

The State of EV Charging in India

An operator's orientation to the market, the policy and the hardware

Where the vehicles actually are, which segments are electrifying fastest, what the policy landscape requires, and what that means for where you put chargers.

FOR Operators, investors and corporate strategy teams

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WHAT YOU GET

- Which vehicle segments are driving charging demand, and why the two-and three-wheeler segment is under-served
- How state EV policies differ on the points that affect operator economics
- The connector standards that matter in India and the ones that do not
- How the demand-charge treatment in your state changes site viability

Where the electrification actually is

Indian EV charging conversations are dominated by cars, and Indian EV adoption is not. The segments electrifying fastest are the ones with the shortest payback on fuel, and they need charging that looks almost nothing like a highway DC corridor. An operator who specifies for the segment in the brochure rather than the segment on the road builds the wrong network.

This chapter is deliberately about structure rather than current registration figures. Those move every quarter and every source disagrees; the shape of the demand does not.

Two- and three-wheelers

The largest EV segment by unit volume and the least served by public charging. Economics drive it: a delivery rider or an auto driver covers enough distance daily that fuel is their largest controllable cost, and the payback on an electric vehicle is measured in months.

- Battery capacities are small, so a modest AC point delivers a meaningful charge in the time a driver would stop anyway.
- Many vehicles charge from an ordinary socket, which means the competition for a public charger is a free plug at home or at a shop.
- Battery swapping is a genuine alternative here in a way it is not for cars, and an operator should understand which it is competing with locally.
- Payment behaviour is different: small amounts, high frequency, extreme price sensitivity, and a strong preference for UPI.

WHAT THIS IMPLIES FOR HARDWARE

Many low-power AC points beat few high-power DC ones for this segment. The capital per bay is small, the sanctioned load required is modest, and utilisation can be high because dwell time is long. It is unglamorous and it is where a great deal of the delivered energy is.

Passenger cars

The segment public charging is built for, and the one where most charging happens somewhere a CPO does not earn from — at home, overnight, on a socket or a wallbox. Public charging for cars is therefore a top-up and confidence product rather than a primary supply.

That has a specific consequence: demand concentrates where drivers cannot charge at home. Apartment dwellers without an allotted charging point are the customer, and they are concentrated in exactly the urban areas where installing chargers is hardest.

Buses

Electrifying through public procurement rather than consumer choice, usually on contracts that bundle the vehicle, the depot infrastructure and often the energy. High power, entirely depot-based, and highly predictable — a bus depot is a load-management problem with a fixed departure schedule.

For a CPO the opportunity is rarely the charging itself; it is operating the depot infrastructure on behalf of a transport authority that does not want to.

Commercial and last-mile fleets

Light commercial vehicles doing predictable urban routes are the segment where the operator economics are cleanest: a known counterparty, a contracted volume, a monthly invoice, and charging that happens at night when nothing else wants the connection.

The rate is lower than public retail and the revenue is far more predictable. A site with a fleet contract underwriting the connection and public traffic on top is the most robust structure available to a new operator.

What to take from this

SEGMENT	WHERE IT CHARGES	WHAT IT NEEDS	OPERATOR OPPORTUNITY
2W / 3W	Anywhere it stops	Many cheap AC points	Volume, under-served
Cars	Mostly at home	DC on routes, AC at destinations	Top-up and confidence
Buses	Depot only	High power, scheduled	Operating someone else's depot
LCV fleets	Depot, overnight	Load management, RFID	Contracted base load

The policy landscape

Indian charging policy operates at three levels that are easy to confuse: central guidelines that set the framework, state EV policies that announce intent and incentives, and state regulatory orders that actually set the electricity tariff you will pay. Only the third one directly determines your costs, and it is the one least often read.

The central framework

The single most consequential piece of it is a classification: public charging is treated as a service rather than as distribution of electricity. That is what allows anyone to set up a charging station without an electricity distribution licence, and to set their own retail price. The entire private charging industry rests on it.

Central guidelines also address technical standards for public charging stations, the obligation on distribution companies to provide connections within defined timelines, and infrastructure targets along highways. They set direction; they do not set your tariff.

WHAT THE CLASSIFICATION DOES NOT CHANGE

You remain an ordinary electricity consumer, bound by your connection agreement and sanctioned load. Exceeding sanction is a contractual breach whatever you are doing with the power, and safety and earthing requirements are unaffected.

State EV policies

Every state has one and most run to dozens of pages, of which roughly four matter to a charging operator. Extract five things and ignore the rest.

- 01 Capital subsidy for charging infrastructure: the percentage, the cap per station, how many per applicant, and whether the window is open.
- 02 Electricity tariff commitments — noting that the operative rate lives in the regulator's order, not here.
- 03 Land and siting: allocation of government land, and mandated charging provision in new buildings.
- 04 Approvals: whether a nodal agency exists and what it can actually clear.
- 05 The policy period and sunset date. A policy that expired last year is history, and several widely-circulated summaries do not mention it.

Policy versus operative order

This distinction is worth more than any other habit in this chapter. A policy announces intent. A government order or notification implements it, with its own eligibility criteria, application process and budget. Subsidies in particular are frequently announced in a policy and operationalised — or not — separately.

BEFORE BUILDING A CASE ON A SUBSIDY

Confirm three things: the scheme is currently open, the budget for the period is not exhausted, and somebody has actually received a disbursement. All three fail more often than the announcement suggests, and the third is usually answered by other operators rather than by a document.

Obligations that come attached

Subsidised and tendered infrastructure carries reporting duties: session counts, energy delivered, availability, and often uptime commitments with penalties. Producing those across a hundred connectors is a systems requirement, not an administrative one.

Confirm before bidding that you can generate availability per connector over an arbitrary period with the outage list attached. It is the field most platforms cannot produce, and it is the one every public contract asks for.

Building codes

The underrated part. Several states now require new buildings above a size threshold to provide charging-ready infrastructure or a proportion of EV-capable parking. For an operator that is not a subsidy — it is a pipeline. Buildings under construction today are laying conduit and panel capacity that will need chargers on it, and the developers frequently have the obligation and no plan for meeting it.

Electricity tariffs and demand charges

Energy is the largest recurring cost in a charging business and its price is set by a state regulator rather than by a market. Most states now publish a dedicated EV charging tariff category, generally more favourable than commercial rates. Which category you land in — and what it includes beyond the per-unit rate — deserves more attention than it usually gets.

Four components, not one

COMPONENT	WHAT IT IS	WHY IT MATTERS
Energy charge	Rate per kWh consumed	Scales with usage — the number everyone quotes
Demand charge	Levied on sanctioned or recorded demand	Does not scale; brutal at low utilisation
Time-of-day multipliers	Peak / off-peak adjustment	Decides whether an off-peak discount is affordable
Duties and surcharges	Electricity duty, fuel adjustment, cross-subsidy	Frequently ignored, frequently material

Why demand charges dominate early

A demand charge is levied on capacity rather than consumption. A 100kW sanction carries the same monthly charge whether the site delivers four hundred units or twelve thousand. On a young site it routinely exceeds the energy charge, which

means the landed cost per unit can be several times the headline tariff and then falls steeply as volume arrives.

Two consequences follow. First, price from landed cost rather than from the tariff, or the first quarter will surprise you. Second, the single largest lever on a site's economics is reducing the sanction you need — which is what load management is actually for.

SANCTIONED OR RECORDED?

Ask your DisCom, in writing, whether demand charge is assessed on sanctioned load, on recorded maximum demand, or the higher of the two. The answer decides whether load management saves you money every month or only protects you from a penalty. Operators have lost significant sums assuming the wrong one.

What the EV concession usually does and does not cover

- It typically reduces the energy charge relative to commercial rates.
- It sometimes reduces or waives demand charges, at least initially — this is the concession that matters most.
- It rarely removes electricity duty, which is a separate levy.
- It may be conditional on the connection serving charging exclusively, which affects a captive site that later opens to the public.

Reading the right document

The operative document is the current tariff order of your state electricity regulatory commission — not the DisCom’s summary page, not a news article, and not a slide from a conference. Orders are revised, usually annually, and the EV category has been moving in most states. Read the one in force, check its effective dates, and re-check at each revision.

Questions to put in writing

- 01 Which tariff category applies to a public charging station at this address, under which clause?
- 02 Is there a separate category for captive or fleet charging, and would our use qualify?
- 03 How is demand charge assessed, and is there an EV concession on it?
- 04 Are time-of-day multipliers applicable to this category, and what are the current window definitions?
- 05 What is required for a separate meter and connection for the charging load, and what is the timeline?
- 06 What happens to the category if the site later serves both captive and public vehicles?

Get the answers in writing. Verbal assurances from a local office do not survive a billing dispute, and the third and sixth questions have cost operators real money when the answer turned out to differ from the assumption.

Standards and connectors

India runs more connector types in active service than most markets, because it electrified several vehicle segments at once and each arrived with its own conventions. Specifying the wrong mix produces bays that nobody can use, and it cannot be corrected without replacing hardware.

What is actually in service

INTERFACE	SERVES	TYPICAL POWER
CCS2 (DC)	Cars, commercial vehicles, buses	High
Type 2 (AC)	Cars, some commercial vehicles	Moderate
Bharat DC-001	Older Indian-market EVs	Low DC
Bharat AC-001	Older Indian-market EVs	Low AC, multiple outlets
LEV AC	Two- and three-wheelers	Low
Ordinary socket	Two- and three-wheelers in practice	Very low

The specification question is about traffic, not standards

The right question is never "which standards should we support" but "which vehicles will actually arrive at this site". A highway plaza on a corridor used by long-distance cars is a CCS2 question. A market street where delivery riders stop

is an LEV AC and socket question. Installing the first at the second site produces a monument.

OBSERVE BEFORE SPECIFYING

Spend an hour at the site counting what actually passes and what actually parks. It is the cheapest input to a hardware decision and almost nobody does it, because registration statistics feel more rigorous. They are not — they describe a district, not a kerb.

The Bharat standards question

Bharat AC-001 and DC-001 serve an installed base of older vehicles. That base is real and still charging, but it is not growing. Specifying for it on new sites means buying capacity for a shrinking population, while omitting it in an area with a concentration of those vehicles means turning away paying drivers.

It is a local question, answered by looking rather than by policy, and the answer differs between two sites in the same city.

Mixed-connector units

Units offering several connectors on one cabinet look like insurance and are frequently a false economy: you pay for connectors nobody uses, and only one session can usually run at full power anyway. Two single-connector units generally beat one dual unit for both availability and utilisation, because a fault takes out half the site rather than all of it.

What to specify regardless of connector

- 01 OCPP 2.0.1 capability on new DC hardware, even though 1.6J is what you will run for now. It cannot be retrofitted, and the units bought this year will still be in service when it matters.
- 02 A separately certified energy meter of a known accuracy class. You bill from it.
- 03 Local authorisation list support, so a network outage does not stop the site.
- 04 An external antenna option, decided at survey rather than discovered at commissioning.
- 05 Cable and connector as a field-replaceable part, because that is what actually fails.

Where the market goes next

Predictions about charging markets age badly. What ages better is a view of which capabilities are prerequisites for others, because that tells an operator what to specify now even where the application is years away.

Roaming: nearly here

Interoperability between networks is the change with the shortest fuse, because it requires no new hardware and no vehicle change — only agreements and an OCPI implementation. For a driver it removes the four-app problem; for an operator it converts an app-install decision into a visibility decision.

The commercial side is where the value and the risk both sit, and it takes longer than the technical side. What to do now: make sure your platform supports OCPI in both roles, and understand that publishing your locations makes them somebody else's app content.

Plug-and-charge: a prerequisite question

ISO 15118 plug-and-charge is the best authentication experience available — plug in, walk away, get billed — and it needs a certificate ecosystem, capable vehicles and capable chargers. For most Indian operators today it is a roadmap item rather than a requirement.

THE DECISION THAT MATTERS NOW

Do not build plug-and-charge. Do specify 2.0.1 and high-level communication capability on new DC hardware, because neither can be retrofitted. That is the whole of the near-term action.

Grid services: further out, and structurally attractive

Charging is a flexible load, and flexible load has value to a grid with a growing share of intermittent generation. The mechanisms to pay for that flexibility are not broadly established in India yet, and an operator who builds a business case on them today is speculating.

What is not speculative is that the platform capability required — enforcing a limit on a charger and verifying it was applied — is the same capability that lets you fit more connectors behind a smaller sanction. Build it for the demand charge, and the grid-services option comes free.

The two-and-three-wheeler build-out

The largest under-served demand in the market. Whoever solves cheap, dense, reliable low-power charging for delivery riders and auto drivers — including the payment behaviour, which is small amounts at high frequency — addresses more delivered energy than the car segment does.

It is a different product from a highway DC network: lower capital per bay, higher unit count, and operations that have to work at a cost per site an order of magnitude below what a corridor site can carry.

What to build toward

- 01 Hardware that is 2.0.1 capable, whatever it speaks today.
- 02 A platform where authorisation is a pluggable decision, so a tag, an app, a vehicle identifier or a contract certificate all resolve to the same question.
- 03 Load management, justified by demand charges rather than by grid services.
- 04 Data you can export in full, because every option above becomes cheaper if you can move.
- 05 A driver relationship you own, because that is the asset roaming makes more valuable rather than less.

About this document

Written by the team building zevOS, the charge point management platform. We publish this kind of thing because operators who understand utilisation, demand charges and settlement make better decisions — including about us.

Corrections and disagreements are genuinely welcome. If something here is wrong, or true in most states but not yours, write to support@zevos.ai and we will fix it in the next revision.

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