

Appendix B

SB 1204 Requirements and Performance Criteria Evaluation For Heavy-Duty Projects (Health & Safety Code Section 39719.2(c) and (d))

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Overview

SB 1204 (Lara, Chapter 452, Statutes of 2014) created the California Clean Truck, Bus, and Off-road Vehicle and Equipment Technology Program funded with Low Carbon Transportation Investments, to support the development, demonstration, pre-commercial pilot, and early commercial deployment of zero- and near zero-emission technologies with priority given to projects that benefit disadvantaged communities. This appendix describes the ten requirements of SB 1204 and how ARB is addressing each of these requirements, followed by an evaluation of how each applicable heavy-duty or off-road project proposed in the FY 2016-17 Funding Plan satisfies the proposed performance criteria.

ARB's proposed heavy-duty vehicle and off-road equipment projects were evaluated based on a range of criteria that address emission reductions, technology viability and advancement, and market acceptance. Both SB 1204 and AB 8 (Perea, Chapter 401, Statutes of 2013) provide important policy drivers behind ARB's process of evaluating heavy-duty and off-road projects for funding consideration. Projects funded by AQIP must be evaluated based on the benefit-cost of criteria pollutant reductions and five additional preference criteria consistent with the requirements of AB 8, as detailed in Appendix A – Emission Reductions: Quantification Methodology. While some of the heavy-duty and off-road projects receive funding from AQIP, most are funded from ARB's Low Carbon Transportation appropriation and must satisfy the requirements of SB 1204, discussed in this appendix. The complete AB 8 and GHG emission analysis is detailed in Appendix A.

1. Addressing SB 1204 Requirements

SB 1204 establishes specific program planning and project eligibility requirements and directs ARB to use the existing AQIP Funding Plan process to develop the guidance necessary to implement the program (Health and Safety Code section 39719.2(c)). The Funding Plan coordinates AQIP and Low Carbon Transportation investments in the heavy-duty sector, while implementing the specific statutory requirements that apply to each program.

SB 1204 establishes ten goals for California Clean Truck, Bus, and Off-Road Vehicle and Equipment Technology Program in Health and Safety Code section 39719.2(d) that should be addressed in ARB's guidance. The following describe how ARB will address each of these requirements, either by continuing procedures and processes that have been in place for previous AQIP or Low Carbon Transportation funding cycles or through new requirements proposed in this Funding Plan, followed by ARB's overarching vision for heavy-duty vehicle investments.

SB 1204 Requirement 1: Outline performance criteria and metrics for deployment incentives. The goal shall be to design a simple and predictable structure that provides incentives for truck, bus, and off-road vehicle and equipment technologies that provide significant greenhouse gas reduction and air quality benefits.

As Low Carbon Transportation and AQIP evolve, there is a clear need to evaluate the effectiveness of program investments. Staff has and will continue to work with stakeholders to identify appropriate metrics of success for each project funded under AQIP and the California Clean Truck, Bus, and Off-Road Vehicle and Equipment Program.

To achieve the pace of technology advancement needed to meet long-term air quality and climate goals, this funding should spur increasingly low-emission and low-carbon technologies as they are introduced and achieve market acceptance. The availability of significant Low Carbon Transportation funding will enable the progression of advanced heavy-duty technologies toward commercialization at a faster pace. Similar to how light-duty vehicles transitioned from basic hybrids to plug-in and fuel cell electric vehicles, basic hybrid trucks are a precedent to advanced hybrids, and finally to the ultimate goal of zero-emission trucks (or trucks that achieve zero-emission miles in specific duty cycles).

While ARB's heavy-duty vehicle incentives have historically funded hybrid and zero-emission urban package and delivery trucks, California Clean Truck, Bus, and Off-Road Vehicle and Equipment Program funding is expected to also expedite widespread deployment of zero-emission urban buses, freight and line-haul trucks, and off-road equipment, which are responsible for the bulk of emissions from the heavy-duty sector. Investments in HVIP, truck and bus pilot projects, freight equipment pilot projects, and demonstrations all play a critical role in transitioning the entire freight and passenger transportation sector to zero-emission technologies, while at the same time providing immediate benefits to disadvantaged communities.

Proposed Performance Criteria for Evaluating Heavy-Duty Projects: Staff proposes the following performance criteria for evaluating heavy-duty projects funded through AQIP, California Clean Truck, Bus, and Off-Road Vehicle and Equipment Program, or both. These performance criteria are also intended to fulfill SB 1204 requirements:

- Potential for statewide and local emission reductions and health benefits.
 - Near-term reductions in both GHG and criteria emissions.
 - Long-term reductions in GHG and criteria emissions.
 - Emission reductions in non-attainment areas.
 - Emission reductions in and benefiting disadvantaged communities.
- Potential for technology viability.
 - Cost parity compared to conventional technology.
 - Reliability and durability in chosen application.

- Ability to transfer technology to other vehicle or equipment types.
- Fueling infrastructure support.
- Ability to integrate renewable fuels.
- Broad market acceptance.
 - Ability to leverage additional public and private funding.
 - Collaboration between multiple entities.
 - Ability to address market barriers.

SB 1204 Requirement 2: Ensure that program investments are coordinated with funding programs developed pursuant to the California Alternative and Renewable Fuel, Vehicle Technology, Clean Air, and Carbon Reduction Act of 2007 (Chapter 8.9 (commencing with Section 44270) of Part 5).

Developing a joint Funding Plan that covers both AQIP and Low Carbon Transportation funding sources ensures coordinated investments between these two programs. The California Clean Truck, Bus, and Off-Road Vehicle and Equipment Program complements and enhances the existing ARB/Energy Commission coordination in the AQIP planning process by directing additional funding for the development, demonstration, pre-commercial pilot, and early commercial deployment of zero- and near zero-emission truck, bus, and off-road vehicle and equipment technologies.

In developing the joint Funding Plan, ARB and the Energy Commission staff meet routinely during the development of each agency's funding/investment plans for these respective programs to ensure that investments are coordinated. ARB has a representative on the Advisory Committee that assists with the development of the Energy Commission's Alternative and Renewable Fuel and Vehicle Technology Program. Similarly, Energy Commission staff participate in the public workshops and work groups that are part of ARB's annual funding plan development.

SB 1204 Requirement 3: Promote projects that assist the state in reaching its climate goals beyond 2020, consistent with Sections 38550 and 38551.

In the FY 2014-15 and FY 2015-16 Funding Plans, heavy-duty projects focused on vehicles and industry sectors that, when transitioned to zero-emission, will have a significant impact on reducing climate change emissions. Both Funding Plans included significant Low Carbon Transportation funding allocations for demonstrations, pilot commercial deployments, and ongoing deployments of commercially available vehicles that will achieve both near-term and long-term GHG emission reductions.

By continuing to develop promising near zero- and zero-emission technologies for use in industry sectors that: (1) are significant GHG emitters; and (2) hold promise for technology expansion and transfer to other sectors, these investments will help the State reach its long-term climate goals. Some of the key performance criteria listed above are "potential for long-term GHG reductions" and "ability to transfer technology to

other vehicle or equipment types.” These criteria help to promote projects that will contribute to meeting post-2020 climate goals.

SB 1204 Requirement 4: Promote investments in medium- and heavy-duty trucking, including, but not limited to, vocational trucks, short-haul and long-haul trucks, buses, and off-road vehicles and equipment, including, but not limited to, port equipment, agricultural equipment, marine equipment, and rail equipment.

Since the launch of AQIP with the first annual Funding Plan in 2009, ARB has funded the types of projects identified by SB 1204, and staff proposes to continue and to expand these investments. As shown in Table 3 in Chapter 2 of this Funding Plan, staff proposes \$175 million for demonstrations, pilots, and deployment projects in the truck, bus, and off-road vehicle and equipment sectors.

SB 1204 Requirement 5: Implement purchase incentives for eligible technologies to increase use of the cleanest vehicles in disadvantaged communities.

Consistent with this requirement, the Board approved the FY 2014-15 and FY 2015-16 Funding Plans with the commitment that at least half of the total Low Carbon Transportation funding be invested in projects that provide benefits to disadvantaged communities. For FY 2016-17, staff proposes to continue this level of incentives in disadvantaged communities. In addition, staff’s proposal ensures that at least 10 percent of these funds will be invested in disadvantaged community census tracts. This will ensure that ARB’s heavy-duty vehicle incentives increase the use of the cleanest vehicles in these communities.

Over past funding cycles, ARB has provided AQIP and Low Carbon Transportation funding for purchase incentives for clean technologies, reducing emissions from the heavy-duty sector and providing benefits to disadvantaged communities. To date, nearly 2,500 vouchers have helped fund hybrid and battery electric delivery trucks and buses through HVIP, with about two-thirds of HVIP funding providing benefits to disadvantaged communities, and about 45 percent spent in disadvantaged communities. In addition, new pilot deployment projects for zero-emission trucks and buses that ARB will launch this year will also increase use of the cleanest vehicles and benefit disadvantaged communities.

SB 1204 Requirement 6: Allow for remanufactured and retrofitted vehicles to qualify for purchase incentives if those vehicles meet warranty and emissions requirements, as determined by the state board.

The Hybrid and zero-emission conversions of original equipment manufacturer (OEM) vehicles were added to HVIP in FY 2015-16 and is proposed to continue for this project in FY 2016-17. ARB is also allowing conversions of existing in-use vehicles to zero-emission as an eligible vehicle category in the zero-emission truck and bus pilot projects being funded as part of the FY 2014-15 Funding Plan and proposed in this

Funding Plan. Additionally, staff is proposing that the Low NOx Engine Incentive Project include repowers of existing heavy-duty vehicles with engines certified to an optional low NOx standard.

SB 1204 Requirement 7: Establish a competitive process for the allocation of moneys for projects funded pursuant to this section.

ARB has used an established process for awarding AQIP funding through competitive solicitations since 2009. This process has served as the basis for allocating most Low Carbon Transportation funding since the FY 2014-15 funding cycle, and staff proposes using the same process moving forward to solicit and award California Clean Truck, Bus, and Off-Road Vehicle and Equipment Program funding. Staff also proposes to allow funding allocations to be directed to a local air district or other agency to competitively solicit projects that more effectively address local needs.

SB 1204 Requirement 8: Leverage, to the maximum extent feasible, federal or private funding.

Currently, most grant solicitations require a minimum level of match funding, and projects that offer more match funding have the potential to be scored higher than projects with less match funding. Proponents are encouraged to seek additional funding from federal, state, and local public sources, as well as private sources. Staff proposes continuing the solicitation scoring criteria to encourage leveraging and is working with other funding providers to maximize federal and private funding.

SB 1204 Requirement 9: Ensure that the results of emissions reductions or benefits can be measured or quantified.

Since the inception of AQIP, all grant solicitations require that the project proponent report various metrics associated with vehicle operation and fuel consumption. Emissions from vehicles certified to a cleaner standard (i.e., low NOx) will be compared to a diesel baseline to determine emission reductions. Fuel consumption and carbon intensity will be used to quantify GHG emission benefits from hybrids, battery electric and fuel cell electric vehicles, as well as from vehicles using renewable fuels, compared to their conventional counterparts. All program-level emission reduction benefits will be quantified by comparing to conventional technologies on a well-to-wheel basis. In addition, telematic devices will be used when possible to monitor in-use data and provide information on usage in disadvantaged communities and other designated areas. Staff proposes to contract with a third party to collect and analyze operation, maintenance, and performance data associated with demonstration and pilot projects.

SB 1204 Requirement 10: Ensure that activities undertaken pursuant to this section complement, and do not interfere with, efforts to achieve and maintain federal and state ambient air quality standards and to reduce toxic air contaminants.

The zero- and near zero-emission technologies funded in California Clean Truck, Bus, and Off-Road Vehicle and Equipment Program provide GHG reductions as well as criteria pollutant and toxic air contaminant reductions, consistent with the existing AQIP program. These technologies operating in and near disadvantaged communities will reduce NOx and diesel particulate matter, contribute to criteria pollutant emission reductions, and reduce GHG emissions in the heavy-duty sector.

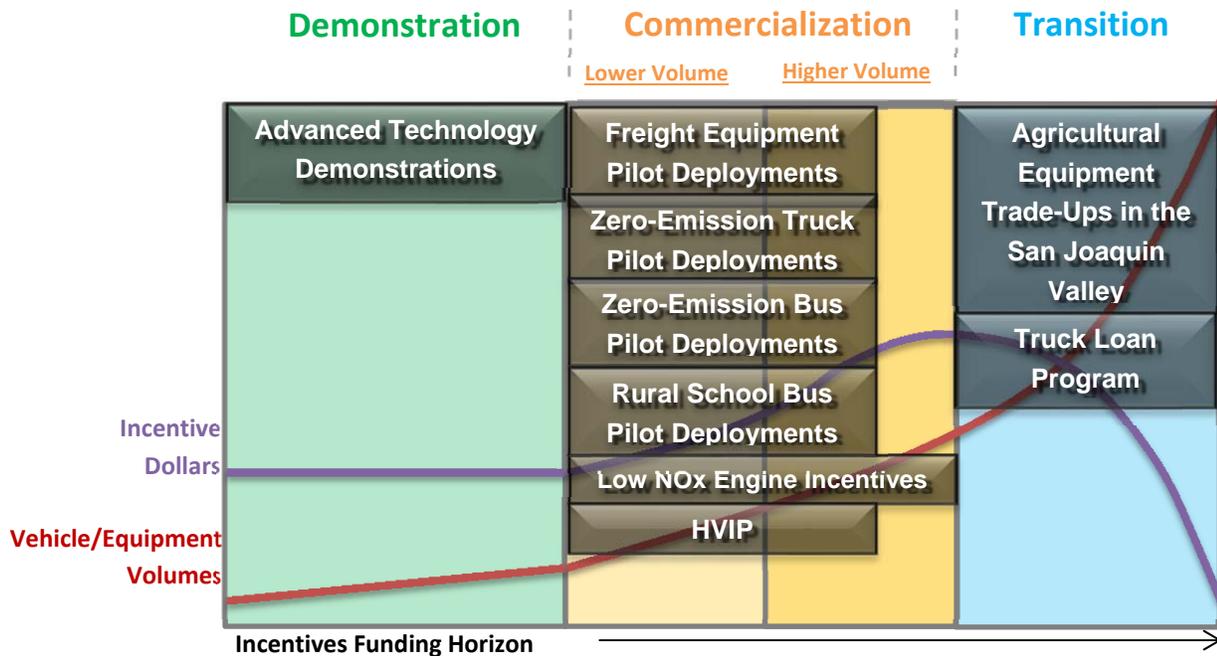
OVERARCHING VISION FOR HEAVY-DUTY VEHICLE INVESTMENTS

SB 1204 directs that the annual framework and plan required under Health and Safety Code Section 39719.2(f):

Articulate an overarching vision for technology development, demonstration, pre-commercial pilot, and early commercial deployments, with a focus on moving technologies through the commercialization process.

The recommended heavy-duty vehicle and off-road equipment projects support SB 1204’s overarching vision for technology development, demonstration, pre-commercial pilot, and early commercial deployments, with a focus on moving technologies through the commercialization process. This evolutionary role of incentives – is illustrated in Figure B-1 and described below.

Figure B-1: Proposed Heavy-Duty Vehicle and Off-Road Equipment Investments



In the *demonstration phase*, manufacturers are placing pre-commercial vehicles and equipment in service under real-world operating conditions. In this phase, per-vehicle incentives are high because manufacturing is not standardized and is focused on smaller batches of vehicles.

Funding is also provided for *pilot projects* to help the technology evolve in the early commercialization phase by deploying a larger volume of vehicles and equipment. Pilot projects can include both pre-commercial pilots and commercial pilots depending on the stage of technology advancement. *Pre-commercial pilots* are focused on first-time demonstrations of advanced technologies in new applications. *Commercial pilots*, on the other hand, involve deployments of vehicles and equipment that have been demonstrated, are certified by ARB, come with a warranty, and are purchased or leased by the end user. Vehicles in commercial pilots are ready to be sold commercially, but in such small numbers that they would not be able to compete without incentive support.

Table B-1: Pilot Project Categories

Milestone	Demonstration or Pre-commercial Pilot	Early Commercial Deployment or Commercial Pilot
ARB Certification/Approval	Experimental permit	Vehicle/engine certification or zero-emission approval letter
Vehicle Ownership	Retained by manufacturer	Purchase or lease transaction
Manufacturer Warranty	No	Yes

In addition, many projects would not advance to commercialization without the appropriate fueling infrastructure. For this reason, ARB provides funding for fueling infrastructure that directly supports funded vehicles and equipment.

In the *commercialization phase*, incentives are provided to encourage consumer adoption of advanced technologies. The commercialization phase can be broadly separated into lower volume and higher volume production phases. In the lower volume commercialization phase, per vehicle incentives are high. As sales grow and economies of scale are achieved, incentive funding levels and vehicle eligibility requirements can be adjusted to reduce per vehicle funding to ensure maximum incentive efficiency. In this higher volume commercialization phase, while per vehicle incentives are decreasing, total sales are increasing and total incentive funding commitments increase as a result. As a technology moves from lower volume commercialization to a fuller more mature higher volume, the incentive funding goals shift from a focus on technology development to a more specific focus on moving the technology from early adopters to mainstream consumers, disadvantaged communities, and the secondary market.

As a technology moves from commercialization into the transition phase, incentives can be adjusted to focus specifically on moving the technology into new consumer demographic segments and on building upon earlier benefits in disadvantaged communities.

2. Project-Specific SB 1204 Performance Criteria Evaluation

Following is an evaluation of each proposed heavy-duty and off-road equipment project in terms of how they satisfy the proposed performance criteria detailed earlier in this appendix. Only projects proposed to be funded with Low Carbon Transportation Investments are included below.

ADVANCED TECHNOLOGY DEMONSTRATION PROJECTS

Following is an assessment of the proposed Advanced Technology Demonstration Projects in terms of how they meet the proposed SB 1204 evaluation and performance criteria.

Potential for Statewide and Local Emission Reductions and Health Benefits: Advanced Technology Demonstration Projects are focused on demonstrating technologies that are on the cusp of commercialization and have the potential for significant emission reductions. The proposed projects for conventional on-road trucks will demonstrate how increasing efficiencies in conventional technologies can result in near-term emission reductions, while the zero-emission truck demonstrations will demonstrate technologies that can replace conventionally fueled trucks, leading to long-term emission reductions in the trucking sector once fully commercialized. In addition to cleaner on-road trucks, the projects focusing on demonstrating zero-emission rail and cargo handling technologies will result in immediate air quality benefits to communities located near rail yards, ports, distribution centers, and airports – which in many instances are within or near disadvantaged community census tracts. Due to their relatively small scale, these demonstration projects will result in modest emission reductions in the short term while, more importantly, supporting the potential for longer term emission reductions from the demonstrated technologies once fully deployed into the marketplace.

Potential for Technology Viability: Advanced Technology Demonstration Projects can achieve several objectives: (1) determining the viability of applying advanced technologies in revenue service through real-world field demonstrations; (2) evaluating the potential for expanding use of the technologies in similar sectors or vocations; and (3) evaluating the use of demonstrated technologies in new applications and industry sectors. The locomotive freight projects, for example, demonstrate the use of zero-emission technologies within and near the rail yards, while providing data to evaluate the potential for increasing the use of zero-emission technologies in line-haul locomotives. Similarly, the zero-emission short and regional haul truck demonstrations will build on the advances made through the demonstration of zero-emission drayage trucks from the FY 2014-15 Funding Plan. The non-freight off-road projects will transfer proven hybrid technologies to agricultural and construction equipment, and are expected to lead to increased operational efficiencies and reduced operation and maintenance costs. Because many of these demonstration projects will require the installation of fueling infrastructure, they provide the opportunity to demonstrate

hydrogen and charging fueling infrastructure in heavy-duty on- and off-road applications, and provide increased opportunities to integrate renewable fuels.

Broad Market Acceptance: The success of any Advanced Technology Demonstration Project is forged on strong public-private partnerships, requiring collaboration between many entities, such as the State, regional municipalities, local air districts, ports and rail yards, fleet owners and equipment operators. Demonstration projects require private technology firms to team with public agencies or non-profit organizations in submitting their application for funding and a significant contribution of match funds. ARB requires a minimum of 25 percent cost share from the project applicants, where a higher contribution from the project proponents is scored higher than those projects that just meet the minimum match requirements. Airport ground support equipment (GSE) and cargo handling equipment, such as baggage equipment, forklifts, reach stackers and yard trucks, are used throughout the State. Successful demonstrations of pre-commercial zero-emission GSE and cargo handling equipment support broad market utilization of these technologies and future cost-reductions due to economy-of-scale production.

FREIGHT EQUIPMENT COMMERCIAL DEPLOYMENT PILOT PROJECT

Following is an assessment of the proposed Freight Equipment Commercial Deployment Pilot Project in terms of how it meets the proposed SB 1204 evaluation and performance criteria.

Potential for Statewide and Local Emission Reductions and Health Benefits: The proposed project is expected to achieve near-term greenhouse gas reductions along with co-benefit reductions in toxic and criteria pollutant emissions. Longer term reductions in GHG, criteria and toxic pollutant emissions will be realized as the off-road zero-emission technology pilots increase in scale over time, and as more end-users take advantage of the incentive funding for these technologies. Staff expects at least 50 percent of the equipment funded will benefit disadvantaged communities, which will have the added benefit of improving air quality in areas non-attainment.

Potential for Technology Viability: Funding to incentivize the purchase of zero-emission off-road freight equipment has significant potential for technology viability by helping to support their penetration into the broader market, which in turn will positively impact cost differentials and consumer acceptability. The availability of funds for current commercialized freight equipment will also help transition zero-emission technologies to similar freight related applications that require even higher horsepower and longer duty cycles.

Broad Market Acceptance: Collaboration and commitment on the part of early users and beneficiaries of clean technology is essential to market acceptance. Fortunately, the need for air quality improvements is the impetus behind federal, state, and local funding for technologies that will result in lower emissions and increased use freight technology. The pilot project will increase public and industry acceptance of the

technology through education, outreach, and positive exposure to new technologies. Zero-emission freight equipment that successfully perform the same functions as their conventional counterparts will send a strong signal to those considering adopting similar zero-emission technologies.

ZERO-EMISSION TRUCK PILOT COMMERCIAL DEPLOYMENTS AND ZERO-EMISSION BUS PILOT COMMERCIAL DEPLOYMENTS

Following is an assessment of the proposed Zero-Emission Truck Pilot Commercial Deployment Project and Zero-Emission Bus Pilot Commercial Deployment Project in terms of how they meet the proposed SB 1204 evaluation and performance criteria.

Potential for statewide and local emission reductions and health benefits:

Zero-emission freight and delivery truck pilot deployments and zero-emission transit, shuttle, and school bus pilot deployments are designed to achieve near-term and long-term emission reduction targets. Displacing diesel-powered vehicles with zero-emission trucks and buses will result in immediate reductions of criteria pollutant, toxic air contaminant, and GHG emissions. Centering projects in disadvantaged communities will ensure that the early criteria pollutant and PM emission reductions directly benefit disadvantaged communities as well as contribute to emission reductions in ozone non-attainment areas. Finally, the pilot deployments are designed to help overcome technology and market barriers to widespread adoption, ultimately leading to long-term reductions in emissions associated with the production and combustion of diesel fuel.

Potential for technology viability: Two key objectives of these pilot deployments are to increase the numbers of zero-emission medium- and heavy-duty vehicles in use, and increase zero-emission miles. Increased production volumes will lead to cost reductions in vehicle components and assembly, energy storage systems, and fueling infrastructure. Economy-of-scale cost reductions combined with potential fuel and maintenance cost savings will help drive zero-emission technology closer to cost parity with conventional technologies. Increased miles traveled by zero-emission trucks and buses will greatly broaden industry's understanding of the technology, and help identify opportunities for cost savings, technology improvements, and technology transfer. Increasing the numbers of advanced technology vehicles and miles traveled will also result in increased demand for electricity and hydrogen fuels, which will help the State meet goals for transitioning from petroleum to renewable fuels.

Broad Market Acceptance: Collaboration and commitment on the part of early users and beneficiaries of clean technology is essential to market acceptance. Fortunately, the need for air quality improvements is the impetus behind federal, state, and local funding for technologies that will result in lower emissions and increased use of transit buses and school buses. This funding coupled with commitments made by local air districts, transit agencies, and planning organizations to invest resources toward improving local air quality motivates technology providers and entrepreneurs to invest in developing zero-emission technologies. For this reason, the truck and bus pilot

deployment solicitation encourages local agency participation as well as leveraging of match funding from public and private sources. The deployment projects will increase public and industry acceptance of the technology through education, outreach, and positive exposure to new technologies. Trucks and buses that successfully perform the same functions as their conventional counterparts will send a strong signal to those considering adopting similar advanced clean technologies.

RURAL SCHOOL BUS PILOT PROJECT

Following is an assessment of the proposed Rural School Bus Pilot Project in terms of how it meets the proposed SB 1204 evaluation and performance criteria.

Potential for statewide and local emission reductions and health benefits: Incentivizing lower carbon options for California's rural school bus fleet is expected to achieve near-term and long-term emission reductions. Displacing older, conventional-fueled school buses with zero-emission or hybrid technologies will result in immediate reductions of criteria pollutant, toxic air contaminant, and GHG emissions, providing health benefits to children, California's largest population group sensitive to the effects of air pollution. Internal combustion engine school buses using renewable fuels will also provide immediate GHG reductions while increasing the demand for low carbon fuels. The pilot deployments are designed to help overcome technology and market barriers to widespread adoption, ultimately leading to long-term reductions in emissions associated with the production and combustion of conventional fuel. Finally, while it is unknown if funding will occur in disadvantaged community census tracts, centering projects in rural areas will enhance fleet turnover to cleaner technologies in areas that would not otherwise benefit.

Potential for technology viability: As with the zero-emission bus pilot deployments, the Rural School Bus Pilot Project will increase the numbers of zero-emission school buses in use and increase zero-emission miles. These increases will contribute to economy-of-scale cost reductions and provide school bus fleets the potential to experience fuel and maintenance cost savings. The use of renewable fuels for internal combustion engine school buses will help support the goals of the Low Carbon Fuel Standard and provide an opportunity to reduce GHG emissions. All of the low carbon options available in this project will help the State meet goals for reducing petroleum use.

Broad Market Acceptance: Collaboration and commitment on the part of early users and beneficiaries of clean technology is essential to market acceptance. The need for air quality improvements is the impetus behind federal, state, and local funding for technologies that will result in lower emissions and increased use of school buses with these technologies. The project will increase public and industry acceptance of zero-emission school buses and clean fuels through education, outreach, and positive exposure to new technologies. Advanced technology school buses and school buses using renewable fuels that successfully perform the same functions as their

conventional counterparts will send a strong signal to those school bus owners considering adopting similar advanced clean technologies.

LOW NOX ENGINE INCENTIVES

Following is an assessment of the proposed low NOx engine incentives in terms of how they meet the proposed SB 1204 evaluation and performance criteria.

Potential for Statewide and Local Emission Reductions and Health Benefits: The Low NOx Engine Incentives project is expected to achieve near-term reductions of GHG and criteria pollutant emissions, particularly with the use of renewable fuels. These near-term reductions will complement the incentives provided for zero-emission pathway technologies that achieve long-term reductions. Staff expects at least 50 percent of the funding for this project will benefit disadvantaged communities. However, the actual geographic locations of vehicle buyers and driving routes are unknown; staff will rely on required reporting and monitoring information to quantify the emission reductions in disadvantaged communities and federal ozone standard non-attainment areas.

Potential for Technology Viability: Funding to incentivize the purchase of early low NOx heavy-duty vehicle engines has significant potential for technology viability. Incentivizing the production and purchase of vehicles with these engines will help support their penetration into the heavy-duty market, which in turn will positively impact cost differentials and consumer acceptability. Making this funding available to medium heavy-duty vehicles (14,001 to 26,000 pounds GVWR) will help transition the technology to heavy heavy-duty vehicles (greater than 26,000 pounds GVWR), since advanced technologies are often implemented in lighter weight classes before evolving to heavier weight classes with longer duty cycles. Lastly, this project encourages the development of renewable fuels by requiring renewable fueling for vehicles funded by Low Carbon Transportation Investments.

Broad Market Acceptance: Incentivizing the production and purchase of vehicles with low NOx engines will help support consumer acceptance and drive down incremental costs. Staff will continue to coordinate with the Energy Commission to ensure a clear, systematic implementation approach for this project. This coordination will be essential in addressing market barriers, since the Energy Commission has significant experience developing and implementing funding projects for alternative fueled vehicles.

HYBRID AND ZERO-EMISSION TRUCK AND BUS VOUCHER INCENTIVE PROJECT

Following is an assessment of the proposed Zero-Emission Truck and Bus Pilot Commercial Deployment Projects relative to the proposed SB 1204 evaluation and performance criteria.

Potential for statewide and local emission reductions and health benefits: Zero-emission trucks and buses, along with hybrid trucks, are designed to achieve

near-term and long-term emission reductions. Vouchers issued to date indicate that about 75 percent of HVIP funding has provided benefits to disadvantaged communities, and staff expects this trend to continue. HVIP is designed to encourage and accelerate the deployment of new hybrid and zero-emission trucks and buses in California, ultimately leading to long-term reductions in criteria and greenhouse gas emissions, and aiding California in attaining federal ozone and particulate matter standard within non-attainment areas.

Potential for technology viability: The incremental cost for zero-emission trucks and buses is substantial when compared to their conventional counterpart. For hybrid trucks, the incremental cost is not as significant. Providing incentive funding towards the purchase of zero-emission trucks and buses, along with hybrid trucks accelerates the penetration of these technologies into the heavy-duty market. Increased production volumes will lead to cost reductions in vehicle components and assembly, energy storage systems, and fueling infrastructure. Making this funding available to medium heavy-duty vehicles (14,001 to 26,000 pounds GVWR) will help transition the technology to heavy heavy-duty vehicles (greater than 26,000 pounds GVWR), since advanced technologies are often implemented in lighter weight classes before evolving to heavier weight classes with longer duty cycles. Increasing the numbers of advanced technology vehicles and miles traveled will also result in increased demand for electricity and hydrogen fuels, which will help the state meet goals for transitioning from petroleum to fuels produced from renewable resources.

Broad Market Acceptance: HVIP is structured to encourage leveraging of local, State, federal funding and private funding. The collaboration between public agencies and their commitment to invest resources toward improving local air quality motivates advanced technology providers to invest in developing near zero-, and zero-emission technologies. Incentive funding, along with public and private partnerships, encourages the deployment of advanced technology, reduces production costs, and increases commercial viability within the truck and bus market.

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