ZEVOS

Charging in Apartment Buildings

The handbook for residential societies and the operators serving them

Shared parking, one sanctioned connection and a managing committee.
The hardest charging environment in India, and the largest.

FOR Operators, developers and society managing committees

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WHAT YOU GET

- How to serve more bays than the sanctioned load allows
- Billing residents individually from a common connection
- Structuring the agreement with a managing committee
- What to install now so the second phase does not mean trenching again

CHAPTER 01

The three constraints

Residential charging is the largest segment in India and the hardest to serve. An apartment complex has shared parking, a common electrical connection and a decision-making body that changes every year. Operators arrive expecting an electrical problem and discover a governance one.

Constraint one: sanctioned load

The building has a connection sized for lifts, pumps, lighting and common areas, with some margin. Charging is a new load nobody planned for, and adding fifty vehicles at full power is not possible on that connection.

This is the easiest of the three, because it is arithmetic and it has a known solution. Overnight charging has a nine-hour window, which means the average power per vehicle is small, which means load sharing lets you serve many more bays than the connection would suggest. The next chapter does that arithmetic.

Constraint two: the bays

Parking is allotted to flats. A resident wants to charge in their own bay, not in a shared one at the far end of the basement. That is reasonable and it is expensive: cabling to fifty scattered bays costs far more than cabling to a bank of ten.

- Dedicated bay charging: highest resident satisfaction, highest cost, and a bay that sits idle when the resident is away.
- Shared bank: cheapest, best utilisation, and requires residents to move cars — which they will not reliably do.

- Hybrid: a shared bank now, with conduit run to allotted bays so individual points can be added on request and at the resident's cost. This is usually the right answer.

Constraint three: the committee

The binding constraint. A managing committee is a volunteer body with a one-or two-year term, answerable to a general body meeting, with no particular expertise and a strong incentive to avoid controversy. It is not obstructive; it is cautious, and the caution is rational.

WHAT THE COMMITTEE IS ACTUALLY WORRIED ABOUT

Not the technology. That the electricity cost will land on the common bill and every non-EV resident will object. That the wiring will be unsafe. That in two years the operator will vanish and leave equipment nobody can maintain. Address those three and the technical discussion becomes easy.

The order to solve them in

01 Establish that residents will be billed individually and exactly, so nothing lands on the common bill. This removes the main objection before it is raised.

02 Establish the phasing, so the committee is approving a first step rather than a whole scheme.

03 Do the load arithmetic, and present it as why no upgrade to the sanction is required.

04 Only then discuss hardware.

Operators reliably do this in reverse, lead with charger specifications, and lose the meeting.

CHAPTER 02

Sizing without over-sanctioning

The reason residential charging looks impossible on paper is that people size it by multiplying bays by charger rating. Twenty bays at 7.4kW is 148kW, which no residential society has spare. Sized by duty cycle instead, the same twenty bays need a fraction of that.

The arithmetic

A typical private car in an Indian city covers a modest daily distance and therefore needs a modest daily energy top-up — considerably less than a full battery. Spread across an overnight window, the average power per vehicle is small.

INPUT	VALUE
Vehicles charging on a given night	12 of 20 bays
Energy needed each	12 kWh
Window, 22:00 to 07:00	9 hours
Average power per vehicle	1.3 kW
Site load if perfectly spread	16 kW
Sum of 20 × 7.4kW nameplates	148 kW

The ratio is close to ten to one, and it is not a trick — it is what an overnight window does to a small daily requirement. The task of load management is to realise that ratio safely.

Two diversities, not one

- Not everyone charges every night. A car doing a short commute charges perhaps every second or third night, and residents travel.
- Those who do charge do not all need a full window. A vehicle needing four hours finishes and releases its share to the others.

Static allocation — dividing the available capacity equally and fixing it — captures neither. Dynamic allocation, which returns capacity to the pool as vehicles finish, is what makes the arithmetic above real rather than theoretical.

How much headroom to ask for

01 Get a recent electricity bill and read the sanctioned load and the recorded maximum demand. The gap is free headroom.

02 Subtract a margin for the building's own peak — lifts and pumps do not run at 03:00, but they do run at 22:00 when cars are plugging in.

03 Set the charging ceiling to what remains, enforced on the chargers.

04 Size for the vehicles you expect in three years, not today, because the ceiling is a software setting and the cabling is not.

USUALLY NO UPGRADE IS REQUIRED

Most societies discover they can serve their first twenty bays inside existing headroom. That single finding — no sanction upgrade, no cost to non-EV residents — converts more committee meetings than any other argument available.

What must be true for the ceiling to hold

The limit has to be enforced on the charger itself, not only in the platform. A society basement with poor mobile signal will lose connectivity, and the ceiling must survive it. Confirm the profile is re-applied after a power cut, because a residential basement has more of those than a commercial site.

And the protection is sized as though load management does not exist. Software is the optimiser; the breaker is the safety system, and it is the only thing standing between a configuration mistake and the building’s main supply.

CHAPTER 03

Billing residents individually

This chapter is the one that decides whether the project happens. Every objection a general body meeting raises reduces to a suspicion that EV owners will be subsidised by everyone else. Billing that is exact, visible and auditable removes it.

The principle

Every kilowatt-hour consumed by a vehicle is attributed to a flat and recovered from that flat, at a rate that at least covers what the society paid for it. Nothing charging-related touches the common bill.

Setting the rate

The rate must be the society’s landed cost, not its energy charge. If the connection carries demand charges or slab pricing, charging load may push the whole building into a higher slab — and that increment belongs to the charging, not to the residents who do not use it.

COMPONENT	INCLUDE IN THE RESIDENT RATE?
Energy charge per unit	Yes
Electricity duty and surcharges	Yes
Increment from a higher slab caused by charging	Yes
Share of demand charge attributable to charging	Yes, if the sanction was raised for it
Maintenance and platform cost	Yes, as a small per-unit or per-month component
Profit	Only if the society intends to run it as a business

PUBLISH THE RATE AND ITS DERIVATION

A society rate presented as a number invites suspicion; the same number presented with its arithmetic invites agreement. Recompute it annually when the tariff order changes, and say so.

How the money is collected

01 Monthly statement per flat, accumulating that flat's sessions, issued alongside maintenance dues. Simplest for residents, and it fits how societies already collect money.

02 Prepaid wallet per resident, deducted per session. Better cash flow and no receivables, but a second payment relationship for the resident.

03 Direct payment per session. Works, but produces many small transactions and a resident who has to think about it nightly.

The first is right for most societies, because it uses machinery that already exists and nobody has to be persuaded to adopt anything.

What a resident statement must show

- Each session: date, duration, energy, rate applied, amount.
- The month's total energy and total amount.
- The rate, and where it came from.
- Their own consumption against the previous month, which is the part residents actually look at.

Reconciling for the committee

Once a month, three numbers: total energy delivered by the chargers, total billed to residents, and the charging share of the society's electricity bill. They should agree within losses. A committee that sees that reconciliation each month stops asking about it — which is the goal.

CHAPTER 04

Guests, staff and the public

A society that installs charging for residents will, within months, be asked about visitors, domestic staff with two-wheelers, and — if the parking is accessible — whether outsiders could use it for a fee. Each is answerable on the same hardware, provided pricing follows the driver rather than the connector.

The mechanism

Driver groups. A resident, a visitor and a staff member are three groups, each with its own tariff, all charging at the same connectors. The rate attaches to who is charging, not to where.

GROUP	TYPICAL RATE	ACCESS
Residents	Cost recovery	All hours, all bays
Domestic staff (2W)	Cost recovery or subsidised	Daytime, designated points
Visitors	Above cost	While a resident vouches for them
Public, if opened	Public rate	Restricted hours, restricted bays

A PLATFORM THAT PRICES PER STATION CANNOT DO THIS

If your system can only set a rate per charger, serving three audiences means three sets of hardware — or one rate that is wrong for two of them. This is worth confirming before procurement rather than after.

Two-wheelers deserve their own thought

Domestic staff, delivery riders and residents' own two-wheelers are a real and growing load, and they are badly served by a car-oriented installation. A few low-power points near the gate, on the same platform and the same billing, cost very little and remove the extension-cord-from-the-guard-room problem that most societies actually have.

Opening to the public

Tempting — it turns a cost centre into a small revenue line — and it introduces strangers, traffic and liability into a residential basement. Most societies should decline, and those that proceed should do so with conditions.

- Only where the parking is at ground level with independent access. Never in a resident basement.
- Restricted hours, aligned with when security staff are present.
- Bays designated for it, so no resident's allotted bay is ever occupied by an outsider.
- A rate that is clearly above cost, because the society is now accepting inconvenience and should be paid for it.
- Check the tariff category — a connection billed at a residential category may not be permitted to serve commercial public charging.

Access control

Time windows per group are the simplest effective control: residents at all hours, staff during the day, visitors while accompanied, public during defined hours. It requires no additional hardware, it is enforced by the platform, and it is easily explained at a general body meeting — which matters more than its technical elegance.

CHAPTER 05

Getting it through the committee

The proposal is technically sound and it will still fail if it is presented as a technical proposal. A general body meeting is a room of people with competing priorities, most of whom do not own an EV, being asked to approve something in their shared basement. Prepare for the room rather than for the engineering.

The six objections, and what answers each

OBJECTION	WHAT ANSWERS IT
"We will end up paying for their electricity"	The billing chapter — exact attribution, monthly reconciliation
"Our connection cannot take it"	The load arithmetic — usually no sanction upgrade needed
"It is a fire risk"	Protection design, RCD per point, an electrical inspection report
"Only four people have EVs"	Phasing — approve phase one, sized for four, wired for twenty
"Who maintains it in five years?"	The agreement: term, maintenance obligation, exit
"Why not let each owner install their own?"	The load problem, honestly explained

The last one deserves a real answer

Individual uncontrolled points are how a society ends up with an unmanaged load, no attribution and a genuine safety issue. But the honest answer acknowledges the appeal: a resident who installs their own point pays for it themselves and controls it. The response is that a managed scheme gives them the same bay-side point, with billing that protects them from being blamed for the common bill, and a limit that stops the building tripping. That is a better deal, and it should be argued as one rather than asserted.

Phase one should be small

ASK FOR LESS THAN YOU NEED

A proposal for four points, wired for twenty, is approved. A proposal for twenty points is deferred for study. The infrastructure decision — conduit, panel capacity, cable route — is the one that matters and it is invisible to the meeting. Get that right and let the points follow demand.

What to bring

01 The load arithmetic on one page, ending in "no upgrade to the sanction required".

02 A sample resident statement, showing exactly what a resident would be billed.

03 The rate and its derivation from the society’s own bill.

04 A one-page agreement summary: who owns what, who maintains it, what happens at the end.

05 A phase plan with costs for phase one only.

06 A reference: another society of similar size, ideally one a committee member can call.

Who to talk to before the meeting

The treasurer, because the billing question is theirs and their support neutralises the loudest objection. The maintenance in-charge, because they will be asked whether the wiring is sound and their scepticism is the most credible in the room. And the two or three residents who already own EVs, who will otherwise be the only advocates and will be dismissed as self-interested.

CHAPTER 06

Phase two

Every successful residential installation gets a request for more points within a year. Whether that request costs a few thousand rupees or requires re-excavating the basement was decided during phase one, by people who were not thinking about phase two.

The five decisions that matter

01 Distribution board capacity. Specify a board with spare ways — at least double what phase one needs. The marginal cost is small and adding ways later usually means replacing the board.

02 Conduit and cable tray sizing. Run oversized conduit on the first pass. Pulling one more cable through a conduit with room is an afternoon; installing a second conduit is a project.

03 Cable route. Take the route past the bays you are not yet serving, not the shortest route to the ones you are.

04 Physical space at the panel. Charging equipment, isolators and metering need room. A tight installation cannot be extended.

05 Supply capacity to the charging board. Size the feeder for the eventual ceiling, not phase one's ceiling — the feeder is the part that is genuinely hard to change.

TRENCHING A CAR PARK TWICE

It is the most avoidable expense in residential charging. The first trench is part of a planned project with a scheduled disruption. The second is an unplanned disruption in a basement full of parked cars, and it costs several times as much for the same metres.

What can safely wait

- The chargers themselves. Buy them as demand appears — prices fall and capability improves.
- The bay-side points at allotted parking. Run conduit, terminate later.
- Any capacity beyond the current headroom, because raising the sanction is a separate decision with its own economics.
- Two-wheeler points, provided the cable route passes the area where they will go.

Recording what was done

Committees change annually and institutional memory is short. Leave a folder — as-built drawings, cable sizes and routes, board schedule with spare ways marked, the sanctioned load and the ceiling configured, and who to call.

Without it, phase two starts with somebody guessing what is behind the wall, and the guess is usually conservative and expensive.

The trigger for phase two

Not a request. A measurement: when the existing points are occupied for a meaningful share of the overnight window, or when a resident has to wait for a bay more than occasionally. That is a number the committee can see, and it converts a contested request into an obvious next step.

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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