CARB ADVANCED CLEAN FLEET REGULATION

presented by
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A WORD ABOUT TERRAVERDE ENERGY

TerraVerde is a leading independent energy consulting firm proudly supporting California public agencies with the design and deployment of energy projects and programs that reduce costs, increase resiliency (backup power), and enhance sustainability. Over the past 14 years, we have supported the successful implementation of over $500 million worth of energy projects for which we provided independent technical and financial feasibility analyses, project development (competitive solicitation) support, project implementation management (overseeing design, interconnection, incentive applications, and construction), and continue to provide ongoing asset management services (performance monitoring, operations & maintenance, revenue program management, detailed energy & financial performance reporting). TerraVerde is proud to serve as ACWA's Preferred Provider for fleet electrification consulting services.

APP
ACWA Preferred Provider

Years of Experience 29

Education
BA, Economics, 1993
MBA, Business, 2003

Phil Villagomez

Senior Vice President

TerraVerde Energy, San Francisco, CA — Senior Vice President — 2020 – Present
Leads TerraVerde's Business Development efforts with a specific emphasis on supporting clients with solar & battery asset management and vehicle fleet electrification.

Shell New Energies, San Francisco, CA — Renewables& E-Mobility — 2016 – 2020
Managed Opportunity Pipeline for Global Utility Scale renewable power projects. Coordinated Greenfield Development for early-stage solar projects including real estate and permitting project tracking. Business Development Manager for E-Mobility efforts in the U.S. with specific task as product owner for a new vehicle charging APP.

Shell Projects and Technology, Houston, TX — Learning Advisor — 2012 – 2016
Developed and Coordinated online and in person training for staff at major locations around the globe.

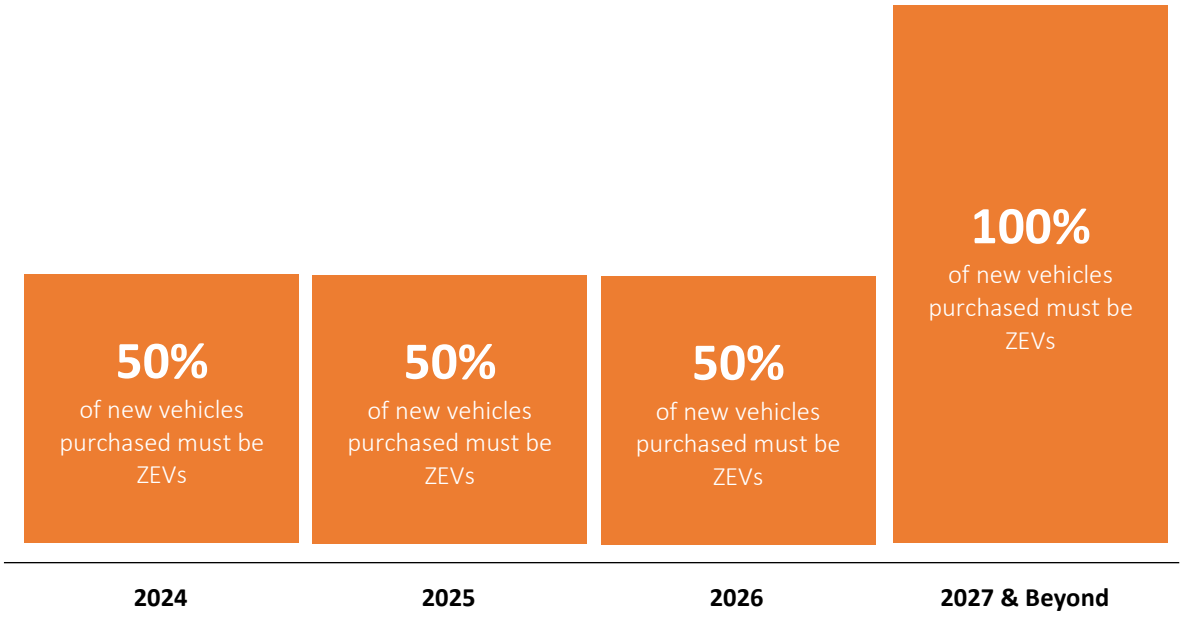
Shell Energy North America, Portland, OR — Originator — 2008 – 2012
Coordinated commodity sales for Commercial customers in the Western U.S. Managed sales pipeline and served as Account Manager for existing accounts. Planned and coordinated annual sales team meetings.

TerraVerde ENERGY

CARB'S ADVANCED CLEAN FLEETS REGULATION

The California Air Resources Board's (CARB) Advanced Clean Fleets (ACF) regulation defines requirements for public agencies (including public utilities) to purchase a specified percentage of Zero-Emission Vehicles (ZEV) as part of their new vehicle purchases. Starting in 2024, fleet owners are required to add. ZEVs per the following schedule. Starting January 1, 2024, 50% of the total number of vehicle additions to the fleet in each calendar year must be ZEVs. Starting January 1, 2027, 100% of the total number of vehicle additions to the fleet in each calendar year must be ZEVs. As an alternative, fleet managers may choose CARB's Milestone Option which de-links the obligation to integrate ZEVs from the fleet manager's new-vehicle purchase decisions, and instead, establishes a commitment to convert portions of the fleet by target dates specified by the Air Resources Board.

Default Option



Note: For agencies whose jurisdiction is solely in "Designated Low Population Counties" (Alpine, Amador, Butte, Calaveras, Colusa, Del Norte, Glenn, Humboldt, Inyo, Lake, Lassen, Mariposa, Mendocino, Modoc, Mono, Nevada, Plumas, Shasta, Sierra, Siskiyou, Sutter, Tehama, Trinity, Tuolumne, and Yuba), starting January 1, 2027, 100 percent of the total number of vehicle additions to the California fleet in each calendar year must be ZEVs.

Milestone Option

Milestone Group	10%	25%	50%	75%	100%
G1 box trucks, vans, buses with two axles, and yard tractors	2025	2028	2031	2033	2035 onward
G2 pickup trucks, work trucks[1], day cab tractors, buses with three axles	2027	2030	2033	2036	2039 onward
G3 specialty vehicles[2], sleeper cab tractors	2030	2033	2036	2039	2042 onward

[1] "Work Trucks": "…a vehicle that does not meet any of the definitions of box truck, van, bus, light-duty package delivery vehicle, day cab tractor, sleeper cab tractor, or specialty vehicle." as per, Advanced Clean Fleets Regulation, High Priority and Federal Fleets Requirements, Final Regulation Order, Attachment A-2 § 2015(b)(H)

[2] "Specialty Vehicle": GVWR greater than 33,000 lbs. as per Advanced Clean Fleets Regulation, Final Regulation Order, Attachment A-2, High Priority and Federal Fleets Requirements, § 2015(b)(A)

A ROADMAP FOR FLEET ELECTRIFICATION

Compliance Planning for CARB's Advanced Clean Fleets Regulation

- Assemble required content for Apr. 2024 CARB reporting
- Identify vehicle & charging requirements (kWh & kW)
- Assess rough order of magnitude (ROM) costs and available incentive funding sources
- Map out initial schedule & plan

Deployment Planning for initial wave of electric vehicles & charging equipment

- Select vehicles & charging equipment
- Charging site design (quantity, power, location & features)
- Assess charge management solutions, rate optimization opportunities, solar PV & battery opportunities
- Initiate utility & contractor coordination

Site & Team Prep for effective operational integration

- Complete hardscape & electrical infrastructure upgrades
- install charging equipment and signage
- Integrate systems: vehicle, charging and building energy management (as needed)
- Organize and conduct training: employees, public, maintenance staff (as needed)

Operations of your electric vehicle fleet

- Monitor vehicle and charging equipment performance, ensure timely maintenance, and minimize utility costs
- Ongoing training
- LCFS revenue generation

ACF FLEET COMPLIANCE PLANS SHOULD INCLUDE

- ☑ ZEV Transition Schedule & Costs
- ☑ Available Incentives Funding Sources
- ☑ Key Findings from Detailed Assessment
- ☑ Considerations for Next Steps

PLANNING FOR FLEET ZERO EMISSION TRANSITIONS

your Agency should start with a clear, actionable assessment of your options, costs, challenges, and opportunities, that enables your team to take an intelligent, risk-mitigated approach to fleet electrification.

ELECTRIC VEHICLE OPTION ASSESSMENT	• Evaluate vehicles by weight Class, purpose, drive and duty-cycles, PTO use (the foundation of ZEV and ZEV infrastructure planning) • Identify "available" ZEV options and costs (GVWR, kWh, operational capability) and potential exemptions • Map out ZEV and ZEV infrastructure deployment timeline
DETERMINE CHARGING REQUIREMENTS & COSTS	• High-level site evaluation (specify required electrical capacity, proximity of parking areas and parking durations) • Specify charging equipment requirements: kW rating, functional features and ROM costs • Quantify vehicle electricity consumption and costs in accordance with available utility rates
INCENTIVES & FUNDING SOURCES ASSESSMENT	• Identify available incentive funding sources (e.g., HVIP, utility programs, tax credits) • Assess revenue opportunities from the Low-Carbon Fuel Standard (LCFS) credit program

SEEK ASSISTANCE IN FLEET PLANNING

Market-Leading Expertise | Search for firms with a deep understanding of the California regulatory compliance requirements, equipment options & costs, incentives & fundings sources, and revenue opportunities

Independent Advisors | Search for firms with an objective perspective for your agency as you consider the road ahead for your fleet electrification journey

Proven Track Record Serving Public Agencies | Search for firms that know California public agencies

Our Director of Fleet Electrification

Years of Experience 20

Education
BS, Marketing
MBA, Business

Matt Zerega

Director, Fleet Electrification

TerraVerde Energy, San Francisco, CA — Director, Fleet Electrification — 2022 – Present
Provides technical leadership to TerraVerde fleet electrification support services team, assisting fleet owners and operators to establish and implement intelligent, risk-mitigated approaches to transitioning to zero emission vehicles.

Energy & Utilities Consultant, Morro Bay, CA — 2018 – 2022
Provided technical and financial analysis, strategy, and new product development services, focused on transportation electrification, charging infrastructure, carbon-free energy generation and climate action.

Shell, San Diego, CA — US Technical Lead, E-Mobility — 2016 – 2018
Provided expert guidance to a multi-national team. Guided and conducted U.S. market assessment., Provided regulatory and strategic guidance, new product design expertise, and development and deployment guidance and support. Identified and led effort to secure pilot commercial-deployment site.

Liberty PlugIns, San Diego, CA — Operations Manager — 2014 – 2016
Built and managed team dedicated to the design, manufacture, and sale of plug-in vehicle infrastructure and hosted transaction processing services (for EV infrastructure start-up). Increased sales by over 400 percent through development of new messaging and accurate, complete understanding of context-specific value. Primary contributor to securing the company's largest single round of financing.

SDG&E, San Diego, CA — Clean Transportation Lead — 2009 – 2014
Led design, development and deployment of new EV-charging equipment and services throughout SDG&E service territory; drove early-stage utility economics analysis and new rate designs to comply with tariffs while maximizing value for customers. Developed new concepts, models and forecasts underlying SDG&E's General Rate Case and Power Your Drive EV-infrastructure program.