



**CALIFORNIA
ENERGY COMMISSION**



**CALIFORNIA
NATURAL
RESOURCES
AGENCY**

California Energy Commission

STAFF REPORT

Localized Health Impacts Report

**Projects Awarded Funding Under Solicitation
GFO-22-502 Innovative Hydrogen Refueling
Solutions for Heavy Transport**

October 2023 | CEC-600-2023-059



California Energy Commission

Jana McKinny
Primary Author

Jamaica Gentry
Esther Odufuwa
Daniel Siu
Commission Agreement Managers

Charles Smith
Branch Manager
TRANSPORTATION INTEGRATION AND PRODUCTION BRANCH

Hannon Rasool
Director
FUELS AND TRANSPORTATION DIVISION

Drew Bohan
Executive Director

DISCLAIMER

Staff members of the California Energy Commission (CEC) prepared this report. As such, it does not necessarily represent the views of the CEC, its employees, or the State of California. The CEC, the State of California, its employees, contractors, and subcontractors make no warrant, express or implied, and assume no legal liability for the information in this report; nor does any party represent that the uses of this information will not infringe upon privately owned rights. This report has not been approved or disapproved by the CEC nor has the Commission passed upon the accuracy or adequacy of the information in this report.

PREFACE

This Localized Health Impacts Report (LHI Report) assesses the local health impacts from projects proposed to receive Clean Transportation Program (CTP) or similar funding. Preventing or minimizing health risks from pollution is vital in any community, but especially in those that are at high risk due to preexisting poor air quality and other factors. Environmental justice (EJ) communities, low-income communities, and minority communities are considered the most impacted by any project that could increase air pollution. Therefore, they are considered “high-risk communities.” This LHI Report:

- Identifies proposed projects located in high-risk communities.
- Analyzes the potential health impacts to communities from project-related emissions or pollution, based on information submitted by the project awardees.
- Describes the plans for community outreach for each project.

Assembly Bill 118 (Núñez, Chapter 750, Statutes of 2007), which created the CTP, also directed the California Air Resources Board (CARB) to develop guidelines to ensure the CTP improves air quality. CARB’s *AB 118 Air Quality Guidelines*, approved in 2008, are published in the California Code of Regulations (CCR), Title 13, Motor Vehicles, Chapter 8.1. Those guidelines require the CEC to issue LHI Reports (13 CCR Section 2343):

“(6) Localized health impacts must be considered when selecting projects for funding. The funding agency must consider environmental justice consistent with state law and complete the following:

“(A) For each fiscal year, the funding agency must publish a staff report for review and comment by the public at least 30 calendar days prior to approval of projects. The report must analyze the aggregate locations of the funded projects, analyze the impacts in communities with the most significant exposure to air contaminants or localized air contaminants, or both, including, but not limited to, communities of minority populations or low-income populations, and identify agency outreach to community groups and other affected stakeholders.

“(B) Projects must be selected and approved for funding in a publicly noticed meeting.”

In addition, the CEC issues LHI Reports for certain projects that are similar to CTP projects but do not receive CTP funding.

The CEC publishes this LHI Report at least 30 days before approving projects at a publicly noticed meeting. This report includes projects that may require a conditional-use permit, discretionary permit, or California Environmental Quality Act (CEQA) review. The CEC interprets “permits” to suggest discretionary and conditional-use permits, because they require a review of potential impacts to communities and the environment before issuance. Since ministerial-level permits do not review public health–related pollutants, CEC staff does not assess projects requiring only ministerial-level permits in this report.

ABSTRACT

This Localized Health Impacts Report describes the potential health impacts to communities from projects seeking California Energy Commission (CEC) funding under Grant Solicitation GFO-22-502. This grant initiative seeks to develop and demonstrate innovative hydrogen refueling solutions to support the decarbonization of emerging medium-duty and heavy-duty on-road and off-road vehicle applications, reduce hydrogen delivery and refueling costs, improve reliability, enable higher fill rates, and minimize energy losses. Under California Code of Regulations Title 13, Section 2343, this report is available for public comment for 30 days before projects can be approved at a publicly noticed business meeting.

CEC staff has proposed three projects for Clean Transportation Program grant funding awards under Solicitation GFO-22-502 Project Group 3 — MDHD On-Road Vehicles. Based on project site information provided by the awardees, two of the five communities (Palm Springs and Victorville) where these projects are located are considered high-risk communities. Staff does not anticipate a net increase in the pollution burden for the communities where these projects are located.

Keywords: Air pollution, California Air Resources Board (CARB), Assembly Bill (AB) 118, California Environmental Quality Act (CEQA), hydrogen refueling station (HRS), fuel cell electric vehicle (FCEV), environmental justice (EJ) indicators, Environmental Justice Screening Method (EJSM), localized health impacts (LHI)

Please use the following citation for this report:

McKinny, Jana. October 2023. *Localized Health Impacts Report: Projects Awarded Funding Under Solicitation GFO-22-502 — Innovative Hydrogen Refueling Solutions for Heavy Transport*. California Energy Commission. Publication Number: CEC-600-2023-059.

TABLE OF CONTENTS

	Page
Preface	i
Abstract.....	.iii
Table of Contents	v
List of Tables.....	.vi
Executive Summary	1
CHAPTER 1: Projects Proposed for Funding.....	3
Background	3
Projects Selected	3
Table 1: Project Details With EJ Indicators	4
Public Comment.....	4
CHAPTER 2: Project Descriptions	6
FirstElement Fuel, Inc.	6
Stratosfuel, Inc.	6
Table 2: Estimated Pollutant Emissions From Hydrogen Generation (lbs/day)	7
ZEV Station	8
Table 3: Operational Emissions (lbs/day).....	8
CHAPTER 3: Location Analysis	9
Part 1: Environmental Standard	9
Part 2: Demographic Standard	9
Analysis Results	10
Table 4: EJ Indicators by Project Location City Demographic	10
Summary	11
Glossary.....	12

LIST OF TABLES

Page

Table 1: Project Details With EJ Indicators.....	4
Table 2: Estimated Pollutant Emissions From Hydrogen Generation (lbs/day)	7
Table 3: Operational Emissions (lbs/day)	8
Table 4: EJ Indicators by Project Location City Demographic.....	10

EXECUTIVE SUMMARY

The California Energy Commission's (CEC's) Clean Transportation Program provides funding to support innovation and accelerate the development and implementation of advanced transportation and fuel technologies. The CEC also provides funding from programs that are similar to but separate from the Clean Transportation Program. An example of a similar program is the funding described in Section 74 of the Budget Act of 2021 (Senate Bill 129, Skinner, Chapter 69, Statutes of 2021).

Under California Code of Regulations Title 13, Section 2343, this Localized Health Impacts Report describes certain GFO-22-502 projects proposed for funding that may require certain kinds of permits or environmental review. The CEC is required to assess the local health impacts of projects proposed for Clean Transportation Program funding. Solicitation GFO-22-502 projects are split into several groups. This report assesses only projects under Project Group 3 (MDHD On-Road Vehicles). Project Group 1 (Mobile Off-Road Equipment) and Project Group 2 (Emerging Applications) are funded by the Gas Research and Development Program; localized health impacts of Group 1 and 2 projects are not required to be evaluated in this report.

This report focuses on how project-related emissions or pollution could affect community health. Environmental justice communities, low-income communities, and minority communities are at higher risk of harm from pollution. Project locations in these communities are considered "high-risk community project locations." CEC staff identifies high-risk communities using a combination of demographic and environmental data. Environmental data for air quality come from the California Air Resources Board. Demographic data are from the U.S. Census Bureau and the California Employment Development Department.

CEC staff proposes three projects for Clean Transportation Program grant funding awards under Solicitation GFO-22-502, titled "Innovative Hydrogen Refueling Solutions for Heavy Transport." This initiative seeks to advance innovative hydrogen refueling solutions to support fuel cell electric vehicle (FCEV) technologies in emerging heavy-duty on-road and off-road sectors. Project Group 3 (MDHD On-Road Vehicles) specifically applies to trucks, buses, and multi-modal solutions that support both medium- and heavy-duty on-road vehicles and other end-uses with shared equipment. Staff analyzed localized health impact information submitted by the three project awardees FirstElement Fuel, Stratosfuel, and ZEV Station.

Based on project site information provided by the awardees, two of the five communities (Palm Springs and Victorville) where proposed projects are located meet the environmental standard and demographic standard by meeting at least two of the environmental justice indicators thresholds and are considered high-risk. Community members near the proposed project sites may be at a higher risk of negative health impacts from pollution. However, staff does not anticipate a net increase in the pollution burden for the communities where these projects are located. Instead, staff expects the projects to result in a net benefit for the surrounding communities, by expanded supply of publicly available hydrogen refueling stations and reducing harmful criteria air pollutants.

CHAPTER 1:

Projects Proposed for Funding

Background

Assembly Bill (AB) 118 (Núñez, Chapter 750, Statutes of 2007) created the Clean Transportation Program (CTP). AB 118, amended by Assembly Bill 109 (Núñez, Chapter 313, Statutes of 2008), authorizes the CEC to “develop and deploy innovative technologies that transform California’s fuel and vehicle types to help attain the state’s climate change policies.” AB 8 (Perea, Chapter 401, Statutes of 2013) reauthorizes the CTP to January 1, 2024.

Section 74 of the Budget Act of 2021 (Senate Bill 129, Skinner, Chapter 69, Statutes of 2021) provides funding that is related to but separate from the CTP.

On October 3, 2022, the CEC released a competitive grant solicitation titled “GFO-22-502 — Innovative Hydrogen Refueling Solutions for Heavy Transport” (GFO-22-502). GFO-22-502 offered funding for projects that develop and demonstrate innovative hydrogen refueling solutions to support the decarbonization of emerging medium-duty and heavy-duty (MDHD) on-road and off-road vehicle applications, reduce hydrogen delivery and refueling costs, improve reliability, enable higher fill rates, and minimize energy losses.

Projects Selected

On August 24, 2023, the CEC posted a revised notice of proposed awards (NOPA)¹ identifying the projects awarded grant funding under GFO-22-502. This LHI Report assesses the site locations of each of the three projects awarded funds from the CTP under GFO-22-502 Project Group 3 — MDHD On-Road Vehicles. Project Group 1 (Mobile Off-Road Equipment) and Project Group 2 (Emerging Applications) do not use CTP funds and are not assessed here. Table 1 lists the proposed project location(s) for each of the awardees and their corresponding environmental justice (EJ) indicators. EJ indicator definitions are in Chapter 3 of this LHI Report, and EJ indicator analysis is in Table 4.

The CEC will release update(s) to this report when specific sites are finalized. An update that requires new location analysis will include a 30-day public comment period; staff calls that type of update an “LHI Report Addendum.”

1 Worster, Brad. 2023. “Notice Of Proposed Awards.” California Energy Commission. Accessed August 30, 2023. [Cover letter](https://www.energy.ca.gov/sites/default/files/2023-08/GFO-22-502_Revised_NOPA_Cover_Letter_2023-08-24_ada.docx) available at https://www.energy.ca.gov/sites/default/files/2023-08/GFO-22-502_Revised_NOPA_Cover_Letter_2023-08-24_ada.docx, and [table of awardees](https://www.energy.ca.gov/sites/default/files/2023-08/GFO-22-502_Revised_NOPA_Results_Table_2023-08-24_ada.xlsx) available at https://www.energy.ca.gov/sites/default/files/2023-08/GFO-22-502_Revised_NOPA_Results_Table_2023-08-24_ada.xlsx.

Table 1: Project Details With EJ Indicators

Proposed Awardee	Project Title	Project Location	EJ Indicator(s)
FirstElement Fuel, Inc.	High Capacity and Improved Reliability Liquid Hydrogen Pump System	660 E Dyer Rd, Santa Ana, CA 92705	Minority
FirstElement Fuel, Inc.	High Capacity and Improved Reliability Liquid Hydrogen Pump System	7810 National Dr, Livermore, CA 94550	none
FirstElement Fuel, Inc.	High Capacity and Improved Reliability Liquid Hydrogen Pump System	2020 Wake Ave, Oakland, CA 94607	Poverty
Stratosfuel	Mojave River Heavy-Duty Hydrogen Station	Vacant lot on northwest corner of Phantom East and Perimeter Road, APN ² 0459-041-27, Victorville, CA 92301	Age, Minority, Poverty, Unemployment
ZEV Station	Multimodal Station for MDHD On-road & Other End Uses	595 West Garnet Ave, Palm Springs, CA 92262	Age, Poverty
ZEV Station	Multimodal Station for MDHD On-road & Other End Uses	500 S Palm Canyon Dr, Palm Springs, CA 92264	Age, Poverty

Source: CEC staff

Funding for these projects is contingent upon approval at a publicly noticed CEC business meeting and execution of a grant agreement.

Public Comment

As provided by Title 13 of the CCR, Section 2343, a 30-day public review period applies to this LHI Report from the date it is posted on the CEC website. The [original posting date for this report](https://www.energy.ca.gov/programs-and-topics/programs/clean-transportation-program/localized-health-impacts-reports) is at <https://www.energy.ca.gov/programs-and-topics/programs/clean-transportation-program/localized-health-impacts-reports>.

The CEC encourages comments by email. Please include your name or your organization's name in the name of the file. Send comments in either Microsoft® Word format (.doc) or Adobe® Acrobat® format (.pdf) to FTD@energy.ca.gov.

A hard copy can be mailed to:

California Energy Commission
Fuels and Transportation Division
715 P Street, MS-44

2 Assessor parcel numbers (APN) are used to inventory or identify a property and are assigned by the local county assessor's office. This property can be located using the APN and the [County of San Bernardino Property Information Management System Internet Site](https://arcpropertyinfo.sbcounty.gov/) available at <https://arcpropertyinfo.sbcounty.gov/>. Accessed on September 6, 2023.

Sacramento, CA 95814-5512

All written comments will become part of the public record and may be posted to the Internet. News media should direct inquiries to the Media and Public Communications Office at 916-654-4989 or by email at mediaoffice@energy.ca.gov.

CHAPTER 2:

Project Descriptions

As part of the GFO-22-502 process for selecting projects, applicants must provide LHI information for their proposed project and location. This information includes the expected impact of the project on local communities and the outreach efforts the applicant has made to engage disadvantaged communities or other local communities. This chapter summarizes that information submitted by the awardees. The awardees identify disadvantaged communities using the CalEnviroScreen³ screening tool developed by the Office of Environmental Health Hazard Assessment.

Note: Applicants use different methods for estimating emissions reductions, so estimates may vary significantly between similar projects.

FirstElement Fuel, Inc.

FirstElement Fuel, Inc.'s (FEF's) proposed project, titled "High Capacity and Improved Reliability Liquid Hydrogen Pump System," will design, develop, and demonstrate an advanced, high-capacity, high-efficiency, low-loss liquid hydrogen (LH₂) pumping system for hydrogen refueling stations (HRS) of MDHD vehicles. Project engineering, design, machining, assembly, and light manufacturing will take place in the existing Innovation Center, zoned for commercial/industrial use in Santa Ana. Project bench testing will take place at the existing Refueling Hub and Test Facility in Livermore. For the 12-month field demonstration, the pump system will be installed at the East Bay Municipal Utility District heavy-duty refueling station in Oakland, which is part of the NorCal Zero project to fuel 30 heavy-duty fuel cell trucks in daily service. FEF does not anticipate any additional project-generated emissions. Hydrogen at the bench testing and demonstration locations will be recycled through the LH₂ pumping system. FEF expects positive environmental benefits through the use of hydrogen vehicle fuel by any future FEF HRS using the low-loss LH₂ pumping system.

Outreach efforts include partnering with the Coalition for Clean Air City for community engagement. FEF will be collaborating with the City of Santa Ana and California State University, Los Angeles (CSU LA) to offer workforce training and employment opportunities for hydrogen station engineers and skilled technicians. FEF will also coordinate with the Center for Transportation and the Environment (CTE), leader of the NorCal Zero project, to incorporate project information into the CTE's education and outreach materials.

Stratosfuel, Inc.

Stratosfuel, Inc.'s (Stratos's) proposed project, titled "Mojave River Heavy-Duty Hydrogen Station," will demonstrate how collocating an HRS at a renewable hydrogen production plant

³ This tool ranks U.S. Census tracts based on geographic, socioeconomic, public health and environmental hazard criteria. See "[CalEnviroScreen](https://oehha.ca.gov/calenviroscreen)." Office of Environmental Health Hazard Assessment. Accessed August 30, 2023. Available at <https://oehha.ca.gov/calenviroscreen>.

can reduce delivery costs while increasing station reliability and utilization. The proposed HRS will be located in a greenfield space with no existing buildings, next to Stratos’s renewable hydrogen plant at the Southern California Logistics Airport (SCLA) in Victorville. Station operation is not expected to increase emissions or truck traffic since hydrogen fuel will be delivered to the HRS via a medium-pressure hydrogen pipeline from the adjacent renewable hydrogen plant. Initially, the HRS is anticipated to dispense 1500 kg/day of fuel. Using an energy efficiency ratio of 1.9 to compare the carbon intensity value of fuel cell trucks compared to diesel trucks, Stratosfuel calculates 86.64 MJ CO_{2e}/day will be displaced through refueling activities. At an operational rate of 98 percent, or 357 operational days per year, an emission reduction of 6,250 metric tons (MT) CO_{2e}/year is expected.

The principle source of direct and indirect emissions will be from the production of hydrogen fuel, quantified in Table 2 below. Estimated emissions from hydrogen fuel production under the project do not exceed the Mojave Desert Air Quality Management District (MDAQMD) threshold of significance for toxic air contaminants.

Table 2: Estimated Pollutant Emissions From Hydrogen Generation (lbs/day)

Source	VOC	NOx	CO	SOx	PM10	PM2.5
Stationary Sources	3	<1	<1	<1	<1	<1
Energy Sources	<1	<1	<1	<1	<1	<1
Mobile Sources	<1	2	4	<1	1	<1
Production Unit	8	28	0	2	11	11
Truck-Loading Equipment	<1	3	2	<1	<1	<1
Project Emissions	11	34	71	2	13	12
MDAQMD Thresholds	137	137	548	65	85	65
Project Emissions Exceed MDAQMD Threshold?	No	No	No	No	No	No

Column totals may not add up due to rounding of model results.

Sources: Stratosfuel, Mojave Desert Air Quality Management District,⁴ and LSA.⁵

Outreach efforts include meetings with the MDAQMD, department heads, public officials, Victorville community leaders, and fire and safety personnel. Information on the hydrogen plant and HRS, equipment, site requirements, environmental benefits, and hydrogen technology educational materials will be provided. A FCEV was also available at outreach meetings for participants to drive. As the project progresses, Stratos will coordinate hydrogen training with the fire marshal, city officials, and first responders. In addition, the Victorville Economic Development Department will assist Stratos in organizing community education through public meetings and site tours of the plant. Designated liaisons will ensure an open line of communication between Stratos and the City of Victorville throughout plant operation.

4 Mojave Desert Air Quality Management District. 2016. [California Environmental Quality Act \(CEQA\) and Federal Conformity Guidelines](https://www.mdaqmd.ca.gov/home/showdocument?id=192). Accessed August 30, 2023. Available at <https://www.mdaqmd.ca.gov/home/showdocument?id=192>.

5 LSA. May 29, 2018. *Air Quality & Climate Change Modeling for the Stratos Fuel Hydrogen Plant in Moreno Valley, California*.

ZEV Station

ZEV Station’s proposed project, titled “Multimodal Station for MDHD On-road & Other End Uses,” will demonstrate a multimodal HRS with four hydrogen fuel types to service a variety of ground transportation vehicles and export hydrogen to airport end uses. Hydrogen fuel types dispensed include compressed gas hydrogen (CGH₂) for MDHD ground vehicles (35–70 MPa), LH₂ fueling for heavy-duty vehicles, and bulk gaseous fueling for mobile hydrogen refuelers for other applications such as aircraft refueling. The project HRS site is a greenfield site next to an existing FedEx Ground Delivery facility in Palm Springs.

The HRS is expected to dispense 5 metric tons per day of hydrogen fuel. It is estimated to annually reduce emissions by 25,000 MT CO_{2e} when used as a transportation fuel to displace 1.6 million gallons of diesel.⁶ It is also estimated to eliminate nitrogen oxides (NO_x) and particulate emissions associated with about 8.7 million MDHD vehicle miles traveled. Emissions during the operational phase of the project are not expected to exceed the South Coast Air Quality Management District (SCAQMD) threshold of significance for toxic air contaminants (Table 3).

Table 3: Operational Emissions (lbs/day)

Source	VOCs	NOx	CO	SOx	PM10	PM2.5
Area Sources	0.2	<0.1	<0.1	0	<0.1	<0.1
Energy Sources	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mobile Sources	1.8	2.1	14	<0.1	2.8	0.8
Total Project Emissions	2	2.1	14	<0.1	2.8	0.8
SCAQMD Threshold	55	55	550	150	150	55
Project Emissions Exceed SCAQMD Threshold?	No	No	No	No	No	No

Source: ZEV Station, LSA Associates

Outreach efforts include developing a press release, educational materials, and a project fact sheet for social media website distribution. Stakeholders will be engaged through a town hall meeting to provide information and answer questions. The HRS will include an educational area for customers to learn about the technology and environmental benefits. ZEV Station is partnering with the Museum of Palm Springs to leverage outreach and educational resources, and in conjunction with CSU LA to plan “The Art of Carbon-Free Transportation,” an educational outreach event featuring project information from engineers, technicians, and graduate students coupled with an art workshop to increase engagement with the audience. ZEV Station will support CSU LA’s new program to develop the future hydrogen workforce through internships, training, a job placement program, and hands-on opportunities for students. This partnership will establish a safety and engineering program to support the rapid deployment of FCEV fueling infrastructure.

6 Matthews, Jason. March 24, 2015. [“Green Freight Math: How to Calculate Emissions for a Truck Move.”](https://business.edf.org/insights/green-freight-math-how-to-calculate-emissions-for-a-truck-move/) Environmental Defense Fund. Accessed August 30, 2023. Available at <https://business.edf.org/insights/green-freight-math-how-to-calculate-emissions-for-a-truck-move/>.

CHAPTER 3:

Location Analysis

This LHI Report identifies projects located in high-risk communities, using staff's adaptation of the Environmental Justice Screening Method (EJSM).⁷ High-risk communities are those with social vulnerability indicators, high exposure to pollution, and greater health risks. This LHI Report is not intended to be a detailed pollution analysis of proposed projects, nor is it intended to substitute for the environmental review conducted during CEQA.

CEC staff identifies high-risk community project locations using data from the California Air Resources Board (CARB), the U.S. Census Bureau, and other public agencies. The data are analyzed to assign EJ indicators for each project location specified in the LHI Report. The proposed project location must meet a two-part environmental and demographic standard to be considered in a "high-risk community."

Part 1: Environmental Standard

Communities meet the environmental standard if they have a high concentration of air pollutants. These pollutants include ozone, particulate matter 2.5 microns in diameter or smaller (PM_{2.5}), or particulate matter 10 microns in diameter or smaller (PM₁₀). The environmental standard uses CARB air quality monitoring data on nonattainment⁸ status for these pollutants.

Using 2022 data,⁹ all projects are in communities that meet the environmental standard since they are within a nonattainment zone for ozone, PM_{2.5}, or PM₁₀. This finding indicates that there may be existing poor air quality where the proposed projects are located.

Part 2: Demographic Standard

Communities meet the demographic standard if they have two or more EJ indicators for minority, age, poverty, and unemployment. Staff defines the EJ indicator thresholds as the following:

1. A minority subset represents more than 30 percent of a given city's population.

7 Pastor Jr., Manuel (University of Southern California), Rachel Morello-Frosch (University of California, Berkeley), and James Sadd (Occidental College). 2010. *Air Pollution and Environmental Justice: Integrating Indicators of Cumulative Impact and Socio-Economic Vulnerability Into Regulatory Decision-Making*. California Air Resources Board. Accessed August 30, 2023. Available at <https://ww2.arb.ca.gov/sites/default/files/classic/research/apr/past/04-308.pdf>.

8 A *nonattainment* area is a geographic area that does not meet the Ambient Air Quality Standards (state, national, or both) for a given pollutant. See "[Maps of State and Federal Area Designations](#)." California Air Resources Board. Accessed August 30, 2023. Available at <https://ww2.arb.ca.gov/resources/documents/maps-state-and-federal-area-designations>.

9 Ibid.

2. The percentage of people living in a city who are younger than 5 years of age, or who are 65 years of age or older, is more than 1.2 times (more than 20 percent higher than) the state average for those age categories.
3. A city's poverty rate exceeds the state average poverty rate.
4. The city (or county if city data are unavailable) unemployment rate exceeds the state average unemployment rate.

The demographic standard uses the U.S. Census Bureau's American Community Survey five-year estimates¹⁰ on race, ethnicity, age, and poverty, and the California Employment Development Department's monthly data¹¹ on unemployment. Specifically, this LHI Report uses city-level¹² and state-level¹³ unemployment data. Unemployment data are not seasonally adjusted.

Analysis Results

Staff finds that two of the five communities where these projects are located meet the criteria for high-risk communities since they meet both the environmental and demographic standards. In Table 4, a **bold** number followed by an asterisk (*) indicates categories that exceed a given EJ indicator threshold. A city/county name in **bold**, followed by a dagger (†), indicates a high-risk community.

Table 4: EJ Indicators by Project Location City Demographic

Site Location	American Indian and Alaska Native (2021)	Asian (2021)	Black or African American (2021)	Hispanic or Latino (Any Race) (2021)	Native Hawaiian and Pacific Islander (2021)	Under 5 Years of Age (2021)	65 Years of Age and Over (2021)	Below Poverty Level (2021)	Unemployment (July 2023)
California	0.9%	14.9%	5.7%	39.5%	0.4%	6.0%	14.4%	12.3%	4.8%
EJ Indicator Threshold	30.0%	30.0%	30.0%	30.0%	30.0%	7.2%	17.3%	12.3%	4.8%
Livermore City	0.6%	14.8%	1.8%	22.8%	0.6%	6.9%	13.5%	4.0%	3.3%

10 American Community Survey codes DP05 and S1701 were used to find data. See "[Explore Census Data](https://data.census.gov/cedsci/)." U.S. Census Bureau. Accessed August 30, 2023. Available at <https://data.census.gov/cedsci/>.

11 Overview page with data from most recent and previous months: "[Unemployment Rate and Labor Force](https://labormarketinfo.edd.ca.gov/data/unemployment-and-labor-force.html)." Employment Development Department. Accessed August 30, 2023. Available at <https://labormarketinfo.edd.ca.gov/data/unemployment-and-labor-force.html>.

12 Most recent data only: "[Monthly Labor Force Data for Cities and Census Designated Places \(CDP\)](https://labormarketinfo.edd.ca.gov/file/lfmonth/allsubs.xls)." Employment Development Department. Accessed August 30, 2023. Available at <https://labormarketinfo.edd.ca.gov/file/lfmonth/allsubs.xls>.

13 Most recent data only: "[Monthly Labor Force Data for Counties](https://labormarketinfo.edd.ca.gov/file/lfmonth/countyur-400c.pdf)." Employment Development Department. Accessed August 30, 2023. Available at <https://labormarketinfo.edd.ca.gov/file/lfmonth/countyur-400c.pdf>.

Site Location	American Indian and Alaska Native (2021)	Asian (2021)	Black or African American (2021)	Hispanic or Latino (Any Race) (2021)	Native Hawaiian and Pacific Islander (2021)	Under 5 Years of Age (2021)	65 Years of Age and Over (2021)	Below Poverty Level (2021)	Unemployment (July 2023)
Oakland City	1.0%	15.7%	22.0%	27.2%	0.5%	6.0%	13.5%	13.5%*	4.7%
Palm Springs City†	0.9%	5.1%	4.9%	24.4%	0.2%	2.5%	32.4%*	14.5%*	4.7%
Santa Ana City	0.9%	11.9%	1.0%	76.7%*	0.2%	6.4%	10.0%	12.3%	3.6%
Victorville City†	1.5%	4.6%	16.0%	55.3%*	0.2%	7.8%*	9.9%	18.8%*	6.9%*

Sources: CEC staff, Employment Development Department, and U.S. Census Bureau.

Summary

If funded, the proposed projects would result in an expanded supply of publicly available HRSs demonstrating innovative hydrogen refueling solutions to enable continued growth of the California FCEV market. This expansion will achieve emissions reductions by encouraging residents to switch from gas-powered vehicles to FCEVs.

Based on EJSM standards, CEC staff has identified two out of five communities where these projects are located as high-risk communities. These communities are at a higher risk of adverse health effects from pollution. However, staff found no indication that the projects identified in this LHI Report would negatively affect community health. Staff does not anticipate a significant increase in local pollutants, and the project awardees identify no major construction that would generate criteria emissions or pollutants. In fact, these proposed projects may create a net benefit for the surrounding communities, by reducing harmful criteria air pollutants, toxic air contaminants, and greenhouse gases (GHGs) that contribute to climate change.

GLOSSARY

Term	Definition
Assessor parcel numbers (APN)	Numbers used to inventory or identify a property and are assigned by the local county assessor's office.
California Code of Regulations (CCR)	The official compilation and publication of the regulations adopted, amended, or repealed by state agencies under the Administrative Procedure Act (APA). Properly adopted regulations that have been filed with the California Secretary of State have the force of law.
California Environmental Quality Act (CEQA)	A statute that requires state and local agencies to identify the significant environmental impacts of their actions and avoid or reduce those impacts, if feasible.
CalEnviroScreen	A screening tool that evaluates and ranks census tracts in California based on potential exposures to pollutants, adverse environmental conditions, socioeconomic factors, and prevalence of certain health conditions.
Carbon dioxide equivalent (CO ₂ e)	A measure used to compare the emissions from various greenhouse gases based upon the associated global warming potential.
Carbon intensity score (CI)	A measure of how clean electricity is measured in grams of hydrocarbons, or greenhouse gas emitted to produce a unit of electricity.
Carbon monoxide (CO)	A colorless, odorless, highly poisonous gas formed by the incomplete combustion of certain fuels, including gasoline.
Compressed gas hydrogen (CGH ₂)	The gaseous state of the element hydrogen kept under pressure. Compressed hydrogen in hydrogen tanks at 350 bar and 700 bar is used for mobile hydrogen storage in hydrogen vehicles; it is used as a fuel gas (35–70 MPa).
Criteria air pollutant	An air pollutant for which acceptable levels of exposure can be determined and for which the U.S. Environmental Protection Agency has set an ambient air quality standard. Examples include ozone (O ₃), carbon monoxide (CO), nitrogen oxides (NO _x), sulfur oxides (SO _x), and particulate matter (PM ₁₀ and PM _{2.5}).
Disadvantaged community	A designation by the California Environmental Protection Agency used to identify areas disproportionately affected by environmental pollution or hazards, due to geographic, socioeconomic, public health, and environmental factors.

Term	Definition
Energy efficiency ratio (EER)	Ratio relating the energy use per mile of the vehicle using the reference fuel/energy to the same vehicle using the alternative fuel/energy.
Environmental justice (EJ)	The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.
Environmental Justice Screening Method (EJSM)	An approach that combines environmental and demographic indicators to inform agency outreach and engagement practices regarding environmental justice.
Fuel cell electric vehicle (FCEV)	A vehicle that is powered partly or completely by fuel cells sometimes in combination with a small battery or supercapacitor, to power its onboard electric motor. Fuel cells in vehicles generate electricity generally using oxygen from the air and compressed hydrogen.
Grant funding opportunity (GFO)	Where the California Energy Commission offers applicants an opportunity to receive grant funding for projects meeting certain requirements.
Hydrogen refueling station (HRS)	A storage or filling station for hydrogen fuel where hydrogen is dispensed by weight.
Liquid hydrogen (LH ₂)	Liquid hydrogen is the liquid state of the element hydrogen. Hydrogen is found naturally in the molecular H ₂ form. To exist as a liquid, H ₂ must be cooled below its critical point of -253°C (-423°F).
Localized health impacts (LHI)	Potential health impacts to communities.
Medium-duty and heavy-duty (MDHD)	Classes 4–6 medium-duty trucks generally weigh between 14,000 and 26,000 pounds. Classes 7 and 8 heavy-duty trucks weigh between 26,001 and 33,000 pounds.
Metric ton (MT)	A unit of weight equal to 1,000 kilograms or 2,205 pounds.
Nitrogen oxides (NO _x)	A general term including 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.
Notice of proposed awards (NOPA)	A document identifying projects that are proposed to receive funding under a California Energy Commission funding opportunity, such as a Grant Funding Opportunity.

Term	Definition
Particulate matter (PM)	Any material besides pure water that exists in a solid or liquid state in the atmosphere. The size of particulate matter can vary from coarse, wind-blown dust particles to fine particles resulting from combustion.
PM _{2.5}	Particulate matter with particles 2.5 microns in diameter or smaller. Also called "fine particulate matter."
PM ₁₀	Particulate matter with particles 10 microns in diameter or smaller. Also called "coarse particulate matter."
Sulfur oxides (SO _x)	A group of pungent, colorless gases formed primarily by the combustion of sulfur-containing fossil fuels, especially coal and oil. Considered major air pollutants, sulfur oxides may impact human health and damage vegetation.
Toxic air contaminant	An air pollutant, identified in California Air Resources Board regulations, which may cause negative health effects even at very low concentrations.
Volatile organic compound (VOC)	Closely related to the term "reactive organic gas" (ROG). VOCs are carbon-containing compounds that evaporate into the air (with a few exceptions), and often have an odor. VOCs contribute to the formation of smog, and/or may themselves be toxic. Some examples include gasoline, alcohol, and the solvents used in paints.

Sources: California Air Resources Board, CEC Energy Glossary, University of Michigan School of Public Health, and U.S. Environmental Protection Agency