

**Written Statement of**

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**Before the  
Select Committee on the Climate Crisis  
United States House of Representatives**

**“Transportation Investments for Solving the Climate Crisis”**

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Chair Castor, Ranking Member Graves, and distinguished members of the Select Committee, thank you for this opportunity to speak with you today on the topics of climate change, transportation and clean air, and American jobs in the context of Congress’s ongoing consideration of infrastructure legislation this year.

I am Bill Van Amburg, Executive Vice President of CALSTART.<sup>1</sup> Today I will share some data on the technical and product revolution underway in zero-emission technologies for commercial vehicles – trucks and buses – and how these vehicles can play a major role in reducing the harmful effects of climate change.<sup>2</sup> But I also want to emphasize the co-benefits of this sector to our nation that go beyond the climate crisis. These vehicles are critical to American technical leadership and competitiveness. They provide a growing source of good-paying jobs, from assembly to supply chain to infrastructure installation, that are in many cases hyper-local. And importantly, these same technologies can cut to zero the pollution load born disproportionately by communities of color. We want to commend the good work this Committee and Congress have put in motion; but we also hope to make clear what still is left to be done.

For ease of organization, my statement will follow this structure: I will discuss CALSTART’s background and membership, provide an overview of the rapidly changing industry, and the “beachhead” strategy that helps to explain these vehicle’s rapid advancement and progression both domestically and globally, as well as some tools we use to help track that progress. Then I will turn to the need for federal leadership in zero-emission commercial vehicle policy, including some of the Committee’s own recommendations in this space; discuss some of CALSTART’s federal recommendations within the surface transportation process and in support of the Administration’s American Jobs Plan; and will close with a brief discussion of what is still left to do to advance our industry.

**Background.** CALSTART is the nation’s largest and oldest clean transportation technologies industry consortium. Nearly 300 companies and organizations are members of the CALSTART industry network.<sup>3</sup> They range in size and role from:

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<sup>1</sup> See [www.calstart.org](http://www.calstart.org)

<sup>2</sup> <https://globaldrivetozero.org/site/wp-content/uploads/2021/05/How-Zero-Emission-Heavy-Duty-Trucks-Can-Be-Part-of-the-Climate-Solution.pdf>

<sup>3</sup> See <https://calstart.org/members/>

- Major established car, truck and bus makers, such as Ford, General Motors, Toyota, Audi, Freightliner, Navistar-International, Volvo, Kenworth, Peterbilt and New Flyer;
- Innovative new electric manufacturers, such as Tesla, Rivian, Arrival, Proterra and Lion Electric;
- Leading companies in the automotive and truck component supply chain, where the bulk of the industry's jobs reside, such as Eaton, Meritor, Dana, Siemens and Danfoss;
- The world's leading fleets, such as UPS, FedEx, DHL, Pepsi-FritoLay, and Ikea; and
- A broad base of hundreds of small to mid-size technology companies who represent America's powerful emerging supply chain for advanced, clean and zero-emission vehicles.

CALSTART's non-profit (501(c)(3)) mission since its founding nearly 30 years ago has been to support and grow this clean transportation technology industry. Our mission and goals are even more resonant today than when we launched: to ensure we have both a healthy environment and a healthy economy. Jobs and clean air and climate action must go hand-in-hand. Our thirty years of experience show they can. By manufacturing and using the world's cleanest vehicles, communities most impacted by transportation pollution can breathe free, while also working in good-paying jobs. Clean air for all citizens, high-quality jobs and economic opportunity, maintaining American technology leadership and competitiveness, cutting climate impacts today – this is what our industry is dedicated to.

With offices in New York, Florida, Michigan, Wisconsin, Colorado and headquarters in California, we support this industry's success and growth in four key ways:

- Developing and managing world-leading technology demonstration and validation programs, to keep America's pipeline of innovation on the cutting-edge;
- Supporting faster adoption of early production clean vehicles with fleet assistance and incentive programs. One key example is the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP), a zero-emission commercial vehicle purchase incentive program CALSTART has helped administer with the California Air Resources Board (CARB) for the last decade since the program's inception;
- Working with industry to develop and secure supportive policies that invest in America's technologies and products; and
- Providing our member companies, fleets and organizations with market, technical, funding opportunity and networking assistance to grow their development and production.

**Rapid Industry Change.** Let me share a quick context of the pace of change we are seeing in advanced, zero-emission technologies, and why their rapid deployment is so important. First, while commercial vehicles – medium- and heavy-duty trucks and equipment – represent just a fraction or about four percent of total vehicles on the road worldwide, they represent an outsized contribution to climate and air pollution emissions. Commercial vehicles account for nearly thirty percent of on-road greenhouse gas emissions, and, just as importantly, more than 60 percent of nitrogen oxides (NOx), a major component of what causes air pollution.<sup>4</sup> In some U.S. cities, the contribution of NOx is as high as nearly 70 percent.<sup>5</sup> Few vehicles; big impact. That's why trucks are a prime segment for targeted, cost-effective emissions reduction.

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<sup>4</sup> <https://globaldrivetozero.org/site/wp-content/uploads/2021/05/How-Zero-Emission-Heavy-Duty-Trucks-Can-Be-Part-of-the-Climate-Solution.pdf>; page 2

<sup>5</sup> <http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/presentation-2022-aqmp-mobile-sources-printer-friendly.pdf?sfvrsn=12>

Importantly, trucks are also undergoing a revolution in the availability of low-carbon, low-emissions technologies that means they can deliver out-sized reductions sooner than many have anticipated. Today, every major North American and European truck maker has zero-emission trucks in early production or final stages before production. Volvo, Kenworth, Peterbilt, Navistar, Mack and Freightliner all are producing at least one, and in some cases several, zero-emission trucks. These are not just small delivery size vans. They include heavy Class 6 “box” trucks used to carry goods around cities and towns and full Class 8 “big rig” tractors, used to haul trailers around larger regions, such as from warehouses to stores or ports and railyards to distribution facilities.<sup>6</sup>

**“Beachhead” Strategy to Drive Change.** CALSTART has developed a fast-track strategy for accelerating the successful deployment of zero-emission trucks by first focusing on those applications that are best suited for success immediately, and outlining the subsequent, rapid phases into heavier and longer-range segments achievable as advanced truck technology advances and production costs drop. It was developed in partnership with CARB to help identify investment strategies to speed zero- and near-zero vehicles to market. Called the “beachhead” strategy, it identifies a first market success, or beachhead, and expands from there by transferring technology and reducing cost by building higher supply chain volumes.<sup>7</sup>

America’s first beachhead segment is electric transit buses, now representing a meaningful percentage of new bus purchases in the United States.<sup>8</sup> The underlying powertrain – electric motors, power electronics and battery packs or fuel cell systems – are highly transferrable to other medium- and heavy-duty applications, such as delivery, distribution and regional heavy freight trucks. This technology transfer helps unlock these next beachheads, allowing new market segments to take hold faster than ever before.

**Learnings from Real-World Applications.** To support this work, CALSTART has developed multiple practical tools to support adoption and track progress, including tools to assess the business case (commonly referred to as Total Cost of Ownership),<sup>9</sup> to plan for infrastructure needs,<sup>10</sup> and a matrix of successful policy instruments.<sup>11</sup> To help fleets and policy makers assess vehicle availability, we developed the Zero Emission Technology Inventory (ZETI), which tracks zero-emission commercial vehicles (ZECVs) in production or coming to market three years out.<sup>12</sup> ZETI Analytics projects that the number of ZECV models will grow globally by 30 percent by 2023; and the number of heavy-duty models will grow by a staggering 80 percent.<sup>13</sup>

**Global Alignment and Competition.** However, the beachhead strategy is not unique to the United States. Indeed, as global market demand and zero-emission commercial vehicle market opportunities grow, we have had visibility to the significant investments in this technology and jobs being created in Asia and Europe. These regions have also been able to apply this theory of change. To support of industry partners, CALSTART developed a worldwide program, the Global Commercial Vehicle Drive to Zero (Drive to Zero) program,<sup>14</sup> that has to date organized nine nations and more than 100 international industry, fleet, utility and government partners around the common goal of creating the supporting conditions for faster ZECV

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<sup>6</sup> <https://californiahvip.org/vehicles/>

<sup>7</sup> <https://globaldrivetozero.org/publication/the-beachhead-model/>

<sup>8</sup> <https://calstart.org/zeroing-in-on-zeps-2020-edition/>

<sup>9</sup> <https://californiahvip.org/tco/>

<sup>10</sup> <https://californiahvip.org/purchasers/#infrastructure>

<sup>11</sup> <http://toolkit.globaldrivetozero.org/>

<sup>12</sup> <https://globaldrivetozero.org/tools/zero-emission-technology-inventory/>

<sup>13</sup> <https://globaldrivetozero.org/tools/zeti-analytics/>

<sup>14</sup> See [www.globaldrivetozero.org](http://www.globaldrivetozero.org)

adoption. This policy ecosystem includes purchase incentives for the early market; investments in charging and refueling infrastructure installation; expanding technology development and demonstration programs to assist industry; and smart regulations.

Earlier this month, eight Drive to Zero nations agreed to develop a Global Memorandum of Understanding (Global MOU) to achieve specific zero-emission deployment targets for commercial vehicles to keep pace with climate change emissions. The Global MOU, modeled on the 15-State MOU in the United States, establishes a goal of 30 percent ZECV sales by 2030 and 100 percent by 2040, with specific actions to meet those goals. By the time of the international climate summit in November (Conference of the Parties, or COP26) we hope to have 15 to 20 nations announce their commitments to these goals.<sup>15</sup>

The policy ecosystems we helping other nations to establish, and which we are strongly recommending at the federal level for the United States, derive directly from our experience working with industry and fleets to understand which policies best support faster production and purchase of zero-emission trucks and buses – and with them, job creation and cleaner air in our most impacted communities.

As one example, both manufacturers and fleet operators have consistently told us that traditional tax incentives do not influence commercial vehicle purchase decisions; fleets need the vehicle cost reduced at the time of sale. Potentially reduced taxes later in the year do not overwhelmingly influence vehicle choice. But incentives directly reducing vehicle cost work.<sup>16</sup> Validated through ten years of real-world results at the state level in Illinois, New York, and California where we administer significant point-of-sale purchase incentive programs, we have put thousands of clean and zero-emission trucks and buses on U.S. roads. Earlier this month, the largest such program we help administer, HVIP in California, was fully subscribed in a period of just three hours with requests for over a thousand zero-emission trucks. Thirty percent of the requests were for heavy-duty Class 8 electric tractors for use in drayage, goods movement and regional distribution.<sup>17</sup> Successful public policy that can drive decarbonization of commercial vehicles resonates globally, as we have seen with Drive to Zero. It also demonstrates both where the United States can lead our partner nations by its example and where we have an opportunity to maintain a domestic competitive advantage.

**The Need for Federal Leadership.** Individual state actions creating a patchwork of supportive policies is not enough: our industry needs a consistent national program so all regions can take part. Shaped directly with our industry partners and proven in the laboratory of the states, CALSTART leads three major national industry coalitions that are making specific federal policy recommendations to advance zero-emission medium- and heavy-duty vehicle (MHDV) deployment and infrastructure: the National Zero-Emission Truck (ZET) Coalition; the Zero-Emission Bus & Innovative Mobility Coalition; and the Clean Corridors Coalition.

A number of these groups' policy recommendations will be familiar to this Committee, showing a broad base of support in industry for advancing clean transportation technologies and good-paying jobs. The Select Committee's majority staff report from last year, "Solving the Climate Crisis: The Congressional Action Plan for a Clean Energy Economy and a Healthy, Resilient, and Just America,"<sup>18</sup> hits on several key

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<sup>15</sup> <https://globaldrivetozero.org/2021/05/31/cem12announcement-5-31-21/>

<sup>16</sup> [https://calstart.org/wp-content/uploads/2020/09/CALSTART\\_VIP\\_White\\_Paper.pdf](https://calstart.org/wp-content/uploads/2020/09/CALSTART_VIP_White_Paper.pdf)

<sup>17</sup> "Funders Forum Update 061621", PowerPoint briefing to Funders Forum meeting

<sup>18</sup> <https://climatecrisis.house.gov/sites/climatecrisis.house.gov/files/Climate%20Crisis%20Action%20Plan.pdf>

points supported by our consensus-driven industry coalitions. Let me quickly summarize a few of these areas:

- The Select Committee's majority staff report first identified the need to pass legislation creating new purchase incentives, such as voucher programs or manufacturer tax credits, for zero-emission heavy-duty vehicles. We are now seeing this idea gain some traction at the federal level, as discussed below.
- The majority staff report, throughout its recommendations, emphasizes the historic opportunity and responsibility to invest in projects in deindustrialized and under-invested communities, including low-income communities and communities of color. This recommendation is particularly apt for a discussion of how to decarbonize goods movement since frontline communities often bear the brunt of the air quality impacts of heavier vehicle movement.
- The Select Committee's majority staff report also calls for the new grants to states and local and tribal governments to facilitate installation of electric vehicle charging stations and hydrogen fueling infrastructure along designated corridors along the National Highway System.
- The Select Committee's majority staff report also recommends increasing funding for the Low-No Grant Program by at least tenfold, including prioritizing projects in environmental justice communities; as well as expanding public transit access.
- The majority staff report prioritizes the role of the U.S. Department of Energy (DOE) in advancing research, development, demonstration, and deployment (RDD&D) to make high-efficiency, zero-emission, long-range trucks commercially viable, including through robust demonstration and pilot deployment of components, vehicles and infrastructure; and to help states through the DOE State Energy Program include transportation electrification planning and guidance in their state energy transportation plans.
- Finally, the Select Committee's majority staff report makes clear that the United States needs to double down on the zero-emission vehicle supply chain, from battery cell and pack technological innovations, to investment in upstream process innovations to provide a sustainable, domestic source of materials and components for battery electric vehicles in particular.

We commend the Committee for making these policies a priority and look forward to helping advance these priorities with our members this Congress.

**Surface Transportation Reauthorization and the American Jobs Plan.** There is an opportunity to advance a number of these areas through the surface transportation reauthorization process currently underway; there are also a number of items that go beyond the surface bill as Congress considers elements of the Biden-Harris Administration's American Jobs Plan. As noted above, several of these recommendations are either moving forward in the Surface Transportation Reauthorization legislation or are in various stages of being included in other legislative packages. But while good progress is being made, more remains to be done.

**Industry Needs and Recommendations.** Below are the core recommendations we have provided to this Committee, to Congress and the Administration to incentivize the adoption of ZECVs.

For Zero-Emission Trucks:

- **Point-of-sale or cash in-lieu of purchase incentives for zero-emission MHDVs**, the proposal advanced early on by this Committee, was incorporated into the Biden-Harris Administration's Fiscal Year 2022 Request in support of the American Jobs Plan. The Committee should be commended for helping elevate this policy over the last year. The Proposal in the FY22 Green

Book includes a business tax credit for new medium- and heavy-duty zero-emission vehicles, including battery electric vehicles and fuel cell electric vehicles in Classes 3 through 8, and the incentive steps down over 5 years. One important element that makes this policy the most aggressive incentive to advance zero-emission trucks currently proposed at the federal level: users would have the option to elect a cash payment in-lieu of a general business credit (i.e., a direct pay option).<sup>19</sup> Allowing the incentive to be elected as a cash payment builds on similar successful point-of-sale incentives at the state level and provides more access to the incentive to fleets of all sizes, closer to the point of purchase, and more quickly. We hope to work with this Committee, the Committee on Ways & Means, and the Senate Finance Committee to support elements of the Administration's proposal in any tax incentives for zero-emission MHDVs advanced through budget reconciliation this Congress.

- We recommend **expanding existing Highway Trust Fund programs, such as the Congestion Mitigation and Air Quality Improvement program (CMAQ)**, to include as an eligible use of funds the purchase of zero-emission MHDVs, related infrastructure, and zero-emission operations equipment. We were pleased to see and thank the Chair for her leadership on an amendment to the House's surface transportation reauthorization legislation, the INVEST in America Act, along these lines that was filed last week.
- We encourage Congress to **support Department of Energy investment in zero-emission truck and bus innovations**, including new RDD&D investment to support 1) robust zero-emission truck demonstrations and pilot deployments in real-world settings; 2) zero-emission truck component innovation, including battery and fuel cell innovation; and 3) zero-emission truck charging and refueling infrastructure. Encouragingly, the President's FY22 DOE Budget Request included \$595 million for the Vehicle Technologies Office, a 45 percent increase from 2020 enacted levels. This additional money will help RDD&D of new, efficient, and clean mobility options and enable widespread adoption of hydrogen and fuel cell technologies. The Request also supports increased investments to develop new innovations in vehicle technologies, leveraging the unique capabilities and world-class expertise of the National Laboratory system while deemphasizing support for RDD&D designed to expand the use of fossil-fueled internal combustion engines. Finally, the Request includes increased support for demonstration efforts to transition medium and heavy trucks to electrified platforms and improve efficiency of the entire freight system. We look forward to working with Congress to make these needed investments.
- Finally, in line with the Committee's own recommendations, we are calling on Congress to **create a new technical assistance program at the Department of Energy** to help states, regulators, utilities, and fleets plan for MDHV electrification and make-ready investments; and to ensure that model MHDV electrification guidelines and best practices are developed with stakeholders and disseminated widely.

#### For Zero-Emission Buses:

- **CALSTART recommends an at least twofold increase in Low and No Emission Program (Low-No) to \$360 million/year starting in FY 2022.** The House Committee on Transportation & Infrastructure, under the leadership of Chairman Peter DeFazio, has advanced a framework under the INVEST Act that would go well beyond this, including \$4.1 billion for FY23 through FY26 for the Zero-Emission Bus grant program, an increase of 1,500 percent above FY20 enacted levels. Robust investment in Low-No will put the federal government on a path to supporting greater

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<sup>19</sup> U.S. Department of Treasury, "General Explanations of the Administration's Revenue Proposals," May 2021, <https://home.treasury.gov/system/files/131/General-Explanations-FY2022.pdf>, pp. 46-47.

and greater deployments of zero-emission buses by the end of the decade, as called for by Select Committee member Congresswoman Julia Brownley's Green Bus Act of 2021. As an interim goal, Low-No should continue to provide funding for both low- and no-emission vehicles, with a growing emphasis on zero-emission vehicles by the middle of the decade to achieve 1,000 zero-emission buses (ZEBs) deployed per year by 2025. Finally, we would support efforts by the Committee to direct the Department to partner with transit agencies and other stakeholders to provide a transition roadmap of needed innovations, infrastructure requirements, and market acceptance factors needed to support this transition through the end of the decade.

- Provide robust investment in systems innovation and vehicle technologies through Federal Transit Administration (FTA) Innovation and Technical Assistance<sup>20</sup> by **authorizing \$50 million/year in funding and \$5 million/year for technical assistance specifically dedicated to support of ZEB integration**. We encourage investment across a wide range of critical technologies, including but not limited to electric and more efficient fuel-fired heating and air conditioning systems for use in extremely cold and hot climates; advanced electric bus charging solutions; integration of transit buses and micro-mobility, and mobility on demand; and hydrogen fuel cell and storage technologies, among other areas. We also believe that, during this period of rapid technological development, transit operators will need technical assistance from entities with specialized knowledge in evaluating, transitioning to, and implementing new technologies. FTA should continue to encourage partnerships between transit operators, fleet suppliers, and qualified nonprofit entities to encourage effective, accelerated adoption of low- and no-emission buses.
- Finally, we encourage Congress to authorize and fund a **new \$200 million/year competitive grant for innovative mobility research, development, and demonstrations**, make proven innovative mobility projects eligible for formula funding, and designate an Innovative Mobility Leader. Within the \$200M/year program, Congress should prioritize an equity-focused and community-led shared mobility services pilot, modeled after the Clean Mobility Options Voucher Pilot program,<sup>21</sup> to jumpstart the adoption of innovative modes of transportation and transit in disadvantaged or underserved communities, in line with the Biden administration's Justice40 Initiative goal of delivering 40% of the overall benefits of relevant federal investments to disadvantaged communities. This investment should also include authorize a competitive grant program to demonstrate and validate targeted examples of comprehensive multi-modal transportation networks of infrastructure for active transportation, advanced public transit systems, and their interconnectivity in cities and towns.

#### For Zero-Emission Commercial Vehicle Infrastructure:

- We encourage Congress to **authorize robust funding for the Federal Highway Administration (FHWA) Alternative Fuel Corridor competitive grant** to build out infrastructure along highway corridors, including a portion for infrastructure to support zero-emissions goods movement nationwide. The INVEST Act again makes strides in this area, calling for \$4 billion in electric vehicle charging and hydrogen refueling infrastructure, helping the United States make a full transition to clean transportation. In line with the American Jobs Plan's goals of creating a national network of 500,000 charging stations across the United States, the INVEST Act would provide \$1 billion per year clean corridors program to provide formula funding to states for electric vehicle charging and hydrogen fueling infrastructure and establishing a new alternative fuel infrastructure freight corridor designation process. We were also encouraged by the provision in the Senate

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<sup>20</sup> 49 U.S. Code §5312

<sup>21</sup> See "Clean Mobility Options: About the Program," <https://www.cleanmobilityoptions.org/about/>

Environment and Public Works Committee's Surface Transportation Reauthorization Act (STRA), reported unanimously out of Committee earlier this month under the leadership of Chairman Carper, which included a new consideration in the grant making process specifically for zero-emission medium- and heavy-duty vehicle charging and refueling. That provision, championed by Senator Alex Padilla, would help emphasize the need for investment in zero-emission infrastructure to support decarbonizing goods movement along freight corridors nationwide.

- We also call on Congress to **advance a new program to provide zero-emission MHDV infrastructure rebates for depot and on-route charging and hydrogen refueling**, and to **extend and reform the §30C alternative fuel infrastructure tax credit**.

For the Electric Vehicle Supply Chain:

- **CALSTART is leading the U.S. Battery Leadership Initiative, involving several key OEM and battery supply chain members focused on advancing incentives and workforce development programs** to support domestic manufacturing supply chain for electric vehicle batteries – from upstream technologies for the sustainable, domestic processing of minerals, to downstream battery cell and pack innovations, to battery recycling manufacturing processes.
- As part of this effort, we are organizing key EV industry voices to support Congress's efforts to invest in **manufacturing investment tax credits, grants, and loans** to retool, equip, and incentivize battery cell, pack, and material manufacturers of all sizes; **invest in innovation** to bolster the domestic ZEV battery supply chain competitiveness; and **train and bolster the U.S. battery supply chain manufacturing and assembly workforce**.

**What is Still Left to Do.** We thank the Committee for its work to date, but the work is not yet done. There are several critical elements for industry, such as the point-of-sale incentive, that have yet to move forward. We strongly encourage the Committee to continue to highlight the need to support and invest in American technology competitiveness; to support and create U.S. jobs by encouraging the production and purchase of these technologies with incentives that match market needs; to ensure America leads the world in building the new infrastructure these zero-emission vehicles need; and to prioritize deploying zero-emissions commercial vehicles in under-invested communities and communities of color, who have born the bulk of the burden of air pollution.

We are at a unique period of inflection for our nation and the world in how we address our climate imperative, and whether we do so in a way that will keep American industry competitive, provide U.S. workers future-proof jobs and clean the air in communities too long left behind. America has invented many of the technologies now being manufactured elsewhere but has often not supported or spurred our own manufacturers to make and our fleets to buy these best-in-class technologies. Asia and Europe are investing deeply in zero-emission technology and the critical component manufacturing leadership it brings. We have the unparalleled opportunity and the national capacity to lead this next phase of transportation. Zero-emission commercial vehicles are a powerful and focused segment that enables targeted policies and investments to make outsized impacts in our nation and world. Our world requires it; our workers deserve it; and equity demands it. Let us not lose this chance to change transportation for good.

We appreciate the opportunity you have given us to provide this information and recommendations. We remain committed to being an asset to the Committee and its staff at any time, and are happy to answer any questions you may have.