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Green Retail and MSME Lending in India's Energy Transition Sizing the NBFC-Addressable Market for Solar, Electric Mobility and Storage, FY2026 to FY2031

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ABSTRACT :

India has set a target of 500 GW of non-fossil energy capacity by 2030. Utility-scale renewable projects are well served by banks and infrastructure lenders, but small green assets in retail and micro, small and medium enterprise (MSME) segments are less served. This paper estimates the annual debt demand, through FY2031, for four such asset classes that is open to non-banking financial companies (NBFCs): residential rooftop solar, commercial and industrial (C&I) rooftop solar, electric vehicles (EVs), and behind-the-meter battery energy storage systems (BESS).

The study uses a bottom-up model with Conservative, Base and Aggressive scenarios. The Base case gives an addressable annual debt volume of ₹62,263 crore in FY2031, within a range of ₹34,196 crore to ₹1,03,550 crore. EV financing makes up about 77% of the Base case. Sensitivity tests show that financing penetration has the largest effect of the variables tested, and that the effect of battery cost is smaller and two-sided. The paper argues that a green NBFC should stage its entry, starting with residential solar and moving into commercial EV financing once adoption and loss data are available. Several inputs remain unverified, and the paper identifies them. The results are an upper bound on addressable demand, not a forecast of lending volume.

Keywords: green finance, NBFC, rooftop solar, electric vehicles, battery storage, India, market sizing

1. Introduction

The transition to clean energy requires large amounts of debt capital. In India, banks, development finance institutions, and capital markets finance most large renewable projects. Decentralised assets, including rooftop solar systems for homes and businesses, electric two-, three- and four-wheelers, and storage systems paired with solar, are less easily financed. Each loan is small, the borrower is often new to formal credit, and the asset is difficult to recover and resell.

This gap matters for policy and for lenders. Government programmes now provide large subsidies for rooftop solar and EVs, which reduce the amount a household or business must borrow but do not remove the need for finance. Non-banking financial companies, which are regulated by the Reserve Bank of India (RBI) but do not hold full banking licences, are a natural source of credit for these segments. Green-focused NBFCs have emerged to serve these segments, and Solfin Sustainable Finance is one of them.

The question this paper asks is how large the annual debt market is for those segments, and how much of it an NBFC can reach. The answer is relevant to a lender deciding where to enter, to an investor assessing growth, and to a policy maker trying to judge whether subsidies are translating into financing. The paper uses a single company, Solfin Sustainable Finance Private Limited, as the reference point, and it draws on public information about that company only.

The paper makes three contributions. It presents a transparent bottom-up model whose inputs and formulas are stated, so that each figure can be traced. It reports scenario and sensitivity results, which show how wide the plausible range is. It identifies which inputs are verified and which are assumptions, so readers can judge which conclusions depend on which inputs.

1.1 Scope and definitions

The study covers India and focuses on high-adoption urban, peri-urban and industrial areas in several states, including Maharashtra, Gujarat, Rajasthan,

Tamil Nadu, Karnataka and Uttar Pradesh. It covers four segments: residential rooftop solar of 1 kW to 10 kW, C&I rooftop solar of 10 kW to 1 MW with tickets below ₹2 crore, electric mobility for two-, three- and four-wheeler fleets, and behind-the-meter battery storage attached to solar. Utility-scale solar above 10 MW, large corporate renewable projects and private passenger EV cars are excluded, because banks and infrastructure funds compete intensely in those markets.

Several terms are used throughout. A non-banking financial company (NBFC) is a company registered under the Companies Act and regulated by the RBI under the RBI Act, 1934, which lends without holding a full banking licence. The total addressable market (TAM), in this paper, is the annual debt volume open to NBFCs in a segment, not the total investment in the segment. Loan-to-value (LTV) is the loan amount as a share of the asset value. Probability of default (PD), loss given default (LGD) and exposure at default (EAD) are the standard credit risk parameters defined in Section 4.5.

The paper is organised as follows. Section 2 sets out the policy and market background. Section 3 describes the literature and industry sources used. Section 4 describes the method. Section 5 reports the results. Section 6 discusses them, Section 7 draws implications for a lender, Section 8 sets out the limitations, and Section 9 concludes.

2. Policy and Market Background

2.1 Rooftop solar

PM Surya Ghar: Muft Bijli Yojana was approved by the Union Cabinet with an outlay of ₹75,021 crore to provide rooftop solar to one crore households (Press Information Bureau, 2024). The central financial assistance is 60% of system cost for systems up to 2 kW and 40% of the additional cost for systems between 2 kW and 3 kW, capped at ₹78,000 for systems of 3 kW and above (Press Information Bureau, 2024). The scheme's stated completion date is FY2026-27 (Energetica India, 2026).

Installation volumes have grown quickly. According to the Ministry of New and Renewable Energy as reported in the trade press, more than 50 lakh households had benefited by August 2026, with about 14.8 GW of cumulative capacity commissioned (KNN India, 2026). July 2026 recorded the highest monthly additions to date. Reported totals were about 10 lakh households in March 2025 (Energetica India, 2025) and about 32 lakh in March 2026 (Energetica India, 2026).

2.2 Electric mobility

PM E-DRIVE was approved with an outlay of ₹10,900 crore over two years to support electric two- and three-wheelers, electric buses and charging infrastructure (Press Information Bureau, 2024). The scheme supports 24.79 lakh e-2W, 3.16 lakh e-3W and 14,028 e-buses (Press Information Bureau, 2024).

Retail sales of electric two-wheelers reached about 14 lakh units in FY2026, a rise of about 22% on the previous year (Autocar Pro, 2026a).Electric three-wheelers reached 830,818 units, up 19% (Autocar Pro, 2026b). JMK Research reports that electric two-wheelers accounted for about 57.8% of all EV sales in FY2026 (JMK Research & Analytics, 2026).

2.3 Battery prices

BloombergNEF reports that the global average lithium-ion battery pack price fell 8% in 2025 to a record low of US$108 per kWh (BloombergNEF, 2025). Stationary storage packs averaged US$70 per kWh, 45% below 2024, and battery-electric vehicle packs averaged US$99 per kWh (BloombergNEF, 2025). These trends matter for both EV affordability and the cost of storage. They also affect the value of a battery when it is repossessed, which bears on lenders' loss estimates.

2.4 Co-lending regulation

The RBI's Co-Lending Arrangements Directions, 2025 replaced the 2020 co-lending framework. The Directions as reported by law firms and consultants set a minimum retention of 10% for each regulated entity, compared with the 20% minimum that applied to NBFCs under the 2020 framework (AZB & Partners, 2025; CARE Ratings, 2025). They also removed the fixed 80:20 split between bank and NBFC and extended co-lending beyond priority sector lending (Cyril Amarchand Mangaldas, 2025). The Directions were scheduled to take effect on 1 January 2026.

The status of these Directions must be confirmed before this paper is submitted. Some secondary sources describe the 2025 Directions as withdrawn, and the author has not yet confirmed their current status against the RBI notification. The analysis in this paper treats the 10% retention rule as the rule to be

applied, and it flags this as a point to be checked.

2.5 Industry structure

Three groups of lenders finance green assets in India: scheduled commercial banks, infrastructure finance companies such as Power Finance Corporation, REC and IREDA, and retail or MSME-focused NBFCs. Banks dominate utility-scale renewables because their deposit funding is relatively cheap. Smaller green assets are less attractive to banks because loan processing is costly, asset standards are not uniform, and many borrowers have no formal credit history.

Industry structure also depends on the sales channel. In rooftop solar and EVs, a large part of the customer relationship is formed at the point of sale, by an installer or a dealer. Lenders that are integrated into those channels can approve loans during the purchase, while lenders that operate separately must reach the customer after the decision has been made. This channel dependence is one reason why distribution partnerships are a central part of the strategy discussed in Section 7.

Competitive pressure is rising from two directions. Fintech originators can source demand quickly but usually depend on partner NBFCs or banks for funding. Banks entering green retail can lower rates on the segments they choose. The combined effect is that an NBFC's advantage must be built on speed, channel integration and data, since none of those alone is likely to be protected.

2.6 Tax treatment of EV loans

Section 80EEB of the Income Tax Act, 1961 allowed individuals a deduction of up to ₹1.5 lakh a year on interest paid on loans for electric vehicles, for loans sanctioned between 1 April 2019 and 31 March 2023 (Income Tax Department, n.d.). No new loans qualify under that window, but existing qualifying loans continue to receive the deduction. The provision therefore affects the existing EV loan book, not new lending in the forecast period.

3. Literature and Sources

This paper does not present a systematic review of the academic literature on green finance in India. The discussion draws mainly on regulatory texts, government programme announcements, sales data and industry research, which are the sources that set the parameters of the market. Where academic work on green finance would normally inform a judgement, the paper says so, and it does not attribute findings to studies it has not checked.

The sources used fall into four groups. Regulatory sources include the RBI co-lending framework and the Income Tax provisions. Government sources include scheme outlays and installation figures. Market data come from sales registration data and from battery price surveys. Company information comes from press releases and trade publications about Solfin, and it is limited to information that is public.

A fuller review would extend the analysis to the academic literature on green credit, on the relationship between subsidies and adoption, and on the loss performance of asset-backed consumer lending. That review is identified in Section 8 as future work.

4. Method

4.1 Bottom-up sizing

The model estimates the annual NBFC-addressable debt in each segment for FY2031. It starts from physical or unit volume, multiplies by cost, and then applies the shares that determine how much of the financed demand is open to an NBFC. The general form is the same for each segment: volume × unit cost × financing penetration × loan-to-value (where relevant) × NBFC share. The bottom-up approach was chosen because it makes each assumption visible. A top-down estimate, based on a share of national credit or of total investment, would hide the assumptions behind a single figure.

For residential solar, the formula is annual capacity × cost per kW × financing penetration × loan-to-value × NBFC share. For C&I solar, it is annual capacity in MW × capex per MW × a combined addressable factor. For EVs, it is units sold × share financed × loan-to-value × NBFC share × average financed value per vehicle. For BESS, it is storage capacity in MWh × system cost per kWh × financing penetration × NBFC share.

4.2 Scenarios

Three scenarios bracket the outcome. The Conservative scenario assumes slower policy enforcement, grid interconnection bottlenecks and gradual EV adoption. The Base case assumes steady policy execution, full realisation of the PM Surya Ghar target, continued battery cost reductions and consistent

RBI support. The Aggressive scenario assumes faster grid parity with fossil fuels, strict state-level green power mandates, battery costs below US$90 per kWh, and universal co-lending. The scenarios are defined in qualitative terms, and the numerical inputs for each are reported in Table 1 where they are stated.

4.3 Inputs

Table 1 lists the Base-case inputs. Each input carries a status. Verified inputs are those confirmed against a public source. Open inputs are those whose source has not yet been confirmed. Inputs marked as assumptions are chosen by the author for the analysis and are not sourced from data.

Table 1

Base-case inputs and their status

Segment	Input	Value	Status
Residential solar	Annual capacity added by FY2031	4.5 GW	Assumption; open
Residential solar	Capex per kW	₹50,000	Open
Residential solar	Financing penetration / LTV / NBFC share	75% / 80% / 65%	Assumptions; open
C&I solar	Annual capacity; capex per MW	1,800 MW; ₹3.8 crore	Open
C&I solar	Combined addressable factor	50%	Open; components multiply to about 32%
E-2W	Annual sales by FY2031; financed share; LTV; NBFC share	65 lakh; 60%; 75%; 65%	Open
E-3W	Annual sales; financing penetration; LTV; NBFC share	12 lakh; 85%; 80%; 70%	Open
E-4W fleets	Annual sales; financing penetration; LTV; NBFC share	2.2 lakh; 80%; 80%; 50%	Open
EV (all)	Average financed value per vehicle	Not stated	Open; required to reproduce EV TAM
BESS	Solar paired with two-hour storage	1,386 MW; 2,772 MWh	Open
BESS	System cost per kWh; financing; NBFC share	₹14,000; 70%; 80%	Assumptions; open
BESS	Attachment rate by FY2031	22%	Open

A point needs stating clearly. The EV TAM values are reported in the source model, but the average financed value per vehicle that would reproduce them is not stated. The EV figures therefore cannot yet be reproduced from their inputs. The EV totals are used in this paper as reported, and the paper treats the EV result as the least verified of the four segments.

4.4 Sensitivity analysis

Sensitivity analysis varies two inputs. The first is financing penetration, set at 60%, 75% and 85%, with 75% as the Base case. Because penetration scales every segment in the model, it is applied proportionally across all segments. The second is battery cost, varied by ±20%. Battery cost affects the BESS segment directly and the EV segment through the battery share of vehicle price. The battery share is taken as 45%, the midpoint of the 40% to 50% range reported for EVs. The battery-linked base is therefore the BESS segment plus 45% of EV TAM.

4.5 Illustrative credit calculations

Two illustrative calculations support the discussion of lending economics. The first applies the standard equated monthly instalment (EMI) formula to a ₹5 lakh loan at two interest rates, 11% and 13%, over five tenures. The second computes expected loss as the product of probability of default, loss given default and exposure at default for a grid of values. Neither calculation uses Solfin's product rates or loss data. Both are included to show how the inputs drive the outputs.

4.6 Data and their limits

Scheme and installation figures come from government statements and from trade reporting of those statements. Vehicle sales come from registration data reported by Autocar Pro and JMK Research. Battery prices come from BloombergNEF. Company information comes from announcements and press coverage. Field interviews were part of the wider work and informed the understanding of the sector. This paper does not report interview findings and does not use them as quantitative inputs. Model inputs that depend on field data are marked as open in Table 1.

4.7 Arithmetic checks

Before the results were used, each published total was recomputed from its rows and each derived figure was recomputed from its stated inputs. Three checks changed the results. The Conservative total in the earlier draft was ₹34,166 crore, but the rows sum to ₹34,196 crore, and the paper uses the sum. The Base-case residential figure of ₹8,823 crore could not be reproduced from its inputs, which give ₹8,775 crore once the 80% loan-to-value is applied, so the paper uses ₹8,775 crore. The Base-case BESS figure of ₹3,903 crore exceeds the total capital cost of the storage systems, which is about ₹3,880 crore. The paper uses ₹2,173 crore, which applies the stated 70% financing and 80% NBFC share to that capital cost.

Two checks could not be resolved and are reported as open. The C&I figure of ₹3,420 crore implies a combined factor of 50%, while its component factors multiply to about 32%. The Conservative and Aggressive residential and BESS rows were not derived from documented inputs, so they are reported as stated. These corrections matter because they change the Base-case total, and a reader comparing this paper with an earlier version should use the figures reported here.

5. Results

5.1 Scenario results

Table 2 reports the annual NBFC-addressable debt for FY2031 in each scenario. The Base case gives ₹62,263 crore. The Conservative total is ₹34,196 crore and the Aggressive total is ₹1,03,550 crore. The Aggressive case is about 1.7 times the Base case, and the Base case is about 1.8 times the Conservative case.

Table 2

Annual NBFC-addressable debt by segment and scenario, FY2031 (₹ crore)

Segment	Conservative	Base case	Aggressive
Residential solar rooftop	2,363	8,775	22,885
C&I solar rooftop (sub-1 MW)	1,403	3,420	7,390
Electric 2-wheelers	7,645	12,603	16,217
Electric 3-wheelers	15,477	22,409	26,873
Electric 4-wheelers (fleets)	6,184	12,883	21,901
Behind-the-meter BESS	1,124	2,173	8,284
Total	34,196	62,263	1,03,550

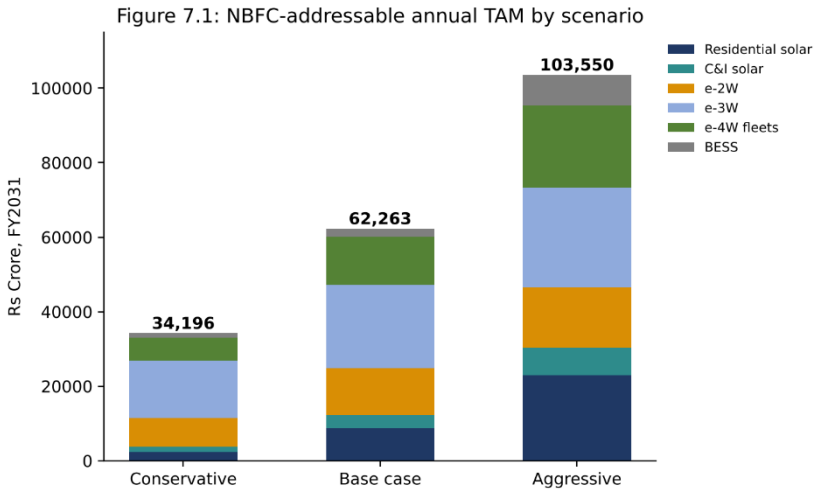


Figure 1

Annual NBFC-addressable TAM by scenario, FY2031

Note. Values are from Table 2. Residential solar and C&I solar are at the smallest scale and are not separately visible at this height.

5.2 Segment composition

In the Base case, the EV segments account for ₹47,895 crore, or 77% of the total. Residential solar accounts for 14%, C&I solar for 5% and BESS for 3%. Within the EV segments, electric three- and four-wheelers together make up 74% of EV TAM. This concentration is important because the EV figures are the least reproducible in the model, as Section 4.3 explains.

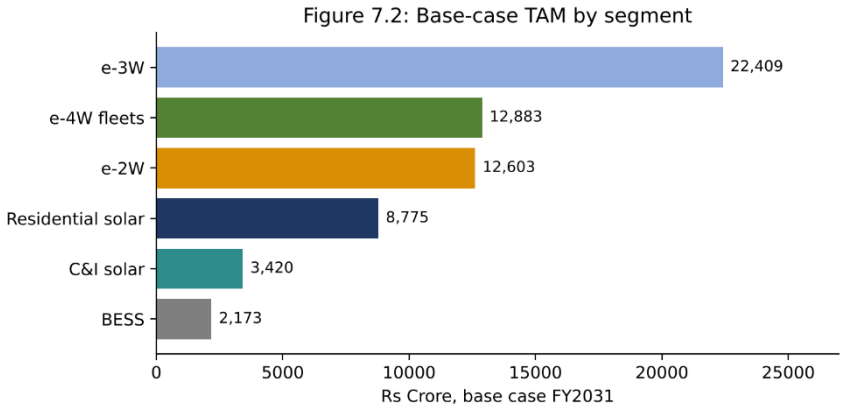


Figure 2

Base-case TAM by segment, FY2031

Note. Values are the Base-case results in Table 2.

5.3 Sensitivity results

Table 3 reports the Base-case result across the financing penetration and battery cost ranges. Financing penetration has the largest effect. Moving from 75% to 60% reduces the TAM by about one-fifth, and moving to 85% raises it by about one-seventh. A 20% change in battery cost moves the TAM by about ₹4,700 crore in either direction. Battery cost raises the TAM in this model because a higher cost increases the capex that is financed. A reduction in demand from higher prices is not captured, and this is a limitation discussed in Section 8.

Table 3

Base-case TAM sensitivity to financing penetration and battery cost (₹ crore)

Battery cost change	60% penetration	75% penetration (base)	85% penetration
−20%	46,014	57,518	65,187

Battery cost change	60% penetration	75% penetration (base)	85% penetration
Base	49,810	62,263	70,565
+20%	53,607	67,008	75,943

5.4 Reality check on EV volumes

The EV assumptions can be compared with recent sales. Electric two-wheeler sales reached about 14 lakh units in FY2026 (Autocar Pro, 2026). The Base case assumes 65 lakh e-2W units a year by FY2031. That is about 4.6 times the FY2026 level, which implies sustained growth well above the rate of the most recent year. Figure 3 compares FY2025 and FY2026 sales for two- and three-wheelers. The e-2W figure in the Base case should therefore be treated as the most uncertain volume input in the model, and the EV TAM should be re-estimated once a justified volume path is available.

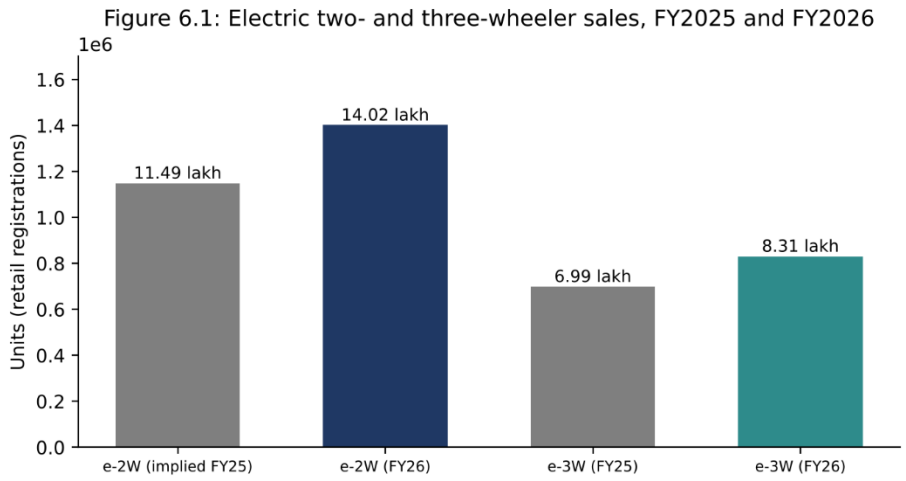


Figure 3

Electric two- and three-wheeler retail sales, FY2025 and FY2026

Note. Source: Vahan registrations as reported by Autocar Pro (2026). The FY2025 e-2W value is implied from the reported 22% growth and is approximate.

5.5 Illustrative lending economics

Affordability is the first test in residential and EV lending. Table 4 shows the monthly EMI on a ₹5 lakh loan. At 11%, a 36-month loan requires an EMI of about ₹${fmt(EMI(500000, 0.11 / 12, 36))}. Extending the tenure to 60 months reduces the EMI but raises total interest paid. A two percentage point rise in rate raises the EMI by a noticeable amount, so a lender's funding cost passes directly to the borrower's monthly outgoing.

Table 4

Monthly EMI on an illustrative ₹5 lakh loan by tenure (₹)

Tenure (months)	EMI at 11%	EMI at 13%
12	44,191	44,659
24	23,304	23,771
36	16,369	16,847
48	12,923	13,414
60	10,871	11,377

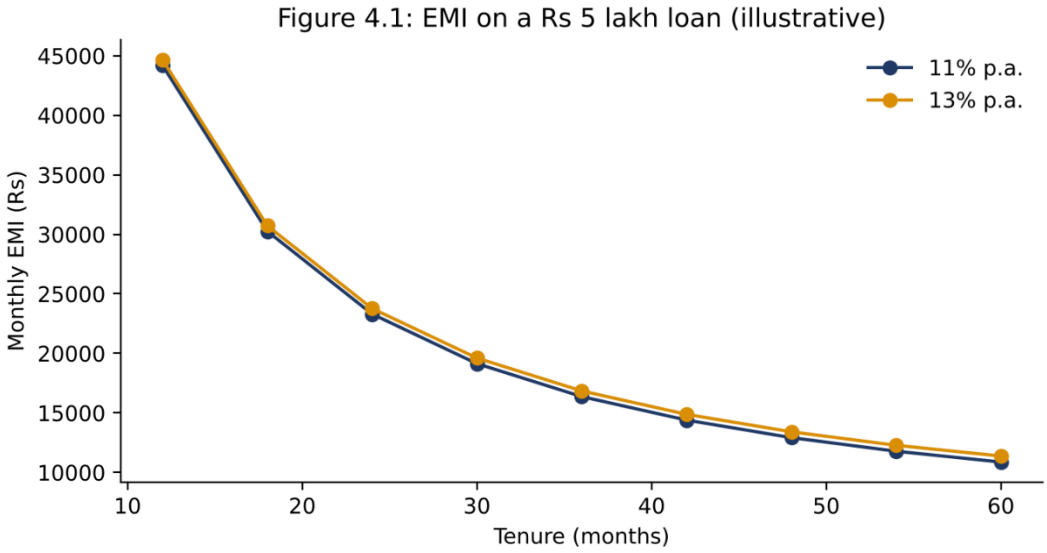


Figure 4

Monthly EMI on an illustrative ₹5 lakh loan

Note. Illustrative only. Rates are assumptions, not Solfin product terms. Calculated with the standard EMI formula.

Expected loss is the product of probability of default, loss given default and exposure at default. On a ₹5 lakh exposure, a 4% probability of default and a 60% loss given default give an expected loss of ₹12,000. Figure 5 shows the grid. The result depends heavily on loss given default, which for green assets is the least known input, because resale markets for used panels and EV batteries are thin.

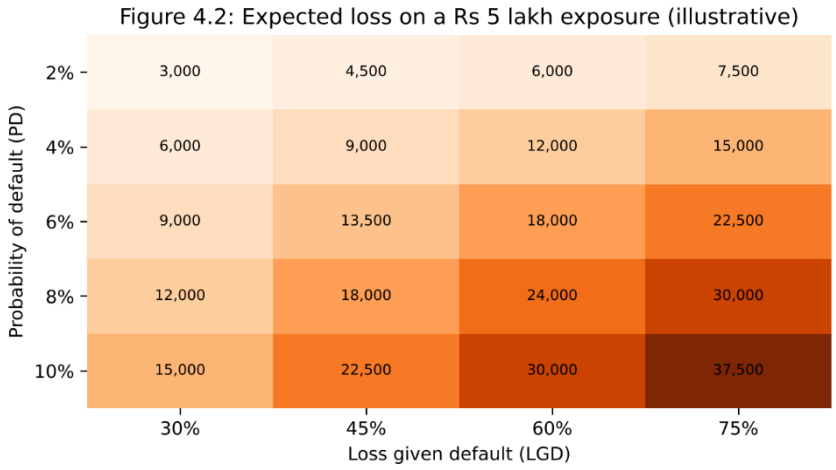


Figure 5

Expected loss on an illustrative ₹5 lakh exposure

Note. Illustrative probabilities and loss rates. Values are PD × LGD × ₹5,00,000.

5.6 Battery price context

The battery price trend supports the view that storage and EV costs are falling. Figure 6 shows the global average pack price from 2023 to 2025 and the 2025 segment values. The model's BESS cost assumption of ₹14,000 per kWh has not been compared directly with these values, and that comparison is an open item.

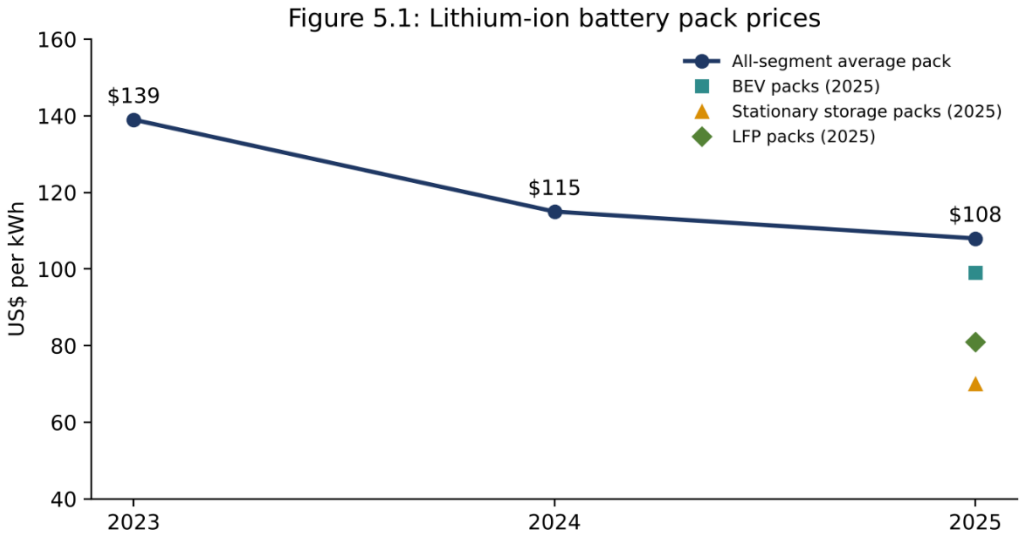


Figure 6

Lithium-ion battery pack prices, 2023 to 2025

Note. Source: BloombergNEF battery price survey as reported in trade press (2025). Values are US dollars per kWh.

6. Discussion

6.1 Where the opportunity is concentrated

The results point to EVs as the largest segment in every scenario, and to residential solar as the segment that depends most directly on a single programme. The EV segment is large partly because each vehicle is financed at a higher value than a rooftop system, and partly because the commercial fleet segment generates daily cash flows that suit frequent repayment. The residential segment is smaller, but it is standardised, its loans are modest in size, and its repayment source, the saving on the electricity bill, is easy to explain.

The concentration matters for strategy. If EV volumes grow more slowly than assumed, the largest segment shrinks, and the lender's plans would need to change. The paper therefore argues that the EV phase should be triggered by observed adoption and loss data, rather than fixed to a calendar.

6.2 Residential solar and the policy horizon

The Base case assumes that the PM Surya Ghar target is fully delivered. The scheme's stated completion date falls in FY2026-27, and the model's FY2031 horizon extends beyond it. The paper does not model what happens to residential demand after the target. Demand may continue at a lower level, funded by households who do not receive the subsidy, or it may fall. Those households are harder to reach and may need a higher rate, so the segment's economics would change even if its volume remained. This is the main policy assumption behind the residential result, and it is flagged rather than tested.

6.3 Co-lending as a funding strategy

Co-lending is central to the funding strategy in the report. Under the 2025 Directions as reported, an NBFC retains at least 10% of each loan and the partner bank funds the rest, which allows an NBFC to grow its book with less balance-sheet capital than a fully funded lender needs. The trade-off is that the NBFC gives up part of the upside and must agree underwriting standards with a partner.

The strength of this approach depends on the partner relationship. A bank can reduce its appetite, and an NBFC that relies on one partner is exposed to that decision. The paper therefore recommends at least two partner banks before co-lending becomes a large share of the book. Because the status of the 2025 Directions has not yet been confirmed, the rule described here should be checked against the current RBI notification before any strategy is based on it.

6.4 Competitive position

The competitive analysis identifies speed as the main advantage of a digital, point-of-sale lender. Commercial banks offer lower rates but take longer to approve, and the competitor comparison in the wider report, which has not yet been verified against public sources, gives turnaround times of 30 to 60

days for public sector banks and 24 to 72 hours for green-focused NBFCs. Those figures are used here only as the basis for the qualitative point. Speed matters most in residential solar and commercial EV lending, where borrowers value approval time over small differences in rate. It matters least in large C&I lending, where clients can negotiate with banks.

The advantage is not secure. Fintech originators can match speed, and banks entering green retail can reduce rates. The lasting advantage is more likely to come from embedding in dealer and installer systems, and from data on loan performance, than from speed alone.

6.5 Funding cost as the binding constraint

A lender's cost of funds sets the price it can offer, and the report identifies higher cost of funds as the main weakness against deposit-taking banks. The analysis of growth shows that equity supports a fixed volume of on-balance-sheet lending, and that anything above that must be funded by debt or co-lending. The growth plan is therefore constrained by funding at least as much as by demand. A market-size estimate says little about whether a lender can profitably reach that market unless its funding cost is known.

6.6 Risk

The main risks to the strategy are policy continuity, discom connection delays, battery degradation and resale values, and dependence on a single region or partner. Each affects a different part of the model. Policy affects the size of the market. Discom delays affect the time between loan approval and disbursal, which is a working-capital risk. Battery degradation affects collateral values and therefore loss given default. Concentration affects the diversification of the book. The paper's view is that the risks are manageable if the strategy is staged and if portfolio data are collected from the first loans.

6.7 Segment-by-segment discussion

Residential solar

Residential solar is the most policy-dependent segment and also the easiest to explain. The product is standardised: a system of a given size, a loan sized to the subsidised cost, and a repayment source in the monthly electricity bill. The loan is small, which limits the size of any single loss, and the point-of-sale channel allows documentation to start before installation. The main operational problem is the interval between installation and disbursal, which is lengthened by grid connection delays. A lender that can structure disbursal in tranches tied to commissioning reduces that exposure. The segment is therefore a suitable starting point for a new entrant, provided the lender does not depend on subsidy continuity beyond the period for which it is confirmed.

C&I solar

C&I solar is a different credit. Each project is larger, the borrower is a business, and the repayment depends on the repayment comes from the company's operating cash flow, not from a household bill. The segment is also more competitive at the top end, because large clients can borrow from banks at lower rates. The natural target for an NBFC is the mid-sized business whose bank application is slow to process, within a ticket range of ₹5 lakh to ₹2 crore. Accelerated depreciation improves early cash flow, though the rate used in the model has not been confirmed against current tax rules. Lending against receivables, where the borrower has them, reduces reliance on the solar equipment as collateral.

Commercial EV financing

Commercial EV financing is the largest segment and the one with the most uncertainty. Borrowers are fleet operators and delivery businesses, many of whom are new to formal credit, and their income is real but irregular. Telematics addresses two problems at once. It provides a measure of vehicle utilisation, which is a proxy for income, and it allows the lender to immobilise a vehicle if payments stop. The principal risk is resale value. If batteries degrade faster than expected, the collateral is worth less when repossessed, and loss given default rises. Conservative loan-to-value limits and monitoring of residual values on repossessed vehicles are the practical responses until degradation data exist.

Behind-the-meter storage

Storage paired with solar is the newest and smallest segment in the Base case. Demand depends on whether a business or household has a clear reason to store power, such as peak-hour tariffs or unreliable supply. Where that reason exists, the saving from storage can service the loan, and the storage protects the solar asset by providing backup. The model's result depends on an attachment rate of 22% by FY2031 and a system cost of ₹14,000 per kWh. The cost assumption may be conservative given the 2025 fall in stationary storage prices. The attachment rate is the more uncertain input, and it should be tested in a pilot before the segment is scaled.

7. Implications for a Lender

7.1 A staged entry

The paper recommends a four-phase entry. Phase one, over the first twelve months, scales residential solar, which is the most standardised segment and the easiest to explain to borrowers and partners. Phase two, months 12 to 24, extends into C&I solar tickets below ₹2 crore, using cash-flow underwriting. Phase three, months 24 to 36, scales commercial e-3W and fleet e-4W lending, with telematics as a condition of lending. Phase four, from month 36, introduces bundled solar-plus-storage products. The timings are planning assumptions, and each phase should begin only when the previous phase meets agreed measures.

7.2 Measures for each phase

A staged plan needs measures that show whether it is working. The indicators most relevant to this strategy are the time from application to sanction, the share of originations from the largest partners, early delinquency at 30 and 60 days, the blended cost of funds, the co-lending share of the book, the recovery rate on repossessed assets, and the time from installation to disbursal. Targets should be set from the lender's own baseline, which the paper does not have.

7.3 Capital and funding plan

The funding plan combines equity, institutional debt, co-lending and, where available, concessional capital from development finance institutions. Concessional capital is treated as an upside to the lending volume and a source of lower cost, not as a base-case assumption. Securitisation is more useful once the portfolio has a performance history, and co-lending is a more practical bridge until then.

7.4 Pilot before scale for storage

Storage is the newest segment and has the most uncertain attachment rate. The paper recommends piloting BESS financing before scaling it, with measures of utilisation and of savings for the borrower. The cost assumption may prove conservative, given the fall in stationary storage prices, but the attachment rate is more uncertain and should be tested first.

7.5 Implications for policy

The analysis suggests three policy points. The first is continuity. Much of the residential result depends on the subsidy path, so a stated plan for the period after the one crore household target would reduce uncertainty for lenders and borrowers alike. The second is connection timelines. Discom approval delays affect the disbursal of every rooftop loan, and published timelines by state would let lenders price and plan more accurately. The third is data. Installation and sales volumes are reported in several units and at different dates, which makes it difficult for a lender or analyst to compare states or track progress. Consistent public reporting by segment and state would improve the quality of market estimates.

7.6 Implications for analysts and investors

For an analyst assessing a green NBFC, the most useful questions are the ones this paper could not answer from public information. These include the share of originations from the largest partners, the performance of loans by channel, the blended cost of funds, and the recovery experience on repossessed assets. A market-size figure establishes that demand exists. It does not establish that a particular lender can serve that demand profitably, and the analyst should look for the company-specific evidence before drawing that conclusion.

8. Limitations

The paper has several limitations, and some of them affect the central results. They are listed here in order of importance.

- The EV figures cannot yet be reproduced. The average financed value per vehicle is not stated, and the e-2W volume assumption is well above the FY2026 level. The EV totals are therefore the least verified part of the model, and they make up most of the Base-case result.
- The C&I combined addressable factor of 50% is not fully supported by its components, which multiply to about 32%. Using the component factors (70% financing, 75% LTV and 60% NBFC share) gives about ₹2,155 crore instead of ₹3,420 crore. This change is reported as a sensitivity and not adopted as the base case.
- The model does not include loan losses. The TAM measures debt demand, not the profit a lender earns from it. A segment with a large TAM

and high losses may be less attractive than a smaller segment with low losses.

- The model does not include a feedback effect of battery cost on demand. A rise in cost raises the financed capex in the model, but it also reduces affordability, so the net effect on lending volume could be negative.
- The model treats TAM as an upper bound. It assumes NBFCs take their stated share of all financed demand, which is unlikely to be achieved quickly or evenly.
- Several Solfin figures used in the wider report are not public and have been removed. The company analysis therefore relies on public information, and the paper cannot assess Solfin's cost of funds, loss experience or portfolio quality.
- The status of the RBI Co-Lending Arrangements Directions 2025 must be confirmed before submission. The paper's treatment of the 10% retention rule depends on that status.
- The literature review is limited, as Section 3 explains. A systematic review of academic work would strengthen the discussion, particularly on the relationship between subsidies and adoption.

9. Conclusion

This paper estimates that the annual debt demand open to NBFCs in four green asset segments in India will reach about ₹62,263 crore by FY2031 in the Base case, within a range of ₹34,196 crore to ₹1,03,550 crore. EVs account for most of the Base-case result, and residential solar is the segment most dependent on a single programme. Financing penetration is the most important sensitivity among the variables tested.

The results support a staged strategy. A lender should enter the most standardised segment first, build a performance record, and move into commercial EV financing once adoption and loss data justify it. Its funding plan matters as much as the market size, because cost of funds determines whether the market can be reached profitably.

The paper is explicit about what it does not know. The EV volumes, the C&I factor, the average EV financed value and the status of the co-lending Directions are each open. Closing those gaps is the most useful next step, and it would make the estimate far more reliable than any further change to the method.

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