



THE BUSINESS CASE FOR SMART CHARGE MANAGEMENT SOFTWARE

How smart energy management creates cost-efficient electric fleets

This practical guide to smart charge management helps electric fleet operators quantify energy savings, operational efficiency gains, and financial returns to build a clear business case for investment.

INTRODUCTION

Running an electric fleet requires precise energy management and seamless operational processes. While basic charger software focuses on charger uptime and maintenance, it cannot plan charging, manage grid demand, or ensure that every bus is always ready for service.

A Charge Management System (CMS) adds a layer of intelligence that improves operations. It connects vehicles, chargers and energy data in one system, helping operators to plan, monitor, and optimize charging in real time.

This ebook outlines the business case for investing in a CMS. It shows how smart charging delivers measurable savings in energy spend, staff time, uptime, and asset value. Each section helps you identify savings, estimate the financial impact, and calculate your own ROI using real data and examples.

About Tenix

Developed with top operators in the Nordics such as Vy Buss and Connect Bus, Tenix is proven in daily operations where uptime and punctuality directly affect contract performance. By coordinating energy use, charging schedules, and grid capacity, it helps operators lower energy costs, prevent missed departures and extend vehicle battery life.

With Tenix, operators typically reduce energy costs by **10–25 percent**, extend battery life by several years, and prevent penalties linked to service delays, typically achieving a full return on investment within **six to nine months**.



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THE SHIFT: WHY ELECTRIC FLEETS NEED SMARTER CONTROL

Electrifying a fleet changes everything about how depot operations are run. Vehicles, chargers, grid capacity, and route schedules must now work together seamlessly. When they don't, reliability drops, costs rise, and staff spend time reacting to problems, like uncharged vehicles or charger breakdowns, instead of running operations.

Electricity becomes one of your largest and most volatile cost drivers. Prices shift hourly, grid limits constrain when and how much you can charge, and one failed overnight session can disrupt an entire morning's service. Every missed departure, last-minute charger swap, or premature battery replacement directly hits your margins and contract performance.

Smart charge management gives operators the control they've lacked, turning energy and charging from an operational pain point into a managed, measurable process.

Key Challenge

Reliability and cost are now shaped by how well you manage energy, not just vehicles.



WHY BASIC TOOLS AREN'T ENOUGH

The Breaking Point: Why Basic Tools Fall Short

Most operators begin with basic charger software, which works in the early stages of electrification but falls short when operations grow. The software applications that come with your charger can track charger uptime or record faults, but they cannot coordinate charging across depots, manage grid demand, or make sure every bus is ready for service.

Without a centralized view of chargers, vehicles and depots, teams spend hours moving between portals, checking SoC, or manually deciding which vehicles to prioritize. At the same time, energy waste, downtime, and unused capacity often go unnoticed, resulting in thousands of missed cost savings each month.

Key Insight

At a 100-bus depot, charging operation inefficiencies can easily add up to €10,000 - €15,000 in avoidable monthly costs.

- 1. Missed departures and downtime**
When charging fails overnight, the problem is often found too late. A bus that cannot depart on time forces last-minute changes, lost service hours, and potential penalties.
- 2. High costs & grid constraints**
Power capacity is a fixed resource and expanding it is costly. Smart load balancing is needed to reduce peak demand, avoid overloads, and minimize energy costs overall.
- 3. Lost staff time**
Depot teams shouldn't spend hours checking SoC or juggling multiple charger portals. Smart alerts and multi-depot overviews let your team focus on running a smooth operation.
- 4. Idle capacity = lost revenue**
Without smart management, most daytime charging capacity sits idle, letting revenue slip through your fingers. Advanced systems support depot sharing, creating additional revenue.

WHAT A SMART CMS DELIVERS

A CMS connects vehicles, chargers, and energy data, giving operators control over when, where, and how vehicles charge, aligning energy use with tariffs, grid limits, and service schedules.

CMS Benefit	How it's Achieved	Quantifiable Impact
Lower energy costs	Balances charging load and schedules charging during low-price periods	15–30% reduction in monthly energy spend
Reliable Operations	Monitors every charger-vehicle connection and alerts staff before issues cause delays	Zero missed routes and reduced penalty risk.
Extended Battery Life	Optimizes charging depth and timing to minimize battery stress and degradation.	+2–5 years longer lifespan, saving up to €120,000 per bus.
Higher Staff Efficiency	Automates manual checks and provides a unified overview of all chargers and depots.	1–2 hours saved per day, improving operational focus.
New Revenue Streams	Enables depot sharing and participation in flexibility markets using spare capacity.	+€1000–€3000 per month in additional income.

HOW SMART CHARGING REDUCES OPERATING COSTS

Electrifying your fleet fundamentally shapes your operational cost structure. Energy becomes a primary ongoing expense. Smart charging offers a way to keep energy spend predictable and lower operating costs overall.

1. Reduce Peak Demand

If your depot has excess capacity or your energy bill is high, set limits to control charging and reduce costs. Cutting peak usage by 20% can lower your bill by 10-15%, depending on your provider and location.

2. Optimize for Price

In markets with variable energy prices, savings come from charging when rates are lowest. Many operators charge at night, but starting later or skipping the final few hours of the night can reduce costs by 5–10%, or more depending on variability in the pricing.

3. Charge Smarter, Not Longer

Full charges are rarely necessary. Charging above 80% takes longer, increases battery wear, and uses more capacity. Reducing charge levels by just 10% can significantly lower your energy bill and extend battery health.

Result

For a 100-bus depot smart charging cuts monthly energy costs by €10,000–€15,000, making it one of the strongest contributors to short-term ROI.



HOW A CMS PREVENTS PENALTIES

When charging stops overnight or a charger-to-bus connection fails, the result can be delayed or cancelled routes. In many countries, authorities impose penalties and fines, and repeated service issues can affect future tenders. A CMS helps prevent these losses by ensuring vehicles are ready before departure.

Beyond the Penalties

When a charge fails, drivers have to be reassigned, schedules get disrupted, and vehicles are swapped. This wastes time, makes depot operations more difficult, and lowers staff confidence, which can increase costs far beyond the penalty.

A smart CMS alerts you to charging stops and gives you a clear picture of charging reliability for your vehicles, chargers, and depots. It highlights recurring issues and provides data so you can fix them before they affect your service.

This approach makes reliability a measurable metric. Operators use it to demonstrate compliance with public transport authorities, strengthen tender bids, and show year-on-year improvement in service availability.

The Ultimate Advantage

Reliable service protects reputation and wins future tenders.



Result

Avoiding just a few cancelled routes each month can save €1000–€2000 in penalties and indirect costs, while higher reliability increases tender competitiveness and drives business growth.

EXTENDING BATTERY LIFE AND ASSET PERFORMANCE

How Smarter Charging Protects Long-Term Fleet Value

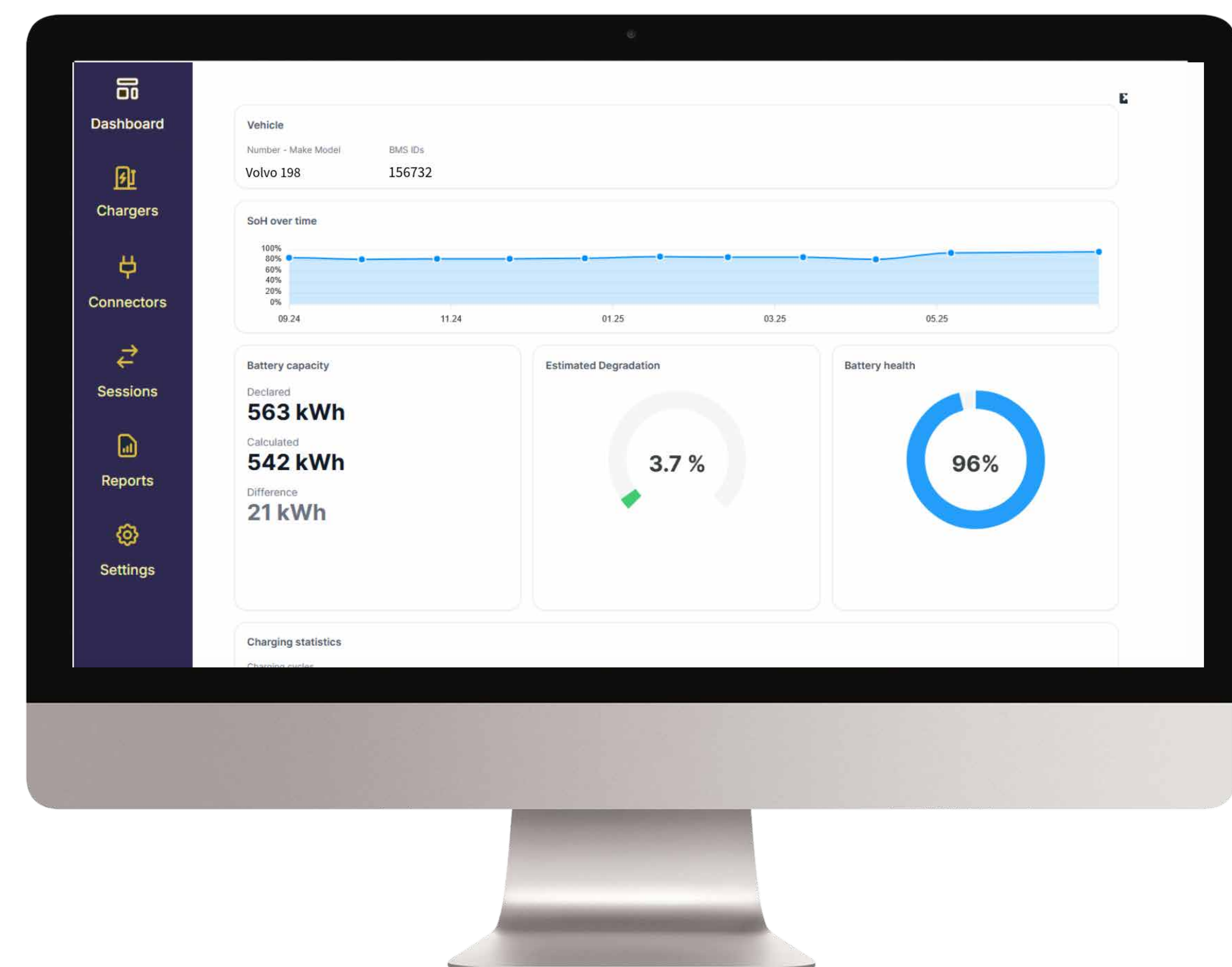
Battery wear depends on how you charge. Fast charging too often, keeping batteries at high charge for long periods, and topping up to 100% when it is not needed all reduce battery life. Smart charging systems can help by adjusting charging schedules for each vehicle, using information such as route, temperature, and past performance. This results in lower energy use, fewer replacements, and greater reliability.

Monitoring and Predictive Insights

Collecting data from every charging session to track battery temperature, efficiency, and degradation makes it possible to identify early warning signs of battery issues before they affect operations. This allows operators to plan maintenance proactively and replace batteries only when necessary, avoiding costly downtime and early replacements.

Long-Term Financial Impact

Extending battery life and making charging more efficient can lower the total cost of ownership. For a fleet of 100 buses, this could mean up to €12 million in savings over the vehicles' lifecycles. With fewer replacements and better reliability, operators may also need fewer standby vehicles. Running the same service with 2 to 4 fewer buses can save several million euros in capital costs over the fleet's lifetime.



Result

Optimized charging can extend battery lifespan by 2-5 years, saving €80,000–€120,000 per bus and preserving fleet value.

TURNING SPARE CAPACITY INTO NEW REVENUE

Electric depots are often built for overnight charging, leaving much of their infrastructure unused during the day. This idle capacity can be shared, traded, or temporarily adjusted to create new sources of income.

Two emerging models enable this: depot sharing and participation in flexibility markets. Both models depend on accurate energy data and controlled access to charging capacity.

Depot Sharing

After morning departures, most depots experience long periods of low load. When fleet owners open that capacity to other users they can recover part of their fixed infrastructure cost.

Modern charge management systems make this possible without compromising control. Access can be scheduled, authorised, and monitored remotely. Energy use is measured per session, and costs are automatically allocated between the host and guest.

Even sharing a small amount of capacity can bring real value. For example, using 1 megawatt of spare capacity for 80 hours per month at a margin of €0.10 per kWh can add €1,000 to €3,000 in extra revenue each month.

Flexibility Market Participation

To keep supply and demand in balance, grid operators now offer incentives for large consumers who can temporarily adjust their load.

When participating in a flexibility program, an operator agrees to reduce or shift consumption on request, in return for financial compensation.

Advanced energy-management tools can handle this automatically without affecting operational readiness. They monitor real-time grid signals and adjust charging activity while sticking to each vehicle's departure schedule. Participation does not require vehicle-to-grid technology; even simple demand reduction can qualify.

Result

Using 1MW of spare capacity for daytime charging or grid services can generate €1000–€3000 in additional monthly income while improving infrastructure utilization.

THE RETURN ON INVESTMENT: WHAT OPERATORS REALLY SAVE

Smart charge management substantially improves the core cost areas of electric fleet operation—energy, reliability, staff time, and asset performance, strengthening the business case for electrification. At a 100-bus depot, the total effect is **€13,000–€17,000** in monthly savings, about **€150 per bus**. These savings come from five main areas:

- 1. Smart load balancing and off-peak scheduling cut peak charges by 15–25%.
- 2. Aligning charging with low-price hours delivers reductions of €6,000–€7,500 each month, depending on tariff structure.
- 3. Charging vehicles only to the level needed for the next route avoids unnecessary top-ups and saving €3,500–€3,700 per month.
- 4. Proactive fault detection prevents missed departures and contract penalties, typically saving €1,000–€2,000 each month.
- 5. Advanced load management enables depots to share infrastructure and join flexibility programs, generating €800–€1,600 in extra monthly revenue.

MONTHLY SAVINGS/GAINS PER 100 BUSES (With Tenix)

€2000	Capacity peak savings
€7000	Dynamic price optimization
€3500	SoC optimization
€1200	Flexibility market participation
€1500	Penalty avoidance
€15,200	Monthly savings

CALCULATING YOUR ROI

A clear return on investment (ROI) helps operators demonstrate the financial case for implementing a CMS. This section shows how to estimate the monthly and annual impact of smart charging using your own data.

STEP 1

MAP YOUR ENERGY USE

Start by identifying the main inputs that determine your total energy cost by filling out the table on this page.

Example

100 buses x 350 kWh x €0.07
= **€2,450 per day**

Metric	Your value
Number of BEVs in daily operation	
Average battery capacity (kWh)	
Average energy price (€/kWh)	
Depot charging capacity (kW)	

Multiply the number of buses by their daily energy requirement and by your energy tariff to estimate total energy spend. This figure is your baseline cost for all further calculations.

STEP 2

ESTIMATE ENERGY SAVINGS

Smart charging typically reduces energy spend by 15–30 percent, depending on tariffs and flexibility. Break this down into the following areas:

Category	Typical % Saved	Typical % Saved	Monthly € Saved
Peak shaving	How much can you save by avoiding high-load periods?	10-15%	_____
Dynamic pricing	How much cheaper can charging be if scheduled at off-peak hours?	5-10%	_____
SoC optimization	How much energy can you save by avoiding unnecessary 100% charges?	5-10%	_____

Calculation Guide

Apply these percentages to your baseline cost to calculate monthly energy savings. Use your own energy bill and tariff information to refine the figures.

Subtotal energy savings: € _____ / month

STEP 3

ADD OPERATIONAL GAINS

Charging reliability and staff efficiency deliver measurable cost improvements beyond energy savings.

Penalty Avoidance

Estimate the average number of missed routes prevented per month × penalty per route (€200–€400 each).

Staff Efficiency

Estimate time saved daily from automated monitoring (1–2 hours × average hourly rate × 30 days).

Add these figures together to calculate monthly operational gains.

Subtotal operational gains: € _____ / month

Calculation Guide

If unsure, start with 4–6 missed routes avoided per month (€200–€400 each) and 1–2 staff hours saved daily at €25/hour.

Typical total: €2,000–€5,000 per month.



STEP 4

INCLUDE NEW REVENUE

If your depot has unused capacity during the day, estimate potential earnings from depot sharing or flexibility market participation.

Category	Your value
Available capacity (kW)	_____
Available hours per month	_____
Total energy available (kWh) = capacity x hours	_____
Energy costs (€ / kWh)	_____
Fee charged to others (€ / kWh)	_____
Gross Revenue (€) = total KWh x fee	_____
Net energy profit (€/kWh)	_____

Subtotal new revenue € _____ / month

Calculation Guide

Use realistic figures based on your grid connection, schedule and demand in your area. Even modest use of spare capacity, such as 1 MW for 80 hours at €0.10 margin can generate around **€1,000–3,000 per month.**

Add the new revenue subtotal to your total monthly savings from step 3.

STEP 5

CALCULATE THE ROI FOR YOUR DEPOT

Once you’ve added up your savings, operational gains, and revenue, you can calculate your monthly return and payback time. Use the fields below to total your results and see how quickly your investment pays back.

Category	Your value
Energy savings (step 2)	
Operational gains (step 3)	
New revenue (step 4)	
Total monthly benefit (A)	
Monthly CMS cost (B)	
Net monthly gain (A-B)	

Calculation Guide

If your CMS costs €10,000 per month and delivers €15,000 in monthly net savings, your payback time is around eight months, with an annual ROI of approximately 50 percent.

Explainer

A 50 percent annual ROI means the system earns back its cost plus half again in savings each year after payback.

$$\text{Annual ROI (\%)} = ((A \times 12) - \text{Annual CMS cost}) \div \text{Annual CMS cost} \times 100.$$

EXTENDED ROI: INCLUDING LONG-TERM VALUE

Beyond monthly OPEX savings and revenue gains, smart charge management extends battery lifespan and reduces fleet redundancy, delivering large lifecycle savings, further strengthening the financial case for a CMS.

Category	Typical Value	Financial Impact
Battery lifespan expansion	+2–5 years	€80,000–€120,000 saved per bus = up to €12 million over 10 years
Reduced fleet size	2–4 fewer buses required	€1.5–3 million saved in capital cost
Combined lifecycle benefit	How much energy can you save by avoiding unnecessary 100% charges?	€1.3–1.5 million per year additional value

$$\text{Full ROI (\%)} = ((A \times 12) + \text{Lifecycle Value} - \text{Annual CMS cost}) \div \text{Annual CMS cost} \times 100$$

A × 12 = Annual operational savings (from Step 5)
Lifecycle Value = Annualized battery and fleet-size savings

Explainer

If your CMS saves €15,000 per month and delivers €1.3 million in annual lifecycle value, your total ROI rises from 50% to more than 150% annually.

DECIDING IF THERE'S A BUSINESS CASE FOR SMART CHARGE MANAGEMENT

A Charge Management System becomes critical when your operations are too big or complex for charger portals and spreadsheets. If you have multiple depots, different brands of vehicles or chargers, or are close to your grid limit, a CMS solves real operational headaches. It streamlines daily tasks with automated workflows, reduces staff workload by bringing controls together, and helps every bus leave on time with accurate charge scheduling.

For smaller fleets or single depots, basic charger software may be sufficient. However, as your energy spend increases, service reliability becomes crucial to contract performance, and your team spends significant time troubleshooting, the need for a well managed charging operation increases.

Each depot has its own grid limits, tariff structures, and schedules. Small changes in charging strategy or energy price can shift your ROI significantly. Review the factors with the largest influence, typically energy tariffs, fleet size, and charging patterns, to understand where automation and optimisation can deliver the fastest returns.

If managing your electric fleet becomes more difficult than your diesel one, it is time to invest in a CMS to keep vehicles charged, ready and within budget.

Invest in a CMS when:

- ✓ You operate multiple depots
- ✓ You have multiple charger brands
- ✓ You manage more than 30 electric vehicles
- ✓ You face grid or capacity constraints
- ✓ Energy costs are spiralling
- ✓ Uptime affects contract performance
- ✓ You plan to scale your fleet

FUTUREPROOFING YOUR OPERATION

In the coming years, every fleet will need to handle more electric vehicles, adapt to new energy tariffs, and meet higher service expectations from authorities. Success will come down to how smoothly these operations run each day.

Technology by itself does not guarantee a profitable fleet. What matters is how well it is managed, including how energy is used, how vehicles are prepared, and how charging infrastructure is maintained. Operators who get these processes right early on will have a strong, lasting advantage.

Tenix Charge is the digital backbone for this future. It brings together every part of the charging ecosystem, including vehicles, chargers, depots, and energy markets, on a single platform. With this visibility and automation, large-scale operations become more predictable, scalable, and financially sustainable.

As your fleet grows, Tenix adapts with you. It supports any charger or vehicle brand, integrates with route and depot management systems, and scales from one depot to dozens without complex reconfiguration. Continuous updates ensure compatibility with evolving grid models and future regulations.

With a system built for long-term flexibility and performance, you can confidently grow your operations, knowing your infrastructure and processes are prepared for the future.



ABOUT TENIX

Tenix helps electric fleet operators manage charging with precision and reliability. Grounded in deep telematics expertise, our Charge Management System excels at managing the vehicle-charger handshake, which we believe is at the core of dependable depot operations.

Proven with the largest Nordic vendors in the most demanding conditions, Tenix offers future-proof, scalable charge management without vendor lock-in.

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