CALIFORNIA ENERGY COMMISSION

California Energy Commission

Clean Transportation Program

FINAL PROJECT REPORT

The 21st Century Truck Stop

The first public medium-duty and heavy-duty charging station in the San Joaquin Valley

Prepared for: California Energy Commission

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WattEV

December 2025 | CEC-600-2025-044

California Energy Commission

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PREFACE

Assembly Bill 118 (Núñez, Chapter 750, Statutes of 2007) created the Clean Transportation Program. The statute authorizes the California Energy Commission (CEC) to develop and deploy alternative and renewable fuels and advanced transportation technologies to help attain the state's climate change policies. Assembly Bill 8 (Perea, Chapter 401, Statutes of 2013) reauthorizes the Clean Transportation Program through January 1, 2024, and specifies that the CEC allocate up to $20 million per year (or up to 20 percent of each fiscal year's funds) in funding for hydrogen station development until at least 100 stations are operational.

The Clean Transportation Program has an annual budget of about $100 million and provides financial support for projects that:

- Reduce California's use and dependence on petroleum transportation fuels and increase the use of alternative and renewable fuels and advanced vehicle technologies.
- Produce sustainable alternative and renewable low-carbon fuels in California.
- Expand alternative fueling infrastructure and fueling stations.
- Improve the efficiency, performance and market viability of alternative light-, medium-, and heavy-duty vehicle technologies.
- Expand the alternative fueling infrastructure available to existing fleets, public transit, and transportation corridors.
- Establish workforce-training programs and conduct public outreach on the benefits of alternative transportation fuels and vehicle technologies.

To be eligible for funding under the Clean Transportation Program, a project must be consistent with the CEC's annual Clean Transportation Program Investment Plan Update. The CEC issued GFO-20-601 to provide funding for projects that demonstrate transformative technology solutions and work to accelerate the successful commercial deployment of electric vehicle charging for both light-duty and medium- and heavy-duty applications. In response to GFO-20-601, the recipient submitted an application which was proposed for funding in the CEC's notice of proposed awards April 16, 2021, and the agreement was executed as ARV-21-024 on September 23, 2021.

ABSTRACT

The 21st Century Truck Stop represents a landmark advancement in medium- and heavy-duty electric vehicle infrastructure in California's San Joaquin Valley. As the first publicly accessible medium- and heavy-duty charging station in the region, the project addresses a critical gap in refueling infrastructure along State Route 99 in Bakersfield—a key transportation corridor for freight and logistics. Designed to support a broad spectrum of vehicles, from long-haul trucks and regional haulers to agricultural and municipal fleets, the station is equipped with 16 dual-port, high-powered, 360 kilowatt chargers, capable of serving both commercial and passenger electric vehicles.

The project is a direct response to the growing demand for electrified transport and the lack of public medium- and heavy-duty charging options, especially for fleets unable to implement private charging solutions. By offering standardized, open-architecture, dual-connector charging in a strategic location, the truck stop not only alleviates range anxiety but also supports equity in electrification across fleet types and sizes.

Through collaboration with the local air district, original equipment manufacturers, and industry stakeholders, the project successfully met its goals: finalizing design, deploying the full suite of chargers, initiating operations, and facilitating daily use through fleet offtake agreements. With at least 10 electric trucks utilizing the site and average daily energy usage of 3.0 megawatt hours, the truck stop is demonstrating a sustainable operational model poised for commercial viability and expansion. This project serves as a foundational step toward broader medium- and heavy-duty electric vehicle adoption, supporting California's transition to zero-emission freight transport.

Keywords: MDHD Electrification, Zero-Emission CHE, Charging Infrastructure, Air Quality Impacts, Health Impacts, Electric Vehicles, Medium-Duty, Heavy-Duty, Battery Electric Vehicles, San Joaquin Valley, State Route 99, Bakersfield, Freight, Logistics, 360kW Chargers, Dual-Cord Chargers, Range Anxiety, Zero-Emission Freight Transport, California Energy Commission, Clean Transportation Program, Megawatt Charging, Distributed Energy Resources, Battery Energy Storage Systems, Air Pollution Mitigation, Community Engagement, Job Creation, Sustainability, Emissions Reduction

Please use the following citation for this report:

Marcelo Barros, Gordon M. Magne, Emil Youssefzadeh, Huzeifa Badshah, Ihor Starepravo. 2025. *The 21st Century Truck Stop*. Publication Number: CEC-600-2025-044.

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EXECUTIVE SUMMARY

The "21st Century Truck Stop" project marks a significant milestone in California's clean transportation initiatives, establishing the first public medium- and heavy-duty electric vehicle charging station in the San Joaquin Valley. Strategically located near State Route 99 in Bakersfield, a vital freight corridor, this facility directly addresses a critical infrastructure gap for the burgeoning electric vehicle freight sector. The station boasts 16 high-powered, 360 kilowatt dual-cord direct current fast chargers, providing 32 charging ports capable of serving a diverse range of electric vehicles, from long-haul trucks to passenger vehicles.

This initiative is a direct response to the escalating demand for electrified transport and the scarcity of public medium- and heavy-duty charging options, particularly for fleets lacking private charging capabilities. By offering standardized, open-architecture, dual-connector charging in such a crucial location, the project effectively mitigates range anxiety and promotes equitable access to electrification across various fleet sizes and types. Operational data already demonstrates a sustainable model, with at least 10 electric trucks utilizing the site daily and an average energy consumption of 3.0 megawatt hours per day.

A key finding emphasizes the station's unique and indispensable role within the regional electric vehicle infrastructure. It is currently the only medium- and heavy-duty charging depot in Bakersfield and one of just seven along the extensive State Route 99 corridor between Lebec and Sacramento. This strategic advantage positions the "21st Century Truck Stop" as a pivotal asset for accelerating medium- and heavy-duty electric vehicle adoption, supporting California's ambitious transition to zero-emission freight transport, and fostering market certainty for fleets and the broader industry. The project's successful execution is largely attributable to BESTFIT funding and the collaborative efforts with the California Energy Commission.

The "21st Century Truck Stop" significantly contributes to California's sustainability goals by expanding the foundational infrastructure for electric vehicle freight, thereby accelerating the displacement of diesel-powered Class 8 internal combustion engine vehicles. This transition leads to tangible improvements in local air quality, particularly in the historically air-polluted San Joaquin Valley, and reduces greenhouse gas emissions. Located in a State of California designated low-income and disadvantaged community, the project also delivers vital social benefits by reducing exposure to harmful pollutants for vulnerable populations. Furthermore, the project has spurred local job creation in construction and related industries, and its ongoing operations are expected to bolster the regional economy.

The BESTFIT funding has been instrumental in paving the way for future technological advancements in electric vehicle freight charging, particularly in advancing megawatt charging capabilities, which are crucial for achieving refueling parity with traditional internal combustion engine vehicles. Future recommendations include expanding megawatt charging, continuing robust community engagement, vigilant monitoring and analysis of operational data, exploring strategic partnerships, and advocating for supportive policies to ensure the long-term success and widespread adoption of heavy-duty electric vehicle infrastructure.

CHAPTER 1:
Project Overview

Introduction

Medium- and heavy-duty (MDHD) vehicle electrification is beginning to accelerate, but lacks the necessary infrastructure to support widespread adoption. Currently, the adoption of MDHD electric vehicles (EVs) has been limited to short-range and return-to-base operations. In order to increase the adoption of long-range vehicles and ensure equity among fleets that lack the physical and financial resources for onsite charging infrastructure, public charging options need to exist.

Deployment of public charging options for MDHD vehicles has not taken place in large part due to the lack of market penetration in EVs. With manufacturers rapidly increasing new product offerings, investment needs to occur now to ensure widespread fleet adoption. California is at the precipice of a market shift and investments in public charging, especially along a critical trade corridor, will provide fleets and the overall industry with more market certainty. This project will provide stimulation and equity in the adoption of MDHD EVs for the commercial sector.

Project Goals

The goal of this project is to install, commission, and operate a public charging facility in Bakersfield, California that will serve MDHD battery electric trucks. In partnership with the local air district, vehicle manufacturers, and industry leaders, this site will drive market adoption of EVs across weight classes through access to affordable and reliable public charging. This project will be enabled by top tier design, engineering, and business innovation to ensure long-term sustainability.

Scope

The scope of this project includes:

- Complete design for the first publicly accessible MDHD truck stop for battery EVs.
- Develop and commission 16 dual cord MDHD chargers at an electric truck stop, 360-kilowatt (kW) rated, direct current fast chargers.
- Operate charging stations throughout the project term, demonstrating a sustainable business model at the end of the project for continued commercial operation and project expansion.

1. Deploy at least 10 electric trucks by 2024 through either their own fleet or offtake agreements that are making daily use of the facility with an average annual energy consumption of 3.0 megawatt hours (MWh) per day.

CHAPTER 2:
Market & Industry Analysis

The global transportation sector is undergoing a transformative shift toward electrification, driven by environmental regulations, advancements in battery technology, and a growing commitment to sustainability. Within this evolving landscape, the MDHD vehicle segment—which includes electric trucks, buses, and industrial vehicles—has emerged as a key focus area for innovation and infrastructure development. As fleet operators and logistics providers increasingly adopt electric MDHD vehicles, the demand for robust, high-capacity charging solutions is accelerating.

This section discusses the current state and future prospects of the MDHD EV charging station industry. It examines the key drivers fueling market growth, including government incentives, and regulatory mandates for emissions reduction. It also identifies technological trends, such as megawatt charging systems, that are shaping the design and deployment of heavy-duty charging infrastructure.

In addition, it also assesses the competitive landscape and evaluates strategic opportunities and challenges facing stakeholders. By understanding the dynamics of this emerging market, businesses, investors, and policymakers can make informed decisions to capitalize on the transition to electrified heavy transport.

Electric Heavy-Duty Truck Market

Electric vehicles in heavy-duty freight are still a very small portion of the overall trucks on the road. While great technological strides have been made in the last few years, the quantity of EV vehicles on the road still remains a small fraction in comparison to their diesel counterparts. Despite this, EV freight utilization continues to grow as decarbonizing supply chains becomes an important aspect of corporate strategy for public and private organizations.

Public policy plays a large role in the transition to EVs. The recent federal administration change significantly alters support for EVs in freight, as well as the charging infrastructure that it requires. How much influence the current administration will have is yet to be determined, though the administration's preliminary policy initiatives regarding EVs are in stark contrast from the previous administration.

California retracted its submission of Advanced Clean Fleets to the federal government. This is a blow to alternative fuel-based freight organizations and those preparing to make the switch to zero-emission; however, local and regional governments have implemented regulation aimed at lowering air pollution and emissions in freight, such as South Coast Air Quality Management District, which has an indirect source rule on emissions for freight to and from warehouses and distribution centers.

While government support and regulation for EVs are important to achieve market viability, private enterprise has been continuing to adopt carbon-conscious alternatives in their supply lines in spite of fluctuations in government direction. This is aided by consistent drops in cost for EVs and other zero-emission technology. As vehicle manufacturers continue to make more efficient products at progressively cheaper prices year by year, taking advantage of the

benefits of EVs (such as reductions in the cost of fueling and maintenance) makes switching to zero-emission a straightforward fiscal decision.

Further, advancements in megawatt charging and megawatt charging capabilities for heavy-duty class vehicles are already being implemented. Megawatt charging is a crucial step in creating logistical and cost parity with internal combustion engine (ICE) vehicles, lowering fueling times to a period comparable with ICE fueling. Megawatt charging is an important step to support independent trucking operators, who make up the majority of the current ICE trucking industry model. Future expansion of WattEV, Inc. (WattEV) Bakersfield will equip the depot with megawatt charging capabilities.

Consumer consciousness is also a driver for private enterprise to decarbonize. Events such as the Palisades and Eaton Fires in California, as well as drought, hurricanes and other super storms reaffirm that climate change needs to be mitigated. Ultimately, electric MDHD freight is still a burgeoning industry and has yet to reach the threshold of adoption as its light-duty counterparts. However, despite a change in support for EV adoption by the federal government, many aspects are still propelling the industry forward.

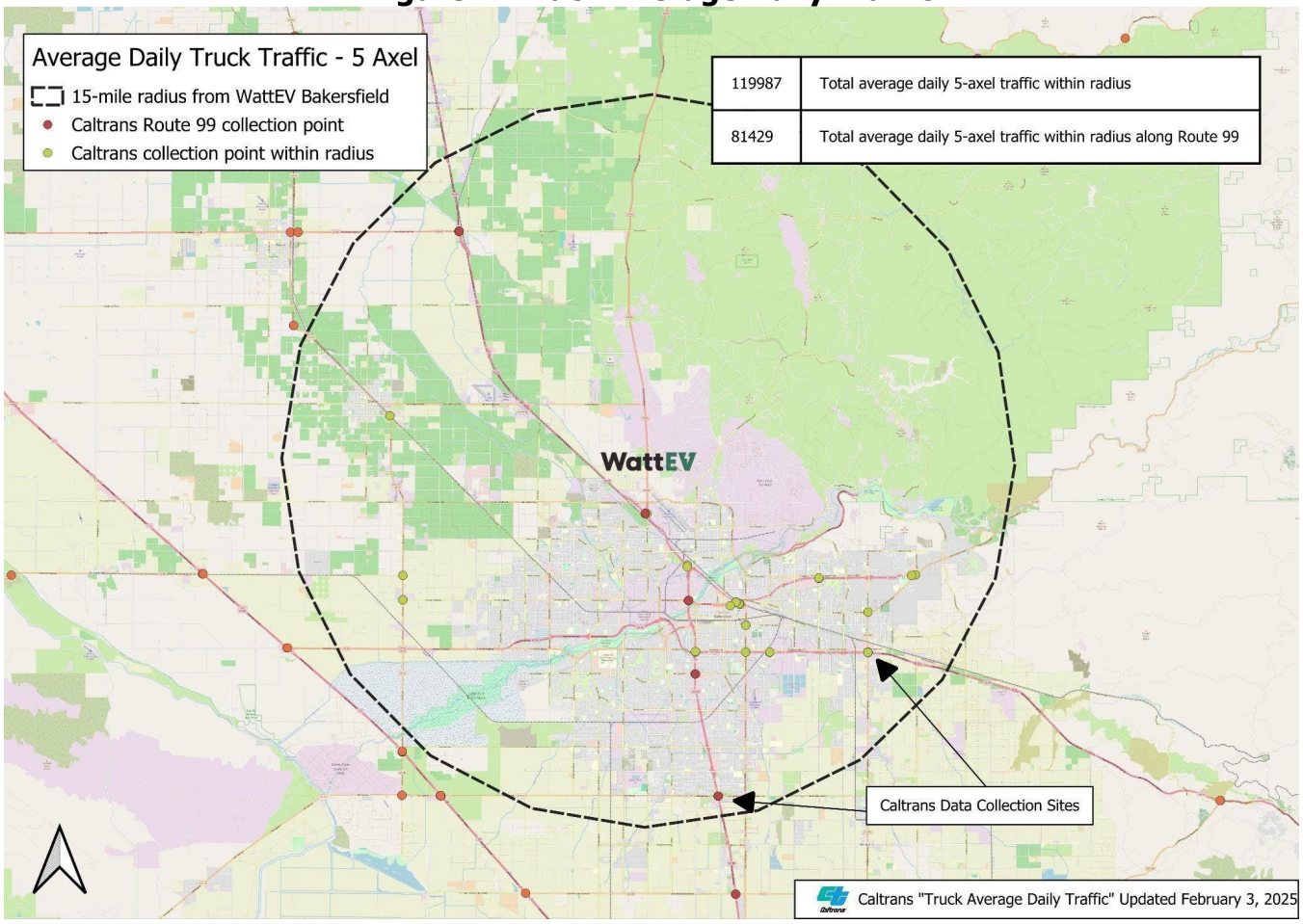
Demand for Charging Infrastructure

Millions of MDHD vehicles traverse the Central Valley on a yearly basis as they serve supply lines between Southern California and Bay Area economic zones. As adoption of MDHD EVs increases, the demand for charging infrastructure within the Central Valley will increase in tandem. Bakersfield is important as it serves as a fueling destination for Central Valley supply lines, as well as freight utilizing Interstates 10, 15, and 40 and other lines coming to and from the eastern Los Angeles region, Nevada, and Arizona.

Using California Department of Transportation (Caltrans) data on daily truck traffic, we have identified that on average about 120,000 five-axle trucks operate within a 15-mile radius of the City of Bakersfield (Figure 1). Within that radius, on average 81,400 five-axle trucks operate along the State Route 99 (SR-99) corridor. While California regulation on the sales and implementation of zero emission vehicles have been thwarted by the federal government, which will influence EV utilization in the near term, even conservative projections of 10 percent to 30 percent share of total industry implementation of EV MDHD vehicles by 2035 would indicate 10,000 to more than 30,000 EV trucks passing Bakersfield on a daily basis.[1]

[1] Caltrans. Truck Average Daily Traffic. Data Updated: September 27, 2024. https://gis.data.ca.gov/datasets/c079bdd6a2c54aec84b6b2f7d6570f6d_0/explore

Figure 1: Truck Average Daily Traffic



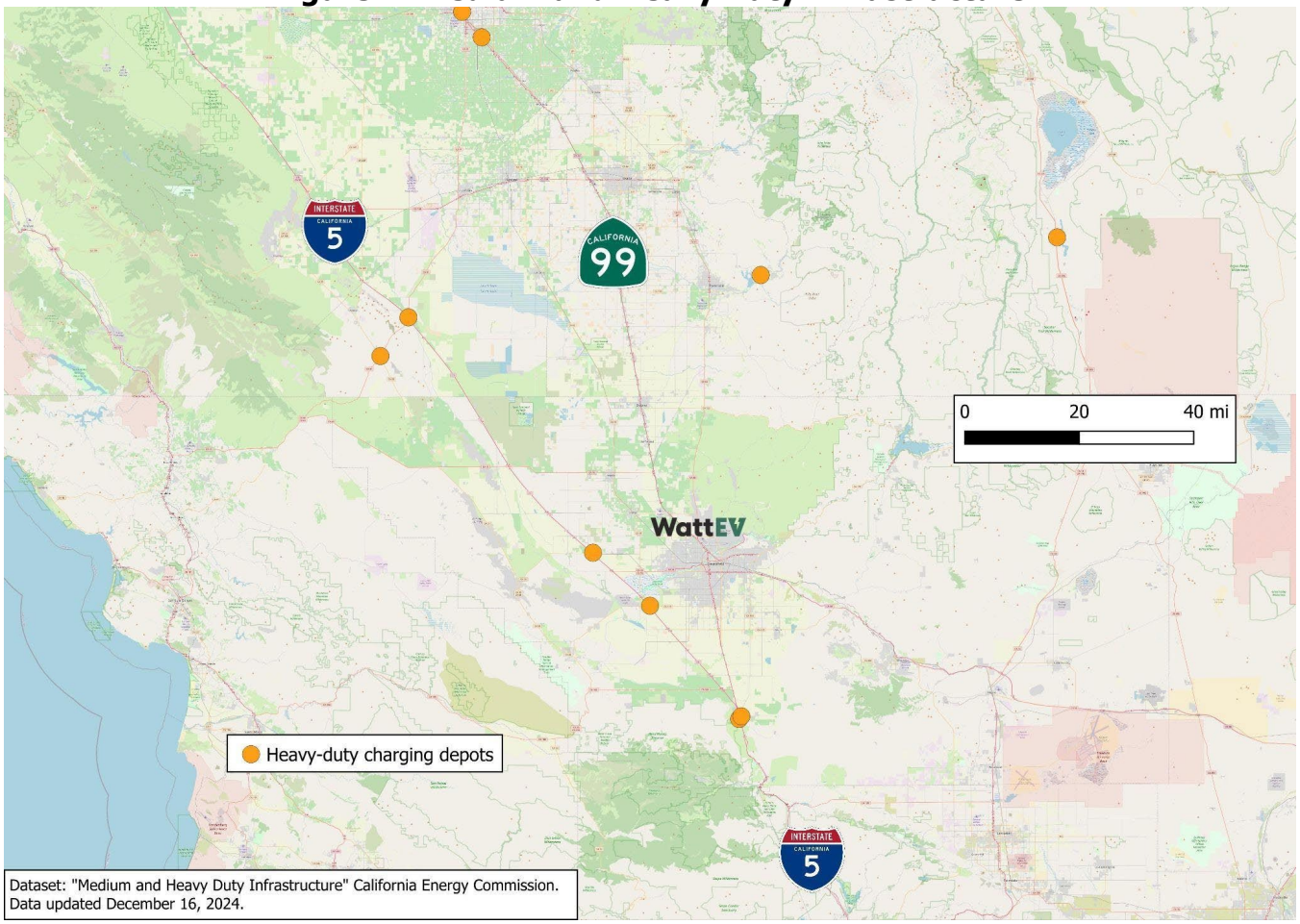
Source: Caltrans

Competitive Landscape

California Energy Commission (CEC) records indicate WattEV Bakersfield is the only charging depot for MDHD vehicles within Bakersfield and its surrounding area.[2] WattEV Bakersfield not only provides an opportunity for charging local vehicles, it also serves as a refueling station at a crucial point in north to south supply chains allowing more electric freight to move through the area. It is only one of seven heavy-duty charging stations along the SR-99 corridor between Lebec and Sacramento (Figure 2).

[2] California Energy Commission. *Medium and Heavy Duty Infrastructure*. Updated December 16, 2024. https://gis.data.ca.gov/datasets/f055c85dec2c43f19e3e1132b48dd659_0/explore?location=0.008080%2C60.640908%2C0.00

Figure 2: Medium and Heavy Duty Infrastructure



Source: California Energy Commission

CHAPTER 3:
Technical Design & Infrastructure

Site Selection

Acquiring large properties within the Los Angeles and San Francisco metropolitan areas is challenging due to high costs and limited availability. Moreover, relying solely on the local utility for electricity in the absence of distributed energy resources (DERs) would compromise the site's ability to independently meet the energy demands of heavy-duty charging. Therefore, locations with sufficient space for future DER implementation are optimal for accommodating future charging infrastructure requirements.

Figure 3 shows the WattEV Bakersfield station. The lot size, availability of land, and proximity to Interstate 5 (I-5) and SR-99 were important considerations for this site. A charging station located in the Central Valley can open trucking lanes outside of the Los Angeles region and create the ability to move EV freight to Northern California, a crucial economic zone, and where WattEV has a number of charging stations under development. Lot size was also an important factor. The development of a solar array and complementing battery energy storage system (BESS) (Phase 2) was a consideration since concepts of the site began. Having adequate land to implement Phase 2 design was a requirement, all while finding availability along the highway corridor.

Figure 3: The 21st Century Truck Stop

Photo Credit: WattEV

Charging Technology

WattEV Bakersfield utilizes 16 dual-cord, first-generation Charge America chargers, providing 32 charging ports. These chargers can deliver up to 360 kW, enabling a full charge for a Class 8 heavy-duty vehicle with a 650 kW battery in under two hours. The total maximum power demand for these 16 chargers is 5,760 kW. The charging stations are California Type

Evaluation Program[3] compliant, and the entire charging process is controlled by a charging station management system[4] through Open Charge Point Protocol[5].

When installing or operating heavy-duty EV charging station equipment, especially for commercial fleets, transit buses, or heavy-duty trucks, safety is a critical concern. The higher voltages, currents, and power levels involved compared to light-duty chargers introduce significant risks.

The charging equipment deployed a number of safety measures including:

- Proper insulation, grounding, and arc flash protection
- Overcurrent protection using circuit breakers, fuses, and other protective devices
- Isolation and ground fault detection through isolation monitoring and ground fault interrupters to detect leakage currents and prevent electric shock
- Only Underwriters Laboratories, International Electrotechnical Commission, or Canadian Standards Association certified equipment are installed in compliance with the National Electrical Code, National Fire Protection Association, International Organization of Standardization, and Society of Automotive Engineers standard
- Lockout/tagout procedures for maintenance to safely de-energize the equipment
- Use of active cooling systems (liquid or forced-air) and temperature sensors in cables and connectors to avoid overheating that can damage equipment or cause fires
- Enclosures must be National Electrical Manufacturers Association-rated
- Clearances and barriers are provided to protect from accidental contact or vehicle collision
- Fire extinguishers rated for electrical fires (Class C), thermal cut-off circuits, emergency stop buttons
- Only qualified electricians install or maintain the equipment who are trained and certified to avoid electrical hazards, follow emergency procedures, and make use of personal protective equipment
- Cybersecurity and communication safety
- Encrypted communication, isolated charging network from corporate information technology infrastructure, regularly updated firmware, and vulnerability testing

Energy Sources & Grid Impact

Navigating the utility interconnection process with Pacific Gas and Electric (PG&E) for WattEV's Bakersfield charging site presented a number of complexities. While PG&E's EV Fleet Electrification Program aims to provide beneficial terms and integrate DERs, WattEV encountered certain procedural and regulatory challenges. Notably, requirements for formal

[3] Standards and protocols for electric vehicle charging infrastructure.

[4] A system for managing and monitoring individual EV charging stations.

[5] A communication protocol for communication between electric vehicle charging stations and a central management system.

interconnection agreements and extensive studies for solar generation in Phase 2, particularly above 1 megawatt (MW), posed considerations, especially concerning power export. PG&E's classification of battery storage in Phase 2 as a load necessitated separate studies, and a policy prohibiting the connection of any load other than EV chargers to the fleet service connection meant that amenities like restrooms or IT systems required distinct metered services, leading to additional expenditures and infrastructure. Furthermore, the variability in PG&E's power delivery schedule influenced WattEV's operational planning, requiring adjustments to align with available capacity. To address these matters, WattEV conveyed their observations to the California Public Utilities Commission and ultimately opted to implement two separate charging operations at Bakersfield: one connected to PG&E without DER interconnection for this agreement, and another self-contained system utilizing DER for Phase 2. WattEV's experience suggests that existing utility frameworks may benefit from further adaptation to support widespread EV adoption, and that regulatory refinements could enhance customer integration.

Other Infrastructure

WattEV Bakersfield, as a large heavy-duty EV charging station designed for commercial fleets, is a complex facility. Beyond the chargers themselves, it provides robust infrastructure to support efficient, safe, and user-friendly operation. Here's a detailed breakdown of the other infrastructure components involved:

- Building facilities that include an office, restrooms, a lounge and electrical room for housing remote monitoring infrastructure, spare parts, diagnostic tools and charging unit components
- Dedicated parking and work zones for EV maintenance technicians
- Lighting counting on high-intensity LED fixtures deployed throughout the site to ensure visibility and safety during night operations. Its design requirements included avoiding glare, being motion-activated, and smart-controlled to save energy and integrated with security systems (e.g. lights triggered by surveillance alerts)
- Signage and wayfinding for entrance/exit routes, charger identification (e.g., Charger 1, 2, 3…), real-time status (available/in use/out of service), instructional signs, safety precautions and emergency. It also includes monument and pole mount business signs at the site entrance as well as a large address lighted sign on the building.
- User Access & Payment Systems through mobile apps (QR code or Bluetooth-based authentication), fleet vehicle auto-authentication via telematics
- Payment Systems including credit cards, prepaid fleet accounts and subscription or invoice billing for commercial fleets
- Safety & Security Systems through the use of surveillance cameras, or Closed-Circuit Television (CCTV) with monitored zones for vandalism or accidents
- Fencing and Access Control with gated areas for maintenance zones, secure storage for high-voltage components

CHAPTER 4:
Environmental & Social Impact

Sustainability

As the transportation sector remains one of the largest contributors to greenhouse gas emissions globally, the electrification of MDHD vehicles presents a critical opportunity to reduce the carbon footprint of freight and logistics operations. MDHD trucks, ranging from delivery vehicles to long-haul rigs, account for a disproportionate share of carbon dioxide emissions due to their size, fuel consumption, and extensive operating hours. Transitioning these vehicles from diesel to electric propulsion is not merely a technological shift, but a cornerstone of global decarbonization strategies.

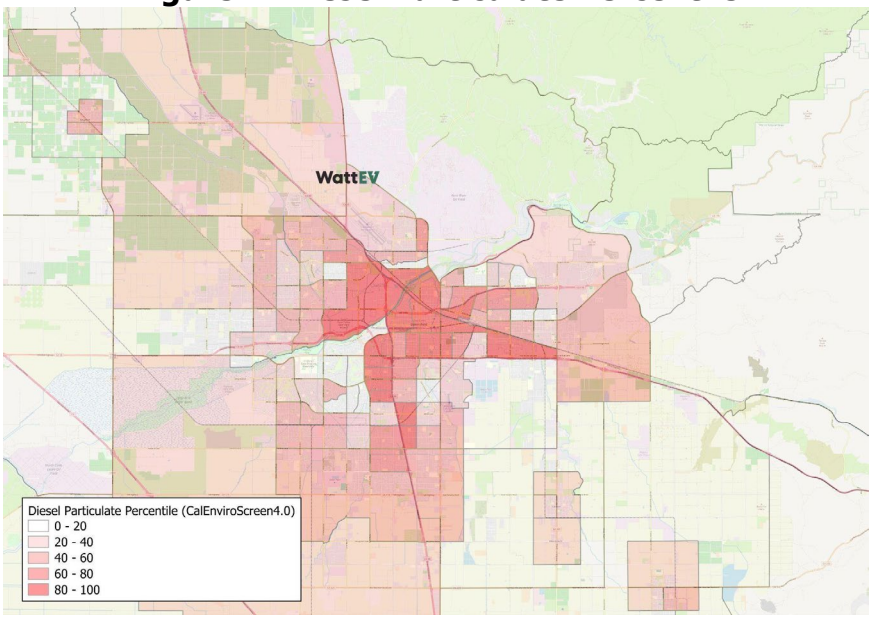
By enabling the adoption of electric trucks, the "21st Century Truck Stop" plays a pivotal role in reducing local air pollution, improving urban air quality, and lowering lifecycle greenhouse gas emissions across supply chains.

Air Quality Improvements

The City of Bakersfield has elevated levels of air pollution due to a variety of factors. The California Central Valley is surrounded by three mountain ranges that prevent the movement and dissipation of air pollution. The plains running between the mountains serves as a transportation corridor for both rail and truck freight between Northern and Southern California. The combination of topography and modern transportation creates a disadvantageous situation with regard to the mitigation of air pollution, and the Central Valley has struggled with high levels of air pollution for decades.

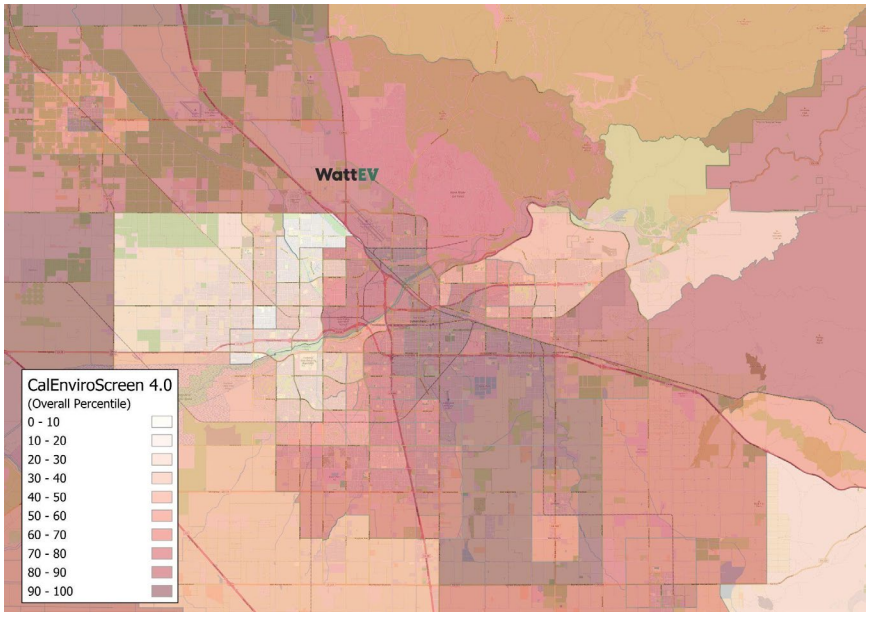
Located in California's Central Valley, an area significantly impacted by air pollution, WattEV Bakersfield offers a crucial solution. This EV charging station not only reduces overall emissions but also specifically addresses the high levels of diesel particulate matter prevalent in Bakersfield. The station supports heavy-duty vehicles operating along the SR-99 corridor, directly mitigating a key source of the region's air quality issues. Figures 4 and 5 illustrate the diesel particulate matter concentration in the region.

Figure 4: Diesel Particulate Percentile



Source: CalEnviroScreen 4.0

Figure 5: California Communities Environmental Health Areas - Overall Percentile



Source: CalEnviroScreen 4.0

Air Pollution Mitigation

MDHD EV charging stations, such as "The 21st Century Truck Stop", play a critical role in reducing air pollution by enabling the replacement of diesel-powered trucks with electric alternatives. Diesel trucks are significant sources of harmful air pollutants, including nitrogen oxides (NO_x), particulate matter ($PM_{2.5}$), carbon monoxide (CO), and volatile organic compounds, which contribute to smog formation, respiratory illnesses, and environmental degradation.

By supporting the widespread adoption of battery-electric trucks, "The 21st Century Truck Stop" eliminates the need for on-site diesel refueling, thereby cutting tailpipe emissions entirely. This shift leads to measurable improvements in local air quality, particularly freight

corridors, and industrial zones where heavy truck traffic is concentrated. Unlike diesel vehicles, electric trucks produce zero emissions at the point of use, significantly reducing exposure to pollutants for drivers, workers, and nearby communities.

Additionally, combining the charging infrastructure with renewable energy (Phase 2), the environmental benefits are further amplified, as the overall lifecycle emissions of electric trucks become substantially lower than those of their diesel counterparts. The result is not only a cleaner fleet but also a healthier environment, especially in regions burdened by freight-related pollution.

Community Engagement

Fostering heavy-duty EV transportation through community engagement involves a strategic, inclusive approach that builds awareness, trust, and support among key stakeholders. WattEV has been involved in a multitude of such initiatives throughout its journey and includes:

- Stakeholder mapping & engagement planning
- Public education & awareness campaigns
- Collaborative visioning & co-design
- Pilot programs with community feedback loops
- Address equity and just transition concerns
- Building strategic partnerships
- Policy advocacy and feedback channels
- Transparent communication and long-term engagement

These initiatives are made present at all sorts of engagement events including community meetings, symposiums, expositions, speaking engagements, special events, and new site groundbreaking ceremonies. Appendix A highlights some of the more relevant knowledge transfer and community outreach initiatives.

Job Creation

WattEV Bakersfield is located in a State of California designated Low-Income and Disadvantaged Community.[6] Before the construction of the site, it was vacant land.

It may be difficult to assess with absolute certainty the creation of jobs in direct relation to a project, it is widely accepted that there is a correlation between spending and job creation. In addition, the spending performed in this project was to create infrastructure in the Bakersfield area, in turn, the investment will benefit specifically Bakersfield for the extent of its operational life.

During construction, WattEV, Inc. employed workers in the industries of civil and electrical design and construction, infrastructure, real estate, consulting, community services, public affairs, and software. The industries that stand to benefit from the commissioning of WattEV Bakersfield are freight, logistics companies, and local businesses such as restaurants, convenience stores, and entities related to truck maintenance. Indirect influence on job

[6] State of California Office of Environmental Health Hazard Assessment (https://oehha.ca.gov/calenviroscreen/sb535)

creation and economic benefit include increased mitigation of air pollution through the operation of electric heavy-duty vehicles which reduce adverse health effects on the local population.

CHAPTER 5:
Economic Analysis

This section provides an economic analysis focusing on capital costs breakdown, revenue models, funding sources and financial projections. It aims to inform stakeholders—including policymakers, fleet operators, and infrastructure developers—on the feasibility and strategic implications of deploying MDHD EV charging networks.

The findings are based on real-world data, industry benchmarks, and scenario modeling, providing a grounded assessment of market potential and financial performance under various deployment configurations. This analysis contributes to the broader discourse on sustainable freight and public transit solutions, offering actionable insights for scaling heavy-duty EV infrastructure.

Cost Breakdown

Understanding the cost structure of a MDHD EV charging station is essential for evaluating its economic feasibility and informing investment decisions. This section provides a breakdown of the capital expenditures associated with deploying such infrastructure. It covers key cost components including site acquisition and preparation, hardware procurement (chargers, transformers, switchgear), installation, utility upgrades, and permitting.

Table 1: Cost Breakdown

CATEGORY	AMOUNT (US$)
Entitlement and Permitting	200,000
Engineering	400,000
Civil Works	2,000,000
Building	1,000,000
Water Line Extension and Hydrants	2,000,000
Electrical gear (e.g., switchgear, transformer, switchboards)	550,000
Electric Vehicle Supply Equipment (EVSE)	1,600,000
Electrical Construction	2,000,000

Source: WattEV

Revenue Model

This section outlines the three distinct revenue streams from WattEV's Bakersfield charging operations, taking into account usage patterns, pricing strategies, and customer segments.

- **Contracted 3rd party charging**
  - Medium- to long-term offtake agreements in which WattEV Bakersfield procures and secures charging capacity on a monthly basis under a fixed price of dollars per kilowatt hour ($/kWh). Potential customers are small and large fleets, including WattEV's proprietary fleet.
- **On-Demand Charging**
  - Revenue generated from walk-in customers that need immediate charging (if available capacity), in this scenario the charging rate ($/kWh) will be based on time of day (i.e., time of use utility rates).
- **Low Carbon Fuel Standard credits**
  - Payments from the California Air Resource Board's Low Carbon Fuel Standards program.

Funding Sources

Establishing a heavy-duty EV charging station requires substantial upfront investment, making access to diverse and strategic funding sources essential to project viability. The following outlines the primary funding mechanisms used to support the planning, construction, and deployment of WattEV's Bakersfield charging station.

- **Government Grants and Incentives**
  - State-level initiatives, in particular, the CEC's Clean Transportation Program.
  - Tax incentives, in particular, the Investment Tax Credit, offsetting some of the capital costs for eligible equipment and installation.
- **Utility Program**
  - Electric utilities often offer make-ready infrastructure programs and co-investment opportunities. Bakersfield's charging station benefited from PG&E's Fleet Electrification Program to reduce some of the cost of grid upgrades and on-site electrical work as well as mitigating demand charges.
- **Private Investment**
  - WattEV's Bakersfield charging station was primarily funded through a mix of equity investment and debt financing.

Financial Projections

Bakersfield's financial analysis considers the complete life cycle of a project under three phases:

1. Project development and three-year construction period (January 2021 to May 2024)
- Projected operations ramp-up period (May 2024 to December 2025), measured by reaching breakeven (4.0 percent utilization)

- Steady state operations period (up to 20-year useful life of the asset), with site utilization reaching at 17 percent (two charges per day per charger).

The financial metric used to measure the project's time weighted unlevered return is the internal rate of return (IRR), which results in a 4.90 percent IRR over the life cycle period of the project.

CHAPTER 6:
Implementation Timeline

Transitioning an idea for a heavy-duty EV charging station into a construction-ready project requires critical planning and execution. This involves design and engineering, as well as a systematic approach to obtain necessary regulatory approvals, permits, and environmental clearances for a compliant and efficient rollout.

Site Planning and Preliminary Feasibility

The planning process began with identifying a suitable site that meets logistical, technical, and regulatory criteria. Key steps included:

Site Selection

Site selection for "The 21st Century Truck Stop" was a critical process, prioritizing proximity to major transportation arteries and ample space for future expansion. The chosen location in Bakersfield is strategically situated near I-5 and SR-99, opening crucial trucking lanes for EV freight movement between Northern and Southern California. This positioning also serves as a vital refueling point for supply lines utilizing Interstates 10, 15, and 40, extending to Nevada and Arizona.

A significant consideration during site selection was the availability of adequate land to accommodate a future 5.2 MW solar array and a 2.7 MW BESS as part of Phase 2. These DERs are essential for ensuring a continuous, high-capacity electricity supply capable of sustaining megawatt-level charging, thereby reducing reliance on the main utility grid and improving system resilience. Acquiring large properties with such potential in metropolitan areas like Los Angeles and San Francisco is challenging due to high costs and limited availability, making the Bakersfield site particularly suitable (Figure 6).

Figure 6: 21st Century Truck Stop

Photo Credit: Google Maps

Feasibility Study
Included grid capacity evaluation, land use compatibility, and access to utilities.

Preliminary Cost Estimate
Established high-level capital and operational expenditure projections.

Stakeholder Identification
Mapped out project stakeholders including local authorities, utility companies, community groups, and environmental agencies.

Design and Engineering
The design and engineering phase translated project requirements into buildable plans. This involved multidisciplinary coordination and technical validation to ensure functionality, safety, and scalability.

- **Conceptual Design**
  - Developed site layout concepts showing vehicle circulation, parking bays, charger positioning, and utility connections.
  - Identified space for auxiliary systems (e.g., switchboards, transformers, switchgear).
- **Electrical Design**
  - Load analysis for charger specifications (e.g., 350 kW+, megawatt charging system).
  - Grid connection requirements, transformer sizing, switchgear, and protection systems.
- **Civil Engineering**
  - Site grading, drainage, pavement design, foundations for equipment, and accessibility.
  - Utility trenching and conduit design.
- **Integration and Scalability**
  - Incorporated future-proofing strategies, such as load sharing charging, battery energy storage, and renewable energy.
  - Considered real-time energy management systems readiness.
- **Construction Drawings and Specifications**
  - Developed detailed construction drawings (civil, structural, electrical).
  - Prepared bills of materials (BOMs), equipment lists, and technical specifications for procurement.

Regulatory Approvals and Permitting
To proceed with construction, a number of permits and approvals were secured from local, state, and federal authorities.

- **Zoning and Land Use Approvals**
  - Confirm site zoning compliance with industrial or transportation infrastructure use.
  - Submit applications for conditional use permits or zoning variances if required.
  - Attend public hearings or planning board meetings as necessary.

- **Building and Construction Permits**
  - Submit architectural and engineering drawings for review by the municipal building department.
  - Obtain: Building permits, Electrical and mechanical permits, Fire and safety system approvals
  - Schedule site, equipment and other special inspections at key milestones during construction.
- **Utility Interconnection**
  - Engage with the local utility early to assess service availability.
  - Submit interconnection application including Load profile, One-line diagrams, Power quality and protection plans.
  - Participate in load impact studies and coordinate on any substation or line upgrades.

Environmental Review and Compliance

Environmental responsibility is integral to project success and public acceptance. Required environmental actions included:

- **Environmental Site Assessment**
  - Identifies potential contamination or environmental liabilities.
- **Environmental Impact Assessment**
  - Conducted for larger projects that may significantly affect the environment.
  - Areas of assessment:
    - Air quality and noise emissions (especially during construction)
    - Stormwater runoff and soil erosion
    - Impacts to flora, fauna, and nearby communities
- **Permits and Clearances**
  - Obtained permits including:
    - Stormwater Discharge
    - Wetland encroachment permits
    - Dust and noise control plans
- **Public Engagement**
  - Public notice and comment periods as required for environmental documentation.
  - Community information sessions to build local support and address concerns.

Construction Phase

The construction phase marks a pivotal step in the deployment of WattEV's EV charging infrastructure, transitioning the project from planning and design into tangible implementation. This phase involves the physical development of site facilities, installation of high-capacity charging equipment, integration with the electrical grid, and execution of all supporting civil and electrical works necessary to deliver a fully operational system.

The EV charging infrastructure demands robust engineering and precise coordination due to the high power requirements and unique operational needs of commercial and industrial

vehicle fleets. The charging station was designed not only to support current MDHD vehicles but also to accommodate future growth in fleet size and evolving technological standards.

Appendix B provides details of the major milestones of the construction process.

CHAPTER 7:
Risk Management & Mitigation

The development and operation of a heavy-duty EV charging station such as "21st Century Truck Stop" involve a range of risks across financial, technical, regulatory, operational, and market domains. A proactive risk management strategy is critical to minimizing disruptions, protecting investments, and ensuring long-term project success. The following paragraphs outline key risk categories and associated mitigation strategies either already implemented or planned by WattEV.

Demand and Utilization Risk

Actual usage of the station may fall short of projections, especially in early years, reducing revenue and delaying return on investment.

- Mitigation Strategies
    - Secure usage agreements with fleet operators (e.g., take-or-pay contracts, exclusive access deals).
    - Phased deployment approach to align infrastructure build-out with real-time demand growth.
    - Diversify offerings (e.g., own assets, drayage, middle mile, relay services).

Regulatory and Permitting Risk

Delays in permitting, zoning conflicts, or changes in regulatory frameworks could affect project timelines or compliance.

- Mitigation Strategies
    - Engage local authorities and permitting agencies early in the planning process.
    - Hire experienced environmental and permitting consultants.
    - Monitor evolving federal, state, and local regulations to ensure proactive compliance.
    - Design the project to meet or exceed environmental and safety standards.

Capital and Construction Risk

Cost overruns, equipment delays, or construction complications that may increase project costs and cause delays.

- Mitigation Strategies
    - Use fixed-price contracts with experienced engineering, procurement, and construction partners.
    - Conduct thorough site assessments and feasibility studies before construction.
    - Include contingency budgets and schedule buffers in project planning.
    - Maintain close coordination with utility providers on infrastructure upgrades.

Grid and Power Supply Risk

Inadequate grid capacity, delays in utility interconnection, or fluctuating energy costs may impact operational reliability and cost-effectiveness.

- **Mitigation Strategies**
  - Collaborate early with utilities to assess grid readiness and define upgrade needs.
  - Incorporate on-site energy storage or renewable generation to reduce utility costs.
  - Participate in utility programs offering EV rates providing time-of-use pricing structures and either minimizing or eliminating demand charges.

Technological Obsolescence

Rapid changes in charging technology may render installed equipment outdated or incompatible with future vehicle platforms.

- **Mitigation Strategies**
  - Choose modular and upgradable charging systems that support emerging standards (e.g., Megawatt Charging System).
  - Partner with technology providers to stay ahead of industry trends.
  - Build flexibility into site design to accommodate future charger types and power levels.

Operational and Maintenance Risk

Equipment failures, poor maintenance practices, or network downtime can negatively impact user experience and revenue.

- **Mitigation Strategies**
  - Establish preventive maintenance schedules and remote monitoring systems.
  - Choose reliable hardware vendors with strong service support and warranties.
  - Implement redundancy (e.g., multiple charging ports or backup systems) to ensure continuous operation.
  - Train on-site staff or secure a service-level agreement with a third-party operator.

Policy and Incentive Risk

Reduction or removal of government subsidies, grants, or favorable energy pricing structures could undermine the financial model.

- **Mitigation Strategies**
  - Secure funding and incentives early in the project timeline and lock in multi-year commitments where possible.
  - Design the business model to remain viable under multiple policy scenarios.
  - Diversify revenue streams (e.g., own assets, drayage, middle mile, relay services).

Cybersecurity and Data Privacy Risk

Increasing digital integration and data collection exposes infrastructure to cybersecurity threats and privacy liabilities.

- **Mitigation Strategies**
  - Implement robust cybersecurity protocols aligned with industry standards.
  - Use secure communication protocols for payment systems and all cloud based management systems.

- Ensure compliance with data privacy regulations.

CHAPTER 8:
Key Performance Indicators

To effectively evaluate the performance, efficiency, and impact of a heavy-duty EV charging station, it is essential to establish and monitor a comprehensive set of Key Performance Indicators (KPIs). These metrics provide quantifiable insights into how well the "21st Century Truck Stop" infrastructure is meeting operational, financial, environmental, and user satisfaction goals.

The selected indicators outline the core KPIs that stakeholders can use to track station performance over time, identify areas for improvement, and guide strategic decision-making. They cover different categories, including charger utilization, energy throughput, reliability, and sustainability outcomes.

Energy and Charging Utilization Rates

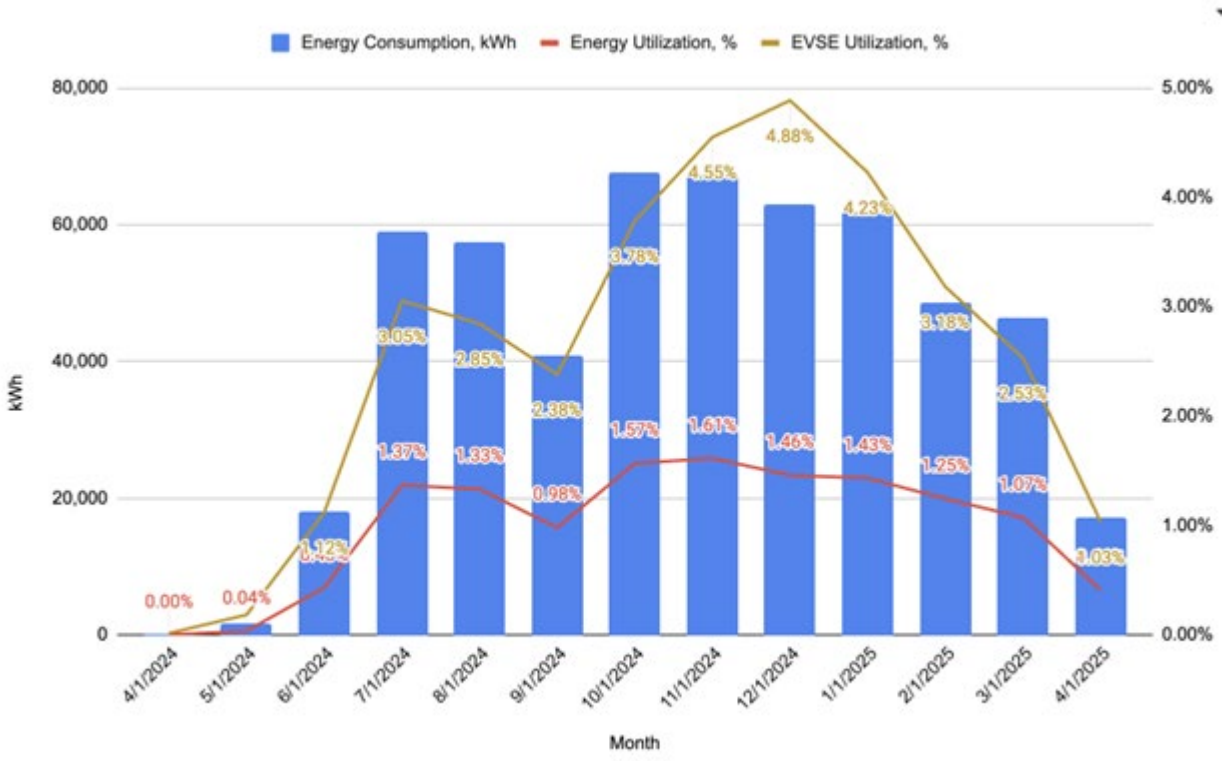
Understanding how effectively a heavy-duty EV charging station is being used is essential for assessing both operational performance and financial viability. The energy throughput and charging utilization rate are key metrics that indicate how much energy is being delivered to vehicles and how frequently the charging infrastructure is in use.

This section analyzes the station's energy consumption patterns, total kWh dispensed, and charger utilization rates over time. These indicators provide insight into demand trends, station efficiency, and infrastructure adequacy.

By tracking and interpreting these metrics, stakeholders can optimize station design, improve fleet charging strategies, and make informed decisions about future expansion or upgrades. This data also supports broader goals related to grid planning, emissions reduction, and return on investment.

Following its launch, the "21st Century Truck Stop" experienced a period of increasing energy consumption due to higher charger utilization. More recently, however, the graph indicates a reduction in these rates (Figure 7). This decrease is attributed to the implementation of DER as part of the project's Phase 2 that is being funded by a grant from the CEC's Electric Program Investment Charge program.

Figure 7: Energy and Charger Utilization Graph



Source: WattEV

Energy Throughput

Energy throughput is a fundamental metric for evaluating the performance and impact of a heavy-duty EV charging station. It measures the total amount of electrical energy delivered to vehicles over a specific period and provides direct insight into how much charging activity is occurring at the site.

Table 2 presents the total energy throughput, since the beginning of operations, daily average and peak energy dispensed, all measured in kWh. They serve as the basis to assess the station's capacity utilization, support for fleet operations, and contribution to emissions reduction. Tracking energy throughput over time helps identify usage trends, forecast future demand, and evaluate the efficiency of infrastructure investments.

Additionally, energy throughput data supports critical operational and financial planning, informing decisions related to energy procurement, load management, and grid integration.

Table 2: Energy Throughput

Total energy provided to EVSE	583,132 kWh
Peak	4,749 kWh
Avg daily	1,756 kWh

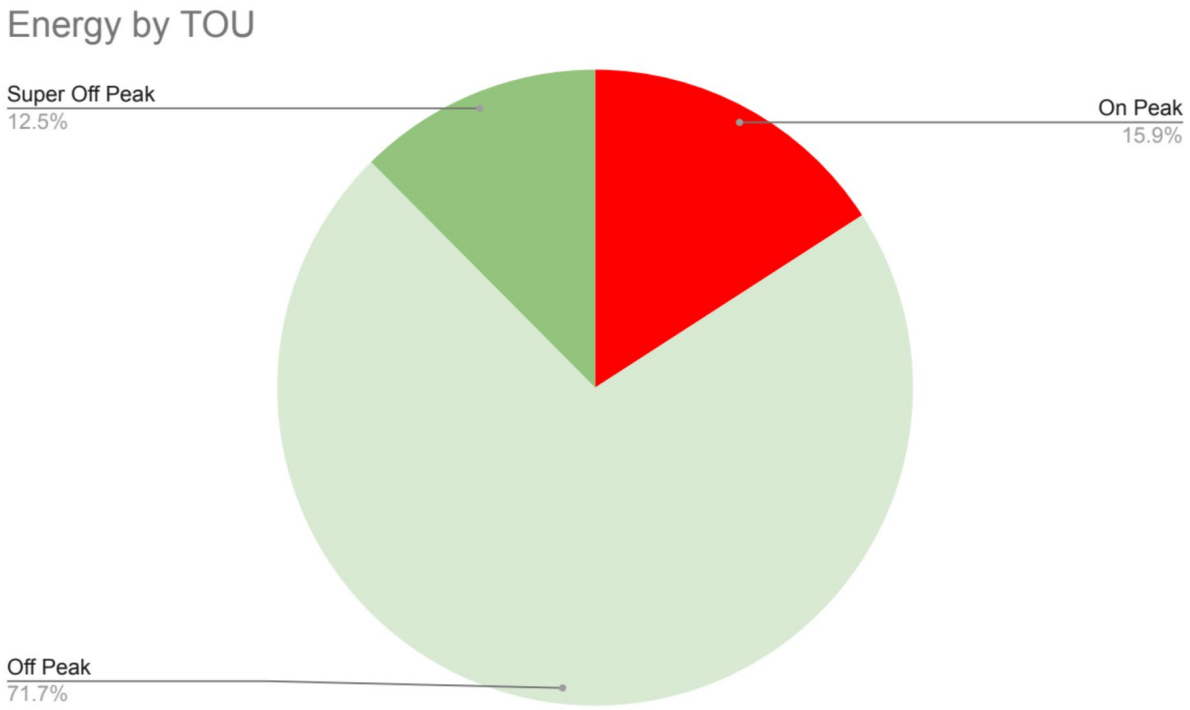
Source: WattEV

Energy Structure

Understanding when energy is consumed at a heavy-duty EV charging station is just as important as understanding how much is used. A Time-of-Use (TOU) graph provides a visual representation of charging activity throughout the day, revealing patterns in energy demand and informing strategies for cost optimization and grid efficiency.

Figure 8 presents a TOU analysis that highlights peak, off-peak and super off-peak charging periods, aligning energy consumption with utility rate structures and operational schedules. By analyzing TOU data, WattEV can identify opportunities to shift charging to lower-cost time windows, reduce exposure to higher charges, and improve overall energy management. It is also critical for designing smart charging strategies, integrating renewable energy, and supporting load balancing efforts.

Figure 8: Energy Dispensed by Time-of-Use



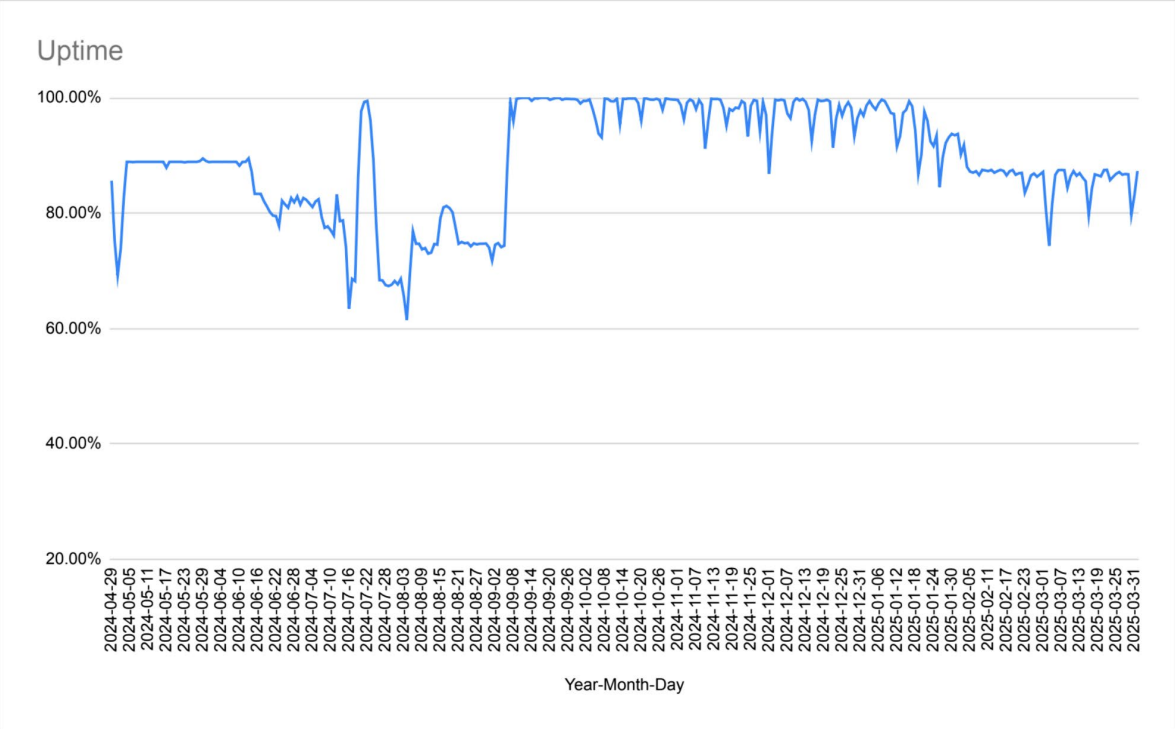
Source: WattEV

Uptime Performance

Reliable operation is critical to the success of a heavy-duty EV charging station, where vehicle schedules and logistics depend on consistent, high-performance charging availability. This section focuses on the station's uptime performance, as a key indicator of operational reliability and user satisfaction.

"21st Century Truck Stop" chargers experienced lower uptime during the first six months of operation. Since WattEV implemented proactive maintenance and refined real-time monitoring, performance has stabilized. The overall average uptime since beginning of operations is about 89 percent, with downtime primarily due to charger equipment failures such as control board issues and problems with dispensing cables and connectors (Figure 9).

Figure 9: Uptime Performance Graph



Source: WattEV

CO_2 Emissions Reduction

One of the most significant benefits of electrifying heavy-duty transportation is the potential to dramatically reduce greenhouse gas (GHG) emissions, particularly CO_2. Diesel-powered heavy-duty vehicles are among the largest contributors to transportation-related emissions, and transitioning to electric alternatives can play a vital role in achieving climate and air quality goals.

Since it began operating, the "21st Century Truck Stop" has dispensed over 580 MWh of energy through 16 360 kW chargers funded by the BESTFIT grant. Table 3 provides an estimated reduction in tailpipe emissions.

Table 3: Emissions Calculation

CO_2 lb.	1,208,182 lbs.
NOx lb.	6,154 lbs.
PM.2.5 lb.	144 lbs.

Source: WattEV

CHAPTER 9: Conclusion

WattEV Bakersfield stands as a pioneering all-electric truck stop on the SR-99corridor, facilitating EV freight movement between Northern and Southern California. This facility plays a crucial role in mitigating air pollution in the Central Valley and is located in a State of California designated Low-Income and Disadvantaged Community.

The project successfully met its objectives, largely due to BESTFIT funding and collaboration with the CEC. The current phase establishes a critical infrastructure point for EV freight.

WattEV Bakersfield significantly contributes to California's sustainability goals by expanding EV freight and accelerating the transition away from heavy-duty Class 8 internal combustion engine vehicles, which are major sources of emissions and particulate pollution. This project has reduced CO_2 by 1.2 million pounds, NOx by about 6,100 pounds, and PM2.5 by nearly 150 pounds. The project has created local jobs, particularly in construction, and is expected to bolster the regional economy through increased truck traffic while improving air quality.

The BESTFIT funding has paved the way for further technological advancements in EV freight charging and has provided the platform for deploying DER microgrid and megawatt charging for heavy-duty vehicles supported by the EPIC Program. The success of megawatt charging is vital for achieving refueling parity with internal combustion engine vehicles, which is crucial for wider adoption of MDHD EVs.

GLOSSARY

BATTERY ENERGY STORAGE SYSTEM (BESS)—An electrochemical device that charges (or collects energy) from the grid or a power plant and then discharges that energy at a later time to provide electricity or other grid services when needed.[7]

CARBON DIOXIDE (CO_2)—A colorless, odorless, non-poisonous gas that is a normal part of the air. Carbon dioxide is exhaled by humans and animals and is absorbed by green-growing things and by the sea.

CALIFORNIA ENERGY COMMISSION (CEC)—The state's primary energy policy and planning agency. The agency was established by the California Legislature through the Warren-Alquist Act in 1974. It has seven core responsibilities:

- Developing renewable energy
- Transforming transportation
- Increasing energy efficiency
- Investing in energy innovation
- Advancing state energy policy
- Certifying thermal power plants
- Preparing for energy emergencies

DISTRIBUTED ENERGY RESOURCES (DER)—Small-scale power generation technologies (typically in the range of 3 to 10,000 kilowatts) located close to where electricity is used (for example, a home or business) to provide an alternative to or an enhancement of the traditional electric power system.

ELECTRIC VEHICLE (EV)—A broad category that includes all vehicles that are fully powered by Electricity or an Electric Motor.

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE)—Infrastructure designed to supply power to EVs.

GREENHOUSE GAS (GHG)—Any gas that absorbs infra-red radiation in the atmosphere. Greenhouse gases include water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), halogenated fluorocarbons (HCFCs) , ozone (O_3), perfluorinated carbons (PFCs), and hydrofluorocarbons.

INTERNAL COMBUSTION ENGINE (ICE)—An engine in which fuel is burned inside the engine. A car's gasoline engine or rotary engine is an example of an internal combustion engine. It differs from engines having an external furnace, such as a steam engine.

INTERNAL RATE OF RETURN (IRR)—One of the two discounted cash flow techniques used in comparative appraisal of investment proposals where the flow of income varies over time. IRR is the average annual return earned through the life of an investment.

[7] Battery Energy Storage System (https://docs.nrel.gov/docs/fy19osti/74426.pdf)

INTERSTATE 5 (I-5)—A federal interstate highway that runs for 1,381 miles north-south from the Mexico border to the Canadian border through the states of California, Oregon, and Washington.[8]

KEY PERFORMANCE INDICATOR (KPI)—A critical, quantifiable measure of progress toward a desired result. They help organizations determine if their efforts are making an impact, allocate resources effectively, and focus improvements where they matter most.[9]

KILOWATT (Kw)—One thousand (1,000) watts. A unit of measure of the amount of electricity needed to operate given equipment.

KILOWATT-HOUR (kWh)—The most commonly-used unit of measure telling the amount of electricity consumed over time. It means one kilowatt of electricity supplied for one hour.

MEDIUM- AND HEAVY-DUTY (MDHD)—Refers to vehicles have a gross vehicle weight rating of more than 10,000 pounds and include vans, buses, and trucks.

MEGAWATT (MW)—One-thousand kilowatts (1,000 kW) or one million (1,000,000) watts.

MEGAWATT CHARGING SYSTEM (MCS)—A high-power charging system designed for heavy-duty electric vehicles.

MEGAWATT-HOUR (MWh)—A unit of energy equal to one megawatt of power sustained for one hour.

NITROGEN OXIDES (NOx)—A general term pertaining to compounds of nitric oxide (NO), nitrogen dioxide (NO_2) and other oxides of nitrogen. Nitrogen oxides are typically created during combustion processes and are major contributors to smog formation and acid deposition. NO_2 is a criteria air pollutant and may result in numerous adverse health effects.

ORIGINAL EQUIPMENT MANUFACTURER (OEM)—Refers to the manufacturers of complete vehicles or heavy-duty engines, as contrasted with remanufacturers, converters, retrofitters, up-fitters, and re-powering or rebuilding contractors who are overhauling engines, adapting or converting vehicles or engines obtained from the OEMs, or exchanging or rebuilding engines in existing vehicles.

PACIFIC GAS AND ELECTRIC COMPANY (PG&E)—A utility company provides natural gas and electric service to approximately 16 million people throughout a 70,000-square-mile service area in northern and central California.[10]

PARTICULATE MATTER 2.5 (PM2.5)—Unburned fuel particles, with an aerodynamic diameter less than or equal to a nominal 2.5 microns, that form smoke or soot and stick to lung tissue when inhaled. A chief component of exhaust emissions from heavy-duty diesel engines.

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[8] Interstate 5 (https://en.wikipedia.org/wiki/Interstate_5)

[9] Key Performance Indicator (https://www.kpi.org/kpi-basics/)

[10] Pacific Gas and Electric Company (https://www.pge.com/en/about/company-information/company-profile.html)

STATE ROUTE 99 (SR-99)—A major north-south highway in California, stretching almost the entire length of the Central Valley.[11]

[11] State Route 99 (https://en.wikipedia.org/wiki/California_State_Route_99)

APPENDIX A:
Knowledge Transfer and Community Outreach Initiatives

WattEV Bakersfield Ribbon Cutting Ceremony May 2024

WattEV marked a significant milestone with the grand opening of its Bakersfield site on May 6th, 2024, commemorated by a celebratory ribbon-cutting ceremony (Figure 10). The event was a resounding success, drawing a diverse and influential group of attendees, including prominent community leaders, esteemed local and state officials, and a wide array of other interested parties. This gathering served as an invaluable platform to underscore the paramount importance of transportation electrification, particularly in a region that has historically borne a disproportionate burden from emissions. The opening of the Bakersfield site represents a tangible step forward in addressing these environmental challenges and fostering a cleaner, more sustainable future for the community.

Figure 10: Bakersfield, Ribbon Cutting Ceremony

Photo Credit: WattEV

CharIn[12] North America Fall Testival 2024

The event was hosted by WattEV and included over 200 guests over the course of two days. Held at our San Bernardino charging depot, participants were able to learn about WattEV's current offerings and future projects, among references to WattEV's other existing and future sites. Stakeholders tested software and tracked efficiency of charging platforms using EV from a variety of original equipment manufacturers (OEMs). Class 8 EVs and infrastructure were on display for the event (Figure 11).

Figure 11: CharIN Testival 2024

Photo Credit: CharIN

CharIN Vehicle Interoperability Testing Symposium 2023

WattEV hosted the CharIN Vehicle Interoperability Testing Symposium at its Long Beach site (Figure 12). The event connected the auto industry, EV charging infrastructure hardware and software providers, government, electric utilities, testing facilities, and policymakers to provide a forum for EV interoperability testing, speakers, networking and demonstrations.

[12] Charging Interface Initiative. An association focused on developing and establishing a global standard for charging systems for electric vehicles.

Figure 12: CharIN Interoperability Testing in Long Beach

Photo Credit: CharIN

Electric Vehicle Symposium & Exposition June 2023

36th Electric Vehicle Symposium & Exposition, organized and hosted by the Electric Drive Transportation Association, located in Washington DC. EDTA is a U.S. trade association promoting battery, hybrid, plug-in hybrid and fuel cell electric drive technologies and infrastructure. The 36th Electric Vehicle Symposium and Exposition is the longest-running premier showcase devoted to electric transportation, technologies, and industry innovation. WattEV had a booth presence and talked to industry and stakeholders prior, during and after the event.

WattEV Port of Long Beach Ribbon Cutting Ceremony 2023

On July 24th, 2023, WattEV held a ribbon cutting ceremony at WattEV site in Port of Long Beach and it was attended by former CEC Commissioner Patricia Monahan and staff (Figure 13).

Figure 13: Port of Long Beach, Ribbon Cutting Ceremony

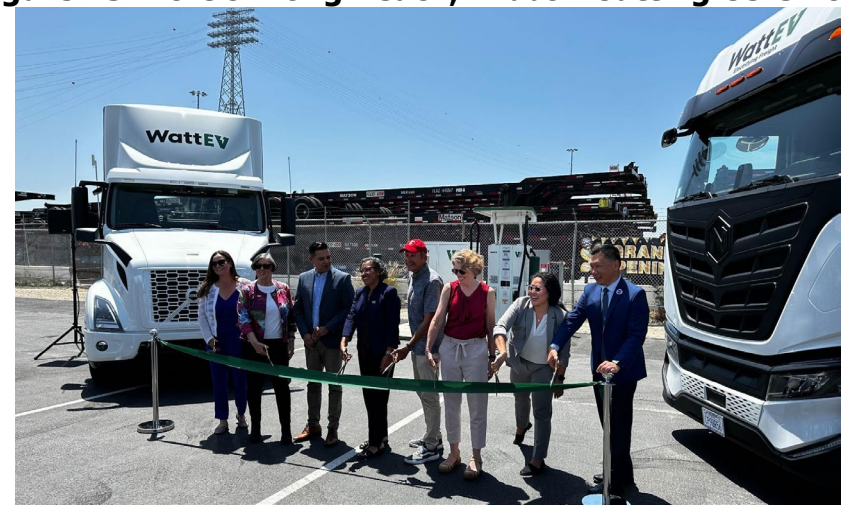

Photo Credit: WattEV

WattEV San Bernardino Ribbon Cutting Ceremony 2024

WattEV celebrated the opening of its San Bernardino site on April 15, 2024, with a ribbon-cutting ceremony (Figure 14). The event brought together community leaders, local and state officials, and other interested parties. It served as a valuable platform to highlight the critical role of transportation electrification in a region heavily impacted by emissions.

Figure 14: San Bernardino, Ribbon Cutting Ceremony

Photo Credit: WattEV

Community Meeting at WattEV Bakersfield July 2023

WattEV and the Central California Asthma Collaborative (CCAC) held a community meeting at WattEV Bakersfield facility to give an update on the progress of the facility as well as raise awareness to local shippers and carriers (Figure 15). The event took place inside the newly installed modular building.

Figure 15: CCAC Community Meeting

Photo Credit: WattEV

Advanced Clean Transportation Expo

WattEV has been present with its own booth in Advanced Clean Transportation Expo since 2022. WattEV engaged with attendees, giving talks to groups and having conversations with transportation industry representatives and the public. Tens of thousands of industry professionals, community representatives, media and the general public have attended these events.

In 2024, WattEV CEO, Salim Youssefzadeh, was a panelist for "EV Charging Event: Publicly Accessible Fleet Charging" and Michael Ganny, WattEV's Director of Grants and Government Affairs, moderated the panel "Federal Funding Discussion – Maximizing Federal Funds for Your Fleet" (Figure 16 and Figure 17).

Figure 16: CEO Salim Youssefzadeh speaks at ACT 2024

Photo Credit: WattEV

Figure 17: WattEV at ACT 2025

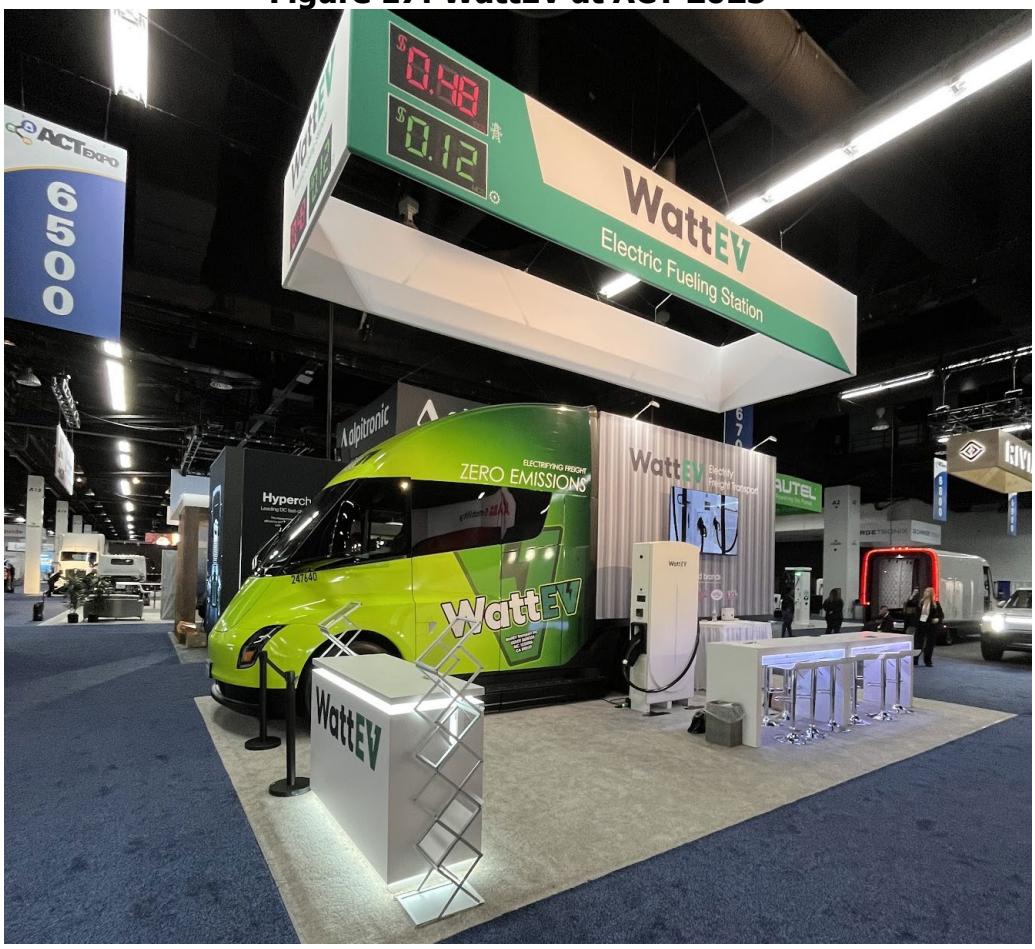

Photo Credit: WattEV

North American Council for Freight Efficiency's Run On Less Program

The Run On Less Program aims to educate the public on fleet scaling considerations such as charging infrastructure, engagement with utilities, total cost of ownership management, driver and technician training, charge management, etc. (Figure 18). The program also highlights effective partnerships between fleets, OEMs, and utilities. This includes a deep dive look into utilities, charging equipment, construction, etc. WattEV was a participant who provided information on the scaling of electric trucks across a variety of market segments.

Figure 18: NACFE Run On Less

Photo Credit: North American Council for Freight Efficiency

Climate Week NYC - September 2024

Salim Youssefzadeh spoke at Climate Week NYC. One of the panels discussed fleet electrification and its challenges. Salim also attended a workshop in DC bringing together technical experts to discuss solutions to heavy-duty vehicle charging infrastructure.

8th Accelerate! - November 2024

Attendance to Accelerate! in Dallas, TX. WattEV had the chance to engage with the Women's Trucking Association to onboard drivers, carriers, and owner-operators, in an effort to be a part of the push to diversify and build equity in the transportation industry.

BloombergNEF Summit San Francisco - January 2025

The BloombergNEF Summit featured panelists discussing the ideas, insights, and connections to formulate successful strategies, capitalizing on technological change and shape a cleaner, more competitive future. Salim Youssefzadeh was a participant on the "Electrifying Transport" panel

APPENDIX B:
Construction Milestones

December 2021 - Ground Break Ceremony held with WattEV company staff and stakeholders (Figure 19).

Figure 19: Ground Break Ceremony

Photo Credit: WattEV

April 2022 - Site rough grading completed (Figure 20).

Figure 20: Site Grading

Photo Credit: WattEV

July 2022 - Road improvements were made to "21st Century Truck Stop" to connect the site to public access (Figure 21).

Figure 21: 21st Century Truck Stop Improvements

Photo Credit: WattEV

August 2022 - Installation of the prefabricated lounge and service building (Figure 22).

Figure 22: Prefabricated Building Installation

Photo Credit: WattEV

July 2023 - Behind-The-Meter installation of primary and secondary electrical onsite distribution (Figure 23).

Figure 23: Behind the Meter Distribution

Photo Credit: WattEV

December 2023 - Extending the domestic and irrigation lines to interconnect to the local utility (Figure 24).

Figure 24: Water Line Extension

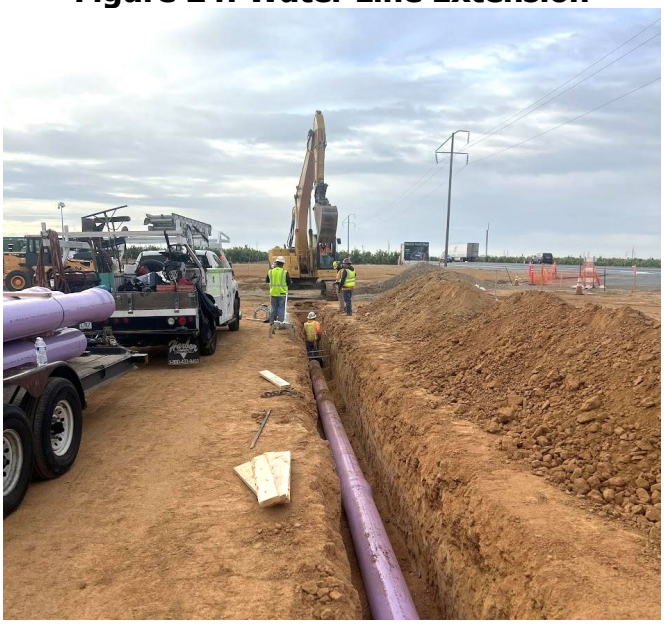

Photo Credit: WattEV

January 2024 - Installation of the Pacific Gas and Electric grid supported chargers (Figure 25).

Figure 25: Grid Supported Chargers

Photo Credit: WattEV

February 2024 - Curbing and paving (Figure 26).

Figure 26: Site Paving

Photo Credit: WattEV

April 2024 - Test and Commissioning (Figure 27).

Figure 27: Test and Commissioning

Photo Credit: WattEV

May 2024 - Site Opened to the Public (Figure 28, Figure 29, and Figure 30).

Figure 28: Site Opening Ceremony

Photo Credit: WattEV

Figure 29: Site Opened to Public

Photo Credit: WattEV

Figure 30: Charging Equipment

Photo Credit: WattEV