



Advice and Insights on Switching to Zero-Emissions Vehicles

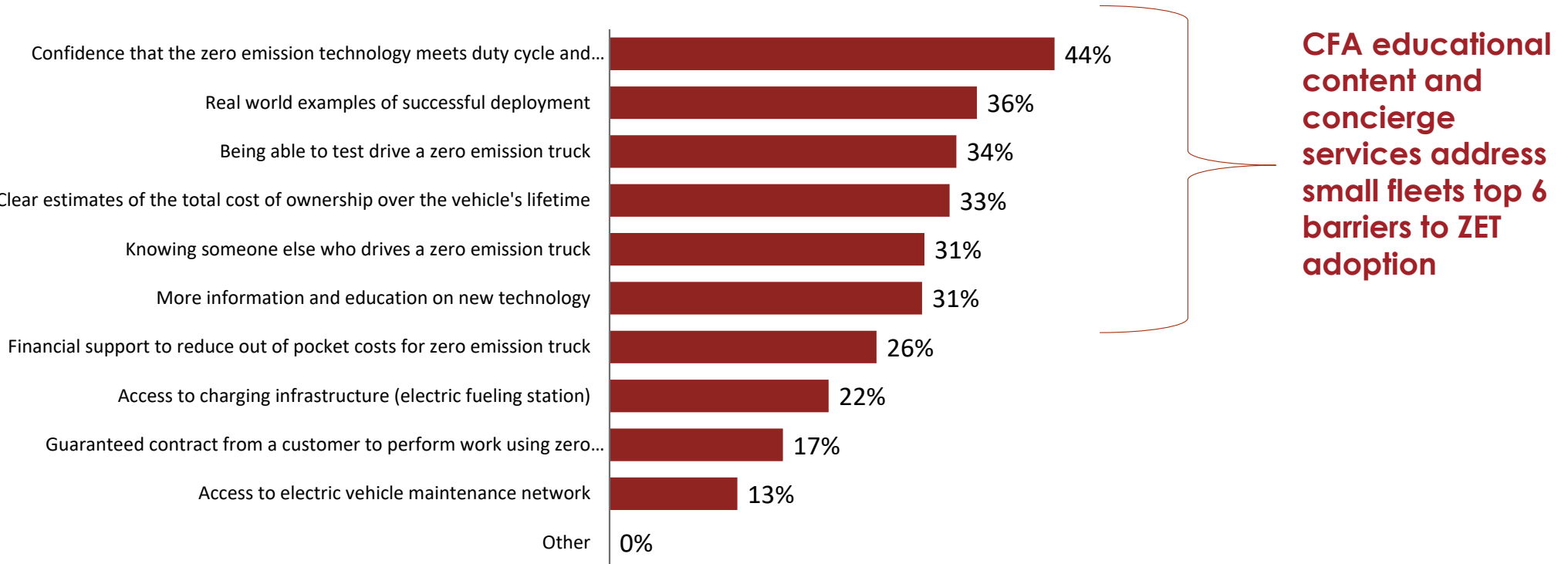
What is CFA?



What Assistance is Needed?



Over 400 small fleets were asked "which of the following would help you feel more comfortable adopting a zero-emission truck? The results:



Source: March 2022 the NGO [Dream Corps Green for All](#) published a report that focuses on the role that small fleets play in the Zero-Emission Trucks (ZETs) transition. Green for All evaluates 446 digital survey responses from small fleets

Cal Fleet Advisor Mission



Cal Fleet Advisor's mission is to provide **no-cost education, technical assistance, and referrals** to enable California's medium- and heavy-duty fleets of any size to switch to **zero-emissions vehicles**.

Cal Fleet Advisor



- Administered by CALSTART on behalf of CARB
- Funded by HVIP
- Provide Technical Assistance to all California MHD fleets
- Prioritize small fleets, drayage, and disadvantaged communities
- Collaborative approach to fleet assistance – learn about fleet needs and provide fleet-specific advice



How We Help



- **Provide** concierge-style assistance to help fleets overcome electrification challenges
- **Address** fleet's specific needs – not a one-size-fits-all approach
- **Focus** on straightforward solutions to stated issues
- **Apply** lessons to future fleet assistance
- **“Everything they need, and nothing they don’t.”**



Who We Serve



- Any on-road medium- or heavy-duty commercial fleet in California
 - 8,500lbs-82,000lbs
- Currently working with fleets from 0 trucks to 52,000
- Includes trucks, vans, and buses
 - Now with 100% more school bus!
- Emphasis on small fleets <20 and Disadvantaged Communities (DAC)

Excluded:

- Light-duty
- Transit
- Out of State

Benefits to Fleets



- **Gain** an understanding of how they can benefit from switching to ZEVs
- **Access** to financial, infrastructure, and logistical tools that can help the fleet make informed ZEV purchases
- **Learn** from experts in ZEV transition on incentives, technology, and regulations
- Get **quick answers** and referrals to:
 - Dealers
 - Utilites
 - Regulation resources
- **Access** to incentive funding & HVIP guidance

What Cal Fleet Advisor Does Not Do:



- Electrical Engineering/Planning/Permitting
 - We can help with total power needs and level 2 vs level 3 chargers
- Grant Writing
- Regulatory Compliance Determinations
 - Refer to CARB or appropriate agency
- Play favorites
 - Referrals are at fleet request
- Enforce Regulations

How to Use CFA



1. **Fill out** the simple form at calfleetadvisor.org
2. **Talk** about your fleet's needs with your advisor
3. **Get recommendations** for vehicles, charging, and incentives
4. **Ask** for referrals to utilities, dealers, and project partners
5. **Get incentives** tailored to your fleet
6. **Start using your ZEVs and save on fuel, maintenance, and more!**



Getting Started with ZEVS



All Fleets: Best Practices



- Contact utility early
- Use incentive programs before regulatory requirement
 - CARB generally incentivizes proactive steps, not compliance
- Select most cost-effective charging option that still gets the job done
- Review duty cycle - can changes be made to reduce charging/payload/range needs and still meet requirements?
- Check public charging/fueling options
 - Opportunity Charging during driver breaks, loading stops



ZEV Fuels

Battery-Electric vs. Hydrogen Fuel Cell



- **Battery Electric MHD Vehicles**

- Typically weigh more
- Lower payload capability
- From 1-10 hrs to charge
- Typical Range 100-250 miles
- Less expensive to purchase and fuel than Hydrogen

- **Hydrogen Fuel Cell MHD Vehicles**

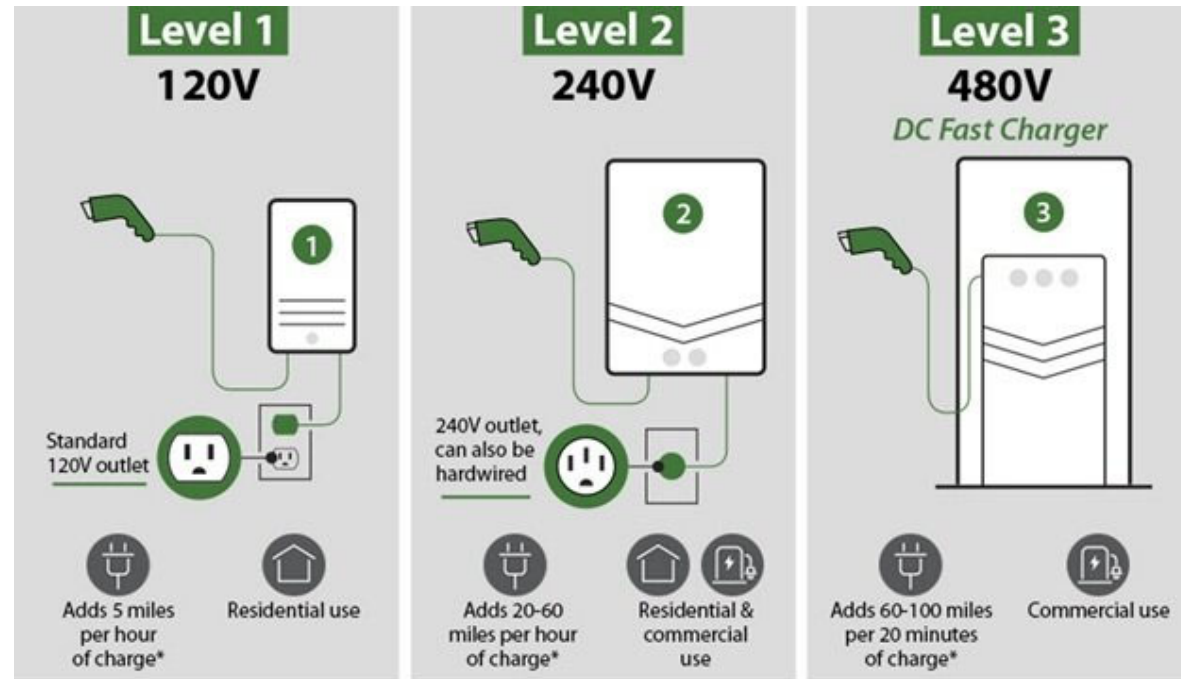
- Weigh more than diesel, but less than BEV
- Standard payload capability
- ~20min fueling time
- Range up to 400 miles
- More expensive to purchase and fuel
- Hydrogen sourcing concerns



ZEV Charging Considerations



- Cost
- Power supply (240v/480V)
- Electric rate structure
- Quantity of vehicles
- Time of use
- Sequential vs simultaneous
- Duty Cycle



Graphic from <https://www.aedesign-inc.com/blog/2021/9/23/ev-charging-101>

Real Life Examples



ZEV Duty Cycle Example



- **A fleet required trucks with 500-mile range to pick up monthly loads from a supplier, beyond the range of the battery-electric trucks they were considering.**
 - All other routes were local deliveries
 - Options include:
 - Rent a vehicle once a month
 - 3rd party carriers
 - Acquire a Hydrogen Fuel Cell Vehicle
 - Retain a legacy vehicle for occasional extended-range loads
 - Fleet elected to retain a legacy vehicle, allowing most loads to be ZEV. Legacy vehicle will be replaced when technology allows.

ZEV Adoption Challenge



- **A fleet would like to switch to ZEVs, but their utility cannot provide needed power for level 3 DCFC for 5 years.**
 - Options include:
 - Route analysis - Is DCFC really required, or would level 2 suffice? Total energy usage many not require DCFC speeds.
 - 3rd party charging - Contracting with an outside provider for charging at a publicly accessible facility.
 - Mobile/Temporary charging - Batteries and charging equipment placed on site and swapped at regular intervals.
 - Battery mediated charging – trickle charge batteries with existing connection, then use energy to fast-charge vehicles.
 - Fleet chose to partner with a 3rd party charging service.

- **A fleet uses Class 3 pickup trucks with ladder racks as maintenance vehicles and cannot find a ZEV equivalent on the market.**
 - Options include:
 - Move to a class 4+ ZEV with a utility body upfit
 - Wait for vehicles to become available
 - Switch to van bodies instead of pickups
 - Keep existing vehicles
 - Fleet elected to switch to vans, saving on operational costs allowing for additional security

- **A fleet wants to buy 5 ZEV delivery vans. How much power will they need?**
 - Vans each have 100kwh batteries and drive 50 miles per day
 - Assuming .625kWh/mile, they will consume ~31kWh each per day
 - Level 2 chargers for this van charge at 11kW
 - Charging all 5 vans at the same time would take ~3hrs and 55kW (about 250 amps at 220v)
 - Charging 2 vans at a time would take ~9 hours and 22kW (about 100 amps at 220v)
 - Level 3 charging at 50kW would take ~ 1 hour and 250kW (about 520amps at 480v)
- **Fleet chose to charge 2 vans at a time with smart chargers**
 - No electrical upgrades needed
 - Assuming \$0.30/kWh electric rates, fuel costs of \$0.19/mile or \$9.50/day
 - 15mpg diesel at \$4.50/G would be \$0.30/mile or \$15/day

Resources for Switching



Popular Incentives



- **HVIP/ISEF**
 - “Cash on the hood”
 - Increased amounts for small fleets, DAC, drayage, and more
- **Carl Moyer**
 - Requires scrapping older diesel vehicle
 - Administered by AQMD
- **VW Diesel Fund**
 - Requires scrapping older diesel vehicle
 - Stackable with HVIP
- **Tax Credits**
 - Commercial clean vehicle credit up to \$40k
 - Up to 30% for infrastructure
 - Direct pay for municipalities
- **Funding Finder**



Resources



- [HVIP Vehicle Catalog](#)
- [ZETI Tool](#)
- [TCO Tool](#)
- [PG&E MSRP List](#)
- [SCE DRPEP Tool](#)
- [Funding Finder](#)
- [CARB Regulatory Resources](#)


The screenshot shows the Cal Fleet Advisor website's Resources page. At the top left is the Cal Fleet Advisor logo. To the right is a navigation menu with links for Home, Who We Are, Get Started Today, Services, and Resources. The main heading is "Resources" in a large, bold font. Below it, the text "Free Tools" is followed by "Cal Fleet Advisor recommends:". There are two featured tools, each with a circular image and a text box. The first tool is the "Zero-Emission Technology Inventory (ZETI) Tool", which includes a description of its purpose. The second tool is the "Funding Finder", which includes a description of its purpose.


CAL FLEET ADVISOR

Home Who We Are Get Started Today Services Resources

Resources

Free Tools
Cal Fleet Advisor recommends:

 **Zero-Emission Technology Inventory (ZETI) Tool**
Use the ZETI tool, to find Class 2b-8 zero-emission vehicles available to purchase in the United States, Canada, Europe, China, India, Mexico, South America, and Oceania.

 **Funding Finder**
Use the Funding Finder tool to see medium- and heavy-duty vehicle and infrastructure funding programs that help you financially.

Access a suite of resources at: <https://calfleetadvisor.org/resources/>

Q&A

Scan Here to enroll
at no-cost today!



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HVIP CALIFORNIA



CAL FLEET ADVISOR
NAVIGATING ZERO-EMISSION TRUCKS

SIGN UP FOR FREE TODAY



www.CalFleetAdvisor.org

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