	1.71 29	1.70 00	1.68 73	1.67 46	1.66 21	1.64 96	1.63 72	1.62 49	1.61 28	1.61 28	1.60 07	1.58 87	1.57 67	1.56 49	1.55 32	1.54 15	1.53 00	1.51 85	1.50 71	1.49 58	1.48 46	1.47 35	
SECTION 2 – ANNUAL COSTS BORNE BY DISCOM (₹ Million)																												
O&M Expenses (₹ Mn)	₹ Mn	$O\&M rate \times Cap \times escalation$	₹0.6 00	₹0.6 12	₹0.6 24	₹0.6 37	₹0.6 49	₹0.6 62	₹0.6 76	₹0.6 89	₹0.7 03	₹0.7 17	₹0.7 31	₹0.7 46	₹0.7 61	₹0.7 76	₹0.7 92	₹0.8 08	₹0.8 24	₹0.8 40	₹0.8 57	₹0.8 74	₹0.8 92	₹0.9 09	₹0.9 28	₹0.9 46	₹0.9 65	
Return on Equity (₹ Mn)	₹ Mn	<i>b</i>	₹1.1 39	₹1.1 39	₹1.1 39	₹1.1 39	₹1.1 39	₹1.1 39	₹1.1 39	₹1.1 39	₹1.1 39	₹1.1 39	₹1.1 39	₹1.1 39	₹1.1 39	₹1.2 60	₹1.2 60	₹1.2 60	₹1.2 60	₹1.2 60	₹1.2 60	₹1.2 60	₹1.2 60	₹1.2 60	₹1.2 60	₹1.2 60	₹1.2 60	₹1.2 60
Interest on Debt (₹ Mn)	₹ Mn	<i>Reducing balance (13-yr repayment)</i>	₹1.4 15	₹1.3 06	₹1.1 97	₹1.0 88	₹0.9 79	₹0.8 71	₹0.7 62	₹0.6 53	₹0.5 44	₹0.4 35	₹0.0 33	₹0.0 22	₹0.1 09	₹0.0 00	₹0.0 00	₹0.0 00	₹0.0 00	₹0.0 00	₹0.0 00	₹0.0 00	₹0.0 00	₹0.0 00	₹0.0 00	₹0.0 00	₹0.0 00	₹0.0 00
Loan Repayment – Principal (₹ Mn)	₹ Mn	<i>Equal instalments over 13 yrs</i>	₹1.2 09	₹1.2 09	₹1.2 09	₹1.2 09	₹1.2 09	₹1.2 09	₹1.2 09	₹1.2 09	₹1.2 09	₹1.2 09	₹1.2 09	₹1.2 09	₹1.2 09	₹1.2 09	₹0.0 00	₹0.0 00	₹0.0 00	₹0.0 00	₹0.0 00	₹0.0 00	₹0.0 00	₹0.0 00	₹0.0 00	₹0.0 00	₹0.0 00	₹0.0 00
Interest on Working Capital (₹ Mn)	₹ Mn	$O\&M/months \times IWC\%/12$	₹0.0 06	₹0.0 06	₹0.0 06	₹0.0 06	₹0.0 06	₹0.0 06	₹0.0 06	₹0.0 06	₹0.0 06	₹0.0 06	₹0.0 06	₹0.0 06	₹0.0 06	₹0.0 06	₹0.0 06	₹0.0 06	₹0.0 06	₹0.0 06	₹0.0 06	₹0.0 06	₹0.0 06	₹0.0 06	₹0.0 06	₹0.0 06	₹0.0 06	₹0.0 06
TOTAL ANNUAL COST (₹ Mn)	₹ Mn	<i>Sum of all cost components</i>	₹4.3 68	₹4.2 71	₹4.1 75	₹4.0 79	₹3.9 83	₹3.8 87	₹3.7 91	₹3.6 96	₹3.6 01	₹3.5 07	₹3.2 40	₹3.2 44	₹3.3 46	₹2.0 44	₹2.0 59	₹2.0 75	₹2.0 92	₹2.1 08	₹2.1 25	₹2.1 42	₹2.1 60	₹2.1 78	₹2.1 96	₹2.2 15	₹2.2 34	
SECTION 3 – LEVELIZED COST (₹/kWh)																												

Cost of Generation per Unit (₹/kWh)	₹/kWh	Total Cost / Net Gen × 10 ⁶	₹2.4931	₹2.4563	₹2.4190	₹2.3811	₹2.3426	₹2.3036	₹2.2640	₹2.2238	₹2.1831	₹2.1418	₹1.9941	₹2.0116	₹2.0749	₹1.2768	₹1.2963	₹1.3162	₹1.3366	₹1.3574	₹1.3786	₹1.4003	₹1.4225	₹1.4452	₹1.4684	₹1.4921	₹1.5164
Discount Factor (WACC)	x	1/(1+WACC)^Year	0.90498	0.81898	0.74116	0.67073	0.60700	0.54932	0.49712	0.44989	0.40714	0.36845	0.33344	0.30175	0.27308	0.24713	0.22365	0.20240	0.18316	0.16576	0.15001	0.13575	0.12285	0.11118	0.10062	0.09106	0.08240

Annexure E — EPC-Annuity Model: DISCOM CBA (25-Year)

Parameter	Unit	Formula / Note	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Yr 11	Yr 12	Yr 13	Yr 14	Yr 15	Yr 16	Yr 17	Yr 18	Yr 19	Yr 20	Yr 21	Yr 22	Yr 23	Yr 24	Yr 25	
A. GENERATION & TARIFF INPUTS																												
Net Generation from RTS (MU)	MU	Linked from LCOE Model	1.7520	1.7389	1.7258	1.7129	1.7000	1.6873	1.6746	1.6621	1.6496	1.6372	1.6249	1.6128	1.6128	1.6007	1.5887	1.5767	1.5649	1.5532	1.5415	1.5300	1.5185	1.5071	1.4958	1.4846	1.4735	
Average Billing Rate – ABR (₹/kWh)	₹/Wh	$ABR_{Yr1} \times (1+esc)^{(yr-1)}$	₹6.0000	₹6.1200	₹6.2424	₹6.3672	₹6.4946	₹6.6245	₹6.7570	₹6.8921	₹7.0300	₹7.1706	₹7.3140	₹7.4602	₹7.6095	₹7.7616	₹7.9169	₹8.0752	₹8.2367	₹8.4014	₹8.5695	₹8.7409	₹8.9157	₹9.0940	₹9.2759	₹9.4614	₹9.6506	
APPC incl. T&D Losses (₹/kWh)	₹/Wh	$APPC/(1-T\&D\%) \times escalation$	₹5.4000	₹5.5080	₹5.6182	₹5.7305	₹5.8451	₹5.8166	₹5.8166	₹5.8166	₹5.8166	₹5.8166	₹6.2691	₹6.2691	₹6.2691	₹6.2691	₹6.2691	₹6.2691	₹6.2691	₹6.2691	₹6.2691	₹6.2691	₹6.2691	₹6.2691	₹6.2691	₹6.2691	₹6.2691	₹6.2691
Cost of Generation – LCOE (₹/kWh)	₹/Wh	Linked from LCOE Model	₹2.4931	₹2.4563	₹2.4190	₹2.3811	₹2.3426	₹2.3036	₹2.2640	₹2.2238	₹2.1831	₹2.1418	₹1.9941	₹2.0116	₹2.0749	₹1.2768	₹1.2963	₹1.3162	₹1.3366	₹1.3574	₹1.3786	₹1.4003	₹1.4225	₹1.4452	₹1.4684	₹1.4921	₹1.5164	
B. DISCOM COSTS (Outflows)																												
Cost of Generation (₹ Mn)	₹ Mn	$LCOE \times Net\ Generation\ costs\ DISCOM$	₹4.3679	₹4.2712	₹4.1747	₹4.0785	₹3.9825	₹3.8868	₹3.7914	₹3.6962	₹3.6013	₹3.5066	₹3.2403	₹3.2442	₹3.3463	₹2.0437	₹2.0593	₹2.0753	₹2.0916	₹2.1082	₹2.1252	₹2.1425	₹2.1601	₹2.1781	₹2.1965	₹2.2152	₹2.2343	
Consumer Rebate – 35% of Generation (₹ Mn)	₹ Mn	$35\% \times Net\ Gen \times ABR - credited\ back\ to\ consumer's\ electricity\ bill$	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	

EPC Annuity Payment (₹ Mn) [Years 1-5 only]	₹ Mn	$33.33\% \times \text{Net DISCOM Capex} \div 5 \text{ yrs} \mid \text{Zero from Year 6}$	₹1.4969	₹1.4969	₹1.4969	₹1.4969	₹1.4969	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000
Loss in Utility Revenue (₹ Mn)	₹ Mn	$\text{Rebate kWh} \times (\text{ABR} - \text{APPC base}) - \text{lost retail margin on rebated units}$	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000
TOTAL DISCOM COST (₹ Mn)	₹ Mn	$\text{Gen Cost} + \text{Rebate} + \text{Annuity} + \text{Revenue Loss}$	₹5.8648	₹5.7681	₹5.6716	₹5.5754	₹5.4794	₹3.8868	₹3.7914	₹3.6962	₹3.6013	₹3.5066	₹3.2403	₹3.2442	₹3.3463	₹2.0437	₹2.0593	₹2.0753	₹2.0916	₹2.1082	₹2.1252	₹2.1425	₹2.1601	₹2.1781	₹2.1965	₹2.2152	₹2.2343
C. DISCOM BENEFITS (Inflows)																											
Avoided Power Purchase Cost (₹ Mn)	₹ Mn	$\text{APPC incl T\&D} \times \text{Net Gen} - \text{every RTS unit} = 1 \text{ unit not bought from grid}$	₹9.4608	₹9.5776	₹9.6959	₹9.8157	₹9.9369	₹9.8143	₹9.7407	₹9.6676	₹9.5951	₹9.5231	₹10.1870	₹10.1106	₹10.1106	₹10.0347	₹9.9595	₹10.6598	₹10.5799	₹10.5005	₹10.4218	₹10.3436	₹11.0769	₹10.9938	₹10.9114	₹10.8295	₹10.7483
Avoided REC Purchase (₹ Mn)	₹ Mn	$\text{REC Floor} \times \text{Net Gen} \text{ (only if RPO not met - set AR_RPO=1 if met)}$	₹1.7520	₹1.7389	₹1.7258	₹1.7129	₹1.7000	₹1.6873	₹1.6746	₹1.6621	₹1.6496	₹1.6372	₹1.6249	₹1.6128	₹1.6128	₹1.6007	₹1.5887	₹1.5767	₹1.5649	₹1.5532	₹1.5415	₹1.5300	₹1.5185	₹1.5071	₹1.4958	₹1.4846	₹1.4735
MNRE Incentive to DISCOM (₹ Mn)	₹ Mn	$5\% \text{ of benchmark cost for } >10\% \text{ above base}$	₹0.2288	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000

Benefit (₹ Mn)	<i>when DISCOM breaks even</i>																										
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Annexure F — RESCO Model: Assumptions & Parameter Tables

Parameter	Value	Unit	Source / Remarks
A. RESCO-SPECIFIC PARAMETERS			
Active Capital Cost Tier	₹41,640	₹/kWp	10–100 kWp commercial benchmark
Gross Capital Cost (1 MW)	₹4,16,40,000	₹	41,640 × 1,000 kWp
MNRE Subsidy (40%)	₹1,66,56,000	₹	40% of gross cost
Net RESCO Capital (1 MW)	₹2,49,84,000	₹	After MNRE subsidy — RESCO funds this
PPA Discount to ABR	40%	%	Consumer pays 60% of retail tariff
PPA Tariff Year 1	₹4.77	₹/kWh	ABR ₹7.95 × (1–40%)
ABR Year 1	₹7.95	₹/kWh	Higher commercial/industrial ABR
B. FINANCING			
Debt Ratio	70%	%	Benchmark
Equity Ratio	30%	%	Benchmark
Interest Rate on Debt	9%	%	MCLR + 40 bps
Loan Repayment Period	13	Years	—
Pre-tax ROE — MAT (Yr 1–10)	16.90%	%	14%/(1–17.16%)
Pre-tax ROE — IT (Yr 11–25)	18.71%	%	14%/(1–25.17%)
C. O&M, T&D & EVALUATION			
Annual O&M Cost	₹0.60	₹ Mn/MW	Benchmark
O&M Escalation	2%	%	Per year
T&D Loss Years 1–5	20%	%	Declining to 12% by Year 25
Discount Rate / WACC	10.5%	%	WACC
REC Floor Price	₹0.34	₹/kWh	SERC / IEX floor

Annexure G — RESCO Model: LCOE Model (25-Year)

Parameter	Units	Formula / Note	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Yr 11	Yr 12	Yr 13	Yr 14	Yr 15	Yr 16	Yr 17	Yr 18	Yr 19	Yr 20	Yr 21	Yr 22	Yr 23	Yr 24	Yr 25	
SECTION 1 – ENERGY GENERATION (Million Units)																												
Gross Generation (MU)	MU	$CUF \times 24 \times 365 \times Capacity(kW) / 1e6$	1.7520	1.7520	1.7520	1.7520	1.7520	1.7520	1.7520	1.7520	1.7520	1.7520	1.7520	1.7520	1.7520	1.7520	1.7520	1.7520	1.7520	1.7520	1.7520	1.7520	1.7520	1.7520	1.7520	1.7520	1.7520	1.7520
Auxiliary Consumption (MU)	MU	$Aux\% \times Gross\ Gen$	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deration Loss (MU)	MU	<i>Cumulative module degradation</i>	0.0000	0.0131	0.0262	0.0391	0.0520	0.0647	0.0774	0.0899	0.1024	0.1148	0.1271	0.1271	0.1392	0.1513	0.1633	0.1753	0.1873	0.1988	0.2105	0.2220	0.2335	0.2449	0.2562	0.2674	0.2785	
Net Generation (MU)	MU	$Gross - Aux - Deration$	1.7520	1.7389	1.7258	1.7129	1.7000	1.6873	1.6746	1.6621	1.6496	1.6372	1.6249	1.6249	1.6128	1.6007	1.5887	1.5767	1.5649	1.5532	1.5415	1.5300	1.5185	1.5071	1.4958	1.4846	1.4735	
SECTION 2 – ANNUAL COSTS (₹ Million)																												
O&M Expenses (₹ Mn)	₹ Mn	$O\&M\ rate \times Capacity \times escalation$	₹0.6000	₹0.6120	₹0.6242	₹0.6367	₹0.6495	₹0.6624	₹0.6757	₹0.6892	₹0.7030	₹0.7171	₹0.7314	₹0.7460	₹0.7609	₹0.7762	₹0.7917	₹0.8075	₹0.8237	₹0.8401	₹0.8569	₹0.8741	₹0.8916	₹0.9094	₹0.9276	₹0.9461	₹0.9651	
Return on Equity (₹ Mn)	₹ Mn	$Equity \times Pre-tax\ ROE$	₹1.2667	₹1.2667	₹1.2667	₹1.2667	₹1.2667	₹1.2667	₹1.2667	₹1.2667	₹1.2667	₹1.2667	₹1.4023	₹1.4023	₹1.4023	₹1.4023	₹1.4023	₹1.4023	₹1.4023	₹1.4023	₹1.4023	₹1.4023	₹1.4023	₹1.4023	₹1.4023	₹1.4023	₹1.4023	₹1.4023
Interest on Debt (₹ Mn)	₹ Mn	<i>Reducing balance method</i>	₹1.7489	₹1.6144	₹1.4798	₹1.3453	₹1.2108	₹1.0762	₹0.9417	₹0.8072	₹0.6726	₹0.5381	₹0.4036	₹0.2691	₹0.1345	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000
Loan Repayment – Principal (₹ Mn)	₹ Mn	<i>Equal annual instalments</i>	₹1.3453	₹1.3453	₹1.3453	₹1.3453	₹1.3453	₹1.3453	₹1.3453	₹1.3453	₹1.3453	₹1.3453	₹1.3453	₹1.3453	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000
Interest on Working Capital (₹ Mn)	₹ Mn	$O\&M/months \times IWC\ rate / 12$	₹0.0055	₹0.0056	₹0.0057	₹0.0058	₹0.0060	₹0.0061	₹0.0062	₹0.0063	₹0.0064	₹0.0066	₹0.0067	₹0.0068	₹0.0070	₹0.0071	₹0.0073	₹0.0074	₹0.0076	₹0.0077	₹0.0079	₹0.0080	₹0.0082	₹0.0083	₹0.0085	₹0.0087	₹0.0088	
TOTAL ANNUAL COST (₹ Mn)	₹ Mn	<i>Sum of all cost components</i>	₹4.9664	₹4.8439	₹4.7218	₹4.5998	₹4.4782	₹4.3567	₹4.2356	₹4.1147	₹3.9941	₹3.8737	₹3.8893	₹3.7695	₹3.6500	₹2.1856	₹2.2012	₹2.2172	₹2.2335	₹2.2501	₹2.2671	₹2.2844	₹2.3020	₹2.3200	₹2.3384	₹2.3571	₹2.3762	
SECTION 3 – LEVELIZED COST CALCULATION																												

Annexures

Cost of Generation (₹/kWh)	₹/kWh	Total Cost / Net Gen (MU×10 ⁶)	₹2.8347	₹2.7857	₹2.7360	₹2.6854	₹2.6342	₹2.5821	₹2.5293	₹2.4757	₹2.4212	₹2.3660	₹2.3935	₹2.3198	₹2.2632	₹1.3654	₹1.3856	₹1.4062	₹1.4272	₹1.4487	₹1.4707	₹1.4931	₹1.5160	₹1.5394	₹1.5633	₹1.5877	₹1.6127
Discount Factor	x	1/(1+WACC) ^{Year}	0.90498	0.81898	0.74116	0.67073	0.60700	0.54932	0.49712	0.44989	0.40714	0.36845	0.33344	0.30175	0.27308	0.24713	0.22365	0.20240	0.18316	0.16576	0.15001	0.13575	0.12285	0.11118	0.10062	0.09106	0.08240

Annexure H — RESCO Model: DISCOM CBA (25-Year)

Parameter	Units	Formula / Note	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Yr 11	Yr 12	Yr 13	Yr 14	Yr 15	Yr 16	Yr 17	Yr 18	Yr 19	Yr 20	Yr 21	Yr 22	Yr 23	Yr 24	Yr 25	
A. GENERATION & TARIFF INPUTS																												
Net Generation from RTS (MU)	MU	Linked from LCOE Model	1.7520	1.7389	1.7258	1.7129	1.7000	1.6873	1.6746	1.6621	1.6496	1.6372	1.6249	1.6249	1.6128	1.6007	1.5887	1.5767	1.5649	1.5532	1.5415	1.5300	1.5185	1.5071	1.4958	1.4846	1.4735	
Average Billing Rate – ABR (₹/kWh)	₹/kWh	$ABR_{Yr1} \times (1+escalation)^{(Yr-1)}$	₹7.9500	₹8.1090	₹8.2712	₹8.4366	₹8.6053	₹8.7774	₹8.9530	₹9.1321	₹9.3147	₹9.5010	₹9.6910	₹9.8848	₹10.0825	₹10.2842	₹10.4899	₹10.6997	₹10.9136	₹11.1319	₹11.3546	₹11.5816	₹11.8133	₹12.0495	₹12.2905	₹12.5363	₹12.7871	
APPC incl. T&D Losses (₹/kWh)	₹/kWh	$APPC/(1-T\&D\%) \times escalation$	₹5.1250	₹5.2275	₹5.3321	₹5.4387	₹5.5475	₹5.5204	₹5.5204	₹5.5204	₹5.5204	₹5.5499	₹5.5499	₹5.5499	₹5.5499	₹5.5499	₹5.5499	₹5.5499	₹6.4163	₹6.4163	₹6.4163	₹6.4163	₹6.4163	₹6.9232	₹6.9232	₹6.9232	₹6.9232	₹6.9232
PPA Tariff to Consumer (₹/kWh)	₹/kWh	$ABR \times (1-PPA Disc\%) \times escalation$	₹5.1675	₹5.2709	₹5.3763	₹5.4838	₹5.5935	₹5.7053	₹5.8194	₹5.9358	₹6.0545	₹6.1756	₹6.2992	₹6.4251	₹6.5536	₹6.6847	₹6.8184	₹6.9548	₹7.0939	₹7.2357	₹7.3805	₹7.5281	₹7.6786	₹7.8322	₹7.9888	₹8.1486	₹8.3116	
RESCO Cost of Generation – LCOE (₹/kWh)	₹/kWh	Linked from LCOE Model	₹2.8347	₹2.7857	₹2.7360	₹2.6854	₹2.6342	₹2.5821	₹2.5293	₹2.4757	₹2.4212	₹2.3660	₹2.3193	₹2.23198	₹2.2632	₹1.3654	₹1.3856	₹1.4062	₹1.4272	₹1.4487	₹1.4707	₹1.4931	₹1.5160	₹1.5394	₹1.5633	₹1.5877	₹1.6127	
B. DISCOM COSTS																												

TOTAL DISCOM BENEFIT (₹ Mn)	₹ Mn	Sum of all benefits	₹18.	₹18.	₹19.	₹19.	₹19.	₹19.	₹19.	₹19.	₹19.	₹19.	₹20.	₹20.	₹20.	₹20.	₹20.	₹21.	₹21.	₹21.	₹21.	₹21.	₹22.	₹22.	₹22.	₹22.	₹22.
			6281	8464	0674	2912	5179	5146	5593	6061	6549	7057	4565	6612	7135	7679	8246	6189	6745	7323	7924	8548	6891	7504	8140	8801	9487
D. NET BENEFIT TO DISCOM																											
Net Annual Benefit to DISCOM (₹ Mn)	₹ Mn	Total Benefit + Cost (cost is negative)	₹13.7532	₹13.9112	₹14.0713	₹14.2334	₹14.3977	₹14.3311	₹14.3118	₹14.2938	₹14.2770	₹14.2614	₹14.9449	₹15.0394	₹15.0222	₹15.0064	₹14.9919	₹15.7142	₹15.6968	₹15.6808	₹15.6662	₹15.6529	₹16.4106	₹16.3944	₹16.3795	₹16.3662	₹16.3543
Net Benefit per Unit (₹/kWh)	₹/kWh	Net Benefit / Net Gen	₹7.8500	₹8.0002	₹8.1534	₹8.3097	₹8.4691	₹8.4936	₹8.5463	₹8.6000	₹8.6548	₹8.7107	₹9.1972	₹9.2553	₹9.3146	₹9.3751	₹9.4368	₹9.9662	₹10.0304	₹10.0959	₹10.1627	₹10.2308	₹10.8071	₹10.8780	₹10.9503	₹11.0241	₹11.0993
Discounted Net Benefit (₹ Mn)	₹ Mn	Net Benefit / (1+WACC)^yr	₹12.4463	₹11.3931	₹10.4291	₹9.5469	₹8.7394	₹7.8724	₹7.1147	₹6.4306	₹5.8127	₹5.2546	₹4.9832	₹4.5382	₹4.1023	₹3.7086	₹3.3529	₹3.1805	₹2.8751	₹2.5992	₹2.3501	₹2.1250	₹2.0161	₹1.8227	₹1.6480	₹1.4902	₹1.3476

Annexure I — RESCO Model: RESCO Returns (25-Year)

Parameter	Units	Formula / Note	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Yr 11	Yr 12	Yr 13	Yr 14	Yr 15	Yr 16	Yr 17	Yr 18	Yr 19	Yr 20	Yr 21	Yr 22	Yr 23	Yr 24	Yr 25
A. RESCO REVENUE																											
Net Generation (MU)	MU	From LCOE Model	1.7520	1.7389	1.7258	1.7129	1.7000	1.6873	1.6746	1.6621	1.6496	1.6372	1.6249	1.6249	1.6128	1.6007	1.5887	1.5767	1.5649	1.5532	1.5415	1.5300	1.5185	1.5071	1.4958	1.4846	1.4735
PPA Tariff Received (₹/kWh)	₹/kWh	From DISCOM CBA	₹4.7700	₹4.8654	₹4.9627	₹5.0620	₹5.1632	₹5.2665	₹5.3718	₹5.4792	₹5.5888	₹5.7006	₹5.8146	₹5.9309	₹6.0495	₹6.1705	₹6.2939	₹6.4198	₹6.5482	₹6.6792	₹6.8127	₹6.9490	₹7.0880	₹7.2297	₹7.3743	₹7.5218	₹7.6722
TOTAL PPA Revenue (₹ Mn)	₹ Mn	PPA tariff × Net Gen	₹8.3570	₹8.4602	₹8.5647	₹8.6705	₹8.7776	₹8.8860	₹8.9957	₹9.1068	₹9.2193	₹9.3332	₹9.4484	₹9.6374	₹9.7564	₹9.8769	₹9.9989	₹10.1224	₹10.2474	₹10.3739	₹10.5021	₹10.6318	₹10.7631	₹10.8960	₹11.0305	₹11.1668	₹11.3047
B. RESCO COSTS																											
Capital Investment (₹ Mn) – Year 1	₹ Mn	Cap×1000×CapCost×(1-sub)/1e7 – outflow in Yr1	- ₹24.9840	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000
O&M Expenses (₹ Mn)	₹ Mn	From LCOE O&M schedule outflow	- ₹0.6000	₹0.6120	₹0.6242	₹0.6367	₹0.6495	₹0.6624	₹0.6757	₹0.6892	₹0.7030	₹0.7171	₹0.7314	₹0.7460	₹0.7609	₹0.7762	₹0.7917	₹0.8075	₹0.8237	₹0.8401	₹0.8569	₹0.8741	₹0.8916	₹0.9094	₹0.9276	₹0.9461	₹0.9651
Interest on Debt (₹ Mn)	₹ Mn	Reducing balance – outflow	- ₹1.7489	₹1.6144	₹1.4798	₹1.3453	₹1.2108	₹1.0762	₹0.9417	₹0.8072	₹0.6726	₹0.5381	₹0.4036	₹0.2691	₹0.1345	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000
Loan Repayment – Principal (₹ Mn)	₹ Mn	Equal instalment – outflow	- ₹1.3453	₹1.3453	₹1.3453	₹1.3453	₹1.3453	₹1.3453	₹1.3453	₹1.3453	₹1.3453	₹1.3453	₹1.3453	₹1.3453	₹1.3453	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000	₹0.0000

TOTAL RESCOST (₹ Mn)	₹ Mn	Capex+O&M+Interest+Principal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			₹28.6782	₹3.5716	₹3.4494	₹3.3273	₹3.2055	₹3.0840	₹2.9627	₹2.8417	₹2.7209	₹2.6005	₹2.4803	₹2.3604	₹2.2408	₹0.7762	₹0.7917	₹0.8075	₹0.8237	₹0.8401	₹0.8569	₹0.8741	₹0.8916	₹0.9094	₹0.9276	₹0.9461	₹0.9651
C. NET CASH FLOWS																											
Net Cash Flow (₹ Mn)	₹ Mn	Revenue + Costs are negative)	-	₹4.889	₹5.115	₹5.343	₹5.572	₹5.802	₹6.033	₹6.265	₹6.498	₹6.733	₹6.968	₹7.207	₹7.516	₹9.101	₹9.207	₹9.315	₹9.424	₹9.534	₹9.645	₹9.758	₹9.871	₹9.987	₹10.103	₹10.221	₹10.340
Cumulative Net Cash Flow (₹ Mn)	₹ Mn	Running cumulative total	-	₹20.433	₹15.317	₹4.974	₹0.598	₹6.400	₹12.433	₹18.698	₹25.197	₹31.929	₹38.898	₹46.175	₹53.690	₹62.791	₹71.998	₹81.313	₹90.737	₹100.271	₹109.916	₹119.673	₹129.545	₹139.531	₹149.634	₹159.855	₹170.195
IRR Cash Flow Series (Yr0 capex + Yr1-25 NCF)	₹ Mn		-	₹45.89	₹5.115	₹5.343	₹5.572	₹5.802	₹6.033	₹6.265	₹6.498	₹6.733	₹6.968	₹7.207	₹7.516	₹9.101	₹9.207	₹9.315	₹9.424	₹9.534	₹9.645	₹9.758	₹9.871	₹9.987	₹10.103	₹10.221	₹10.340