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24-EVI-01 RFI Ideas and Considerations for CA Ports USDOT CFI

Additional submitted attachment is included below.

Response to

CALIFORNIA ENERGY COMMISSION
Discretionary Grant Program Request for Information
TN#256874 RFI

Considerations for the California Energy Commission Zero-Emission Medium- and Heavy-Duty Drayage Infrastructure Application for the U.S. Department of Transportation's Charging and Fueling Infrastructure

Submitted by

ZERO EMISSION CONSORTIUM
www.zeroemissionconsortium.com
Aegir Systems
Indranet Partners
Mavericks Microgrids
Young Moon, Inc
Xemplar Carbon

June 27, 2024

Zero Emission Consortium

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Transmittal Letter

June 27, 2024

California Energy Commission
Docket Unit, MS 4
Re: Docket No. 24-EVI-01
715 P Street
Sacramento, CA 95814-5512

Honorable Members of the California Energy Commission:

RE: 24-EVI-01 RFI Ideas & Considerations for CA Ports USDOT CFI

We, the ZERO EMISSION CONSORTIUM, a network of 300+ research labs, NGOs, and technology firms, submit our response to the California Energy Commission's 24-EVI-01: RFI Considerations for CA Ports USDOT CFI.

We have a long track record of working on infrastructure development. We have a robust team of clean-energy, sustainable infrastructure, program management, logistics, and community benefit professionals. We have a decade-long track record of deploying public-sector transformation programs, such as those for the U.S. Department of Defense (DOD), the U.S. Department of Transportation (DOT), and the U.S. Department of Energy (DOE).

Our efforts will support local workforce training and retention, improve the local Electrical Power System (EPS) resiliency, reduce greenhouse gas (GhG) emissions, and deploy an equitable cost recovery method that maximizes the efficiency of energy usage. Furthermore, we will deliver a) mix-fuel dispensing stations (e.g., hydrogen, renewable diesel, syngas, EV charging stations) located in high-density transit corridors; b) speed up 2042 decarbonization goals in the commercial transportation sector (e.g., light-duty vehicles, up to Class 8 trucks, buses, fleets, all non-residential vehicles), and c) foster sustainable workforce investment in high-paying clean energy jobs.

Very Respectfully,

R. Bong Vergara
Co-CEO, Young Moon, Inc.

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Letter of Commitment

June 27, 2024

The Honorable Pete Buttigieg
Secretary of the United States Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

Subject: Letter of Commitment for the California Energy Commission's Medium- and Heavy-Duty Drayage Infrastructure Project under the Charging and Fueling Infrastructure Discretionary Grant Program Opportunity 693JJ324NF00017

Dear Secretary Buttigieg:

On behalf of the ZERO EMISSION CONSORTIUM, I express our commitment and support for the California Energy Commission's (CEC) project to install charging and/or hydrogen fueling stations for zero-emission medium- and heavy-duty (MDHD) drayage trucks at California ports.

The ZERO EMISSION CONSORTIUM is committed to contributing to the success of this initiative by using MDHD vehicles in operations to transport and deliver hydrogen to fueling stations, to transport captured CO2 away from on-site blue hydrogen production base stations and for MDHD offroad equipment such as yard trucks and rigging applications, applying for the funding should the CEC be awarded, and coordinating the refinement of our ***California Hydrogen Highway and Clean Energy Hub*** model (click here for the concept paper). We believe our contribution will significantly enhance the project's impact and help to ensure the successful deployment and use of zero-emission MDHD vehicle charging and fueling infrastructure.

We are engaged in ongoing dialogue with private companies, Tribal groups and local government agencies to establish these details jointly. Two NREL software tools for economic analysis across the hydrogen supply chain will optimize the scoping and siting of fueling stations. Scenario Evaluation Regionalization Analysis (SERA) and H2A will optimize how hydrogen infrastructure is built in a least-cost manner.

These tools will output the infrastructure build out, system cost, and dispensed levelized cost of hydrogen. We are confident that these locations will see significant usage and will be instrumental in supporting the drayage activity at Port of Humboldt, Port of Oakland, Port of Stockton, Port of Hueneme, and the Ports of Los Angeles and Long Beach.

Our vision is to power equitable zero-emission development in urban, rural, and tribal communities by pairing PFAS cleanup with local implementation of the *Advanced Clean Fleets rule* in eleven (11) California counties, namely Humboldt, Kern, Kings, Lassen, Mendocino, Monterey, Orange, Riverside, San Diego, Shasta, and Tulare. As such, our business model complements the state's goal of a carbon-free energy and self-sustaining hydrogen fuel market. Furthermore, it is aligned with ARCHES, California's hydrogen hub framework for fuel cell electric medium and heavy-duty vehicles.

We support CEC's vision in its FY 2024 Charging and Fueling Infrastructure (CFI) application. We are prepared to collaborate closely with the CEC and other stakeholders to achieve a publicly accessible network of MDHD hubs that reflects the *National Zero-Emission Freight Corridor Strategy*.

We appreciate the opportunity to provide our input and are eager to support the CEC's application for the FY 2024 CFI program. Please do not hesitate to contact us at rbvergara@young-moon.org for further discussion on how we can contribute to the success of this critical initiative.

Very Respectfully,

R. Bong Vergara
Co-CEO, Young Moon, Inc.

RESPONDER'S NARRATIVE

1. Please disclose your business type and vehicle class, if applicable. Are you a driver, fleet operator, truck stop operator, charging and/or hydrogen fueling provider, installer, manufacturer, utility, public agency, or other? Are you part of a small, veteran-owned, woman-owned, or minority-owned business?

ZERO EMISSION CONSORTIUM is made up of 300+ US-based research labs, NGOs, and technology firms that are focused on the food-energy-water nexus. Our consortium includes members focused on charging and/or hydrogen fueling generation, distribution, and provision; installation; hydrogen-fuel truck manufacturing; and gas leak detection. Our members are small, veteran-owned, woman-owned, and minority-owned businesses. We come together to deliver climate-smart agriculture, clean energy, and clean water solutions to rural and coastal communities in an integrated way, preventing local governments and communities from dealing with the unintended consequences that siloed solutions bring. Our program is defined by #TechFlattensTheCurve, an initiative that flattens food insecurity, energy insecurity, water scarcity, and social inequality that are made worse by climate-related issues. Our website is www.zeroemissionconsortium.com.

2. The purpose of this RFI is to help inform the CEC's application to the Federal Highway Administration (FHWA) for federal funding. If awarded, the CEC will release a competitive grant funding solicitation to provide funding to end recipients who would develop and construct the zero-emission MDHD infrastructure. Would you consider applying for CFI grant funding for site development if the CEC is awarded funding?

Yes, we would apply for CFI grant funding for site development, if the CEC were awarded funding.

3. Do you already operate or plan to use zero-emission MDHD vehicles in the next five years? Please use a 1-5 rating scale where 1= least likely and 5=most likely. Please add additional information regarding your (planned) use of zero-emission MDHD vehicles as desired.

Most likely, or 5. We plan to use MDHD vehicles in operations to transport and deliver hydrogen to fueling stations, to transport captured CO2 away from on-site blue hydrogen production base stations and for MDHD offroad equipment such as yard trucks and rigging applications.

4. For drayage fleet operators and drivers: **NOT APPLICABLE**

5. For EV charging and hydrogen fueling providers, describe:

a. Your organization's business model for public charging and/or hydrogen fueling offerings.

Our business model for public charging and/or hydrogen fueling offerings is to build, commercialize, and manage carbon-free energy, and hydrogen generation, storage, and distribution infrastructure. We aim to convert local and regionally sourced tire, plastic, biomass waste, and sludge from water reclamation facilities into commodities, such as hydrogen, syngas, and biochar. A renewable (primarily solar and wind) hydrogen microgrid system will be implemented to enable end-to-end solutions, resulting in maximized grid resilience. High-value carbon products, such as biochar, will sequester CO2, further reducing the GhG emissions of the microgrid. By doing these, we commercialize

feedstock from rural and tribal communities for H2 fueling, soil amendment, electricity, climate resilience, public charging and/or hydrogen fueling.

By design, our efforts will support local workforce training and retention, improve the local Electrical Power System (EPS) resiliency, reduce greenhouse gas (GhG) emissions, and deploy an equitable cost recovery method that maximizes the efficiency of energy usage. Furthermore, we will deliver a) mix-fuel dispensing stations (e.g., hydrogen, renewable diesel, syngas, EV charging stations) located in high-density transit corridors; b) speed up 2042 decarbonization goals in the commercial transportation sector (e.g., light-duty vehicles, up to Class 8 trucks, buses, fleets, all non-residential vehicles), and c) foster sustainable workforce investment in high-paying clean energy jobs.

Our objective is to maximize the potential of our feedstock processing system, generating a diverse range of clean energy products, such as electricity, biochar for agricultural soil amendment, synthesis gas ('syngas'), and hydrogen. This diversified approach will foster a resilient and sustainable energy production method. Our vision is to power equitable zero-emission development in urban, rural, and tribal communities by pairing PFAS cleanup with local implementation of the *Advanced Clean Fleets rule* in eleven (11) California counties, namely Humboldt, Kern, Kings, Lassen, Mendocino, Monterey, Orange, Riverside, San Diego, Shasta, and Tulare. As such, our business model complements the state's goal of a carbon-free energy and self-sustaining hydrogen fuel market. Furthermore, it is aligned with ARCHES, California's public-private hydrogen hub consortium's statewide framework for fuel cell electric medium and heavy-duty vehicles.

b. Mechanisms your organization might leverage to provide affordable charging and fueling services to drayage fleet operators.

Charging-as-a-Service (CaaS): We are actively mobilizing partnerships to enable CaaS offerings and mitigate upfront purchasing costs. Noting that the total cost of ownership may be higher, CaaS eliminates the need for extensive planning and operations support for drayage fleets.
Advanced Clean Fleets Regulation (ACF): California's ACF regulation mandates that drayage trucks entering seaports and intermodal railyards must be zero-emission by 2035. Our business model proactively builds zero-emission MDHD infrastructure to comply with this requirement.
California Fleet Transition Services: We actively coordinate with the Governor's Office of Business and Economic Development to ensure our model provides resources for transitioning to zero-emission fleets, including Transportation-as-a-Service (TaaS) for last-mile and drayage operations, electric vehicle leasing, and charging bundled with parking, maintenance, and management.
Charging Infrastructure Grants: The U.S. Department of Transportation's Charging and Fueling Infrastructure (CFI) Discretionary Grant Program supports the deployment of publicly accessible electric vehicle charging and alternative fueling infrastructure. We are actively mobilizing our consortium to submit joint applications for infrastructure incentives for shared or public electric charging or hydrogen refueling stations.

c. The scope of services, facilities and amenities provided at your recharging/refueling locations.

The scope of services, facilities and amenities provided at recharging/refueling locations in eleven (11) California counties along major routes, including Interstate 5 (I-5), Interstate 10 (I-10), Interstate 80 (I-80), U.S. Route 101, and State Route 99 (SR-99), include: a) integrated hydrogen and distributed energy resource systems and facilities (e.g., sites with generation, storage, and distribution); b) CaaS to mitigate upfront purchasing costs and eliminate extensive planning and operations support for drayage fleets; c) TaaS for last-mile and drayage operations; d) electric vehicle leasing, and e) charging bundled with parking, maintenance, and management.

d. The anticipated site size, parking configuration (e.g., pull-through), total number of charging stalls capable of simultaneous charging, and total number of truck parking spaces that are not dedicated to charging or refueling.

We are engaged in ongoing dialogue with private companies, Tribal groups and local government agencies to establish these details jointly. Two National Renewable Energy Lab (NREL) software tools for economic analysis across the hydrogen supply chain will optimize the scoping and siting of fueling stations. **Scenario Evaluation Regionalization Analysis (SERA)** and **H2A** will optimize how hydrogen infrastructure is built in a least-cost manner. These will output the infrastructure build out, system cost, and dispensed levelized cost of hydrogen.

e. How your organization approaches right-sizing infrastructure for near-term market demand and future-proofs infrastructure to be responsive to evolving needs.

We are committed to a holistic approach in transforming transport fueling infrastructure to meet both near-term market demand and future needs requires. Key elements of our holistic approach include a prioritization of sustainability across five dimensions:

- Digital: We leverage Big Data in data-driven decision-making, from safety monitoring to inventory tracking, to infrastructure maintenance and optimization.
- Economic: We balance cost-effectiveness and long-term benefits
- Environmental: We ensure resilience to climate change
- Institutional: We collaborate with stakeholders effectively and work with ecosystem partners to explore scalable solutions at regional levels
- Social: We foster inclusivity, accessibility, and responsiveness to local needs using iterative approaches to community engagement best able to foster resolution of evolving needs

6. What distance should separate stations to support zero-emission drayage truck activities around California ports? Provide a description of a typical route or use case considered when making this recommendation. Describe the vehicle class and location if it differs from the info in question 1.

Stations should be strategically positioned within the operational range of electric drayage trucks, near ports and railyards, and in proximity to communities impacted by emissions. This approach supports both zero-emission goals and community well-being. We are considering the following factors with partners and local stakeholders to support zero-emission drayage truck activities around California ports, the distance between EV stations:

- Community Health and Environmental Impact: In prioritizing high-traffic corridors where drayage trucks frequently operate, especially those near environmental justice communities, sufficient incentives and transition support should be available to reduce tailpipe emissions in these regions is crucial for public health and air quality goals.
- Inland-Based Drayage Fleets: For inland-based drayage fleets that often have one-way trip distances of 40 miles or more, the placement of stations should account for these longer routes.
- Proximity to Ports and Railyards: Place stations near seaports and intermodal railyards, where drayage trucks frequently operate. The Port of Oakland, for example, celebrates hydrogen-powered trucks with a range exceeding 400 miles. For the seaports and intermodal railyards required to comply with existing regulations, stations should be located within about 1 mile of disadvantaged communities to ensure accessibility.
- Range of Electric Drayage Trucks: Hydrogen-powered drayage trucks have varying ranges. Some models can travel up to 250 miles at 80,000 GVWR (gross vehicle weight rating) or 300 miles at 45,000 lbs. Therefore, stations should be placed within these ranges to ensure uninterrupted operations. Current Class 8 battery-electric trucks have estimated ranges of 130 to 230 miles, and near-term battery electric trucks from Volvo are estimated to have up to 275 miles of range. Therefore, strategically placed charging stations should be within these ranges to ensure seamless operations.
- Typical Routes: For instance, trucks operating in the Bay Area and Central Valley have a range of over 400 miles on a single hydrogen fill. Stations should be strategically located along the routes drayage trucks follow.

7. Provide any general cost estimates for MDHD charging and/or hydrogen fueling stations you have designed, built, or have experience with, including charger power levels and number of stations installed. Please provide a range of public cost-share as a percentage of the total project cost necessary to support more public charging stations to serve zero-emission trucks along drayage corridors. Should the publicly funded cost share be 50% CEC/federal and 50% private/other?

We estimate that our plan will cost USD 1.1 billion for 11 hub stations. USD 40 million per hub and USD 20 million per spoke (an average of 3 spokes per hub) = USD 100 million per hub site. California should enable the use of investment tax credits, in the same manner that the BIL and the Inflation Reduction Act did, to finance energy infrastructure and decarbonization projects. A 50/50 cost share structure between government entities and private partners could sufficiently de-risk a project and foster further private sector investment. Such a cost share structure should carefully account for:

- Capital Costs: Split investment costs (e.g., infrastructure construction, equipment) based on project ownership or usage.
- Operating Costs: Share ongoing expenses (e.g., maintenance, operations, fuel supply).
- Performance Guarantees: Ensure performance-based incentives tied to project success.
- Risk Allocation and Mitigation: Address risks (e.g., cost overruns, delays) and allocate risk management responsibilities accordingly (e.g., insurance, contingency funds).
- Tax Incentives: Offer tax breaks or credits to private partners.

8. Use the maps in the "Corridor Segments" section to identify areas where you expect to need zero-emission truck infrastructure in the next three years (2024-2027). These Corridors have been selected to align with the National Zero-Emission Freight Corridor Strategy, the California Transportation Commission's SB 671 Clean Freight Assessment and to complement California, Washington and Oregon's Tri-state application.

a. Pinpoint sites where you plan to build stations, or where you would like to see a station as a driver.

We will build 100 stations in eleven (11) California counties along major routes, including Interstate 5 (I-5), Interstate 10 (I-10), Interstate 80 (I-80), U.S. Route 101, and State Route 99 (SR-99). These correspond to the following Corridor Segments: a) **Port of Humboldt**, b) **Port of Oakland** (I-80: From the US-101 interchange in San Francisco to the I-80BL/US 50 interchange in West Sacramento and US 101: From the I-880 interchange in San Jose to the SR 152 interchange in Gilroy), c) **Port of Stockton** (I-80: From the US 50 interchange in West Sacramento to the Nevada Border and SR-99: From the US 50 interchange in Sacramento to the Enoch Christoffersen Southbound Rest Area in Turlock), d) **Port of Hueneme**, e) **Ports of Los Angeles and Long Beach** (I-10: The I-405 interchange in Los Angeles to Exit 88 in Calimesa and I-110: From the I-10 interchange in Los Angeles to the SR-47 interchange in San Pedro).

b. If possible, provide specific details for each location, including the preferred location, the number of stations, the type of fuel (hydrogen or electric), power levels (if applicable), and vehicle class.

We will build 11+ hub stations (generation, storage) and ~99 spoke stations (dispensing) in eleven (11) California counties. These 100 stations will be mixed-fuel dispensing stations (e.g., hydrogen, renewable diesel, syngas, EV charging stations) for light-duty vehicles, up to Class 8 trucks, buses, fleets, all non-residential vehicles. All of these stations will be located in high-density transit corridors that align with the National Zero-Emission Freight Corridor Strategy, the California Transportation Commission's SB 671 Clean Freight Assessment, namely a) **Port of Humboldt**, b) **Port of Oakland**, c) **Port of Stockton**, d) **Port of Hueneme**, e) **Ports of Los Angeles and Long Beach.**

We are engaged in ongoing dialogue with private companies, Tribal groups and local government agencies to identify fueling station locations. Two NREL software tools for economic analysis across the hydrogen supply chain will optimize the siting of fueling stations. Scenario Evaluation Regionalization Analysis (SERA) and H2A will optimize how hydrogen infrastructure is built in a least-cost manner. These will output the infrastructure build out, system cost, and dispensed levelized cost of hydrogen.

c. Identify any corridor segments you think should be considered that have not been included and how they align with the National Zero-Emission Freight Corridor Strategy.

No comment.

9. If you represent a utility: **NOT APPLICABLE**