

**Request for Information for  
Zero Emission Trucks, Pilots & Infrastructure  
for Goods Movement**



**Issued in collaboration with the  
California Air Resources Board  
and the Ports of Los Angeles and Long Beach**

**Date Issued: September 5, 2018  
Response Due Date: November 5, 2018**



# RFI for Zero Emission Trucks for Goods Movement

Issued by the Los Angeles Cleantech Incubator

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## RFI for Zero Emission Trucks for Goods Movement

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### Summary

In an effort to accelerate the Southern California goods movement sector's transition to zero emissions, the Los Angeles Cleantech Incubator (LACI), in collaboration with the California Air Resources Board (CARB), and the Ports of Los Angeles and Long Beach (Ports), has issued an RFI for Zero Emission Trucks for Goods Movement. For this RFI, zero emissions vehicle (ZEV) technologies are defined as on-road heavy-duty class 8 vehicles that generate zero tailpipe emissions. These trucks can be powered by electricity (battery), hydrogen-fuel cell, or any other type of technology that has zero tailpipe emissions.

This RFI seeks proposals from technology manufacturers/OEMs and others in the value chain in order to:

1. Gain insight into the current and future state of zero emission heavy-duty truck technologies, along with related infrastructure needs;
2. Understand where synergies and partnerships might exist between organizations for zero emission truck deployment, infrastructure, and concepts for pilots;
3. Inform the California Air Resources Board (CARB) and other policymakers in their design of future incentive programs.

### Purpose of RFI and Use of Responses

The responses to this RFI will be used to contribute to the following objectives:

1. Work synergistically with CARB's programs that drive advanced transportation technology, including:
  - a. the Zero- and Near Zero-Emission Freight Facilities solicitation released in March 2018;
  - b. the Volkswagen Beneficiary Mitigation Plan released in April 2018, and;
  - c. Other Low Carbon Transportation funding opportunities.
2. Inform other policy makers at agencies, cities, and ports including:
  - a. South Coast Air Quality Management District (SCAQMD).
  - b. Ports of Los Angeles and Long Beach (Ports).
3. Aggregate stakeholders and partners that can help accelerate the introduction of zero emission, heavy duty trucks. Many partnerships already exist within the industry, but LACI hopes to bolster existing project teams and help facilitate new ones.
4. Lay the foundation for large-scale zero emission pilot projects ready for implementation in the next 1-3 years including:
  - a. Short, medium or long haul drayage in the Ports and throughout the South Coast Air Basin.



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- b. Medium to heavy duty urban logistics for freight and package delivery
- c. Opportunities for zero emission support along key freight corridors (e.g., I-710, I-5, etc.) including, infrastructure, concentration of charging/renewable hydrogen refueling, and vehicles.

### Responses Requested

LACI requests responses to the RFI to align with one or more of the following categories:

- a. **ZEV Truck Offerings** – current and future truck offerings from manufacturers and partners that include:
  - a. **Short/Medium/Long range** zero emission class 8 heavy duty trucks
  - b. **Urban logistics:** Medium to heavy duty zero emission vehicles for urban freight and package delivery; and
- b. **Zero Emissions Truck Pilot Concepts:**
  - a. 50 to 100 Trucks: 50-100 zero emissions on-road drayage trucks deployment at the Ports at scale.
  - b. Other EV truck pilots for LACI to consider that address key needs in the State and Southern California.
- c. **Zero Emission Infrastructure for I-710 and other freight corridors** – needs of infrastructure (e.g., size, speed, standards, etc.), suggested location for concentration of charging/renewable hydrogen refueling (e.g., locations) to support ZEVs, and especially heavy duty trucks along key corridors such as I-710, I-5, etc.

### RFI Issuer

The Los Angeles Cleantech Incubator (LACI) is a private non-profit organization building an inclusive green economy. Recognized as one of the most innovative business incubators in the world, LACI works closely with regional cleantech entrepreneurs, industry stakeholders, and community residents to identify and support the discovery, commercialization and deployment of market transformative cleantech innovation. In just six years, LACI has helped 70+ companies raise \$180M+ in funding and create 1,700+ jobs.

### RFI Background

In May 2018, LACI launched the [transportation electrification partnership](#) (TEP) to accelerate statewide zero emissions goods movement and regional transportation electrification to accelerate the reduction of related greenhouse gas emissions and air pollution by the time the world arrives in Los Angeles for



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the Olympic and Paralympic Games in 2028. The TEP's Leadership Group includes the Chair of CARB, the Mayor of Los Angeles, President of Southern California Edison, General Manager of the Los Angeles Department of Water and Power, the County of Los Angeles, and LA Metro.

As part of the partnership, LACI is preparing a Zero Emissions (ZE) 2028 Roadmap that will set short-term and long-term goals for both regional transportation electrification and zero emissions goods movement, identify gaps with regards to infrastructure, technology, and funding, and build coalitions to facilitate pilot projects to meet the goals.

LACI, in collaboration with CARB and the Ports, is issuing this RFI to inform CARB's solicitation and distribution of funds, inform other state and regional policymakers and regulatory agencies, and inform future pilots and demonstrations. Furthermore, results from this RFI will be provided to the Ports to help inform their efforts to achieve the goals set forth in the 2017 Climate Air Action Plan Update.

### Who Should Respond to this RFI

We welcome responses from all interested entities, including, but not limited to, trucking companies and fleet operators, truck manufacturers, truck brokers, logistics operators, station equipment designers, utilities and/or fuel providers, funding agencies, and other stakeholders on issues related to zero emission trucks. Entities may respond on their own, but are strongly encouraged to partner with various entities in the value or supply chain to prepare responses to the RFI.

### Why You Should Respond to this RFI

LACI anticipates using information gleaned from the responses to inform and shape pilots, as well as identify gaps and potential solutions (e.g., funding, market signals, infrastructure, etc.). This RFI will inform CARB's 2018 Funding Plan as well as potential funding solicitations in Fall 2018 and beyond. This RFI will work synergistically with CARB's programs that drive advanced transportation technology, including the Zero- and Near Zero-Emission Freight Facilities solicitation released in March 2018, the Volkswagen Beneficiary Mitigation Plan released in April 2018, and other Low Carbon Transportation funding opportunities. This RFI will also be used by the Ports to help develop future RFPs and pilot programs for zero emissions on-road drayage truck deployment at the Ports.

Note that this process is run by LACI, and screened results will be shared with CARB, SCAQMD, the Ports, and other key stakeholders.



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### RFI Schedule

Responses to this Request For Information (RFI) should be submitted via email to the contact listed below by **Monday, November 5, 2018, 5:00 PM PT.**

### RFI Contact

LACI will schedule a conference call for RFI questions on Monday, September 24, 2018 1:00 PM- 2:00 PM PT. If you are interested in participating, please [RSVP here](#).

Respondents are encouraged to seek clarification as needed to submit a complete and comprehensive response. Further communications and clarifications regarding the RFI should be made to: [zetruckrfi@laci.org](mailto:zetruckrfi@laci.org).

### Confidential and/or Proprietary Information

LACI recognizes that a respondent may wish to include information in its response to this RFI that the respondent considers proprietary, a trade secret, or confidential to the respondent. If, in any response that you provide to LACI in connection with this RFI, you include information that you consider proprietary, a trade secret or confidential, please identify such information in the response by clearly noting confidential information. LACI will screen responses and will not share confidential information with other stakeholders of the RFI. LACI will deem any such designated information as submitted to it, including, any third-party advisors to assist it with the RFI evaluation process, with the express understanding that such designated information will be held in confidence and will not be disclosed or used for any purpose other than the review of the respondent's response to this RFI or any resulting proposal from the respondent.

### Background

Transportation is the largest source of GHG emissions in the state at 50%, when including both tailpipe and fuel production emissions, and goods movement is the largest source of air pollution in Southern California. Air pollution impacts are more likely to negatively impact disadvantaged communities due to their adjacency to freight corridors. Meeting the goals outlined below will require meaningful technology development for the goods movement sector, particularly around zero emission technologies. As of today, zero emission technologies are not yet widely available for all classes of trucks, however, this technology is developing rapidly and there are certain markets that could be served by



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technology that is in the pre-commercial and demonstration phase of development.

### Goods Movement Sector

The truck market for goods movement includes drayage and regional distribution. The duty cycle for both markets is categorized by frequent starts and stops, high idle times, and generally less than 200 miles in driving range per day. These characteristics are ideal for zero emission trucks because those vehicles generally have regenerative braking that leads to efficiency improvements relative to internal combustion vehicles, they generally do not consume fuel while idling, and current technologies have range limitations of less than 200 miles per day.

The importance of these vehicles cannot be overstated; exhaust from heavy duty trucks contain harmful pollutants like fine particulate matter and nitrogen oxide (NOx) that negatively impact the health of our communities.

### GHG Emissions and Air Quality Goals

The California Sustainable Freight Action Plan, issued by the Governor's Office in 2016 estimates that freight emissions in California will lead to 980 premature deaths and an associated loss of economic value of \$10 billion in 2017 US dollars by 2030<sup>1</sup>.

To ensure air quality improvements, elected officials and public agencies in California have enacted the following requirements, targets, and goals.

- Executive Order B-32-15 (AB 32) signed in 2006 requires California to reduce its GHG emissions to 1990 levels by 2020 and Executive Order B-30-15 (SB 32) signed in 2016 requires California to reduce greenhouse gas (GHG) by 40% relative to 1990 levels by 2030. These pieces of legislation task CARB with developing regulations and market mechanisms to achieve said goals. Subsequently many strategies have been developed, including reducing petroleum use by vehicles by 50%.
- Air Quality Management Plan (AQMP) authored and managed by the South Coast Air Quality Management District (SCAQMD) in 2016, is a plan to achieve 1-hour and 8-hour ozone, and 24-hour and annual PM 2.5 standards set by the National Ambient Air Quality Standards.
- California Sustainable Freight Action Plan goals:
  - System Efficiency Target – improve freight system efficiency by 25% by increasing the value of goods and services produced from the freight sector relative to the amount of carbon that it produces in 2030.

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<sup>1</sup> The California Sustainable Freight Action Plan, July 29, 2016; link [here](#)



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- Zero Emission Technology Target – deploy over 100,000 freight vehicles and equipment capable of zero emission operation and maximize near-zero emission freight vehicles and equipment powered by renewable energy by 2030.
- Competitiveness and Economic Target – foster future economic growth within the freight and goods movement industry by promoting flexibility, efficiency, investment, and best business practices through State policies and programs that create a positive environment for growing freight volumes, while working with industry to lessen immediate potential negative economic impacts.
- Sustainable City pLAN goals for the City of Los Angeles started in 2015:
  - Increasing the percentage of port-related goods movement trips (as defined by pieces of equipment over a certain size and utility) that use zero emission technologies to meet and exceed 15% by 2025 and to 25% by 2035
  - Air quality outcomes in the pLAN (e.g., zero non-attainment days by 2025) emissions by 85% by 2020.
- Clean Air Action Plan (CAAP) adopted by the Ports:
  - Reduce population-weighted residential cancer risk of port-related diesel particulate matter (DPM) by 85% by 2020.
  - Reduce port-related emissions by 59% for NO<sub>x</sub>, 93% for SO<sub>x</sub>, and 77% for DPM by 2023.
  - Reduce GHGs from port-related sources to 40% below 1990 levels by 2030 and 80% below 1990 levels by 2050.
  - Transition all on-road trucks that visit the Ports to zero emissions by 2035 and all off-road cargo handling equipment to zero emissions by 2030.



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### RFI Response Instructions

All respondents **must provide the information requested in SECTION I** of the RFI. SECTION I should be no more than 2 pages, single-spaced at 12-point font.

SECTIONS II-IV provide instructions and guidance for submitting information/responses on truck technology (II), recommendations with respect to design of truck pilots (III), and infrastructure pilots (IV). **Respondents can respond to one or more of SECTIONS II-IV and can submit more than one response to Section III – Truck Pilots.** Each response to SECTIONS II-IV should be no more than seven (7) pages, single-spaced at 12-point font. Provided as pdf or Word document.

**All responses must include the information requested in SECTION I and at least one response to SECTIONS II-IV.**

Responses should be emailed with the Subject line: SUBMISSION\_[YOUR COMPANY NAME] to [zetruckrfi@laci.org](mailto:zetruckrfi@laci.org) before **MONDAY, NOVEMBER 5, 2018 5:00 PM PT.**

We encourage early submissions. If there are challenges or issues relating to the submission of the RFI responses, they can be directed to [zetruckrfi@laci.org](mailto:zetruckrfi@laci.org).



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### SECTION I: RESPONDENT OVERVIEW

**ALL RESPONDENTS must respond to SECTION I with the following information:**

1. Company Name
2. Authorized Contact
3. Contact Email
4. Contact Phone Number
5. Company Website
6. Company Designations (i.e. Minority-, Veteran-, Women-owned, etc.)
7. Company overview - Provide a brief background about your company including the year experience and role it plays in the zero emission goods movement. (350 words max)
8. Team – Provide key members of the company, including titles & relevant experience. (250 words max)



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### SECTION II: RFI RESPONSES AND INSTRUCTIONS – TRUCK TECHNOLOGY

**Answer only if you are submitting information for the Zero Emissions Truck Technology offerings.**

**Any confidential information should be clearly marked. LACI will screen responses and hold confidential information in confidence from other stakeholders.**

We are seeking responses from truck manufacturers and other relevant stakeholders on the current and future offerings in the next 1-3 years of Class 8 trucks for the following applications:

- Zero emissions vehicle (ZEV) drayage trucks for near dock and local drayage
- ZEV heavy duty trucks for regional drayage. These vehicles would be capable of moving goods from the Ports of Los Angeles and Long Beach to the Inland Empire (Moreno Valley, Ontario, San Bernardino) and potentially across the Tejon Pass/Grapevine.
- Medium to heavy duty urban logistics for freight and package delivery

In your response, please address the following:

#### **1. Current offerings:**

- a. What are your current offerings for ZEV Heavy Duty Truck Movement and performance metrics including:
  - i. For all ZEV submissions:
    1. Total range in miles
    2. Fuel type
    3. Fueling infrastructure requirements
    4. Time to refuel
  - ii. For Battery Electric Vehicles (BEV):
    1. Charging standards/requirements
    2. Charging time hours at 240V (L2) and/or 50kW (DCFC)
    3. Charging time (hours) for DCFC and/or AC power (kW)
    4. All electric range in miles
    5. Battery Size in kW
  - iii. Warranty Conditions
    1. Expected life (battery or other technology)
    2. Warranty conditions



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- b. If applicable, please answer for the following scenario: If your company was awarded a contract to build 10 or more zero emissions trucks to operate in drayage service in Southern California:
  - i. What would be the realistic timeline of production for service readiness?
    - 1. This includes commissioning of the vehicle, e.g. from start of production to free operation by the end-user.
  - ii. Do you have a plan for asset ownership or alternative to direct purchasing?
  - iii. What would be the estimated cost to provide the trucks and service?
  - iv. What type of post-purchase service/support will be provided by your company on this specific project?

### 2. Future Offerings:

- a. What new ZEV Heavy Duty Truck product offerings are you planning to offer? What is the schedule for development and production?
- b. What are the anticipated performance metrics:
  - i. For all ZEV submissions:
    - 1. Total range in miles
    - 2. Fuel type
    - 3. Fueling infrastructure requirements
    - 4. Time to refuel
  - ii. For Battery Electric Vehicles (BEV):
    - 1. Charging standards/requirements
    - 2. Charging time hours at 240V (L2) and/or 50kW (DCFC)
    - 3. Charging time (hours) for DCFC and/or AC power (kW)
    - 4. All electric range in miles
    - 5. Battery Size in kW
  - iii. Warranty Conditions:
    - 1. Expected life (battery or other technology)
    - 2. Warranty conditions
- c. What are key risks and barriers to commercialization for your offering(s)?
- d. What are key barriers to scale (e.g., specifics of economics and feasibility) for your offering(s)?

### 3. Infrastructure: Please provide information regarding the infrastructure required to operate your zero emissions truck.

- a. Do you have any experience with installing infrastructure or partnerships with infrastructure installers, specifically as needed by your product?
- b. If so, what type of infrastructure was installed to deploy the zero emissions trucks?



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- c. Where is it located?
  - d. How long did it take to install?
  - e. What lessons were learned?
  - f. Does your refueling/charging equipment have third party safety certification?
- 4. Partnerships:**
- a. Describe any ongoing or future partnerships that your company is engaged in would bring innovative solutions to truck manufacturing (i.e. relationships that enable innovative financing for truck procurement)
- 5. Financing:**
- a. Does your company offer procurement options other than purchasing? If yes, describe available options.
  - b. Is your company willing to enter into a cooperate purchasing agreement across cities / agencies?
  - c. At what sales volume is there a price break and what is the percentage discount?
  - d. What rebates / tax incentive are your vehicles eligible for?
- 6. Other information:**
- a. Any other information that would be helpful to advancing our understanding of the challenges and opportunities to the market in the next 1-3 years?



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### SECTION III: RFI RESPONSES AND INSTRUCTIONS – ZERO EMISSION TRUCK PILOTS

**Answer only if you are submitting information on ZE Truck Pilot projects.**

**Any confidential information should be clearly marked. LACI will screen responses and hold confidential information in confidence from other stakeholders.**

We are looking to provide information to public agencies as they design pilots to test the use of zero emissions technologies at scale. Before releasing RFPs for pilots, agencies need industry's input on how best to structure these pilots and what requirements to include. We encourage pilot concepts submitted as collaborations that describe existing or potential partnerships that could provide innovative business models, financing mechanisms, and/or implementation strategies.

Please address at least one of the following truck pilots in your submission. If you'd like to submit for multiple pilots, please submit responses for each pilot concept:

- 1) **50 to 100 zero emissions on-road drayage trucks deployment at the Ports of Los Angeles and Long Beach.** The Ports of Los Angeles and Long Beach have identified this pilot in their recently approved 2017 Clean Air Action Plan Update. The intent is to launch large-scale deployments of at least 10 ZE trucks from individual teams at the same time (adding up to 50-100 trucks) to demonstrate how a fleet can integrate a larger deployment into their daily operations, evaluate the ability of truck manufacturers to support larger deployments, and to evaluate the infrastructure requirements for larger deployments.
- 2) **Other EV truck pilots** LACI could consider in the state or Southern California Region

In your response, please address the following:

1. Overview of the pilot project concept
2. Key stakeholders and project partners, as well as their anticipated contributions
3. Estimated timelines and key milestones
4. Equipment, specifications and performance
5. Infrastructure, charging network and/or management, and/or adjacent emerging technology
6. The plan for deployment, other needs (not addressed previously) and dependencies



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7. Rough order of magnitude cost estimations for the project, including equipment, installation, permitting, etc.
8. Financing proposal, including what the respondent may be able to provide for financial resources and what would be needed as a subsidy from the public sector
9. Key risks, issues and barriers
10. Metrics to determine the success of the pilot
11. Ongoing or future partnerships that your company is engaged in would bring innovative solutions to ZE truck pilots (e.g. a truck manufacturer partnering with a shipping company and a truck stop to implement a ZE pilot).



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### SECTION IV: RFI RESPONSES AND INSTRUCTIONS – ZERO EMISSION INFRASTRUCTURE PILOTS

**Answer only if you are submitting information on Zero Emission Infrastructure pilots.**

**Any confidential information should be clearly marked. LACI will screen responses and hold confidential information in confidence from other stakeholders.**

We are looking for zero emission infrastructure pilots that address the following area:

- 1) **Zero Emission Infrastructure for I-710 and other freight corridors:** needs of infrastructure (e.g., size, speed, etc.), suggested location for concentration of charging/refueling (e.g., location) to support heavy duty class 8 ZEV trucks along key corridors such as I-710, I-5, etc.

In your response, please address the following:

1. An overview of the of the pilot project and the criteria targeted (as noted above)
2. Key stakeholders and project partners, as well as their anticipated contributions
3. Estimated timelines, milestones, and scope of work for the project
4. Product needs, specifications and performance
5. Needs adjacent and emerging technologies
6. The plan for deployment, other needs (not addressed previously) and dependencies
7. Rough order of magnitude cost estimations for the project, including equipment, installation, permitting, etc.
8. Financing proposal, including what the respondent may be able to provide for financial resources and what would be needed as a subsidy from the public sector
9. Key risks, issues and barriers
10. Metrics to determine the success of the pilot
11. Ongoing or future partnerships that your company is engaged in that would bring innovative solutions to ZE Infrastructure pilots (e.g. relationships that enable innovative business models and financing mechanisms).