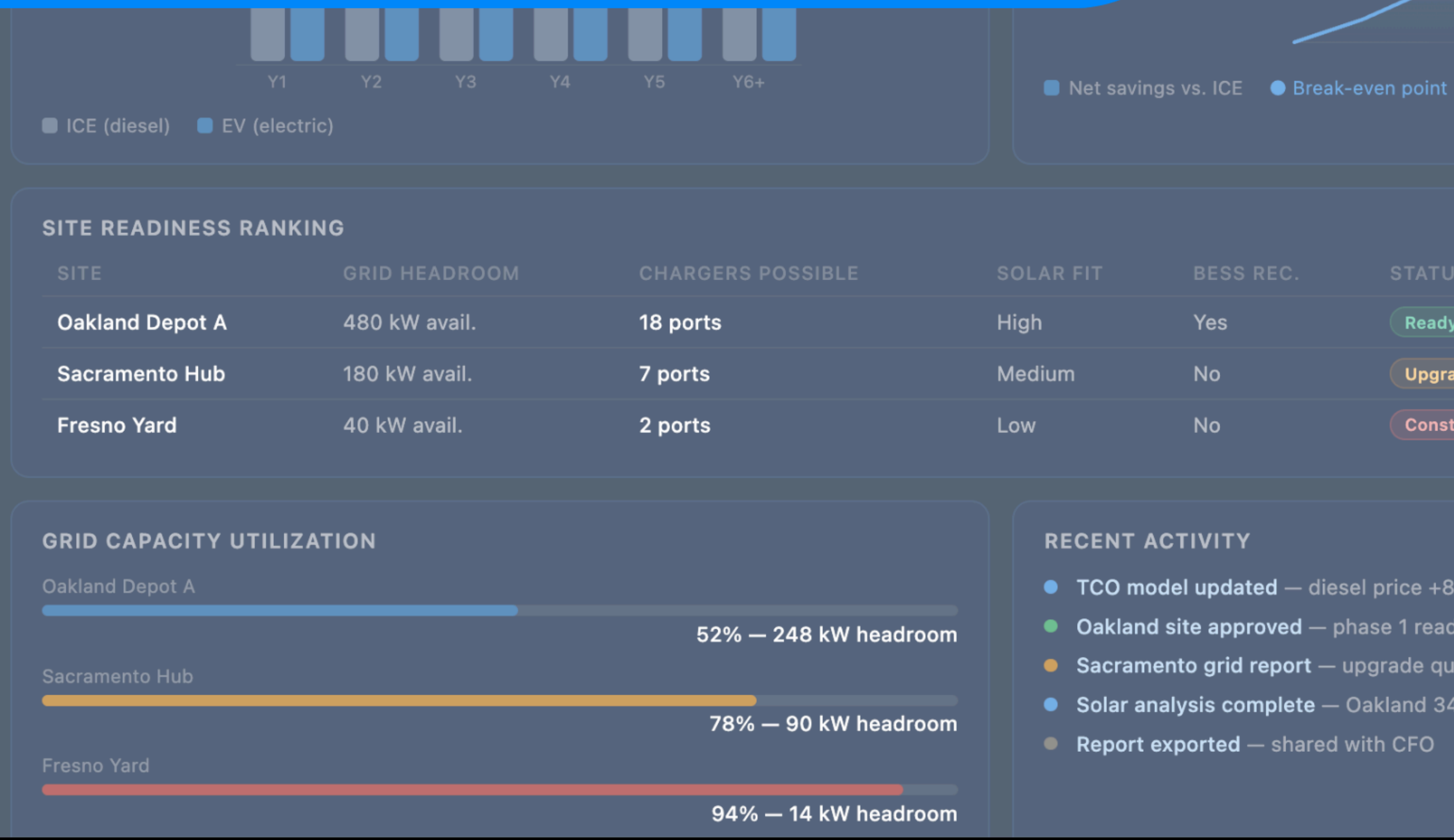
Feasibility, TCO & ROI Analysis for Electric Fleets and Sites

2026



This report presents our methodology for assessing the financial and operational viability of fleet electrification. It covers total cost of ownership, infrastructure sizing, grid constraints, and energy cost optimization for electric fleets at industrial and logistics sites.

ampcontrol

More information: www.ampcontrol.io

EXECUTIVE SUMMARY

The business case for electrification is strong — if sized correctly

Ampcontrol works with fleet operators, logistics companies, and industrial site managers to build a rigorous financial and operational case for electrification. Our assessment methodology covers every cost driver and infrastructure constraint that determines whether — and when — switching from combustion vehicles to electric makes sense.

The transition to electric fleets is no longer a question of technology. It is a question of timing, sizing, and financial structuring. The operators who electrify successfully are those who model their specific duty cycles, grid constraints, and energy costs before committing capital — not after.

This document outlines three core analyses we conduct for every site: total cost of ownership (TCO) comparison between EV and ICE fleets, energy infrastructure sizing (chargers, grid capacity, BESS, and solar), and ROI modeling that quantifies payback period and annual savings.

30–45%

Average TCO reduction vs. diesel over 10 years

Yr 3–5

Typical break-even period for EV fleet transition

60%

Reduction in charger CAPEX achievable with smart scheduling

Joachim Lohse

CEO

joachim@ampcontrol.io

ANALYSIS 1

Total cost of ownership: EV vs. ICE fleet

Problem statement

Fleet operators frequently make the mistake of comparing vehicle purchase prices alone when evaluating electrification. This leads to an incomplete picture. Electric vehicles carry higher upfront acquisition costs but dramatically lower operating costs over their lifetime — particularly fuel and maintenance. The financial case is only visible when the full 5 to 10-year cost stack is modeled per vehicle type, per route profile, and per local energy price.

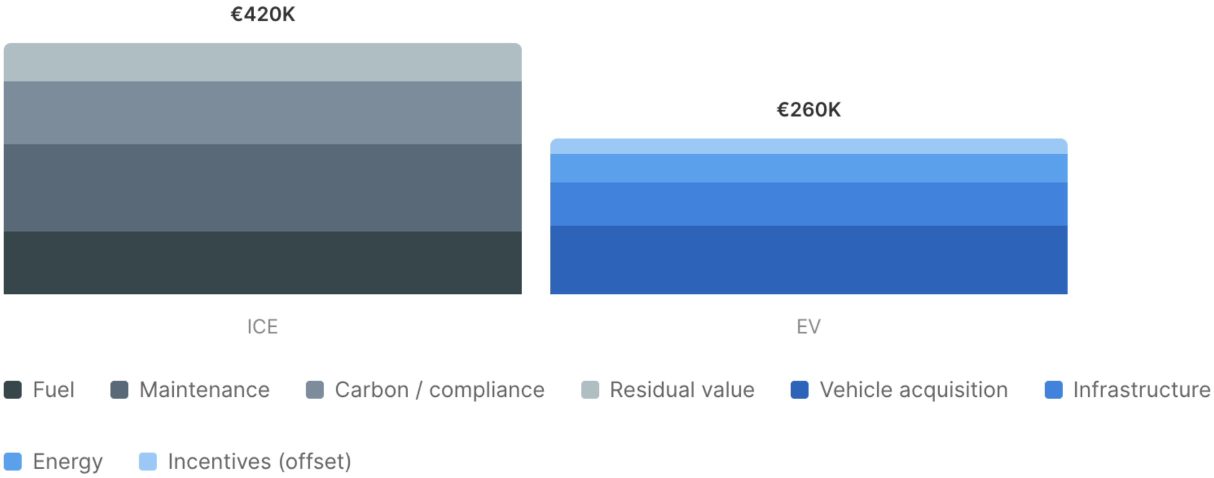
Ampcontrol approach

Our TCO model is built on your operational data: vehicle types, daily mileage, shift patterns, fuel spend, maintenance records, and existing utility rate schedules. We model every cost category across a configurable horizon of 5, 10, or 15 years.

Without a complete TCO model, operators either overestimate the cost of electrification and delay unnecessarily, or underestimate infrastructure costs and face budget overruns post-commitment.

Vehicle acquisition	EV purchase or lease cost net of federal and state incentives (IRA, CARB, EU ETS, etc.)
Fuel vs. energy	Diesel or gas spend vs. modeled electricity cost at your tariff and charging schedule
Maintenance	ICE maintenance benchmark vs. EV maintenance reduction (typically 30–40% lower)
Infrastructure CAPEX	Charger hardware, installation, grid upgrades, and civil works — amortized per vehicle
Residual value	Projected end-of-life vehicle value for both ICE and EV assets
Carbon cost	CO_2 pricing exposure for ICE fleet under applicable regulatory regimes

ILLUSTRATIVE 10-YEAR CUMULATIVE COST PER VEHICLE — EV VS. ICE (€K)



38% lower total cost — EV vs. ICE over 10 years

Key outputs

- Year-by-year cost breakdown per vehicle class across the full fleet
- Break-even year and cumulative 10-year savings vs. ICE baseline
- Sensitivity analysis: diesel price, electricity tariff, incentive scenarios
- Applicable federal, state, and utility incentive mapping by location and fleet type

ANALYSIS 2

Infrastructure sizing: chargers, grid, BESS, and solar

Problem statement

Deploying the wrong charging infrastructure is the most common and costly mistake in fleet electrification. Too few chargers create dispatch bottlenecks and stranded vehicles. Too many waste capital and overloads the grid. Most sites also have a fixed grid capacity that cannot be immediately expanded — meaning the number of chargers, their power level, and the charging schedule must be engineered together, not selected independently.

For sites with solar PV or battery storage already installed — or considering it — these assets further change the optimal configuration. An unintegrated solar array may actually increase peak demand charges by mismatching generation with charging load.

Ampcontrol approach

We model your site as an integrated energy system: grid connection, transformer rating, building baseload, charger configuration, BESS dispatch, and solar generation — all simultaneously. The goal is the minimum cost infrastructure that guarantees all vehicles depart fully charged.

1

Grid capacity and charger count

How many chargers can your site support today?

We calculate your available grid headroom — the difference between your service entrance capacity and your existing peak building load — and model how many chargers can run simultaneously within that envelope. We then determine whether a phased rollout or immediate grid upgrade is the more cost-effective path.

- Available grid capacity at service entrance (kW)
- Maximum simultaneous chargers under current supply
- Grid upgrade cost and timeline to expand capacity
- Phased deployment roadmap by fleet growth stage

2

Charger speed and quantity for your routes

Right-sizing L2 vs. DCFC for your duty cycle

We simulate your fleet's return times, dwell windows, state-of-charge requirements, and shift patterns to determine the optimal number and power level of chargers. A fleet with long overnight dwell times needs far fewer — and cheaper — Level 2 chargers than one with tight turnarounds requiring DC fast charging.

- Recommended charger count by vehicle class and shift pattern
- L2 vs. DCFC cost-benefit analysis for your specific duty cycle
- Charging session simulation across your peak operational day
- Oversubscription risk and smart charging headroom analysis

3

Battery storage (BESS): when does it pay off?

Peak shaving, demand charge reduction, grid deferral

BESS makes financial sense for sites with high demand charges, constrained grid connections, or significant solar generation. We model your load profile, utility rate structure, and charging schedule to determine the optimal BESS capacity and dispatch strategy — and whether storage accelerates or reduces your overall ROI.

- Demand charge reduction modeling by tariff structure
- Optimal BESS capacity and charge/discharge dispatch strategy
- ROI with and without storage, side-by-side
- Grid upgrade deferral value — years and dollars saved

Illustrative site readiness ranking

SITE	GRID HEADROOM	CHARGERS TODAY	BESS REC.	STATUS
Distribution center A	480 kW avail.	18 ports	Yes	Ready
Bus depot B	180 kW avail.	7 ports	No	Upgrade needed
Industrial yard C	40 kW avail.	2 ports	Yes	BESS required
Port terminal D	1,200 kW avail.	40 ports	Yes	In assessment

ANALYSIS 3

ROI modeling and the electrification roadmap

Problem statement

Even when the TCO case is favorable and the infrastructure is well-sized, fleet operators face a capital allocation challenge: electrification competes with other business investments, and finance teams need a clear payback period and risk profile before approving spend. Without a rigorous ROI model, electrification projects stall at the business case stage — or proceed with incomplete assumptions that lead to budget overruns.

A second challenge is sequencing: most operators cannot electrify their entire fleet at once. They need a phased roadmap that prioritizes sites and vehicle classes by financial return, operational impact, and grid readiness.

Ampcontrol approach

We build a fleet-level financial model that integrates all three analyses — TCO, infrastructure, and energy — into a single ROI view. The model is parameterized with your actual operational data and can be stress-tested against key assumptions: diesel price trajectories, electricity tariff changes, incentive expiration, and fleet growth scenarios.

Payback period	Simple and discounted payback at your cost of capital, by site and fleet phase
Net present value	10-year discounted value of the electrification investment vs. ICE continuation baseline
Risk scenarios	Best case, base case, and downside scenarios across fuel price and energy tariff assumptions

Phased rollout roadmap

Based on the site readiness ranking and ROI by vehicle class, we develop a sequenced deployment plan — typically across 3–5 years — that prioritizes the highest-return sites and vehicle types, stages infrastructure investment to match grid availability, and aligns with fleet replacement cycles to avoid stranded combustion assets.

> **Example outcome:** A regional logistics operator with 120 vehicles across 4 sites received an assessment showing a base-case fleet value of **€6.2M** over 10 years, with a break-even at year 4. Prioritizing two high-readiness sites in phase 1 reduced initial CAPEX by 60% while capturing 75% of the available annual savings from day one.

Benefits across the organization

Finance & CFO

- Clear payback period and NPV
- Incentive and grant mapping
- Risk-adjusted scenarios
- Capital phasing options

Fleet & Operations

- Charger count and speed by shift
- No-wait charging guarantee
- Dispatch integration plan
- Driver notification workflow

Facilities & Energy

- Grid capacity analysis
- BESS and solar sizing
- Utility rate optimization
- Phased upgrade roadmap

About Ampcontrol

Ampcontrol is a leading provider of energy management and EV charging optimization solutions, designed to streamline the deployment and operation of charging infrastructure at industrial and logistics sites. Our software and hardware solutions enable seamless integration, real-time monitoring, and intelligent management of EV charging networks at scale.

Ampcontrol's Energy Management System optimizes energy usage across diverse sites, accommodating the unique constraints of each depot: transformer ratings, grid connections, energy tariffs, vehicle departure schedules, and on-site generation. The system enables real-time optimization of both chargers and vehicles, integrating with OEM telematics systems and third-party platforms without additional hardware.

Our feasibility and TCO assessment is the first step — and it is free. We work with your team to gather the operational data, run the models, and deliver a report your finance team can take to a board.

www.ampcontrol.io
contact@ampcontrol.io

ampcontrol

www.ampcontrol.io

contact@ampcontrol.io