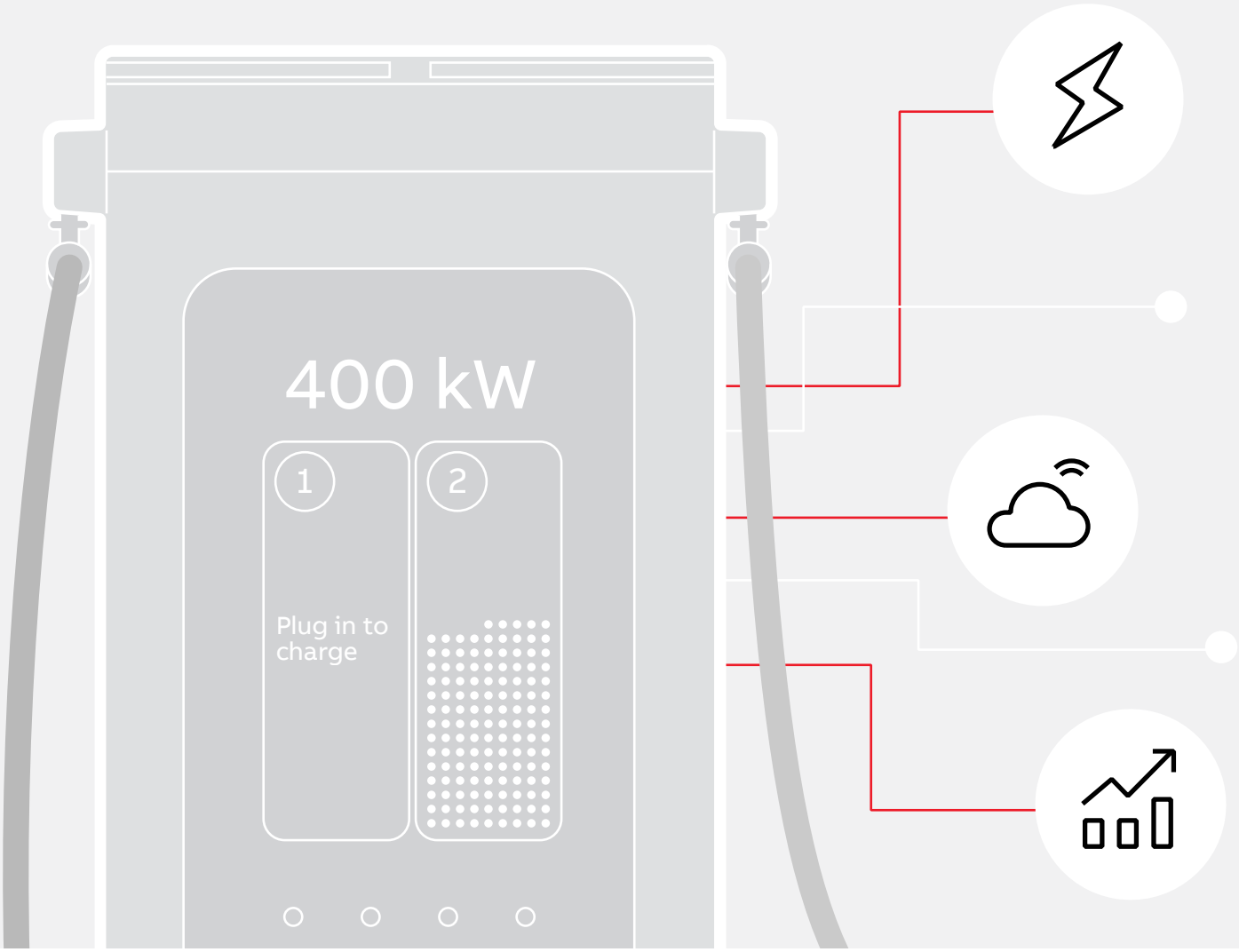

The Critical Role of Service in Maximizing Uptime

Ensuring High Reliability and Performance of EV Charging Infrastructure

Inside this White Paper

More Than a Metric

In the fast-evolving electric vehicle (EV) market, the success of electrification depends on one critical factor: chargers that work when needed.

This reliability is captured by *uptime* – the percentage of time a charger is ready and available for charging, based on live status data such as available, occupied, or reserved.

For Charge Point Operators (CPOs), Fleet Managers, and Public Transit Operators, uptime is more than a technical metric. It is the foundation of operational efficiency, customer trust, and business performance. In some markets, it has even become a legal requirement. Both the United Kingdom and the United States have introduced specific uptime benchmarks for public charging infrastructure, signaling how critical reliability is for EV adoption.

Maintaining reliability throughout a charger's lifespan is the result of more than just durable hardware. It requires a stable energy supply, dependable connectivity, and streamlined service processes that prevent issues from ever reaching the end user. Other industries illustrate this clearly: telecom networks, wind farms, high-speed rail, and aviation all rely on ongoing maintenance to remain operational in demanding conditions. The same is true for DC fast chargers, where availability defines performance and even brief interruptions can have significant consequences.

This white paper defines uptime as the key performance metric for EV charging infrastructure, explores the factors that influence it, and examines how proactive maintenance and structured service agreements can help operators turn reliability into a competitive advantage.

Performance in Motion
Uptime determines whether people or goods get from A to B without disruption.

Not a One-time Effort
Uptime is achieved through ongoing maintenance, upgrades and partnership.

What Real-World Performance Looks Like

No charging network, no matter how advanced, will achieve 100% uptime indefinitely.

Components wear out, environmental factors take their toll, and unforeseen events – from grid fluctuations to vandalism – can cause interruptions. Industry benchmarks will cite 99% overall operational uptime, but this figure is often misunderstood. For operators, the difference between 99% and 95% uptime is the difference between dependable service and disruption.

99% uptime equates to a maximum of **3.6** days downtime per year.

While downtime is inevitable, it is rarely caused by a single issue. Instead, it is caused or prolonged by a combination of factors across four domains:

Hardware and environment

Chargers operate in demanding conditions. Heat, dust, moisture, and salt accelerate wear, while power modules naturally degrade with heavy use. Vandalism and accidental damage add further risk.

Grid and energy supply

Local grid instability, site capacity, and power quality issues can cause outages or limit performance. Many operators are now considering on-site assets, such as battery storage (BESS).

Connectivity and digital systems

Chargers depend on stable connections to backend systems, payment platforms, and roaming networks. Failures in these layers can result in the charger appearing offline to the user, even if the hardware itself is functioning properly.

Operations and maintenance

The speed and effectiveness of issue detection, case management, technician dispatch, and spare parts logistics determine whether downtime lasts minutes or days.

The Business Impact of Downtime

Downtime costs are multi-layered, including direct and indirect costs that extend beyond the immediate loss of charging revenue.

Direct Costs: Lost Revenue

A 400 kW charger averaging 10 sessions per day at €40 a session loses €400 for every day it is offline. Across networks, downtime quickly scales into thousands of euros in lost revenue.

Indirect Costs and Total Cost of Ownership (TCO)

The true cost of downtime becomes clearer when indirect effects are considered.

Damaged customer trust

Many EV drivers will abandon a network after just one failed charging attempt. Poor uptime leads to negative app ratings, lower usage, and declining brand loyalty. For CPOs, this loss of trust can be more damaging than the financial impact.

Disrupted fleet and transit services

For commercial fleets or public transit depots, downtime can be operationally devastating. A single charger failure may leave vehicles unprepared for morning service, resulting in missed routes, delayed deliveries, and potential contractual penalties.

High operating costs

Without structured monitoring and service processes, downtime forces operators into reactive mode. Each incident can trigger repeated site visits, higher labor costs, and wasted resources – costs that could have been avoided with preventive measures.

The Four Drivers of Uptime

Maintaining high uptime requires every part of the charging ecosystem to work together seamlessly.

From the operator's perspective, downtime is shortened or avoided altogether when four critical areas are managed in unison.

> "High uptime is not the result of any single design choice. It is achieved only when all of these factors are managed holistically."
>
> **Cliff Fietzek, ABB E-mobility**

01

Continuous monitoring

Chargers must stay connected to report on status and enable remote diagnostics. Even minor connectivity issues, such as an unstable SIM card or a local network fault, can make a charger appear offline and block remote troubleshooting.

02

Effective remote support

In the event of an issue, automated case management is critical. Service requests must be accurate and supported by proper diagnostic data. Remote support, being the fastest resolution channel, relies on technician expertise, failure timing, and reliable charger access.

03

Rapid on-site intervention

When remote resolution is not possible and components need replacing, coordination of on-site support becomes a top priority. High-voltage chargers often demand specialized skills, making trained and certified technician availability essential.

04

Spare parts readiness

Even the most skilled technician cannot restore a charger without the right component. Strategic stock management and efficient, on-time delivery are necessary to ensure the right part is available when needed and repairs can be completed on the first visit.

Behind Every Reliable Charger is a Trusted Service Partner

Reliability is not just built on engineering, but the support that stands behind it.

Charger faults rarely occur at convenient times. They often strike during peak travel periods, severe weather events, or moments of high customer demand when uptime matters most. In these moments, the difference between a simple inconvenience and a major disruption comes down to the quality of the service partnership.

For operators, a trusted service provider with trained technicians ensures confidence that when issues arise, there is a clear and coordinated response in place. Defined Service Level Agreements (SLAs) between operator and service partner turn unpredictable costs into stable operating expenses and transform unplanned downtime into manageable risks.

Service commitments that benefit operators across all industries:

Specified response times

Critical issues are prioritized and addressed within clearly defined timeframes, ensuring minimal disruptions and faster resolution.

Cost predictability

All service calls, field work, and spare parts are covered under a structured agreement, simplifying budgeting and eliminating unexpected expenses.

Priority handling

Repairs are triaged and resolved based on urgency, helping operators maintain and avoid extended service interruptions.

Spare parts availability

Components are stocked and ready for dispatch, ensuring chargers are brought back online quickly.

If service is planned properly	
Higher charger uptime	✓
Increased revenue	✓
Customer loyalty	✓
Predictable OPEX	✓
Improved brand reputation	✓

ABB E-mobility Service Packages

ABB E-mobility's Service Packages are designed to turn the uncertainty of downtime into predictable, manageable operations.

Delivering high uptime requires a structured framework that ensures issues are detected early, resolved quickly, and prevented from recurring. For operators seeking confidence in charger performance, ABB E-mobility SLAs offer:

- ✓ **Guaranteed resolution times**
  Your issues are not just acknowledged; they are resolved within contractually committed timeframes.
- ✓ **Predictable annual costs**
  A fixed annual fee covers regular maintenance, remote support, on-site intervention, and spare parts to eliminate surprise service costs. Your TCO becomes predictable and bankable.
- ✓ **Priority service queue**
  Cases are automatically escalated through cloud-based service platforms, ensuring customers with a Service Package are prioritized.
- ✓ **Guaranteed spare parts availability**
  ABB E-mobility stocks and prioritizes certified components to minimize downtime and can also support customers or partners in building local spare part inventories to accelerate repairs.
- ✓ **Advanced remote diagnostics**
  Many issues can be diagnosed and resolved remotely, minimizing the need for costly and time-consuming on-site visits.
- ✓ **Preventive maintenance**
  Activities aimed at reducing failure risk include inspections, calibrations, and scheduled part replacements.
- ✓ **Enhanced serviceability**
  Customers who prefer a self-service approach receive certified training, tools, and documentation that enable safe, standards-compliant preventive maintenance.

Predictability Pays Off
The cost of a Service Package is a predictable operational expense. The cost of downtime is an unpredictable, uncapped liability.

Extending beyond reactive support, ABB E-mobility SLAs include proactive, data-driven optimization strategies to achieve telecom-level reliability:

✓ **Proactive case creation**

Through continuous self-diagnostics and proactive scans, ABB E-mobility chargers automatically generate service cases – enabling our service team to identify and resolve issues before customers experience any disruption.[1]

✓ **Data and analytics**

An integrated Asset Management Platform (AMP) provides real-time visibility of network health, enabling smarter decisions and faster response times. This visibility allows operators to identify underperforming assets, usage trends, and opportunities for network improvements.

✓ **Software and firmware assurance**

Regular software and firmware updates keep chargers secure, compatible with new vehicle models, and aligned with evolving industry standards.

✓ **Open standard support**

A commitment to open protocols such as OCPP ensures interoperability and protects customers from vendor lock-in, fostering long-term flexibility and scalability.

[1]This feature is currently in pilot and expected to become fully available in 2026.

A Modular Service Offering to Suit Every Customer

No two charging networks are the same. Some operators rely entirely on external partners, while others leverage in-house technicians or regional service providers. To address different customer needs, ABB E-mobility has built their Service Packages around four major components that support charger infrastructure maintenance.

Remote Support

Experts remotely diagnose, update, and resolve issues – boosting efficiency and minimizing downtime.

Asset Intelligence

A unified digital toolchain ensures optimized uptime, smarter diagnostics, and evolving charger capabilities with over-the-air software updates.

On-site Support

When remote fixes are not enough, certified technicians are sent on-site with guaranteed response times to quickly restore charger uptime and minimize disruption.

Spare Parts Management

Fast and reliable access to spare parts – delivered when and where they are needed to keep chargers operational.

This modular service model gives operators the flexibility to choose the coverage that fits their needs – from remote expertise to full end-to-end support. Customers who prefer a hands-off approach can rely on ABB E-mobility for all service, maintenance, and optimization activities. For those seeking greater serviceability, ABB E-mobility provides the tools, manuals, training, and maintenance schedules that enable qualified teams to perform preventive maintenance safely and to ABB E-mobility standards.

A flexible service framework, backed by certified training, ensures every operator – regardless of size or capability – can maintain uptime, safety, and long-term performance of their EV charging infrastructure.

Pre-Configured Packages

ABB E-mobility offers three pre-configured Service Packages, each tailored to different operator needs and levels of in-house capability:

	‘Parts’ Essential protection	‘Smarts’ Stay one step ahead	‘Uptime’ End-to-end coverage
	The **Parts** package provides coverage of spare parts for corrective maintenance activities.	The **Smarts** package ensures your operations are backed by experts.	The **Uptime** package delivers complete confidence from a single partner.
Warranty Corrective parts coverage for the first 24 months	✓	✓	✓
Optional Extended Parts Coverage Corrective parts coverage for the following 3-10 years[2]		**Optional**	✓
		Intelligence & Enablement Software updates, remote control, monitoring and alerts.	✓
		Remote Support Remotely diagnose, update, and resolve issues.	✓
			On-site Support Certified field technicians with guaranteed on-site response times.
	Ideal for channel partners, new site operators or pilot projects with lower charger utilization.	**Ideal for** customers with qualified service partners or in-house expertise seeking support to strengthen and scale their business strategy.	**Ideal for** customers who want full service coverage but do not want to manage multiple vendors.

[2]When bundled with ‘Smarts’

Conclusion

A comprehensive service agreement is not just a support contract, it is an essential investment for business continuity.

For CPOs, fleet managers, and transit providers, a service agreement ensures charging assets perform as promised, with predictable costs and clear commitments that transform uncertainty into confidence.

Operating without a structured service framework puts operators and their infrastructure at risk of prolonged outages, rising costs, reputational damage, and lost revenue opportunities. In markets where minimum uptime is now a legal requirement, the stakes are even higher.

As networks grow and customer expectations rise, uptime will remain the benchmark of success. Delivering reliable operations to this standard requires more than advanced hardware. It takes proactive maintenance, digital intelligence, and a trusted service partner. With ABB E-mobility Service Packages, operators gain a framework that safeguards performance today and ensures reliability for tomorrow.

Contact us
to find the right protection for your charging infrastructure