



# Fiscal Year 2019-20 Low Carbon Transportation Investments Zero-Emission Drayage Truck and Infrastructure Pilot Project

## List of Applications Received

March 17, 2021



The Zero-Emission Drayage Truck and Infrastructure Pilot Project solicitation was open for applications from November 19, 2020 through February 16, 2021. Solicitation materials are available online at: <https://ww2.arb.ca.gov/our-work/programs/low-carbon-transportation-investments-and-air-quality-improvement-program/low>.

Applicant information listed below is in alphabetical order.

Applicant	Project Title	Location	Disadvantaged Community?	Funding Requested
California Hispanic Chamber of Commerce Foundation (CHCCF)	Gonzalez Logistics, Inc. (GLI) Electrification	Los Angeles	Yes	\$22,755,014.00
Center for Transportation and the Environment (CTE)	NorCAL Drayage	Oakland	Yes	\$21,878,132.00
San Diego Air Pollution Control District (SDAPCD)	Zero-Emission Drayage Truck Infrastructure Pilot Project	San Diego	No	\$14,278,609.00
San Joaquin Valley Air Pollution Control District (SJVAPCD)	Grocery Operations for Carbon Emission Reductions (GROCER)	Tracy/Sacramento	Yes	\$23,422,298.00
San Joaquin Valley Air Pollution Control District (SJVAPCD)	South-Central Fresno Pepsi Delivery Truck Electrification	Fresno	Yes	\$12,150,710.00
South Coast Air Quality Management District (SCAQMD)	California Joint Electric Truck Scaling Initiative (JETSII)	South El Monte	Yes	\$26,984,271.05
University of California, Riverside (UCR)	Fully Zero: Achieving a Fossil Free Future in Goods Movement	San Francisco Bay Area	Yes	\$29,127,408.00

Project summaries are provided by applicants and are not reviewed, edited, or endorsed by the California Air Resources Board.

## **ATTACHMENT 1. Project Executive Summary**

GLI Electrification is a project to deploy 50 on-road heavy-duty Class 8 zero-emission battery electric drayage trucks at Gonzalez Logistics, Inc. (GLI) located at 2221 E Washington Blvd, Los Angeles CA 90021. The Lead Applicant for this project is The California Hispanic Chamber of Commerce Foundation (CHCCF). The goal of this project is to deploy 50 Lion8T electric drayage trucks, manufactured and delivered by The Lion Electric Co. (Lion), and 50 direct-current fast charge (DCFC) charging stations manufactured by Nuvve, at or near the GLI headquarters in Los Angeles, to demonstrate the feasibility of large electric truck deployments within a single fleet and at a single site. The project will also include workforce development activities to support job training and job creation among the local residents and community surrounding the site where the trucks will be deployed. In addition, community engagement activities and programs will ensure involvement of the local community in the implementation and evaluation of the project and its successes. GLI is located in a disadvantaged community (DAC) within the 90-95<sup>th</sup> percentile for DAC scoring on the CARB Disadvantaged and Low-Income Community Map. This project will provide the following benefits to this disadvantaged community: the local community will see an increase in the amount of goods moved by zero-emission trucks, which will improve air quality and reduce emissions in the immediate environment, and will bring opportunities for community engagement, skill building, and job training for members of the community who are interested in careers in the clean truck industry. Outcomes of this project include an increase in job creation and retention, increased community engagement and education (including awareness about electric trucks), and increased economic activity in the immediate area, all while improving local air quality. Major project partners include GLI, Lion, the California Mobility Center, Nuvve, the Los Angeles Department of Water and Power, and one or more local community-based organizations. The total project cost is \$46,867,701. The total requested funding amount is \$22,755,014. The total match funding to be contributed to this project is \$24,112,687. The total expected emissions reductions from the entire project include 86 t-CO<sub>2</sub>e/year per truck for greenhouse gases; 0.0013 ton/year per truck for toxic air contaminant emissions; and 0.0243 ton/year per truck for criteria pollutants.

## **Attachment 2 – Project Executive Summary**

**Applicant:** Center for Transportation and the Environment (CTE)

**Project Technology Demonstrator:** Hyundai Motor Co.; FirstElement Fuel

**Project Title:** NorCAL Drayage

**Project Objectives:**

1. Deploy 30 Hyundai XCIENT Class 8 fuel cell electric trucks (FCET) to northern California
2. Install and operate a high-capacity/throughput liquid hydrogen fueling station near Port of Oakland

**Project Description:**

CTE assembled a project team to deploy 30 Hyundai XCIENT Class 8 FCETs to the US market. The trucks will be deployed in northern California and domiciled near the Port of Oakland. The project will also establish a high capacity and high throughput liquid hydrogen fueling station, built and operated by FirstElement Fuel, that will support more than 50 trucks and back-to-back fueling, with the expectation of completing a single 60-kg fill in less than 15 minutes.

The range of these trucks is 500 miles, and they can thus complete multiple duty cycles. The trucks will be able to operate from Oakland to Sacramento, Stockton, Modesto, and Fresno on a single fill of hydrogen. Trucks will also be able to operate as far as Bakersfield and return to Oakland in a single day because FirstElement Fuel has a truck refueling station in Fresno. The capabilities of the Hyundai trucks match the needs of the fleet operator, Glovis. Glovis handles auto parts and full vehicle shipping for many automotive OEMs and is a strong proponent of zero-emission logistics.

The proposed site for domiciling the vehicles and the primary fueling station are both located in Census Tract 6001401700, which is classified as a Disadvantaged Community. Routes in the three primary corridors that the trucks will travel on pass through disadvantaged communities and will thus contribute to reduced emissions in these communities.

The NorCAL project is seeking less than half the available CARB and CEC grant funds. This will allow for two projects, one in northern California, and the other in southern California, featuring multiple zero-emission technologies, multiple OEMs, and multiple statewide locations.

**DAC Benefits:** Yes

**Technologies deployed:** Hyundai XCIENT Class 8 FCETs; High capacity/throughput liquid hydrogen fueling station

**Potential benefits and outcomes:**

- Competitive entry of a Class 8 FCET, commercially available in Europe, from a global OEM into the California market.
- Proven range of 500 miles on a single hydrogen fill, a payload of 40,000 lbs. to achieve duty cycles, and the ability to refill a truck in 10–15 minutes allowing multiple 24-hour shifts.
- Co-locating hydrogen fueling station adjacent to a major port enabling expanded use of FCET by drayage fleet operators.
- Providing emission benefits to the West Oakland community.
- FirstElement Fuel’s network of heavy-duty fueling stations with fast-fill capabilities.

**Major project partners:** Hyundai Motor Company; Glovis America; FirstElement Fuel (FEF); NorCal Kenworth; Macquarie Group Limited; Fiedler Group; University of California, Berkeley; West Oakland Indicators Project

**Total project cost: \$54,581,953**

**Requested funding: \$21,878,132**

**Match amounts proposed: \$32,703,821**

**Expected emission reductions:**

	Per Truck	Project Entirety
GHG	135.34 metric tons CO2e/year	4,060 metric tons CO2e/year
Criteria & Toxic Pollutants	0.073 tons	2.19 tons WER/year

## **ATTACHMENT 2: PROJECT EXECUTIVE SUMMARY**

### **NAME OF THE APPLICANT**

San Diego Air Pollution Control District (SDAPCD)

### **PROJECT TECHNOLOGY DEMONSTRATOR(S)**

Class 8 Battery Electric Vehicle (BEV) and Class 8 Fuel Cell Electric Vehicle (FCEV) with associated charging/refueling infrastructure

### **PROJECT TITLE**

Zero-Emission Drayage Truck Infrastructure Pilot Project

### **OBJECTIVES OF THE PROJECT**

Project objectives are aligned with those stated in the solicitation and SDAPCD's aim to constantly improve air quality:

- Advance zero emission technology for Class 8 on-highway trucks focused on regional haul **and** drayage type operations, particularly in the San Diego region and along the US/Mexico border.
- Collect meaningful operational data to better understand fleet dynamics and impacts on associated infrastructure when deploying a large fleet from a single location under single operational control
- Provide maximum benefits to disadvantaged communities both in the quality of environment improvements and direct economic benefits
- Train the workforce of the future to prepare for increased usage of zero emission vehicles

### **DESCRIPTION OF THE PROJECT**

SDAPCD has brought together a team to deploy a commercial fleet of 53 Class 8 tractors comprising 45 BEV and 5 FCEV (plus three back-up tractors) paired with dedicated refueling infrastructure and operating out of a secured central fleet site. This committed, U.S. owned and operated expert team cooperated to prepare a fully aligned scope, schedule, and budget that ensure that the project is low risk and that stated objectives are achieved. The partner fleet operates across a spectrum of regional, drayage and cartage haul routes, including routes in and through disadvantaged communities, offering a beneficial mix of 18 months of data across vehicle type and duty cycle, and shall remain in operation after project completion. The project results in training and job creation for fleet staff as well as broader opportunities for community education regarding zero emission vehicles.

### **LOCATED IN OR PROVIDING BENEFIT TO DISADVANTAGED OR LOW-INCOME COMMUNITIES**

Zero emission vehicles operating in disadvantaged communities within San Diego and South Coast Air Basins.

### **TECHNOLOGIES TO BE UTILIZED AND SUPPORTING INFRASTRUCTURE**

International® RH Series BEV with supporting EV charging infrastructure, RH Series FCEV with supporting hydrogen fuel infrastructure.

CALSTART and Navistar in-truck and fueling infrastructure data collection analysis technologies

**POTENTIAL BENEFITS AND OUTCOMES**

Potential benefits and outcomes include:

- Ability to compare electric and fuel cell vehicles operating out of single location
- Ability to ascertain impact of large zero emission fleet on the local San Diego environment
- Ability to collect data over multiple drayage and regional haul routes
- Replacement of existing diesel trucks

**MAJOR PROJECT PARTNERS (INCLUDING MAJOR SUBCONTRACTORS)**

CALSTART	Data Collection and Analysis
Casa Familiar	Community Based Organization
Duran Freight Corporation	End User/Fleet Operator
In-Charge Energy	Battery Electric Charging Infrastructure
Navistar International Corporation	ZEV Class-8 Truck Provider
OneH2	Fuel Cell Infrastructure and Hydrogen Provider
San Diego Gas & Electric	Electrical Infrastructure and Electricity Provider

**TOTAL PROJECT COST**

\$29,664,378

**REQUESTED FUNDING AMOUNT**

\$14,278,609

**MATCH AMOUNTS PROPOSED**

\$15,385,769

**EXPECTED EMISSION REDUCTIONS FROM THE ENTIRE PROJECT IN CRITERIA; TOXIC AND GHG**

2,158 metric tons CO<sub>2</sub>e per year

1.645 weighted tons criteria pollutants per year

**GROCERY OPERATIONS  
FOR CARBON EMISSIONS REDUCTIONS  
(GROCER) PROJECT**



**EXECUTIVE  
SUMMARY  
GFO-20-606**

San Joaquin Valley Air Pollution Control District (SJVAPCD) seeks funding for the **GRocery Operations for Carbon Emission Reductions (GROCER) Project. Partnering with the Bay Area Air Quality Management District (BAAQMD) and Sacramento Metropolitan Air Quality Management District (SMAQMD), we are proposing a groundbreaking collaboration between three prominent Air Districts to bring zero-emission transport solutions to Northern California.**

# PROJECT TEAM



ELECTRIC

**SJVAPCD, BAAQMD, & SMAQMD** – The Northern California Megaregion’s leading Air Districts delivering successful emissions reductions for their communities—historic collaboration supporting this unique regional project proposal.

**Volvo Trucks North America and Volvo Technology of America** – the first OEM to bring battery-electric Class 8 tractors to commercial production, and partner in the successful Volvo Low Impact Heavy Duty Solutions (LIGHTS).

**Albertsons Companies, Inc.** – the third-largest grocery chain in the world, with over 1100 trucks in their US fleet.

**Burns & McDonnell** – a globally recognized engineering firm, with class-leading expertise in charging infrastructure solutions.

Regional, local, and hyper-local **workforce development and community-based organizations**: EVITP, California Mobility Center, Valley Vision, ChargerHelp!, Opportunity Stanislaus, New Voices Are Rising, Valley Vision, and Environmental Justice Project.

**Momentum** – one of the leading grant administrators and technology transfer organizations in California.



# TECHNICAL MERITS & BROADER IMPACTS

The GRO CER project is a beachhead program with the objectives of demonstrating a deployment of a large fleet of Class 8 electric trucks to meet the needs of a dynamically routed regional haul distribution operation. The fleet of 50 Class 8 electric trucks will service a 20,000 square-mile area, benefiting priority populations in disadvantaged and low-income communities. The project will contribute to the regional economies, bolster workforce development, and create jobs.

Additionally, GRO CER will deploy some of the most cutting-edge technologies commercially available—examining containerized modular charging infrastructure, affordable charging solutions such as AC charging, advanced charge point management software, and fleet management integration for seamless operations and maximum uptime. A separate effort plans to examine zero-emission TRUs in alignment with an ongoing test program at Albertsons.



# PROJECT PLANS

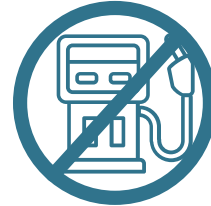
SJVAPCD requests \$23,422,298 from the California Energy Commission and California Air Resources Board. The Project Team has committed \$28,874,289 in match—55.9% of the Project’s \$52,296,587 total cost.

The Project Team has performed exceptional due diligence on equipment lead times to ensure expedited infrastructure deployment and will deliver a full 24 months of data collection. To enhance project cost-efficiency, it is proposed to select a “Charging-as-a-Service” provider, who will purchase, own, and operate the chargers.

Competitive bidding will be used for selecting equipment and service providers, including insurance for the trucks and construction program, the provision of zero-carbon electricity, charge point management software, and uptime license agreements.

The Project Team has support from 16+ elected officials and plans an unprecedented workforce development and community engagement effort to prepare the Northern California Megaregion for the future of goods movement, **directly advancing the clean air agenda in the region.**

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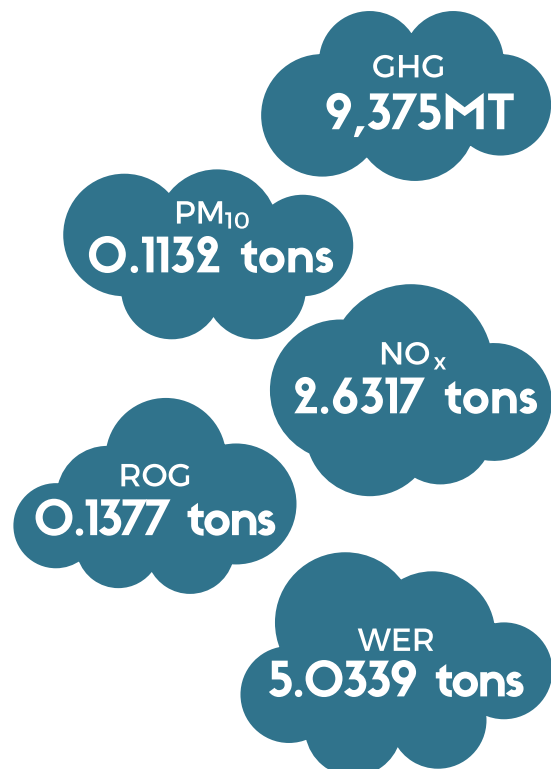


Gallons of Diesel  
Avoided



Renewable  
Electricity

## Yearly Reductions Of:



## Attachment 2: Executive Project Summary

**Project Title:** South-Central Fresno Pepsi Delivery Truck Electrification

**Requested Funding Amount:** \$13,150,710

**Total Project Cost and Match Amount:** \$26,303,710

**Applicant:** San Joaquin Valley Air Pollution Control District

**Industry Partners:** Bottling Group, LLC, New Bern Transport Corporation, CALSTART, Inc., Tesla

**End User/Demonstrator:** New Bern Transport Corporation and Bottling Group, LLC (collectively, Pepsi)

**Emissions Reductions:** 2,145 MT CO<sub>2</sub>e/year GHG reductions; 1.3 tons/year of criteria pollutants.

**Project Overview:** To protect public health and reduce the impacts of climate change, the San Joaquin Valley Air Pollution Control District (SJVAPCD/District) has partnered with Bottling Group, LLC (BGLLC) and New Bern Transport Corporation (New Bern) (collectively, Pepsi), which are operating subsidiaries of PepsiCo, Inc. (PepsiCo), along with CALSTART, Inc. (CALSTART) for the implementation of the *South-Central Fresno Pepsi Delivery Truck Electrification* (Project) located at the Fresno bottling facility at 1150 E. North Ave, Fresno, CA (Site) which is owned and operated by BGLLC.

The objective of this Project is to deploy 50 Tesla Semis, which are battery-electric, zero-emission, Class 8 trucks (ZEVs); install electric vehicle supply equipment (EVSE) with 8 700+ kilowatt (kW) DC-fast charging Megawatt Charging System (MCS) connectors and a battery energy storage solution (BESS); and develop alternative fuel vehicle workforce training opportunities in South-Central Fresno. The Project will demonstrate the ability of a large fleet to transition from fossil-fuel to zero-emission, goods delivery. The ZEVs will operate as local delivery trucks in and around South-Central Fresno and provide reduction of greenhouse gas (GHG) and criteria pollutant emissions in this disproportionately, impacted region.

This project is located within a designated AB617 Community and aligns directly with the communities' Community Emission Reduction Plan (CERP). The CERP outlines the community members direct input on what emission reductions activity they want to see occur. The deployment of zero emission heavy-duty trucks was identified by the South Central Community as a high priority CERP measure. Additionally, the project site is designated by CalEnviroScreen 3.0 in the 97th percentile for worst pollution burden and highest poverty in the State.

The Project seeks to reduce over 2,145 metric tons of GHG emissions, annually, within this region heavily burdened by poor air quality while reducing dependence on fossil fuels, demonstrating regional haul trucking capabilities utilizing battery-electric technologies, and accelerating market adoption and commercialization of HD ZEVs. It is expected that this project will result in dynamic workforce training for 100 Pepsi employees as a direct result of project implementation, with over 100 students developing skills in the field of electric trucks and infrastructure maintenance annually. The Project supports PepsiCo's global goal to reduce GHG emissions by 75% by 2030 and achieve carbon neutrality by 2040.

## Attachment 2: Project Executive Summary

**Applicant:** South Coast Air Quality Management District (South Coast AQMD)

**Technology Demonstrators:** NFI Interactive Logistics, Inc. (NFI) and Schneider National, Inc. (Schneider)

**Project Title:** California Joint Electric Truck Scaling Initiative (JETSII)

**Objectives:** The project's objective is to demonstrate the ability for fleets to effectively operate heavy-duty battery electric vehicles (BETs), charging infrastructure (EVSE), and distributed energy resource (DER) technologies at scale. The project will enable NFI to be the first 100% BET fleet operator in California, and deploying 50 BETs in South El Monte will prepare Schneider to electrify its other sites, such as San Bernardino.

**Description:** JETSII will deploy 100 BETs and install 50 chargers at two sites. The project will provide 5 megawatt-hour (MWh) of battery energy storage and 1 MW of renewable solar power generation at NFI's facility.

**Disadvantaged Communities:** The BETs will domicile in disadvantaged communities (DACs) at NFI and Schneider's facilities in Ontario and South El Monte, respectively. The BETs will operate primarily in DACs to deliver goods to the ports, railyards, and distribution centers. The 100 BETs will displace 690,000 gallons of diesel fuel annually in these communities.

**Technologies:** 80 Daimler Truck North America (DTNA) eCascadia and 20 Volvo Trucks North America (Volvo) VNRe BETs. 20 Volvo VNRe BETs and 50 DTNA eCascadias will be used in drayage applications, and 30 Daimler eCascadias will be used in regional haul applications.

**Benefits and Outcomes:** JETSII invests \$73.8 million into the region. 420 indirect and induced jobs will be created for construction, and 239 will be directly employed for equipment maintenance and operation. Lessons learned and efficiencies gained will allow other fleets to approach electrification more easily and at a lower price point.

**Project Partners:** The project team includes: South Coast AQMD (project administrator), NFI (fleet); Schneider (fleet); DTNA (OEM); Volvo (OEM); Power Electronics (EVSE coordination); Electrify Commercial (EVSE coordination); Black & Veatch (EVSE installer); Clear Blue Technologies Group (EVSE installer); Coalition for Clean Air (CBO for DAC outreach); Gladstein, Neandross & Associates (communications, ZEV workforce plan, and reporting); Electric Power Research Institute (charging performance analysis); Los Angeles Clean Tech Incubator (ZEV workforce plan, cleantech startup meetings); Ricardo (BET data collection); CALSTART (EVSE data collection), University of California Riverside (Eco-Routing), Southern California Edison (SCE), Green Paradigm Consulting, Inc. (administrative support) and Mobile Source Air Pollution Reduction Review Committee (MSRC), Port of Long Beach (POLB) and Port of Los Angeles (POLA) as technical advisors and funding agency partners.

**Total Project Cost:** \$73,808,955.27

**Funding Requested:** \$26,984,271.05

**Match Funding:** Total match funding for the project is \$46.82 million. Match funding is provided by South Coast AQMD (\$5.397 million); MSRC (\$8 million); San Pedro Bay Ports (\$3 million); NFI (\$16.77 million); Schneider (\$8.65 million); and SCE (\$5 million).

**Emission Reductions:** JETSII will provide 5.00 weighted tons of NO<sub>x</sub>, ROG, and PM 10 emission reductions annually or 40.00 tons over eight years. JETSII will provide 8,247 metric tonnes of GHG reductions annually or 65,979.76 metric tonnes of GHG over eight years.

## **Attachment 2**

### **PROJECT EXECUTIVE SUMMARY**

The proposed Project named Fully Zero: Achieving a Fossil Free Future in Goods Movement, aims to deploy 50 hydrogen cell electric Class 8 heavy-duty vehicles to replace 50 existing diesel fueled heavy-duty vehicles in Amazon's fleet. The Project will also deploy a hydrogen refueling station (HRS) utilizing low-carbon intensity hydrogen, to support the operation of the zero emission vehicle (ZEV) fleet.

The Regents of the University of California, Riverside, serving as the prime applicant, will manage the Project and team consisting of HYZON Motors Inc. as a fuel cell electric truck (FCET) provider, Shell as the HRS developer, owner, and operator, Amazon Logistics, Inc. as fleet owner and operator, California Truck Centers as maintenance and service provider, and West Oakland Environmental Indicators Project as community-based organization.

The hydrogen FCETs developed by HYZON provide a longer range (342 miles) compared to other ZEVs available, such as battery electric trucks, thereby providing zero compromise and enabling Amazon's drivers to capture a larger percentage of available routes in network on a daily basis. The proposed HRS will have the capacity of fueling 9 trucks in 1 hour with 50 kg of hydrogen each. During the term of the Project grant agreement, Shell will supply hydrogen to the proposed HRS from low-carbon intensity hydrogen production facilities, using an efficient "trailer-swap" mode of operation.

The 50 HYZON hydrogen FCET, HRS and hydrogen supplied will directly benefit California low-income, disadvantage communities (DACs), and tribal lands by advancing the commercialization of zero-emission, heavy-duty vehicles, which disproportionately impact air quality in these communities and are the largest contributors to greenhouse gas (GHG) emissions and criteria emissions in the transport sector. Specifically, the proposed Amazon truck routes and HRS at the Port of Oakland will replace diesel trucks driving through low-income and DACs, while providing convenient access to reliable and cost advantaged hydrogen fuel to the community of Oakland.

The fleet of 50 FCET will provide environmental benefits to communities in the San Francisco Bay Area that will help alleviate concentrated air pollution in dense urban areas where warehouses and distribution centers directly impact low-income and DACs.

The proposed HRS is expected to deliver significant emissions savings by displacing diesel fuel combustion in high-emitting drayage and regional haul trucks. The predicted well-to-wheels GHG emissions savings from replacing diesel fuel combustion with the hydrogen fuel cell-powered trucks is projected to be 9,888.23 metric tons CO<sub>2</sub>e per year, and 6.11 metric tons criteria pollutants per year. Over the 10-year useful life for each vehicle and piece equipment, the greenhouse gas emissions savings are 98,882.34 metric tons CO<sub>2</sub>e, and 34.989 metric tons criteria pollutants, consisting of 31.943 tons NO<sub>x</sub>, 1.671 tons ROG, 1.374 tons PM<sub>10</sub>.

## **Attachment 2 PROJECT EXECUTIVE SUMMARY**

The proposed Project total budget is \$64,658,730. The amount requested from the California Energy Commission is \$12,104,306, while the amount requested from the California Air Resources Board is \$17,023,102. Total Matching Funds are committed at the level of \$35,531,322, equal to 54.95% of the total budget.