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Building Performance

APIS GUIDE 11 · ENERGY

EV charging *infrastructure planning.*

Networks, public sites and municipal rollout. A network is not judged on how many charge points it has — it is judged on whether they are used, and that is decided by site selection.

APIS · EV CHARGING DIVISION

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ABOUT THIS GUIDE

Charge point count is *the wrong target.*

Almost every public charging programme is announced as a number of charge points. It is the easiest thing to state, the easiest thing to measure, and it produces the wrong network — because a target expressed as a count is met most cheaply by installing points where installation is cheapest, which is very rarely where drivers need them.

The measure that matters is utilisation: how many sessions each point serves, and therefore whether the asset is doing anything. Utilisation across a network is never evenly distributed. A small share of sites carries most of the sessions, and a meaningful share of sites — in almost every network — carries almost none.

That single distribution is the subject of this guide. It means **site selection dominates every other decision**, that a network built to a count target will contain expensive assets nobody uses, and that the planning question is not how many but where, in what order, and on whose balance sheet.

WHAT THIS GUIDE COVERS, AND WHAT GUIDE 08 COVERS

This guide is about **networks and public sites**: multiple locations, planned together, serving drivers who are not yours. Municipal and national rollout, public car parks, highway and destination charging, retail and hospitality forecourts, and portfolio programmes across many properties.

Guide 08 in this series covers charging on private sites — depots, yards, workplaces and car parks serving your own vehicles or your own staff. If your question is a single site serving a known fleet, that is the guide you want, and it will answer it better than this one.

The two overlap in the physical work and diverge almost everywhere else, because a fleet depot is sized against a known demand and a public network is sized against a demand nobody can forecast reliably. Section 02 is about that difference.

NO FIGURES, AGAIN, AND FOR THE USUAL REASON

No power ratings, no charging times, no prices, no tariffs, no utilisation percentages and no payback figures. Charge point technology, vehicle acceptance and the utilisation a site can achieve all move faster in this field than in any other subject in this series.

What does not move is the structure: the distribution of utilisation, the criteria that decide a site, the way grid capacity has to be planned across a portfolio rather than a site, and the commercial models available. Those are the same whatever the technology does next.

Who this is written for

- Municipalities and public bodies planning charging on public land or public car parks
- Ministries and agencies designing a national or regional programme
- Charge point operators and concession bidders
- Fuel retailers, retail chains and hospitality groups planning across their estate
- Property portfolio owners deciding what to install, where, and on what commercial basis
- Investors and lenders assessing a charging network proposal

What this guide is not

It is not a design document and does not replace an electrical designer, a grid connection specialist or a transport planner. It does not cover vehicle procurement or fleet transition planning, and it does not cover the detailed engineering of an individual installation, which is Guide 08.

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SECTION 01

What the network *is for.*

Four objectives, and they build four different networks. Programmes fail most often because two of them were pursued at once without anyone saying so.

A public charging programme is commissioned for a reason, and the reason determines everything downstream — where the sites go, what power they are, how they are funded, and what success looks like. Stating it plainly, before any site is identified, is the highest-value hour available.

THE FOUR OBJECTIVES

Objective	What it means	What it builds
Coverage	Nobody should be more than a certain distance from a charge point. A policy objective, usually public	A geographically spread network including sites that will never be commercially viable. **This must be funded as infrastructure, not as a business**
Utilisation and revenue	Charge points should be used, and should earn	A concentrated network at high-traffic locations. Commercially rational and it will leave large areas uncovered
Enabling a transition	Removing charging as a barrier to vehicle adoption, particularly for residents without off-street parking	Residential and overnight-focused provision — a different network again, with different power levels and different economics
Meeting an obligation	A requirement attached to a building, a development consent, a funding condition or a policy commitment	Whatever the obligation specifies. **Establish exactly what it requires before designing anything** — the difference between installed points, cabled bays and ducting is an order of magnitude

COVERAGE AND COMMERCIAL VIABILITY ARE IN DIRECT TENSION

This is the central difficulty of public charging and it is rarely stated in a programme document. A site chosen for coverage is, by definition, a site the market did not choose — because if it were commercially attractive, somebody would already have built it.

A programme that pursues both without acknowledging the tension produces one of two failures: an operator who takes the profitable sites and quietly does not build the rest, or a public network of unused assets that becomes an operating liability nobody wants to fund.

The honest structures are to fund coverage sites explicitly as infrastructure, or to bundle them with commercial sites in a single concession so that the profitable ones subsidise the rest. Section 06 sets out how each works. What does not work is hoping the tension will resolve itself.

Three questions to settle before any site is identified

1. **Which objective is primary, and which is secondary?** Both may be legitimate. They cannot both be primary, and the site list is completely different depending on the answer.
2. **What does success look like, measured how?** If the answer is a count of charge points, that is what you will get. If it is sessions per point, or coverage of a defined population, or vehicles enabled, the programme will be built differently. Section 08.

3. **Who carries the risk if utilisation is lower than hoped?** The public body, the operator, the landowner or a lender. This determines the commercial model more than any other factor, and it should be decided before the model is chosen rather than discovered inside it.

> IF A REGULATORY TARGET APPLIES
>
> Some jurisdictions apply requirements on the provision of publicly accessible charging — density, coverage along defined routes, power levels or payment accessibility. Where such a requirement applies to your programme, **it governs the design and must be obtained in its current form**, because these instruments are recent and are being revised.
>
> This guide states no target, no distance and no date, and takes no position on what applies in any jurisdiction. Establish it with your legal adviser and with the responsible authority before the site list is fixed — a coverage requirement discovered afterwards will invalidate it.

SECTION 02

Demand — and why *the forecast will be wrong.*

Not because the forecaster is poor. Because the inputs are genuinely unknowable — which changes what you should do about it.

Every network proposal contains a demand forecast: vehicles in the area, charging events per vehicle, share of those events that happen in public, sessions per point. Each step multiplies an uncertainty by another uncertainty.

The unknowns are real. Vehicle adoption rates in the region depend on purchase costs, taxation, used-vehicle imports and income growth. The share of charging that happens in public depends on how many drivers have off-street parking — which is a housing statistic nobody collects for this purpose. Vehicle battery sizes and charging behaviour are both changing. And a competitor opening two kilometres away can halve a site's sessions in a week.

> DESIGN FOR ADAPTABILITY, NOT FOR ACCURACY
>
> Because the forecast cannot be made reliable, the sensible response is not a better forecast. It is a network that can be adjusted cheaply when the forecast turns out to be wrong.
>
> In practice that means three things, and they run through the rest of this guide: **infrastructure sized generously and equipment sized modestly** (Section 05); **phasing with defined decision points** rather than a single committed build; and **site selection that is robust across a range of demand outcomes** rather than optimal at one (Section 03).
>
> A plan that is right only if the forecast is right is a plan that will be wrong.

What is worth establishing, since the forecast is not

These are knowable, and they discipline a forecast more than refining its arithmetic.

Input	Why it is worth the effort
Off-street parking availability	The single strongest driver of public charging demand. Drivers with a driveway or an allocated space charge at home and use public charging rarely. Areas of apartment blocks with street parking are where public demand concentrates
Actual traffic and dwell patterns	Where vehicles already stop, and for how long. Guide 08 §03 explains why dwell time sets the power — the same logic governs site selection here
Existing charge points and who operates them	Including planned ones. A site's economics are set by its competition more than by its traffic
The local vehicle fleet as it is now	Registration data, and the composition — a fleet dominated by older imported vehicles behaves differently from one with new sales
Commercial and municipal fleets in the area	Often the anchor demand that makes a site viable, and frequently overlooked because they are treated as a separate question
Transit routes and destinations	Where non-local drivers stop, which is a different demand from resident demand and wants different power

Three ways demand forecasts mislead

1. **They forecast vehicles, not sessions.** A doubling of electric vehicles does not double public charging demand if most of the new vehicles belong to drivers with off-street parking. The link between the two is the variable that matters and the one least examined.
2. **They assume the network is the only network.** Sites are forecast in isolation and then compete with each other and with entrants nobody modelled.
3. **They average across the network.** An average utilisation figure across a portfolio conceals the distribution in Section 08 — which is the thing that actually determines whether the programme works.

> THE HONEST WAY TO PRESENT A FORECAST
>
> As a range with the assumptions exposed, and with an explicit statement of what happens at the low end. A single central case presented with confidence is the least credible element of any network proposal, and an investment committee that has seen one before will discount everything around it.
>
> Better: state the low case, state what the programme does if the low case occurs — fewer phases, slower rollout, a defined exit — and show that the infrastructure decisions in Section 05 do not depend on the forecast being right.

SECTION 03

Site selection, *which decides everything.*

The one decision that cannot be corrected later by operating better. A well-run charge point in the wrong place is a well-run asset nobody uses.

Almost every other decision in a charging programme is adjustable. Tariffs can be changed, software can be migrated, equipment can be replaced, power can be increased. Location cannot. A site chosen badly stays chosen, and it consumes capital, connection capacity and maintenance attention for as long as it stands.

The criteria, in the order they eliminate sites

SITE ASSESSMENT

Criterion	What to establish
1 · Grid capacity	What the connection point can carry today, and what reinforcement would cost and take. **This eliminates more candidate sites than every other criterion combined**, and it is the one most often checked last. Section 04
2 · Land control	Who owns it, what the lease or licence permits, for how long, and what happens at the end. A charging asset has a life measured in decades on land frequently held for less
3 · Why vehicles are already there	Charging is almost never the reason for a stop. It is something done while doing something else. A site with no independent reason to stop depends entirely on drivers who need charge — a much smaller and less predictable population
4 · Dwell time at that reason	How long people actually stay, which sets the power the site needs. A supermarket, a restaurant, a hotel and a motorway services all differ. Guide 08 §03 sets out the logic
5 · Visibility and access	Whether a driver can see it, reach it, and get out again. Charge points behind a barrier, in a paid car park with no exemption, or requiring an awkward manoeuvre are used measurably less
6 · Competition, present and probable	What exists nearby and what is likely to. A site whose case depends on being the only one is a site with a short advantage
7 · Physical constraints	Space for bays and manoeuvring, cable routes, equipment siting, and where the connection actually enters. Guide 08 §05 covers the civils
8 · Permitting and heritage	Planning consent, street works permissions, conservation constraints, and utility wayleaves. These decide programme, not feasibility, and they are routinely underestimated
9 · Safety and security	Lighting, passive surveillance, vandalism exposure. A site people avoid after dark loses a substantial share of its potential sessions
10 · Accessibility	Bay dimensions, approach gradients, kerb transitions, reach and the weight of cables. Frequently an obligation and always the right thing; retrofitting is expensive

CHECK GRID CAPACITY BEFORE ANYTHING ELSE, ON EVERY CANDIDATE

The standard failure in network planning is to select sites on traffic and land, produce a programme, and only then discover that half the list needs reinforcement that costs more than the equipment and takes longer than the funding window.

Run a capacity screen across the whole candidate list at the outset, with the distribution system operator, before any site is committed. It is a single conversation rather than one per site, and it will reorder the list. Section 04 sets out how to have it.

Scoring a candidate list

For a programme of more than a handful of sites, score rather than argue. A simple structure works better than a sophisticated one:

- **Eliminate first, then score.** Grid capacity and land control are pass or fail — a site that fails either is not a low-scoring site, it is not a site
- **Score the survivors** on the demand criteria — reason to stop, dwell, visibility, competition — with weights that reflect the objective from Section 01. A coverage-driven programme weights these differently from a revenue-driven one, and the weighting is where the objective becomes concrete
- **Record the cost and programme risk separately** from the demand score, because a good site with a bad connection is a phase-two site, not a rejected one
- **Keep the rejected list with reasons.** Conditions change — a reinforcement happens for another reason, a landowner changes position — and a documented list is a phase-three pipeline rather than work repeated

TWO SITE TYPES THAT CONSISTENTLY UNDERPERFORM

The municipal car park chosen because the land was available. Land control is a constraint to be satisfied, not a reason to select. A site whose only qualification is that the public body owns it will be judged on utilisation like every other site, and will usually disappoint.

The prestige site. Charge points outside a public building, at a symbolic location, or where a programme wants to be visible. These have a legitimate demonstration purpose — but fund and measure them as demonstration, not as network, and do not let them set the tariff or the utilisation expectation for the rest.

SECTION 04

Grid capacity *across a portfolio.*

The constraint that eliminates most candidate sites — and the one place where planning a network is genuinely different from planning a site.

On a single site, the grid connection is a question with one answer: what can this connection point carry, and what would more cost. Guide 08 §02 sets out how to establish it.

Across a portfolio, it becomes a different exercise. Sites compete for capacity on the same network. Reinforcement triggered by one site may create headroom that another can use. The order in which sites are built changes what each costs. And the distribution system operator has its own investment plan, which may already include work that would transform a site's position — information that is generally available for the asking and almost never asked for.

HAVE ONE CONVERSATION ABOUT THE WHOLE LIST, NOT THIRTY ABOUT INDIVIDUAL SITES

Take the entire candidate list to the operator at the outset and ask four things:

1. **Which of these have capacity available today, and how much?**
2. **Which would require reinforcement, at roughly what cost and over what programme?**
3. **Where does your own investment plan already include work** that would change the answer, and when?
4. **Are there locations we have not identified where capacity exists and is under-used?** Operators frequently know this and are rarely asked

That fourth question has added sites to more programmes than any analysis, because the operator holds information about their own network that no external study can reconstruct.

What changes when capacity is planned across sites

- **Sequencing has value.** Building a site that triggers reinforcement may make two other sites viable at no further cost. Building them in the other order may mean paying twice. This only becomes visible when the list is examined together
- **Capacity can be reserved, or lost.** Available headroom is not held for you. A programme that identifies capacity and takes two years to build may find it taken by an unrelated connection. Establish whether it can be secured, on what terms and at what cost
- **Flexible or curtailable connections may unlock sites** that a firm connection would not. A connection that accepts limitation at defined times may be available faster and cheaper — and for charging, where load can be managed, that is often acceptable. Establish whether the operator offers such an arrangement and what it means operationally
- **Storage changes the connection question.** On-site storage can serve short high-power peaks from a smaller connection, which converts a reinforcement problem into an equipment decision. It is a separate investment with its own case — Guide 03 of this series — and it should not be assumed into the connection strategy without being assessed on its own terms

Load management at network scale

Guide 08 §04 covers load management on a site. Across a network the same principle applies with a wider boundary, and two additional considerations:

- **The limit is a commercial parameter, not just a technical one.** A site constrained to a lower total is a site that will occasionally disappoint a driver. Where that matters — a highway site, a site with a service expectation — the constraint has a revenue and reputational cost that belongs in the site's case
- **Failure behaviour must be defined per site** and must fail to a safe low value, not to full power. Where load management is what makes the connection viable, its failure mode is the connection's failure mode

> START THE APPLICATIONS EARLY AND IN PARALLEL
>
> Connection applications are the longest lead item in a charging programme, they are processed per site, and they cannot be compressed by paying more. A programme that identifies sites, designs them, procures them and then applies will be delayed by the length of the connection process on top of everything else.
>
> Apply as soon as the candidate list survives the capacity screen — before detailed design, before procurement — and let the operator's responses shape the design rather than contradict it. On a multi-site programme this single sequencing decision is usually worth more months than any other.

SECTION 05

Phasing, *and building once.*

Because the demand forecast is unreliable, the infrastructure should be generous and the equipment should not. That asymmetry is the whole strategy.

Section 02 established that the forecast cannot be made reliable. Section 03 established that location cannot be corrected. Together they produce a clear planning rule: **commit irreversibly to the things that are cheap to oversize, and commit reversibly to the things that are expensive to get wrong.**

WHAT TO OVERSIZE, AND WHAT NOT TO

Element	Commit	Reasoning
Ducts, cable routes, draw pits	**Generously, now**	The excavation and reinstatement cost is largely independent of what goes in the trench. Reopening ground later costs a multiple and is disruptive on a public site
Cable sizing to the final load	**Generously, now**	Cable is a modest share of the cost of installing cable
Connection capacity	To a defined growth position	Capacity is not free and unused capacity may carry a standing charge — but increasing it later means reapplying and possibly reinforcing. This is the judgement call in the whole programme
Foundations, bases, bollards	**For all planned bays, now**	Cheap while the ground is open, expensive afterwards
Switchgear and distribution space	With spare ways and physical room	Adding a board later is straightforward if the space and the ways exist and awkward if they do not
Charge points	**Modestly, phased**	The item whose technology moves fastest and whose cost falls. Installing points that stand idle for three years buys obsolescence
Software and subscription	Modestly, and on open terms	Priced per point in most models, so an over-built site pays subscription on unused assets. Guide 08 §07

THE THREE-LEVEL BAY, APPLIED ACROSS A NETWORK

Guide 08 §05 sets out the three levels of provision for a single site. Across a network they become a planning instrument:

- **Installed** — energised now, at bays the current demand supports
- **Cabled** — cable and protection in place, unit not fitted. Adding it is a day's work with no excavation and no permit
- **Ducted** — route and pits in place, no cable. Adding a bay means pulling cable, not digging or closing a street again

A site built with a small installed count and generous cabled and ducted provision can double or triple in capacity in response to actual demand, at a fraction of the cost and disruption of a second civils programme — and without having committed capital to points that might not be used. **This is the single most valuable thing in this guide.**

Phasing the programme

A network built in one committed phase carries the whole forecast risk. A network built in defined phases with decision points carries much less, provided the decision points are real.

1. **Phase one: the strongest sites.** Highest-scoring locations with available capacity. The purpose is not only revenue — it is **evidence**. Real utilisation data from your own sites is worth more than any forecast for planning phase two
2. **A defined decision point.** Stated in advance: what will be measured, over what period, and what result triggers acceleration, continuation or a pause. Without this the phasing is presentational
3. **Phase two: informed by phase one.** Both by the measured utilisation and by what was learned about cost, permitting and programme
4. **Coverage sites deliberately scheduled**, funded on their own basis, and not quietly deferred until the commercial sites have been taken. Section 01 and Section 06

FUTUREPROOFING HAS A LIMIT, AND IT IS WORTH NAMING

Ducts, cables and foundations are worth oversizing because their cost scales weakly and their replacement cost scales strongly. Connection capacity is a genuine judgement — it is not free, and capacity contracted and unused may be paid for annually.

Where the answer is uncertain, the questions to put to the operator are whether capacity can be increased in stages, on what notice and at what cost; and whether a flexible connection now can be converted to a firm one later. Those two answers usually resolve the judgement, and they are rarely asked.

SECTION 06

Ownership and *commercial models.*

Four structures. The choice is a decision about who carries utilisation risk, and everything else follows from it.

Charging infrastructure can be owned, operated and monetised in several ways. They differ in capital requirement, in control, and above all in who loses if the sites are used less than hoped. Section 01 asked that question; this section is the set of answers.

THE FOUR STRUCTURES

Model	How it works	Who carries utilisation risk, and what you give up
Own and operate	You fund, own and run the network, contracting installation and possibly operations	**You do.** Maximum control over siting, tariff and service; maximum exposure if utilisation disappoints. Appropriate where the objective is coverage or policy rather than return, and where the capital exists
Own, and contract operation	You fund and own the assets; an operator runs them for a fee or a revenue share	**Mostly you**, depending on how the fee is structured. Keeps control of siting and tariff while buying operating capability. The fee structure is where the risk actually sits — see below
Concession	An operator funds, builds and runs the network for a defined term in exchange for the revenue, usually with obligations attached	**The operator does.** No capital from you, and you give up tariff control and much of the siting flexibility. **This is the structure that can make coverage sites happen**, by bundling them with commercial ones
Host and partner	You provide land, power and access; an operator installs and runs the equipment, paying you a rent or a share	**The operator does.** Common for retail and hospitality sites. Little capital and little control, and the operator will only take sites that work commercially — which is exactly the coverage problem

THE CONCESSION IS THE INSTRUMENT THAT SOLVES COVERAGE

A concession bundles sites the operator wants with sites the programme needs, and awards them as a single package with obligations attached. The profitable sites subsidise the rest, and the operator accepts that because the package as a whole works.

It only functions if three things are true. **The obligations must be specific** — named sites or defined coverage, with dates. **They must be enforceable**, with a consequence for non-delivery that is real. And **the package must be viable overall**, because a concession whose obligations exceed what the commercial sites can carry will attract no credible bidder, or will attract one who intends to renegotiate.

The failure mode is a concession where the commercial sites are built promptly and the coverage sites are perpetually delayed for reasons that are always individually plausible.

What to settle whichever model is chosen

Term and what happens at the end	Who owns the assets at expiry, in what condition, and whether there is an obligation to remove or to hand over. A network reverting in poor condition with an obsolete platform is a liability, not an asset
Tariff control	Who sets prices, within what constraints, and whether there is a mechanism for review. On a public network this is politically material
Service standards	Availability, defined precisely, with measurement and consequence. See Section 08 — “uptime” means whatever the contract defines it to mean
Obligations and their enforcement	Which sites, by when, and what happens if not. The whole of the concession argument above
Data	Who owns session and utilisation data, and whether you can see it. **Without it you cannot manage the contract, plan phase two, or evaluate the operator**
Exclusivity	Whether the operator has exclusive rights over your land or your area, for how long, and what that forecloses. Exclusivity granted lightly is regretted
Interoperability	Whether drivers on other networks can use the sites, and on what terms. Section 07 — a network usable only by its own customers is a smaller network
Step-in and continuity	What happens if the operator fails, is acquired, or exits. Charging is a consolidating industry and the counterparty may not be the same one in five years

WHERE A REVENUE SHARE HIDES THE RISK

In an own-and-operate-by-contract model, the fee structure determines who genuinely carries utilisation risk regardless of what the model is called. A fixed operating fee places the risk entirely on the owner: the operator is paid the same whether the sites are busy or empty. A pure revenue share aligns the operator with utilisation but may leave them unwilling to invest in availability at weaker sites.

Most workable structures combine a modest fixed element with a share, and tie part of the fee to a measured availability standard. **Whatever the structure, work out what the operator earns if utilisation is half the forecast** — if the answer is “the same”, the risk is yours and the model should say so.

SECTION 07

How to tender *a network.*

A network tender is not a larger site tender. What is being bought is a service over a term, and the specification has to reflect that.

Tendering a single installation buys equipment and labour against a specification. Tendering a network buys a fifteen-year relationship in which the counterparty controls the software, holds the data, sets the service level and may be the only party who can maintain what they installed. The documents have to be written for that.

What the tender documents must contain

BEYOND THE TECHNICAL SPECIFICATION

Clause	What to require
Objective and success measure	Stated, per Section 01, with the measure that will be used. Bidders optimise for what is measured; if that is charge point count, that is what you buy
Site list and obligations	Which sites, by when, and which are obligations rather than options. Section 06
Three-level provision per site	Installed, cabled or ducted, specified site by site, so bids are comparable and the futureproofing is not value-engineered out. Section 05
Grid connection responsibility	Who applies, who pays for reinforcement, and what happens if a connection proves more expensive or slower than assumed. **The largest single risk in the contract**
Open protocol requirement	Named, with version and required functions, plus a migration reference. Guide 08 §07 sets out the questions that separate open from “supports open”
Roaming and interoperability	Which arrangements must be supported, so that drivers on other networks can use the sites. Below
Payment accessibility	That a driver without an account or an app can pay. Frequently a regulatory requirement and always a utilisation issue
Availability standard	Defined precisely — what counts as unavailable, measured how, over what period, with what consequence. Section 08
Data rights	Ownership, access, format and export of session and utilisation data, during the term and at the end
Tariff mechanism	Who sets it, within what constraints, and how it is reviewed
End of term	Asset ownership, condition standard, handover of software, credentials and data, and removal obligations where they apply
Step-in and assignment	What happens on operator failure, acquisition or exit, and whether the contract can be assigned without consent
Accessibility standard	Bay dimensions, approach, reach and signage, specified rather than left to the bidder
Lifetime cost basis for evaluation	How bids will be compared — below

EVALUATE ON LIFETIME COST, AND SAY SO IN THE DOCUMENTS

A bid comparison based on installed cost will select the bidder with the cheapest equipment and the most expensive platform, because that is where the return sits in this industry. Over a fifteen-year term the subscription alone frequently exceeds the installation.

Require bidders to state, in a fixed format: capital cost by site; annual platform and subscription cost per point, with the term and any indexation; maintenance and availability costs; assumed equipment replacement within the term; and end-of-term position. Then evaluate on the total. Guide 07 of this series sets out how to build and write that comparison.

State the evaluation basis in the tender documents. Bidders price what they are evaluated on, and a lifetime-cost evaluation announced afterwards is not one.

Roaming and interoperability

A public charge point that only serves customers of one operator is a smaller asset than the same point serving anybody. Roaming — the arrangements by which a driver with one provider's account can charge on another's network — is what makes a network usable by the whole market.

- **Specify that roaming must be supported**, and through recognised interfaces rather than bilateral arrangements only
- **Establish which roaming platforms the operator participates in**, what it costs per session, and whether joining or leaving one is your decision or theirs
- **Require ad-hoc payment** without an account, which is both an accessibility and a utilisation matter and is a regulatory requirement in some jurisdictions
- **Require price transparency** — that the price is visible to the driver before the session starts, including any roaming surcharge

IF THIS IS A PUBLIC PROCUREMENT

Public procurement rules govern above anything in this guide, and they constrain how a concession may be structured, how long it may run, how obligations may be defined and how bids may be evaluated. **Establish the applicable rules with your legal adviser before the documents are drafted**, not after — a lifetime-cost evaluation, an exclusivity term or a bundled obligation may each be constrained.

Where the programme is externally funded, the funder's own procurement framework may apply in addition and is frequently stricter. Obtain it and read it before drafting.

SECTION 08

Utilisation, *and why sites fail.*

The measure that decides whether the programme worked — and the distribution nobody plans for.

Utilisation across a network is not evenly distributed and never has been. A minority of sites carries a large majority of the sessions, and a meaningful number of sites carry almost none. This is observed consistently and it is the single most important planning fact in this guide.

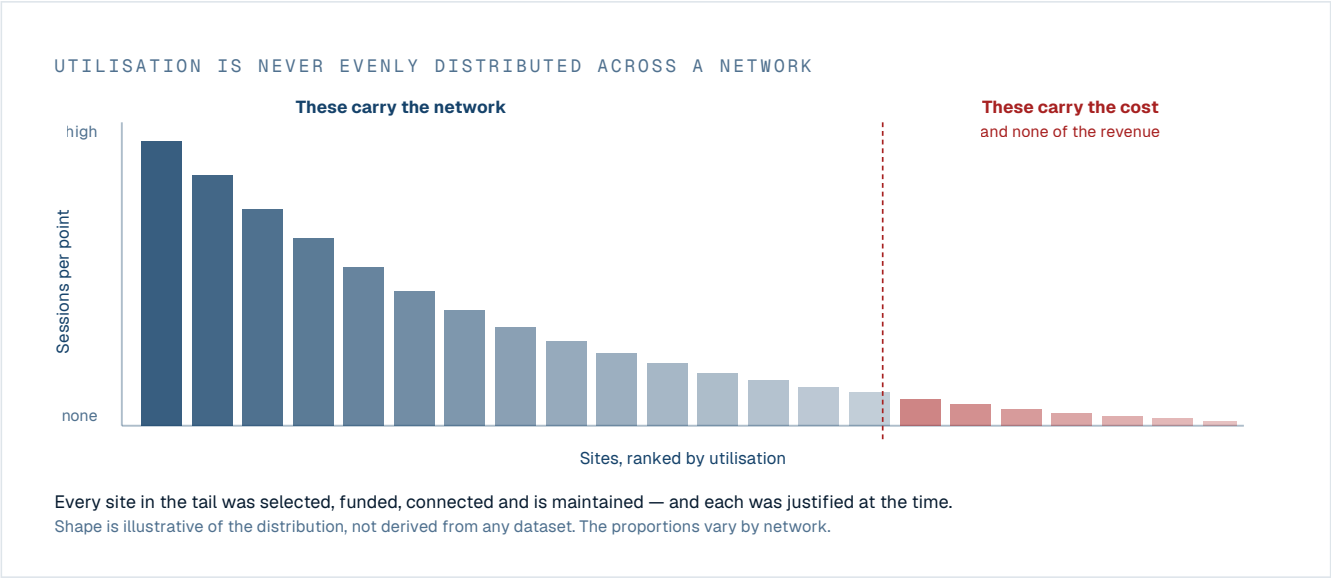

Figure 8.1 — The distribution that governs network planning. Bar heights illustrate the shape of the relationship only and are not derived from any dataset; the proportions differ between networks.

What follows from the distribution

1. **Average utilisation is a misleading number.** A network reported as adequate on average may consist of a few excellent sites and many empty ones. Always ask for the distribution, not the mean — and if an operator reports only the mean, ask why.
2. **Site selection dominates.** No amount of operational excellence moves a site from the tail to the head. This is why Section 03 is the longest section in the guide.
3. **The tail must be a deliberate choice.** Some sites in the tail are there for coverage and were always going to be — that is legitimate and should be funded as such. Sites in the tail by accident are the failure.
4. **Phasing protects you** from building the tail before you have evidence about the head. Section 05.

Why individual sites fail

Cause	What it looks like, and whether it is fixable
No independent reason to stop	Nothing to do while charging. **Not fixable** — this is a selection failure and the most common one
Wrong power for the dwell	High power where people stay for hours, or low power where they stop briefly. Partially fixable, expensively
Poor visibility or access	Hidden, behind a barrier, awkward to reach. **Partly fixable** — signage, barrier exemption and bay marking recover real sessions and cost very little. Check this before concluding a site has failed
Reliability	Points that do not work, or that fail intermittently. Drivers who fail once at a site frequently do not return. **Fixable, and the highest-return operational intervention**
Payment friction	App required, account required, unclear pricing. Fixable and often overlooked
Blocked bays	Occupied by non-charging vehicles or by vehicles left after charging. Fixable through enforcement and idle policy, and requires the landowner's cooperation
Competition	A better site opened nearby. Not fixable, and should have been anticipated in selection
Tariff	Priced above alternatives without a reason a driver perceives. Fixable, within whatever the contract permits

> DEFINE AVAILABILITY PRECISELY, OR THE NUMBER MEANS NOTHING
>
> Availability is the headline service metric and it is defined differently by every operator. Establish in the contract: **what counts as unavailable** — a fault, a blocked bay, a connection failure, a payment system outage, planned maintenance; **at what level** — a single connector, a point, or the site; **measured how and by whom**; over what period; and **with what consequence**.
>
> A site reported at high availability while drivers cannot charge is entirely possible under a loose definition, and it is the most common source of dispute in charging contracts.

What to review, and how often

- **Monthly:** sessions and energy per point, availability against the standard, fault log, and the distribution across sites rather than the average
- **Quarterly:** the tail — which sites are underperforming, why, and whether the cause is fixable. Test the cheap fixes before writing a site off
- **Annually:** the network against the Section 01 objective, the phase decision points, and whether any tail sites should be relocated — a charge point can be moved, and where the civils exist elsewhere, relocation is cheaper than a new site

SECTION 09

The forty-point *checklist.*

Attach it to the programme business case or to the tender. If every box can be ticked before commitment, the network will be used.

A · OBJECTIVE AND DEMAND

- [ ] Primary objective stated — coverage, revenue, transition or obligation
- [ ] Secondary objective stated, and the tension between them acknowledged
- [ ] Success measure defined, and it is not a count of charge points
- [ ] Who carries utilisation risk decided before the commercial model is chosen
- [ ] Any applicable regulatory target obtained in its current form
- [ ] Off-street parking availability established for the target area
- [ ] Existing and planned competing charge points mapped
- [ ] Commercial and municipal fleet demand identified as potential anchor demand
- [ ] Demand presented as a range with the low case and its consequence stated
- [ ] Plan tested against the low case, and shown not to depend on the forecast being right

B · SITES

- [ ] Candidate list scored, with eliminate-then-score structure applied
- [ ] Grid capacity screened across the whole list before any site committed
- [ ] Land control established per site, with term and end-of-term position
- [ ] Independent reason to stop identified for each site
- [ ] Dwell time at that reason established, and power matched to it
- [ ] Visibility, access and barrier arrangements assessed
- [ ] Permitting, street works and heritage constraints identified per site
- [ ] Lighting, security and passive surveillance assessed
- [ ] Accessibility requirements specified per site, not left to the installer
- [ ] Rejected sites retained with reasons as a future pipeline

C · GRID AND BUILD

- [ ] Whole candidate list taken to the distribution operator in one conversation
- [ ] Operator's own investment plan obtained and reflected in the sequencing
- [ ] Operator asked where under-used capacity exists that you have not identified
- [ ] Whether available capacity can be secured, and at what cost, established
- [ ] Flexible or curtailable connection options established
- [ ] Connection applications submitted early and in parallel, before detailed design
- [ ] Ducts, cable routes and foundations sized for the end state at every site
- [ ] Installed / cabled / ducted decided per bay and specified in the tender
- [ ] Load management specified with defined fail-safe behaviour per site
- [ ] Phase decision points defined, with what is measured and what each result triggers
- [ ] Coverage sites scheduled and funded explicitly, not deferred by default

D · COMMERCIAL AND CONTRACT

- [ ] Commercial model selected against who carries utilisation risk
- [ ] Where a fee is paid, what the operator earns at half the forecast utilisation calculated
- [ ] Obligations specific, dated and enforceable, with a real consequence
- [ ] Availability defined precisely — what, at what level, measured how, with what consequence
- [ ] Data ownership, access and export secured, during the term and at the end
- [ ] Open protocol specified with version, functions and a migration reference
- [ ] Roaming, ad-hoc payment without an account, and price transparency required
- [ ] End of term, step-in, assignment and exclusivity all settled
- [ ] Bids evaluated on lifetime cost, with the basis stated in the tender documents

Programme sign-off

Complete and retain with the business case or the tender documents.

NETWORK PROGRAMME SIGN-OFF

Item	Name and role	Date and signature
Programme and area		
Primary objective and success measure		
Grid capacity screen completed with		
Site list scored and approved by		
Commercial model approved by		
Procurement route confirmed by		
Checklist points 1–40 confirmed		
Released for tender by		

IF YOU CAN ONLY DO THREE THINGS

One. Screen the whole candidate list for grid capacity with the operator before committing a single site. It will reorder the list, and it eliminates more sites than every other criterion combined.

Two. Size ducts, cables and foundations for the end state and install charge points modestly. The forecast will be wrong; make it cheap to be wrong.

Three. Measure the distribution of utilisation, never the average — and decide deliberately which sites are in the tail for coverage reasons rather than discovering them there.

REFERENCE

Standards referred to *in this guide.*

Listed by number and subject. Confirm the current edition and the applicable national adoption before citing any of them in a contract document.

STANDARDS REGISTER

Reference	Subject
IEC 61851 series	Electric vehicle conductive charging systems — general requirements, AC charging, DC charging stations, and digital communication between vehicle and station
IEC 62196 series	Plugs, socket-outlets, connectors and vehicle inlets — conductive charging of electric vehicles
ISO 15118 series	Road vehicles — vehicle to grid communication interface
IEC 60364-7-712	Low-voltage electrical installations — requirements for special installations: supplies for electric vehicles
IEC 61439 series	Low-voltage switchgear and controlgear assemblies
IEC 62305 series	Protection against lightning
EN 17186	Identification of compatibility between vehicles and charging infrastructure — the labelling a driver sees at the connector
EN 50549 series	Requirements for generating plants connected in parallel with distribution networks — relevant where bidirectional charging or export is intended, and where on-site storage or generation is proposed
EN 17210	Accessibility and usability of the built environment — functional requirements. Relevant to bay dimensions, approach and reach at publicly accessible sites
ISO 50001	Energy management systems — relevant where the operator or host runs a formal energy programme

OPEN PROTOCOLS REFERRED TO

OCPP	Open Charge Point Protocol — communication between a charge point and a management platform. An open industry protocol, not an ISO or IEC standard
OCPI	Open Charge Point Interface — roaming and interoperability between charging networks. Likewise an open industry protocol. Section 07

HOW TO USE THIS REGISTER — AND WHAT GOVERNS ABOVE IT

Standards are revised, withdrawn and superseded. Verify the current edition with the national standards body applicable to your programme, and confirm that the clause you intend to rely on still says what you think it says. Nothing in this guide should be relied upon as a statement of the content of any standard or protocol.

For a public charging programme, four things govern above all of the above: the requirements of the distribution system operator; the applicable planning, street works and permitting regime; any regulatory requirement on the provision of publicly accessible charging, which is recent and being revised and must be obtained in its current form; and the public procurement rules applicable to the award. Where any of these differ from anything in this guide, they prevail.

About APIS

APIS is an integrated engineering group founded in Kosovo, operating across the Western Balkans and into the European Union. The Group delivers mechanical, electrical, energy and infrastructure works through twenty-one delivery divisions across two strategic business units — Building Systems & Technologies, and Energy, Industry & Infrastructure — supported by four engineering excellence centres. APIS operates management systems certified to ISO 9001, ISO 14001, ISO 45001 and ISO 50001.

The **EV Charging Division** plans and delivers charging infrastructure at network scale as well as at individual sites — candidate screening and site scoring, grid capacity assessment across a portfolio, connection applications, electrical design and civils, installation and commissioning, and long-term operation. Work is delivered under the Group's DBOM lifecycle model — design, build, operate and maintain — so the party that selects and sizes the sites is accountable for whether they are used.

Prepared by the APIS EV Charging Division · **Document** APS-GD-11 issue v1.0 of 20 August 2026 · **Contact** apisgroup.net/contact

Have a site list and a target, *but no capacity screen?*

Most programmes do, and it is the step that reorders the list. Our engineers will screen your whole candidate list against the network before a single site is committed, score what survives, and tell you which sites are phase one, which are phase three, and which were never sites at all.

SPEAK TO THE EV CHARGING DIVISION

Candidate screening and site scoring · portfolio grid capacity assessment · connection applications · phasing and futureproofing strategy · network tender documents and evaluation · electrical design and civils · installation, commissioning and long-term operation

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Planning charging on your own site rather than a network? See Guide 08 in this series.
apisgroup.net/guides-ebooks

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