DYNACHRG

Fleet Electrification at Scale

Operations Lessons from 2024-2025

What fast-growing fleets learned about charging reliability, infrastructure planning, and operational readiness

Executive Summary

Fleet electrification accelerated rapidly in 2024 and 2025 as delivery, service, municipal, and logistics operators moved from pilots to multi-site rollouts. While vehicle availability and incentives improved, many fleets encountered unexpected operational challenges tied to charging infrastructure, power availability, and day-to-day execution.

Industry surveys show that more than **60% of fleet operators plan to electrify or significantly expand EV adoption within the next five years** [1].

This white paper captures key lessons observed across fast-growing fleet deployments during this period. Drawing from operational data, on-the-ground experience, and system performance trends, it outlines the infrastructure patterns, planning gaps, and charging strategies that most strongly influenced fleet uptime and total cost of ownership.

Insights in this paper reflect a combination of publicly available industry research and real-world deployment observations across multiple fleet environments.

For fleets scaling beyond early pilots, treating charging as an operational system rather than a construction project has become a critical success factor.

1. **Fleet Electrification Moved Faster Than Infrastructure Planning**

In 2024-2025, many fleets advanced vehicle procurement timelines faster than their charging infrastructure planning. In several cases, vehicles arrived before charging sites were fully operational, or chargers were installed without sufficient attention to power constraints, site operations, or future growth.

Common contributing factors included:

- Aggressive sustainability targets
- OEM delivery timelines that outpaced site readiness
- Underestimations of utility interconnection timelines
- Overreliance on nameplate charger power rather than usable capacity

Industry research indicated that approximately **65% of fleet operators plan to replace internal combustion vehicles with EVs within the next five years,** while a growing share already operate EVs in active service [2].

2. The Hidden Complexity of Fleet Charging Operations

Once fleets moved beyond pilot scale, charging quickly became an operational system rather than a static asset. Daily dispatch schedules, vehicle dwell time, shift overlap, and route variability all influenced charging behavior.

Operational challenges frequently observed included:

- Peak charging coinciding with facility peak demand
- Vehicles returning late with insufficient dwell time
- Charger contention during overlapping shifts
- Inconsistent charging behavior across drivers
- Limited visibility into charger uptime and utilization

Left unaddressed, these challenges often translate into missed routes, vehicle swaps, delayed departures, and reduced service reliability.

Real-world fleet charging data reinforces these challenges. Studies of fleet charging behavior show that the majority of fleet charging sessions, often cited at approximately 70%, occur on Level 2 chargers, with DC fast charging used primarily for operational exceptions [3,4].

These issues often surfaced only after fleets reached 10-20+ vehicles per site.

3. Why ‘More Power’ Was Not Always the Right Answer

Many early fleet deployments assumed that higher-power chargers or full electrical upgrades were required to scale. In practice, this approach often introduced:

- Long delays due to utility upgrades
- Significant capital costs
- Underutilized infrastructure during off-peak periods

While electrical upgrades are sometimes unavoidable, many fleets found they could scale further than expected by aligning charging behavior with available power before pursuing major infrastructure upgrades.

In contrast, fleets that prioritized intelligent load management and operational alignment were often able to:

- Support more vehicles with less available power

- Reduce peak demand charges
- Maintain operational flexibility as routes evolved

National charging infrastructure data shows that while DC fast charging capacity expanded rapidly between 2024 and 2025, utilization rates for high-power charges, particularly outside of high-traffic corridors, grew more slowly than installation rates [4].

4. Patterns Observed Across Successful Fleet Deployments

Across fast-growing fleets, several consistent patterns emerged:

- Charging strategy mattered more than charger count
- Visibility and control were essential for uptime
- Static power allocation limited scalability
- Operational constraints changed faster than infrastructure
- Software flexibility reduced long-term risk

These patterns align with broader industry findings that emphasize system visibility, utilization optimization, and operational control as primary drivers of fleet charging reliability [5].

Fleets that treated charging as an operational system, rather than a construction project, adapted more effectively as vehicle counts increased.

5. Infrastructure Requirements for Scaling Fleets

Based on deployments observed in 2024-2025, scalable fleet charging infrastructure consistently required:

- Site-level demand management
- Dynamic power allocation across chargers
- Integration with operational schedules
- Real-time monitoring and alerts
- Hardware flexibility to avoid vendor lock-in
- The ability to scale without repeated electrical upgrades

These requirements applied across delivery fleets, service vehicles, municipal fleets, and mixed-use depots. They mirror findings from national fleet electrification research programs, including U.S. Department of Energy supported research programs, which highlight demand management and software control as essential for scalable depot charging [6].

6. The Role of Smart Load Management in Fleet Uptime

Across fleet deployments, software-driven load management consistently played a larger role in uptime and reliability than charger nameplate power alone.

Smart load management emerged as a critical enabler for fleets operating under real-world constraints. Rather than maximizing instantaneous charging power, fleets prioritized:

- Predictable vehicle readiness
- Controlled peak demand
- Balanced power distribution
- Operational resilience during disruptions

This shift allowed fleets to maintain uptime even as vehicle counts and route complexity increased.

Industry surveys indicate that charger reliability remains a major operational risk for fleets. In multiple studies, **fewer than one-third of fleet operators** were able to recover from a charger failure within four hours, while nearly half experienced outages lasting between 4 and 24 hours [7].

7. **Looking Ahead: What Fleets Should Plan for Next**

With a majority of fleet operators expecting EVs to represent a meaningful share of their fleets by the end of the decade, many are planning beyond pilot-scale infrastructure [8]. As vehicle counts grow, fleets are reassessing how charging infrastructure, software, and operations must evolve together.

Key considerations for the next phase of electrification include:

- Designing for expansion from day one
- Avoiding infrastructure decisions that limit flexibility
- Aligning charging strategy with fleet operations
- Treating charging software as a core operational tool

Fleets that apply lessons from 2024-2025 will be better positioned to scale efficiently, control costs, and maintain reliability.

Conclusion

Fleet electrification at scale is no longer hypothetical. The experiences of 2024–2025 demonstrate that success depends less on hardware specifications and more on operational alignment, power management, and system visibility.

By learning from real-world deployments and prioritizing flexibility over brute-force infrastructure, fleets can electrify faster, reduce risk, and improve long-term performance.

Fleets that plan charging with the same operational discipline as dispatch and routing are better positioned to scale efficiently while controlling cost and risk.

About DynaChrg

DynaChrg is a technology-driven provider of EV charging hardware, software, and managed services focused on enabling scalable, reliable, and community-first charging infrastructure. Built on nearly two decades of utility integration and energy management expertise from our parent company, 3Insys, DynaChrg offers solutions across residential, multi-family, commercial, fleet, and municipal use cases.

EVES — the Electric Vehicle Energy Solution — provides advanced charger visibility, smart load management, dynamic power throttling, OCPP-based orchestration, payment processing, and demand-response compatibility. EVES enables site hosts, operators, and utilities to deploy EV charging with greater flexibility, lower cost, and higher uptime.

Learn More

EVES Product Overview:
https://dynachrg.ai/platform/eves

DynaChrg Website:
https://dynachrg.ai/

Contact Us

For partnership inquiries, product demonstrations, or multi-family charging strategies, contact: info@dynachrg.ai or sales@dynachrg.ai | https://dynachrg.ai/contact-us

Note: All data referenced in this paper is drawn from publicly available industry research and third-party sources. Metrics and findings are illustrative of broader industry trends and do not represent proprietary DynaChrg fleet performance data.

References

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