FINAL:
Funding Agricultural Replacement Measures for Emission Reductions (FARMER)
Program Guidelines

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EXECUTIVE SUMMARY

California's agricultural industry consists of approximately 77,500 farms and ranches, providing over 400 different commodities, making agriculture one of the State's most diverse industries. Producers, custom operators, first processors, and rental companies own and operate approximately 160,000 pieces of off-road, diesel-fueled, mobile agricultural equipment statewide, in addition to stationary equipment, and on-road vehicles used in agricultural operations. Even with increasingly more stringent emission standards on engine manufacturers, emissions from these vehicles and equipment are a significant source of air pollution. Reducing these emissions are necessary to meet federal ozone and particulate matter air quality standards, particularly in the San Joaquin Valley where the agricultural sector is a vibrant and critical part to the local and state economy, but also contributes to the poor air quality.

Most agricultural vehicles and equipment are operated for several decades – sometimes because the equipment is only used seasonally, but also due to the equipment durability, and relatively low cost to maintain compared to the cost of purchasing new vehicles or equipment. Unpredictable weather, varying commodity prices, farm size, and other factors impact a farmer's ability to purchase new equipment. Because of the volatility of this sector, businesses are often reluctant to purchase new equipment unless absolutely necessary.

Natural turnover is not sufficient to meet California's clean air needs. The primary driver for increased turnover in the off-road agricultural sector is due to local, state, and federal dollars leveraged with substantial private investment. While our air district and agricultural industry partners have been diligent in continuing to make strides in turning over their vehicles and equipment, more investment is needed.

In recognition of the strong need and this industry's dedication to reducing their emissions, the State Legislature allocated $135 million to the California Air Resources Board (CARB or Board) from Fiscal Year (FY) 2017-18. The Legislature directed the use of the monies to "reduce agricultural sector emissions by providing grants, rebates, and other financial incentives for agricultural harvesting equipment, heavy-duty trucks, agricultural pump engines, tractors, and other equipment used in agricultural operations." CARB staff has developed the proposed Funding Agricultural Reduction Measures for Emission Reductions (FARMER) Program to meet the Legislature's objectives and help meet the State's criteria, toxic and greenhouse gas emission reduction goals. The FARMER Program Guidelines discuss the funding allocations for air districts, eligible project categories and criteria, program implementation details, and the justification for these investments.

CARB staff recommends that funds be allocated to local air districts to administer and staff is proposing a formula to distribute funds, based on statewide emissions from off-road, mobile agricultural equipment and air quality and attainment status. Table ES-1 displays the proposed distribution to the local air districts. Staff proposes to allocate 80 percent to the San Joaquin Valley Air Pollution Control District because this district has a high concentration of emissions from vehicles and equipment used in the agricultural sector, a high proportion of disadvantaged communities, and is in extreme nonattainment with National Ambient Air Quality Standards for ozone. For the remaining 20 percent, staff proposes to distribute the funds through a formula based on each district's portion of emissions from farm equipment in the publicly available inventory and attainment status with National Ambient Air Quality Standards. Staff also proposes combining funds into a shared pool for districts with less than one percent of the statewide emissions from farm equipment to access for FARMER Program-eligible projects.

Table ES-1: Proposed District Funding Allocations for FY 2017-18

Air District	Proposed Funding Allocation
Bay Area	$1,990,800
Butte	$1,695,600
Colusa	$1,380,600
Eastern Kern	$737,000
Feather River	$2,257,800
Glenn	$1,453,200
Imperial	$1,186,200
Monterey Bay	$1,298,200
Sacramento Metro	$989,200
San Diego	$1,269,700
San Joaquin Valley	$108,000,000
San Luis Obispo	$906,800
Santa Barbara	$666,900
South Coast	$1,878,800
Tehama	$652,100
Ventura	$1,234,100
Yolo Solano	$1,830,900
Districts with less than 1 percent	$5,572,100

Once under grant agreement with CARB, air districts will be able to use their funding on a suite of projects that will turn over older vehicles, equipment, and engines used in

agricultural operations. These projects are based on cost-effectiveness, potential reduction of criteria pollutants and toxic air contaminants, contribution to regional air quality improvement, ability to achieve GHG reductions, and ability to promote the use of clean alternative fuels and vehicle technologies. Details of eligible project types are included in the proposed FARMER Program Guidelines.

For the first year of the FARMER Program, staff recommends directing investments primarily to agricultural projects that have been successfully implemented in other incentive programs, such as the Carl Moyer Program and the Air Quality Improvement Program. Utilizing this existing incentive program framework, at least initially, will help ensure that funds are spent efficiently and expeditiously. Further, should future funding become available, CARB staff will continue to analyze and expand the FARMER Program to provide emission reductions while meeting the needs of the agricultural sector.

Eligible project types included in the FARMER Program will reduce criteria pollutants, toxic air contaminants, and GHG emissions from agricultural sources. Furthermore, agricultural regions are often surrounded by disadvantaged and low-income communities and employ many of the residents living in these communities. Addressing the air quality and climate change impacts of vehicles and equipment used in agricultural operations is a multi-year effort and the proposed FARMER Program Guidelines set the foundation for a long-term emission reduction program.

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1 INTRODUCTION

In September 2017, Assembly Bill (AB) 134 (Committee on Budget, Chapter 254, Statutes of 2017) and AB 109 (Ting, Chapter 249, Statutes of 2017) appropriated $135 million from the State Budget for Fiscal Year (FY) 2017-18 to the California Air Resources Board (CARB or Board) for the reduction of criteria, toxic, and greenhouse gas (GHG) emissions from the agricultural sector. CARB staff developed these proposed *Funding Agricultural Replacement Measures for Emission Reductions (FARMER) Program Guidelines* (Guidelines) to cover the three related sources of funding included in AB 134 and AB 109.

In both budget bills, the following vehicle and equipment categories are listed as eligible for funding:

- Agricultural harvesting equipment;
- Heavy-duty trucks;
- Agricultural pump engines;
- Tractors; and
- Other equipment used in agricultural operations.

The proposed Guidelines outline CARB's plans for expending these funds in a manner consistent with the legislative direction from the two bills, existing statutes, and regulations. The Guidelines describe district funding allocations, eligible project categories and criteria, program implementation details, and the justification for these investments.

1.1 THE NEED FOR EMISSION REDUCTIONS FROM THE AGRICULTURAL SECTOR

California's agricultural industry consists of approximately 77,500 farms and ranches, producing over 400 different commodities, making agriculture one of the State's most diverse industries.[1] Producers, custom operators, first processors, and rental companies in the agricultural industry own and operate approximately 160,000 pieces of off-road, diesel-fueled, mobile agricultural equipment statewide, in addition to stationary equipment, such as agricultural pump engines, and on-road vehicles, such as heavy-duty trucks, used in agricultural operations.

Emissions from agricultural equipment are a significant source of air pollution, especially in the San Joaquin Valley, and reducing these emissions is necessary to meet federal ozone and particulate matter (PM) air quality standards. Additionally, the agricultural

[1] *California Agricultural Statistics Review,* https://www.cdfa.ca.gov/statistics/PDFs/2016Report.pdf

industry is often one of the first to experience the impacts of climate change and is a critical component for addressing greenhouse gas emissions and climate impacts. CARB's incentive programs and regulations are already reducing emissions from a wide variety of diesel engines, including trucks, buses, construction equipment, and fixed commercial generators and pumps. However, to meet federal air quality standards and California's climate change goals, a continuing transition to the cleanest technologies is necessary.

In 2018, off-road, mobile agricultural equipment is expected to account for 7.8 percent of the oxides of nitrogen (NOx) emissions from mobile sources and 8.1 percent of the PM 2.5 emissions (particulate matter that is 2.5 microns or smaller) from mobile sources statewide, as shown in Figures 1 and 2 below.[2] In the San Joaquin Valley, off-road, mobile agricultural equipment plays a significant role in the air quality challenges due to the region's large agricultural economy. In the current emissions inventory, off-road, mobile agricultural equipment accounts for over 21.7 percent of the NOx emissions from mobile sources and 27.2 percent of the PM 2.5 emissions from mobile sources in the San Joaquin Valley air basin, also shown below.

Figure 1: NOx Emissions Inventory

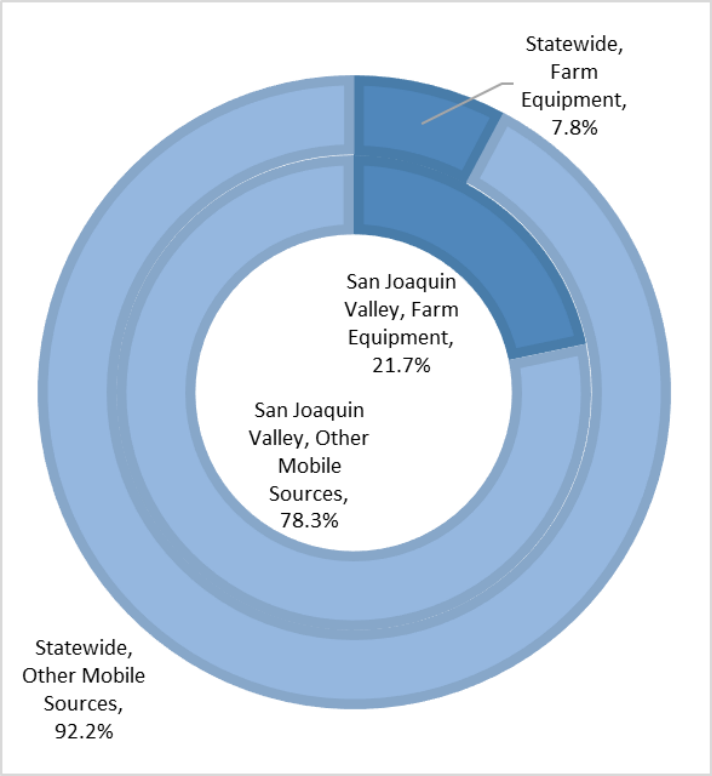
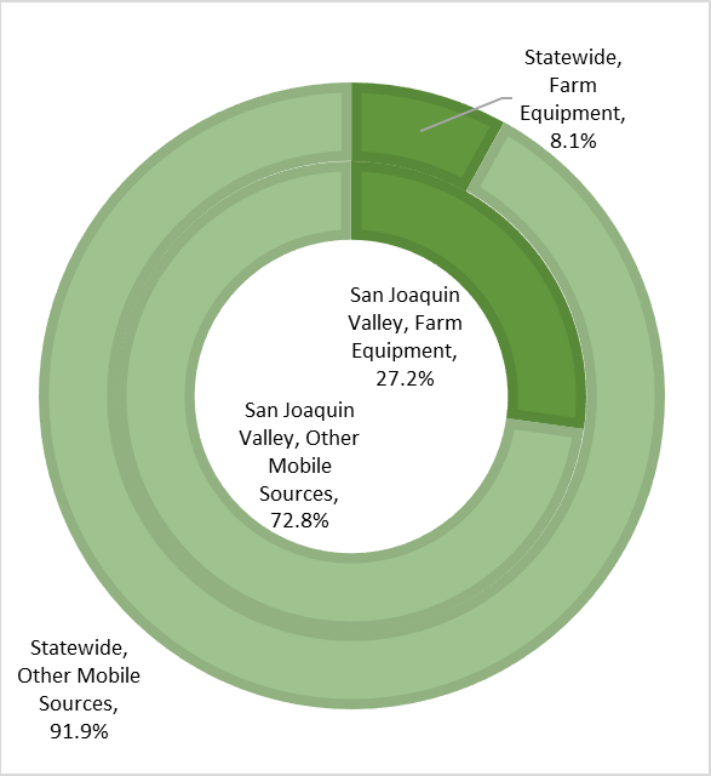


Figure 2: PM Emissions Inventory



[2] ARB's Mobile Source Emissions Inventory – Off-Road Diesel Vehicles, https://www.arb.ca.gov/msei/ordiesel.htm

Although increasingly stringent new engine standards for off-road equipment will reduce emissions from mobile agricultural equipment over time, most mobile agricultural equipment is operated for several decades due to the equipment's durability and relatively low cost to maintain. Because of the volatility of the agricultural sector, businesses are often reluctant to purchase new equipment unless absolutely necessary. Unpredictable weather, varying commodity prices, farm size, and other factors impact a farmer's ability to purchase new equipment. Thus, natural turnover is not sufficient to meet California's clean air needs.

As a result, incentives for purchasing the cleanest available vehicles and equipment are crucial for achieving the additional criteria, toxic, and greenhouse gas emission reductions from the agricultural sector that are necessary to meet National Ambient Air Quality Standards in nonattainment areas, California's climate change goals, and greenhouse gas emission reduction targets. Most farms are also surrounded by disadvantaged and low-income communities and employ many of the residents living in these communities. Further, emission reduction benefits from agricultural vehicles and equipment will assist in meeting the goals of AB 617 (Garcia, Chapter 136, Statutes of 2017), which addresses criteria pollutants and toxic air contaminants at the community level. Addressing the air quality impacts of vehicles and equipment used in agricultural operations is a multi-year effort and the proposed FARMER Program Guidelines sets the foundation for a long-term emission reduction program.

2 GUIDING PRINCIPLES

The Legislature appropriated funding to CARB for local assistance from three sources: $85 million from the Greenhouse Gas Reduction Fund (GGRF), $15 million from the Air Quality Improvement Fund (AQIF), and $35 million from the Alternative and Renewable Fuel and Vehicle Technology Fund (ARFVTF). AB 109 and AB 134 direct that the funds shall be used to:

> *Reduce agricultural sector emissions by providing grants, rebates, and other financial incentives for agricultural harvesting equipment, heavy-duty trucks, agricultural pump engines, tractors, and other equipment used in agricultural operations.*

The Legislature directed the use of monies from the three funds for identical purposes, "notwithstanding" other statutory requirements. Such legislative direction generally requires administrative agencies to carry out the Legislature's new intent, while giving effect to applicable existing statutory provisions. CARB understands the Legislature to have directed CARB to establish a combined program addressing the three sources of monies, while designing the new program in light of the statutory requirements ordinarily applicable to the underlying funds, to the extent consistent with this new direction.

The timetable and expenditure deadlines for these projects are demanding for implementation of a new program. Funds must be encumbered by June 30, 2019, and liquidated by June 30, 2021. This section of the Guidelines discusses how CARB will implement the Legislature's mandate, while supporting the underlying purposes of the three funds: GGRF, AQIF, and ARFVTF.

2.1 EMISSION REDUCTIONS FROM AGRICULTURAL OPERATIONS

In AB 134 and AB 109, the Legislature appropriated funding to reduce agricultural sector emissions by providing financial incentives for equipment and vehicles used in agricultural operations. CARB interprets the term "agricultural sector emissions" to allow for reductions of criteria, toxic, and GHG pollutants, consistent with the Health and Safety Code's (HSC) broad definition of "air pollutant."[3]

The overarching implementation priority for the first year of the FARMER Program is directing agricultural investments to support deployment of advanced technologies and cleaner diesel technologies needed to meet California's State Implementation Plan (SIP) and climate change goals. These investments may be considered for SIP credit

[3] *See* HSC, § 39013.

when the emission reductions from these projects are surplus, quantifiable, enforceable, and permanent, as defined below.

- "Surplus" means emission reductions that are not otherwise required by any federal, state, or local regulation, or other legal mandate, and are in excess of the baseline emission inventory, attainment year, and progress milestone year forecasts that include adopted regulations.

- "Quantifiable" means emission reductions can be reliably determined through the use of well-established, publicly available emission factors and calculation methodologies, as outlined in current Carl Moyer Program Guidelines[4] and the proposed FARMER Program Guidelines.

- "Enforceable" means emission reductions are enforceable if the incentive program guidelines include provisions for ensuring the following:
    - The emission reductions are independently and practicably verifiable through reporting, inspections, monitoring, and other mechanisms;
    - Incentive program requirements are defined through legally binding contracts, including identifying the party or parties responsible for ensuring that emission reductions are achieved;
    - Funding recipients are obligated to provide all records needed to demonstrate that emission reductions are achieved; and
    - The air district provides public access to all emissions-related information for reductions claimed.

- "Permanent" means actions are taken to physically destroy or disable forever the older, dirtier agricultural equipment or vehicle to ensure the reduction of emissions for the duration of the project life.

For the FARMER Program, staff proposes funding vehicle and equipment projects that are used in "agricultural operations," as defined by the Regulation for In-Use Off-Road Diesel-Fueled Fleets (Off-Road Regulation).[5] The definition of "agricultural operations" is, as follows:

> *"Agricultural Operations" means (1) the growing or harvesting of crops from soil (including forest operations) and the raising of plants at wholesale nurseries, but not retail nurseries, or the raising of fowl or animals for the primary purpose of making a profit, providing a livelihood, or conducting agricultural research or*

[4] https://www.arb.ca.gov/msprog/moyer/guidelines/current.htm.
[5] Title 13, California Code of Regulations (CCR), § 2449.

instruction by an educational institution, or (2) agricultural crop preparation services such as packinghouses, cotton gins, nut hullers and processors, dehydrators, and feed and grain mills. Agricultural crop preparation services include only the first processing after harvest, not subsequent processing, canning, or other similar activities. For forest operations, agricultural crop preparation services include milling, peeling, producing particleboard and medium density fiberboard, and producing woody landscape materials.

Consistent with the Off-Road Regulation, a vehicle or equipment that is used for both agricultural and nonagricultural operations is considered to be a vehicle engaged in agricultural operations only if over half of its annual operating hours are for agricultural operations.

2.2 THE GOALS OF AB 109 AND AB 134 AND OF AQIF, ARFVTF, AND GGRF

AB 109 and AB 134 direct CARB to develop a new program focused on vehicles and equipment engaged in agricultural operations using funds that already broadly support emission reductions programs. To develop this new program consistent with the Legislature's direction to use each fund for the same purpose to reduce agricultural emissions, CARB followed the usual requirements for AQIF, ARFVTF, and GGRF to the extent that they can be applied in this new context, while developing appropriate new requirements to further support the Legislature's intent.

Because the funds, and their governing statutes, focus on reducing air pollution and supporting the use of innovative fuels and technologies for this purpose, they are appropriate sources of funding for the agricultural emission reductions program, FARMER. AQIF, ARFVTF, and GGRF governing statutes generally support emission reductions of the sort that the Legislature has directed CARB to reduce from agricultural sources. Thus, CARB has based its program design upon the relevant statutes to the maximum extent possible to aid in administration and to implement the Legislature's direction.

AB 109 and AB 134 direct CARB to fund projects that will "reduce agricultural sector emissions by providing grants, rebates, and other financial incentives for agricultural harvesting equipment, heavy-duty trucks, agricultural pump engines, tractors, and other equipment used in agricultural operations."[6] CARB will fund projects that can

[6] CARB notes that AB 109 explicitly directs that "agricultural pump equipment" projects be funded from AQIF and ARFVTF monies, even though those funds ordinarily focus upon vehicle and fuel projects. This direction is consistent with earlier legislative direction to fund agricultural pump programs through the similar Moyer Program. (*See* AB 923 (Firebaugh, Statutes of 2004) & H&SC § 44275(a)(7)). As the Legislature determined at that time, vehicles and agricultural sources emit the same air pollutant

accomplish these goals if they are also all consistent with the project categories listed in AQIF and ARFVTF statutes and are consistent with the requirements of AQIF, ARFVTF, and GGRF governing statutes.

AQIF and ARFVTF statutes list authorized project types, whereas GGRF statutes do not. CARB has identified project types listed in the AQIF and ARFVTF statutes that would serve the Legislature's purposes for the FARMER program. These project types are described in more detail in Section 3.2 – Eligible Project Categories.

2.3 California Climate Investments and Greenhouse Gas Reduction Fund

California Climate Investments (CCI) is a statewide program that puts Cap-and-Trade allowance auction and sale proceeds to work reducing GHG emissions, strengthening the economy, and improving public health and the environment – particularly in disadvantaged communities.

The statutes governing CCI establish a two-step process for allocating funds to State agencies to invest in GHG-reducing projects. The Department of Finance, in consultation with CARB, is required to submit to the Legislature a three-year Investment Plan identifying proposed investments of auction proceeds, which are placed in the GGRF. Funding is then appropriated to State agencies from GGRF by the Legislature through the annual Budget Act, consistent with the Investment Plan.

AB 398 (Garcia, Chapter 135, Statutes of 2017) provides additional direction from the Legislature on priorities for investing auction proceeds. Those priorities are:

- Air toxic and criteria air pollutants from stationary and mobile sources;
- Low- and zero-carbon transportation alternatives;
- Sustainable agricultural practices that promote the transitions to clean technology, water efficiency, and improved air quality;
- Healthy forests and urban greening;
- Short-lived climate pollutants;
- Climate adaptation and resiliency; and
- Climate and clean energy research.

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emissions, so reducing emissions from either set of sources collectively reduces pollution burden, and hence future regulatory needs from either source category. (*See, e.g.*, AB 923, Sec. 1, finding that "motor vehicle owners" must contribute to a "fair and balanced funding program" to reduce emissions, including on agricultural sources). Accordingly, vehicle fee funds may properly be used to address agricultural source emissions to reduce this jointly-created and inherently-linked pollution problem, consistent with requirements of HSC § 44271(a)(5) and Article XIX of the California Constitution.

In addition to facilitating reduction of GHG emissions, CARB's FARMER Program aligns well with these priorities. Funding sustainable agricultural practices that promote the transitions to clean technology and improved air quality is the main driver for this program, with toxic and criteria air pollutant reductions from stationary and mobile sources as co-benefits.

2.3.1 GHG Emission Reductions

AB 1532 (Pérez, Chapter 807, Statutes of 2012) requires that Cap-and-Trade auction proceeds be used to facilitate the achievement of GHG reductions in California and specifies additional co-benefits to consider. The FARMER Program will facilitate the achievement of GHG reductions and other co-benefits through incentivizing the replacement of the legacy, diesel agricultural fleet with zero-emission or the cleanest available technologies.

2.3.2 GGRF Reporting and Recordkeeping Requirements

SB 1018 (Budget and Fiscal Review Committee, Chapter 39, Statutes of 2012) set accountability requirements to help ensure that all GGRF expenditures facilitate the achievement of GHG reductions and further the purposes of AB 32 (Núñez, Chapter 488, Statutes of 2006). Details on reporting and recordkeeping requirements for the FARMER Program are included in Section 3.3 – Reporting and Section 4.3 – Audit and Program Review Procedures.

SB 1018 also requires State agencies that receive GGRF monies to prepare an expenditure record documenting the use of the funds. CARB will prepare an expenditure record for this program, consistent with SB 1018, that describes:

- The proposed use of GGRF monies;
- How a proposed expenditure will further the regulatory purposes of AB 32 and related statutes;
- How a proposed expenditure will contribute to achieving and maintaining GHG emission reductions;
- How CARB considered the applicability and feasibility of other non-GHG reduction objectives; and
- How CARB will document the result achieved from the expenditure.

2.3.3 Disadvantaged Community, Low-Income Community, and Low-Income Household Investment Requirements

SB 535 (de León, Chapter 830, Statutes of 2012) established the original requirements relating to the investment of auction proceeds in disadvantaged communities in order to provide economic and health benefits to these communities. In 2016, AB 1550 (Gomez,

Chapter 369, Statutes of 2016) revised these requirements, increasing the share of the State's auction proceeds that must be invested within disadvantaged communities and adding new requirements to direct additional investments to low-income communities and low-income households. AB 1550 requires at least 25 percent of auction proceeds be invested for projects within and benefiting disadvantaged communities; 5 percent for projects within and benefiting low-income communities or benefiting low-income households statewide; and 5 percent for projects within and benefiting low-income communities, or low-income households, that are within a half mile of a disadvantaged community. For the FARMER Program, CARB staff recommends allocating 50 percent of the total funds for projects within and benefiting disadvantaged communities and 5 percent for projects within and benefiting low-income households, based on the CalEnviroScreen 3.0 model.[7] To maximize AB 1550 benefits, CARB staff is considering options such as additional outreach and assistance for small growers in disadvantaged and low-income communities. A discussion of the steps CARB is taking to maximize AB 1550 benefits is included in Appendix B.

2.3.4 CCI Program Guidance

In 2015, CARB approved the *Cap-and-Trade Auction Proceeds Funding Guidelines for Agencies that Administer California Climate Investments* (GGRF Funding Guidelines) establishing the requirements that State agencies receiving Cap-and-Trade auction proceeds must follow as they implement their programs. These guidelines define criteria for determining whether projects qualify as being located in and benefiting a disadvantaged community. The guidelines also identify approaches for implementing State agencies to maximize benefits to disadvantaged communities, while recognizing additional priorities identified by disadvantaged communities (in addition to reducing GHG emissions) that State agencies should strive to achieve with their investments. In late 2016, CARB published a Funding Guidelines Supplement for FY 2016-17 Funds.[8] In fall 2017, CARB published 2017 Draft Funding Guidelines for Agencies that Administer California Climate Investments that reflect the legislative requirements of AB 1550 and feedback from stakeholders on the existing program from prior years of implementation.[9]

CARB is now in the process of updating the GGRF Funding Guidelines to address legislation passed in 2017 and FY 2017-18 appropriations. On February 2, 2018, CARB released a discussion document to provide an overview and solicit comments on

[7] http://calepa.ca.gov/EnvJustice/GHGInvest/.

[8] https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/final_supplemental_ggrf_funding_guidelines_12_30.pdf.

[9] https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/fundingguidelines.htm.

anticipated changes.[10] The FARMER Program will be implemented in accordance with all requirements of the revised guidelines.

2.4 AB 118: AQIF AND ARFVTF

In 2007, AB 118 (Núñez, Chapter 750, Statutes of 2007) created AQIF, along with the Air Quality Improvement Program (AQIP), a mobile source incentive program that focuses on reducing criteria pollutant and diesel particulate emissions with concurrent reductions in GHG emissions. AB 118 also created ARFVTF, along with the Alternative and Renewable Fuel and Vehicle Technology Program, an incentive program that focuses on developing and deploying innovative technology and alternative and renewable fuels to help attain the State's climate change policies.

In 2013, AB 8 (Perea, Chapter 401, Statutes of 2013) reauthorized the fees that support AQIF and ARFVTF through 2023 and set requirements for CARB to provide preference to projects with higher benefit-cost scores when considering projects for funding from AQIF and ARFVTF.

ARFVTF and AQIF statutes also provide information on projects that may be funded. In addition to being consistent with the Legislature's direction in AB 109 and AB 134 and with GGRF guidelines, projects funded under the FARMER Program should also fit into one of the following categories, drawn from HSC § 44272(e) and HSC § 44274(c):[11]

- Infrastructure Projects: Projects to develop alternative and renewable fuel infrastructure, fueling stations, and equipment, and infrastructure projects that promote alternative and renewable fuel infrastructure development connected with existing fleets, public transit, and existing transportation corridors, including physical measurement or metering equipment and truck stop electrification.

- Emissions control technologies projects: Projects to develop and improve light-, medium-, and heavy-duty vehicle technologies that provide for better fuel efficiency and lower GHG emissions, alternative fuel usage and storage, or emission reductions, including propulsion systems. This also includes on-road and off-road equipment projects that are cost-effective, and projects that provide mitigation for off-road gasoline exhaust and evaporative emissions.

[10] https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/funding-guidelines-discussiondoc-2018.pdf.
[11] Please consult the listed statutory sections, rather than relying solely on these paraphrased summaries, for full project type descriptions. Please note that project categories funded by the AQIF and ARFVTF as a general matter, but inconsistent with the Legislature's direction in AB 109 and AB 134, have been omitted.

- Fleet retrofit projects: Programs and projects to retrofit medium- and heavy-duty on-road and off-road vehicle fleets with technologies that create higher fuel efficiencies, including alternative and renewable fuel vehicles and technologies, idle management technology, and aerodynamic retrofits that decrease fuel consumption. Incentives for medium- and heavy-duty vehicles and equipment mitigation are also included.

- Small engine projects: Incentives for small off-road equipment replacement to encourage consumers to replace internal combustion engine lawn and garden equipment.

Within these categories, CARB staff has conducted an analysis, consistent with AB 8, to determine the appropriate classes of projects for the FARMER Program. The details of this analysis are discussed in Appendix A of these Guidelines.

The statutes require that projects funded by AQIF and ARFVTF must complement, and not interfere with, criteria and toxics pollution control efforts, and maintain or improve upon emission reductions in the SIP and relevant fuels regulations. Projects must be additive to those already required by law,[12] and must be consistent with any established sustainability goals, leverage additional funds where possible, produce quantifiable benefits,[13] and be consistent with other applicable legal requirements. The FARMER Program Guidelines serve as the funding plan and guidelines required by statute.

2.5 Project Selection and Assessment Process

The Legislature has directed CARB to ensure funds are encumbered by June 30, 2019 and expended by June 30, 2021. Because of this timeline, CARB has worked to design a process to assess potential projects that can meet the Legislature's goals while maintaining the core project assessment criteria set forth in the ARFVTF and AQIF statutes (the GGRF statutes do not include such criteria). The AQIF and ARFVTF statutes provide that assessment and selection of potential projects should consider "benefit-cost scores."[14] Additional project selection criteria can also be used to further assess project types. Generally, these scores and criteria are used as part of a "competitive process for the allocation of funds."[15]

[12] *See* HSC, § 44271(b) & (c)).
[13] *See* HSC § 44271(a)).
[14] *See* HSC § 44270.3, 44271(a)(2)).
[15] *See* HSC, § 44271(a)(2)).

Certain aspects of the competitive process that are usually used for AQIF and ARFVTF, including an extended solicitation period, are not consistent with the Legislature's direction for the FARMER Program, and are therefore inapplicable as written.[16] The time required for a full grant solicitation process, combined with the complexity of agricultural source categories and limited window provided for the encumbrance and expenditure of funds renders such a process inconsistent with AB 109 and AB 134's clear direction. AB 109 and AB 134 direct CARB to fund agricultural source categories that typically require specialty or custom-built vehicles and equipment, resulting in an extended timeframe before the vehicles and equipment are delivered and funds can ultimately be expended. Because of the seasonality of agricultural operations, agricultural businesses are often reluctant to purchase new vehicles and equipment during growing seasons, further limiting the timeframe to expend funds.

However, CARB recognizes the importance of ensuring that the projects funded are consistent with the goals of the statutes, and that the identified project types would have been selected through a full competitive process had there been time for one to occur. As such, CARB has developed appropriate benefit-cost scores, which take into account the cost-effectiveness calculation methodologies set in the 2017 Carl Moyer Program Guidelines, as well as key factors that demonstrate advanced technologies. CARB has conducted an analysis of the project categories that may be funded under the FARMER Program to ensure that each project type has an acceptable benefit-cost score and is consistent with, and can support, other statutory criteria that may also generally be used to assess projects supported by these funds.

These additional criteria, as stated in HSC § 44272(c), and HSC § 44274(b), include:

- The project's ability to promote cleaner vehicle technologies and clean fuels used in covered vehicles.

- The project's ability to drive new technology adoption and market transformation, especially to support the widespread use of low carbon or zero-emission technologies and vehicles.

- The project's ability to reduce criteria air pollutants and air toxics and reduce or avoid multimedia environmental impacts and the project's contribution to regional air quality improvement.

[16] *See People v. Fuentes*, 1 Cal. 5th 218, 227 (2016)).

- The project's consistency with existing state climate change policy and low carbon fuel standards and the project's ability to achieve greenhouse gas benefits in addition to criteria pollutant or air toxic emission reductions.

- The project's ability to support the California economy by promoting California-based technology firms, jobs, and businesses and to enhance a workforce utilizing clean technologies and fuels.

- The project's ability to support a sustainable landscape and sustainable resource use.

- The project's ability to leverage private funds.

The Legislature directs CARB to fund agricultural vehicle and equipment projects, similar to projects historically funded through AQIP. Therefore, CARB analyzed potential project types and categories based on benefit-cost scores and the applicable additional criteria mentioned above, consistent with the AB 8 analysis in the annual Low Carbon Transportation Investments and AQIP Funding Plan.[17] Based on this analysis, staff recommends funding heavy-duty truck replacements, mobile off-road farm equipment replacements, agricultural irrigation pump replacements, zero-emission agricultural utility terrain vehicles (UTV), and the Off-Road Mobile Agricultural Equipment Trade-Up Pilot Project (Ag Trade-Up Pilot Project). These project categories are discussed in Chapter 3 of these Guidelines. Assumptions and results for the AB 8 analysis are included in Appendix A.

For the FARMER Program, CARB intends to include only project categories that would be selected in a competitive process, and are consistent with the project types identified by the Legislature in AB 109 and AB 134. Additionally, districts are encouraged to select projects within these categories that provide higher benefit-cost scores and consider additional project assessment criteria.

[17] https://www.arb.ca.gov/msprog/aqip/fundplan/fundplan.htm.

3 PROGRAM FRAMEWORK

As discussed earlier, the overarching implementation priority for the first year of the FARMER Program is directing investments to agricultural projects that can be implemented through existing incentive program framework to ensure that funds are spent efficiently and expeditiously. Since the late 1990s, CARB and the local air districts have partnered to successfully administer over $3 billion in incentive funds to clean up over 100,000 heavy duty engines. To continue this partnership and provide local assistance throughout the State, staff proposes to work with local air districts to administer and implement the projects.

3.1 DISTRIBUTION OF FUNDS

Staff proposes to allocate 80 percent of FARMER Program funding to the San Joaquin Valley Air Pollution Control District (SJVAPCD) due to the district's high agricultural activity, extreme nonattainment status with National Ambient Air Quality Standards for ozone, and large population affected by harmful emissions, as compared to other districts. For the remaining 20 percent of FARMER Program funding, CARB staff proposes the following formula to distribute the funds among local air districts. To help ensure the funds are distributed equitably among districts, the formula will distribute the remaining funds based on each district's statewide emissions from farm equipment[18] and each district's air quality and current attainment status with National Ambient Air Quality Standards.

All districts except for SJVAPCD will be included in this formula to determine the appropriate funding levels. Districts with at least one percent of the statewide emissions from farm equipment will have a line item allocation based on the results of this distribution formula. However, there is still a need for agricultural emission reductions in districts with less than one percent of the statewide emissions from farm equipment, therefore, staff recommends combining these districts' funding into a shared pool to be administered by the California Air Pollution Control Officers' Association (CAPCOA) or one air district for FARMER Program-eligible projects. The administration of this shared pool of FARMER Program funding is described in Section 3.1.1 – Shared Allocation for Districts with Less than One Percent.

With this proposed formula for the districts other than SJVAPCD, 75 percent of the funds will be distributed based on each district's share of statewide emissions from farm equipment and 25 percent of the funds will be distributed based on each district's air quality and attainment status. To distribute funds based on air quality and attainment

[18] Based on data from the California Emissions Projection Analysis Model (CEPAM). https://www.arb.ca.gov/app/emsinv/fcemssumcat/fcemssumcat2016.php

status, the formula uses a “severity point” system, similar to the Carl Moyer Program, which provides districts points on a scale from one to seven for attainment with the 2008 ozone standard, one point for districts with PM emissions exceeding 1,000 tons, and one point for districts that are impacted by emissions transported from Mexico. The points are added up and then funds are distributed based on each district’s share of points.

Table 1 shows the FY 2017-18 funding allocations for air districts based on this proposed formula.

Table 1: Proposed District Funding Allocations for FY 2017-18

Air District	Proposed Funding Allocation
Bay Area	$1,990,800
Butte	$1,695,600
Colusa	$1,380,600
Eastern Kern	$737,000
Feather River	$2,257,800
Glenn	$1,453,200
Imperial	$1,186,200
Monterey Bay	$1,298,200
Sacramento Metro	$989,200
San Diego	$1,269,700
San Joaquin Valley	$108,000,000
San Luis Obispo	$906,800
Santa Barbara	$666,900
South Coast	$1,878,800
Tehama	$652,100
Ventura	$1,234,100
Yolo Solano	$1,830,900
Districts with less than 1 percent	$5,572,100

Upon Board approval of the FARMER Program Guidelines, CARB will send tentative allocations for each air district with an application. Similar to the Carl Moyer Program, air districts must indicate on the application and notify CARB within 60 days whether they would like to accept the funds, reallocate them, or decline the funds. Specifically, a district has five options. They may either accept the tentative allocation; designate it to another air district to administer; designate it to the shared allocation pool; accept less than the tentative allocation specified on the application and designate the remaining

allocation to another air district, the shared allocation pool, or to be redistributed through the distribution formula; or decline all funds. Once the districts have responded accordingly, CARB sums the tentatively allocated funds accepted by districts and redistributes remaining funds through the formula. Before executing grant agreements, districts must provide CARB with a resolution or minute order, approved by their governing board, indicating their acceptance of the funds.

Additionally, Section 5.2 – Contingency Provisions contains information on the process for reallocating funds among districts if there is the potential risk that the funding will not be spent before the expenditure deadline.

3.1.1 Shared Allocation for Districts with Less than One Percent

This shared allocation of FARMER Program funding represents a partnership between 18 air districts with less than one percent of the statewide emissions from agricultural equipment to ensure those districts have the opportunity to have access to FARMER funding and streamline implementation of the FARMER Program. For FY 2017-18, this shared allocation for districts with less than one percent of the statewide emissions from agricultural equipment is $5.6 million. Staff recommends that CAPCOA or one of these air districts be the administrator of this $5.6 million shared allocation on behalf of all of these districts. This facilitates air district participation by streamlining the grant administrative process and by encouraging the pooling of financial and technical resources. These consolidated resources lower the threshold for participation in the FARMER Program and maximize project funding in districts with lower agricultural equipment populations.

Individual projects funded from this shared allocation are subject to all applicable requirements within the FARMER Program Guidelines.

Roles and Responsibilities among these partners are as follows:

1. CARB notifies the Administrator of funds designated to the shared allocation.

2. The Administrator approves receipt of funds via resolution or minute order approved by their governing board.

3. The Administrator must sign a grant agreement with CARB to accept funds for this shared allocation, maintain a Policies and Procedures Manual, and are responsible for all grant obligations, such as contracts with grantees for project implementation, project inspections, monitoring, and reporting.

4. The Administrator establishes criteria for project selection and approves projects.

5. The Administrator provides outreach, prepares the application and project solicitation, performs initial application screening, ensures project eligibility, ranks projects based on project selection criteria, selects projects, and determines recipient air districts.

3.2 Eligible Project Categories

To ensure funds are spent efficiently and expeditiously in the first year of the FARMER Program, staff proposes directing investments to agricultural projects that have successfully been implemented through existing incentive programs. To provide additional flexibility, staff also proposes delegating authority to CARB's Executive Officer to approve additional project categories or make modifications to project categories as necessary to ensure that the program will be successful. Staff anticipates if additional funds are appropriated to the FARMER Program in future fiscal years, staff will bring modifications to the Board that will address lessons learned in the first year of the program and additional project categories as deemed necessary.

Staff recommends including the following project categories in the FARMER Program for districts to select from in FY 2017-18: Carl Moyer Program-eligible agricultural projects; the Zero-Emission Agricultural UTV Project; and the Ag Trade-Up Pilot Project in the San Joaquin Valley. These proposed project categories are described below.

3.2.1 Carl Moyer Program-Eligible Projects

Staff proposes including projects eligible under the 2017 Carl Moyer Program Guidelines and any future approved Guidelines, and current and future Program Advisories and Mail-outs, provided that the vehicles and equipment are engaged in agricultural operations, as defined by these Guidelines. These projects include, but are not limited to:

- On-road heavy-duty truck replacement and repower projects;[19] and
- Off-road equipment replacement and repower projects[20] for:
    - Off-road mobile, diesel agricultural equipment ("farm equipment" as defined by Carl Moyer Program Guidelines);
    - Off-road mobile, large spark-ignition (LSI) equipment; and
    - Agricultural irrigation pump engines.

[19] For additional criteria for these project categories, refer to the 2017 Carl Moyer Program Guidelines, Chapter 4, Section C.2.(A)).
[20] For additional criteria for these project categories, refer to the 2017 Carl Moyer Program Guidelines, Chapter 5, Section D.

In addition to the requirements outlined in the FARMER Program Guidelines, Carl Moyer Program-eligible projects are required to abide by all project criteria set forth in the 2017 Carl Moyer Program Guidelines and any future approved Guidelines, and current and future Program Advisories and Mail-outs. This includes the Carl Moyer Program's cost-effectiveness thresholds and reporting requirements, except as modified in the FARMER Program Guidelines or through subsequent actions by CARB's Executive Officer for the FARMER Program.

3.2.2 Zero-Emission Agricultural UTV Project

The Zero-Emission Agricultural UTV Project is a new project intended to encourage and accelerate the use of off-road, zero-emission UTVs in agricultural operations by providing rebates for the purchase of new zero-emission vehicles. The Zero-Emission Agricultural UTV Project would provide incentives for up to 75 percent of the cost of a new zero-emission UTV to qualified individuals, businesses, public agencies and entities, and non-profit organizations involved in agricultural operations.

3.2.2.1 Eligible Vehicles

To be eligible for the Zero-Emission Agricultural UTV Project, UTV models would be required to meet the following criteria:

- New: The vehicle must be a new vehicle, as defined in the California Vehicle Code Section 430, meaning a vehicle constructed entirely from new parts that has never been the subject of a retail sale, or registered with the department, or registered with the appropriate agency or authority of any other state, District of Columbia, territory, or possession of the United States, or foreign State, province, or country.

- Zero-Emission: The vehicle must emit zero tailpipe emissions from its onboard source of power (such as all electric or hydrogen fuel cell vehicles), and may not undergo any modification that would allow propulsion by any other means.

- Vehicle Specifications and Performance Thresholds: Eligible UTVs must have a towing capacity of 600 pounds or greater and a total vehicle weight of 700 pounds or greater.

- Warranty Provisions: The vehicle drivetrain, including applicable energy storage tanks or battery packs, must be covered by a manufacturer warranty. Prior to approving a project, CARB or the District may request that the manufacturer provide copies of representative vehicle and battery warranties and a description of the manufacturer's plans to provide warranty and routine vehicle service.

3.2.2.2 Participant Requirements

To receive funding for the purchase of a new, zero-emission agricultural UTV, the vehicle purchaser would be required to:

- Be an individual, business, non-profit, or government entity that can show proof of California residency or proof that the agricultural operation for which the UTV would be used occurs in California;
- Self-certify that the UTV would be used exclusively for California agricultural operations;
- Enter into a contractual agreement with the District;
- Keep the vehicle and meet all applicable project requirements for the duration of the contract;
- Provide the District with past maintenance records and/or service history on the UTV that would be replaced;
- Surrender the used UTV, as identified in the pre-inspection, to be permanently destroyed by a District approved dismantler,
- Not purchase, make payments toward, and/or take possession of the new UTV prior to receiving a fully executed contract from the District,
- Not make or allow any modifications to the vehicle systems, including motor and other hardware, the addition of auxiliary power sources, or changes to the software calibrations;
- Commit that any emission reductions generated by the purchased UTV will not be used as marketable emission reduction credits, to offset any emission reduction obligation of any person or entity, or to generate a compliance extension or extra credit for determining regulatory compliance;
- Be available for follow-up inspection if requested by the District, CARB, or CARB's designee for the purposes of project oversight and accountability; and
- Install and maintain an operational hour meter on the new UTV.
    - If during the project life, the hour meter fails for any reason, the hour meter must be repaired or replaced as soon as possible at the owner's expense.

3.2.3 Ag Trade-Up Pilot Project

CARB staff recommends including the Ag Trade-Up Pilot Project as an eligible project category for SJVAPCD to administer. The Ag Trade-Up Pilot Project provides CARB an opportunity to continue evaluating the feasibility of a new incentive model, intended for owners of high-emitting, off-road mobile agricultural equipment that are not well served by existing incentive programs. Owners of small and mid-size farms may not have accessed incentive funds in the past due to low equipment usage or the inability to purchase new vehicles and equipment, even with assistance from other incentive programs. This project category provides an excellent opportunity for these farmers to

affordably upgrade their older mobile agricultural equipment.

The trade-up concept is a two-step transaction in which the owner of equipment with a Tier 0 (uncertified) or Tier 1 certified diesel engine agrees to scrap that equipment in exchange for a previously used and reconditioned piece of cleaner diesel equipment (certified Tier 2 or Tier 3 engine), at little out-of-pocket cost. The used equipment comes from another owner who relinquishes it for an incentive to purchase new agricultural equipment with the cleanest engine technology (Tier 4 Interim or Tier 4 Final certification).

SJVAPCD has been administering this pilot project since June 2016 and is working with CARB to assess this new incentive model in a San Joaquin Valley-wide scale. If the project demonstrates feasibility, CARB may expand the trade-up concept in future years to become a new, statewide mobile equipment incentive category.

3.2.3.1 Eligible Equipment

Eligible equipment under this project category include the following three off-road mobile, agricultural equipment types: 1) new Tier 4 equipment purchased, in part, with incentive funding, 2) Tier 2/Tier 3 (T2/T3) equipment to be refurbished for trade-up, and 3) old, high-emitting equipment to be scrapped. The following are specific requirements for each equipment type under this project category:

- The new Tier 4 equipment purchased in part with incentive funding must:
    - Be Tier 4 mobile, self-propelled off-road agricultural equipment with a diesel powered engine greater than or equal to 25 horsepower.
        - The certification emission standard and/or Tier designation for the engine must be determined from the CARB Executive Order issued for that engine.
    - Not have been previously owned and be designated as new by the dealer at the time of purchase. Used equipment are not eligible for funding as replacement equipment.
    - Equipment that served as rentals, were previously leased, or were floor/demonstration models may be eligible on a case-by-case basis determined by SJVAPCD staff prior to funding. Documentation from the dealer may be required.
    - Have an operating hour meter to record annual usage in hours.

- The Tier 2/Tier 3 equipment to be refurbished for trade-up must:
    - Be T2/T3 mobile, self-propelled off-road agricultural equipment with a diesel powered engine greater than or equal to 25 horsepower.

    - Have less than 8,000 hours on the hour meter.
        - The 8,000-hour requirement may be waived on a case by case basis by SJVAPCD.
    - Include maintenance records kept by owner to ensure the equipment is operable and able to be used for a three (3) year project life as stated in contract.
    - Be in good operating condition, meet OSHA safety requirements, and pass the eligibility evaluation conducted by SJVAPCD's sub-contractor.

- The old, high-emitting equipment to be scrapped must:
    - Be uncontrolled (Tier 0) or Tier 1 mobile, self-propelled off-road agricultural equipment.
    - Have a compression-ignition (CI) engine greater than or equal to 25 horsepower.
    - Have been owned and operated in California for the previous two (2) years and must currently be in operating condition.
        - Operating condition will be verified through an inspection process conducted by SJVAPCD staff or its sub-contractor.
        - If selected for funding, the beneficiary may be required to submit documentation demonstrating that the T0/T1 equipment has been in operational condition for the previous year.

3.2.3.2 Budget Requirements

Due to the complex arrangement of the Ag Trade-Up Pilot Project, unique budgetary requirements must be considered. The following budget requirements apply to these types of projects:

CARB funds cover:

- Up to 80% of the cost of the new Tier 4 replacement equipment,
- Up to 90% per T2/T3 equipment for repair, and
- Up to $1,500 per T2/T3 equipment for transportation and mechanical assessment.

Awardees (purchasers of the new Tier 4 replacement equipment) cover:

- 20% of the cost of the new Tier 4 replacement equipment.
    - Awardees would use either cash, or financed loans to fulfil this match requirement.

Beneficiaries (recipients of the T2/T3 equipment) cover:

- 10% of the repair cost for the T2/T3 equipment.
    - This is based upon the maximum allowable repair costs, which is $8,500.
    - The Beneficiary would cover 100% of the repair costs exceeding $8,500.

3.2.3.3 Participant Requirements

In addition to the unique budget requirements, the Awardee (purchaser of the new Tier 4 replacement equipment) is required to:

- Enter into a contractual agreement with SJVAPCD,
- Provide SJVAPCD with past maintenance records and/or service history on the T2/T3 equipment,
- Not purchase, make payments toward, and/or take possession of the new equipment prior to receiving a fully executed contract from SJVAPCD,
- Agree to a Project Implementation Phase (time period in which the applicant is required to own, operate, and maintain the equipment) not less than ten years from the date in which the new equipment is received,
- Remain the owner of the new equipment throughout the full term of the agreement,
- Maintain the replacement equipment in accordance with manufacturer specifications,
- Maintain replacement value insurance for the replacement equipment through the full term of the agreement,
- Operate at 100% of the replacement equipment's annual hours within SJVAPCD boundaries,
- Purchase a minimum of a one-year or a 1,600-hour power and drivetrain warranty for the replacement equipment. The warranty must cover parts and labor, and
- Install and maintain an operational hour meter on the new equipment.
    - If during the project life, the hour meter fails for any reason, the hour meter must be repaired or replaced as soon as possible at the owner's expense.

The Beneficiary (recipient of the T2/T3 equipment) is required to:

- Enter into a contractual agreement with SJVAPCD,
- Not take possession of the T2/T3 equipment prior to receiving a fully executed contract from SJVAPCD,
- Agree to a Project Implementation Phase (Time period in which applicant is required to own, operate and maintain the equipment) of not less than three years from the date in which the T2/T3 equipment is received,
- Remain the owner of the new equipment throughout the full term of the agreement,

- Maintain the T2/T3 equipment in accordance with manufacturer specifications,
- Maintain replacement value insurance for the T2/T3 equipment through the full term of the agreement,
- Operate 100% of the T2/T3 equipment's annual hours within SJVAPCD boundaries,
- Surrender the T0/T1 equipment, as identified in the pre-inspection, to SJVAPCD's sub-contractor to be permanently destroyed by a SJVAPCD-approved dismantler,
- Agree to not receive money for the scrap value of the T0/T1 equipment,
- Submit annual reports to SJVAPCD that include information on the T2/T3 equipment's hours of operation, maintenance, and any other pertinent information requested by SJVAPCD on a form to be provided to the Beneficiary by SJVAPCD for the duration of the Project Implementation Phase, and
- Release the Awardee and SJVAPCD of any and all liability that could foreseeably arise as a result of the Agreement.

In addition to the requirements described above, projects funded under the Ag Trade-Up Pilot Project must meet all reporting and recordkeeping requirements described in these Guidelines, the 2017 Carl Moyer Program Guidelines and any future approved Guidelines, and current and future Program Advisories and Mail-outs.

3.2.4 Additional Project Categories

In addition to the project categories described above, CARB staff is considering additional options for on-road trucks used in agricultural operations. Staff has heard concerns from stakeholders about funding levels for on-road, agricultural trucks in other incentive programs, especially specialty agricultural trucks, and is considering an additional project category for these vehicles in the FARMER Program.

CARB staff is also considering additional options to increase equipment incentive levels for small growers in disadvantaged and low-income communities. Staff will partner with air districts and community-based organizations to evaluate what equipment incentive levels and outreach would be needed to increase small grower participation in the FARMER Program.

Staff recommends that the Board grant CARB's Executive Officer authority to approve additional project categories as necessary. Staff would be required to first hold a public meeting to establish the criteria for the new program. This may include the options for on-road trucks used in agricultural operations, increased incentives and outreach for small growers in disadvantaged and low-income communities, and expanding San Joaquin Valley-specific projects to other districts or statewide projects.

Providing the authority for CARB's Executive Officer to approve additional project categories and make modifications to existing project categories would enable CARB to respond to new information while providing a mechanism to ensure funds are spent expeditiously.

3.3 REPORTING

GGRF Funding Guidelines set tracking and reporting requirements for agencies that administer GGRF programs, such as CARB. The tracking and reporting required of administering agencies include:

- Develop guidelines, solicitation materials, and grant agreements that contain tracking and reporting requirements for funding recipients, in accordance with the California Climate Investment Guidelines.
- For all projects, collect and compile data from funding recipients, including estimated GHG emission reductions and information on benefits to AB 1550 populations (disadvantaged communities, low-income communities, and low-income households).
- Maintain records and submit reports on expenditures and investment benefits.
- For a subset of projects, collect and compile data to support project outcome reporting.
- Provide records and reports, as requested, to support audits and program reviews conducted by State agencies.

In addition, districts are required to report information on all projects funded through the FARMER Program on an annual basis to CARB. Districts are required to report project information in the Clean Air Reporting Log (CARL) database, either through CARL directly or by batch import. The reported information must be sufficient to populate the required data fields and to calculate covered emission reductions and cost-effectiveness for equipment types where required. Districts will ensure the reported information is complete, correct, and supported by documentation.

Because the FARMER Program is funded in part by GGRF, reporting and recordkeeping is required to quantify and document each project's benefits in keeping with GGRF requirements, in addition to the reporting and recordkeeping required under Carl Moyer Program Guidelines. Funding recipients are required to track annual usage for the new vehicle or equipment, in terms of hours or miles per year, provide location data to allow for calculation AB 1550 benefits, and submit annual updates to districts while under contract.

Districts must submit Annual Reports to CARB that, at minimum, include:

- Contract execution and liquidation status of FARMER Program funds.
- Outputs generated by CARL for the default years specified in the utility.
- For the most recent fiscal year, additional funds available to FARMER from the following sources. These funds will be included in the target for the funding year due for liquidation in four years unless the air district directs CARB staff to include them in an earlier year target.
    - The amount of any interest accrued on FARMER Program funds held in local accounts. An air district may choose to designate in the Yearly Report all or a portion of this interest for remittance to CARB.
    - Funds recaptured from liquidated projects, including funds provided back to the air district following CARB enforcement actions, identified by project name and funding year.
    - Non-grant revenue earned for the FARMER Program by the air district, such as from the sale of scrapped engines or equipment.
- A list of any projects identified as non-performing and a brief narrative of any related enforcement actions.

4 PROGRAM IMPLEMENTATION

This section of the FARMER Program Guidelines describes the required oversight and implementation of projects funded through the FARMER Program, including project costs, advance payment, and audit and program review procedures. Projects funded through the FARMER Program would also be subject to the oversight and implementation requirements of the Carl Moyer Program.

4.1 PROJECT COSTS

Definitions and allowable expenditures for costs associated with the grant are defined below:

- Project implementation costs include:
  - Personnel costs and fringe benefits;
  - Operating costs (i.e., rent, supplies, and equipment);
  - Indirect costs (e.g., general administrative services, office space, and telephone services);
  - Travel expenses and per diem rates set at the rate specified by the California Department of Human Resources (CalHR);[21]
  - Overhead;
  - Consultant fees (if pre-approved by CARB); and
  - Printing, records retention, and mailing.

  Project costs should be detailed such that they include all necessary staff and tasks to implement the project. If appropriate, this includes activities such as outreach and education and research, data management, and reporting.

  In no event shall administrative costs, which are included within the project costs, exceed five percent of the total grant amount. Administrative costs are indirect costs, which are not tied directly or solely to the project, such as distributed administration and general administrative services; non-project related contracts or subscriptions; rent and office space, phones and telephone services, printing, or mailing services not associated with staff working on the project; or any other costs that are not directly and fully incurred to support the grant.

- Technology costs: costs associated with vehicles, equipment, and infrastructure that is either used to demonstrate the ability of technology to achieve emission reductions or to deploy technology to an end user (i.e., business, consumer, etc.)

[21] ARB will only reimburse travel expenses and per diem rates that are set by CalHR. The Grantee will be responsible for travel expenses and per diem rates that exceed CalHR rates.

for the purpose of achieving emission reductions. This includes the direct maintenance of these components, if required by the project.

4.2 Advance Payment

AB 109 directs CARB to "provide advance payments of the grant award to the recipient to initiate and implement the project in a timely manner." Further, CARB, in consultation with the Department of Finance, "shall adopt additional requirements in regulations regarding the provision of advance payments and the use of advance payments by the recipient of the grant to ensure that the moneys are used properly." Consistent with this direction, and with the Legislature's direction to expeditiously disburse grants, CARB intends to provide advance payments of grant awards in a timely manner to support project initiation and implementation with a focus on mitigating the constraints of modest reserves and potential cash flow problems.

Recognizing that appropriate safeguards are needed to ensure grant monies continue to be used responsibly, CARB intends to include specific terms and conditions within each grant to establish control procedures for advance payments. While each grant is different, these protections will typically include, at a minimum:

- Grantees must track interest accrued on any funds received. Interest earned on disbursements shall only be used for eligible grant-related expenses or returned to CARB.
- CARB has the right to terminate grant agreements in accordance with the terms of each agreement, and for non-performance or misuse of funds. In the event of termination, all funds not committed must be returned immediately.
- Documentation is required to support requests for funding. Grantees are required to maintain all supporting documentation for a prescribed period of time, to ensure adequate opportunities for audit exist.

4.3 Audit and Program Review Procedures

CARB staff will work collaboratively with air districts to conduct Incentive Program Reviews to help ensure that air district programs achieve expected emission reductions and are implemented in a manner consistent with the Carl Moyer Program Guidelines.[22] The reviews will cover the most recent five-year period and include air districts that represent at least 80 percent of program funding. Additional air districts will be reviewed as deemed necessary by CARB program staff. Small air districts that receive higher funding allocations than previously received through other incentive programs will be subject to more frequent Program Reviews, similar to large air districts.

[22] Carl Moyer Program Guidelines; Chapter 3.R: https://www.arb.ca.gov/msprog/moyer/guidelines/2017gl/2017_gl_chapter_3.pdf

Incentive Program Reviews may also include fiscal audits completed by the California State Controller's Office in accordance with Generally Accepted Government Auditing Standards. CARB will have final authority with respect to corrective measures and follow-up, in consultation with the air district.

During the Incentive Program Review process, CARB will:

1) Identify the scope of the review,
2) Work collaboratively, while maintaining open communication with air districts,
3) Ensure objectivity and predictability,
4) Post all reports and related documents on the FARMER Program website, and
5) Conduct follow-up activities to ensure that any deficiencies are mitigated.

Air district staff will work to fully and promptly mitigate deficiencies identified during the review process, work to resolve any disagreements, and request assistance from CARB as necessary.

5 NEXT STEPS AND FUTURE ACTIONS

The proposed FARMER Program Guidelines identify the projects staff recommends funding for the first year. Addressing the air quality impacts of vehicles and equipment used in agricultural operations is a multi-year effort and the proposed FARMER Program Guidelines will set the foundation for a long-term emission reduction program. The proposed FARMER Program Guidelines specify all policy-related details regarding the proposed projects, including eligible applicants, the criteria districts will use to evaluate applications, eligible vehicles and equipment, maximum incentive amounts, and other requirements. This chapter covers the next steps CARB will take to implement the FARMER Program, including the project implementation timeline, contingency plans, and CARB's plans for updating FARMER Program Guidelines in the future.

5.1 PROJECT IMPLEMENTATION TIMELINE

CARB staff held five public workshops and numerous meetings in Northern California, the Central Valley, and Southern California to gather input on the proposed Guidelines in January and February 2018. After the workshops and meetings, CARB staff incorporated feedback and developed these proposed guidelines for Board consideration.

Upon Board approval of the proposed FARMER Program Guidelines, CARB staff will enter into grant agreements with local air districts and/or CAPCOA. These grant agreements will include all programmatic details for districts to implement the projects.

In order to meet CARB's statutory deadline to encumber funds by June 30, 2019, CARB staff expects to enter into grant agreements with air districts within several months after Board approval of FARMER Program Guidelines. This provides districts with approximately three years to fully liquidate funds before the June 30, 2021 expenditure deadline. However, CARB will set timelines well in advance of the expenditure deadline to trigger the contingency provisions outlined in Section 5.2 – Contingency Provisions to ensure that funds are spent before the June 30, 2021 expenditure deadline and will not revert. CARB staff will also continue to work with air districts to ensure sufficient outreach is conducted to inform farmers of the program.

5.2 CONTINGENCY PROVISIONS

This section describes staff's proposed contingency provisions in case mid-course corrections are needed to ensure funding is spent expeditiously and efficiently. Such contingencies are important in voluntary incentive programs where it is not possible to fully anticipate participation levels in advance. Staff proposes that the Board delegate authority to CARB's Executive Officer to redirect funds from Board-approved district

funding allocations in the case described below should the need arise. In all other cases, staff would request Board approval to redirect funds.

5.2.1 Contingency Provisions Related to District Funding Allocations

Proposed district funding allocations are based on each district's statewide emissions from agricultural equipment and each district's air quality and attainment status and staff anticipates that each district's funding allocation will not exceed its agricultural funding demand. However, in the event that participation does not meet expectations and funds are at risk of reverting before the expenditure deadline, staff proposes a contingency plan that would allow the Executive Officer to divert a portion of a district's FY 2017-18 funding allocation to air districts with the greatest demand. Specific direction on how to handle unused funds will be provided in the grant agreements with districts and will follow similar requirements set forth in other CARB incentive programs administered by districts.

5.3 Reports to the Board and Legislature

The three funding sources that support the FARMER Program – GGRF, AQIF, and ARFVTF – set reporting requirements for administering agencies. These reporting requirements are discussed in more detail below.

5.3.1 GGRF Annual Reports to the Legislature

All agencies that administer GGRF investments must submit project data, including project descriptions, project location, information on timelines and budgets, GHG emission reductions, co-benefits, and project status. CARB compiles project data and program-level data and works with the Department of Finance to prepare the Annual Report to the Legislature, which is due in March every year.

For the FARMER Program, CARB will report on the outcomes of funded projects, including: GHG reductions achieved or anticipated using the appropriate CARB quantification methodology; progress in meeting or exceeding AB 1550 targets for investments in disadvantaged communities, low-income communities, and low-income households; updates on expected co-benefits achieved or anticipated; and project locations.

5.3.2 AB 118 Reports

AB 8 sets requirements for CARB and the California Energy Commission (CEC) to report on projects funded through the AB 118 programs, AQIF and ARFVTF. Because AB 109 allocated the funding to CARB to administer, projects funded through AQIF and ARFVTF will be included in CARB's biennial report to the Legislature. As outlined in AB 8, this report will include:

- A list of projects funded;
- The expected benefits of the projects in promoting clean, alternative fuels and vehicle technologies;
- Improvement in air quality and public health, greenhouse gas emission reductions, and the progress made toward achieving these benefits;
- The impact of the projects in making progress toward attainment of state and federal air quality standards; and
- Recommendations for future actions.

5.4 Future Guideline Updates

The proposed FARMER Program Guidelines will set the foundation for a long-term program to reduce agricultural sector emissions. If additional funding is allocated to the FARMER Program in the future, CARB staff will evaluate if there is enough flexibility in the FARMER Program Guidelines to continue funding cost-effective and innovative agricultural projects or if updates are needed. If staff determines that updated FARMER Program Guidelines are necessary, staff will hold public workshops to solicit input and staff will release updated FARMER Program Guidelines for a 30-day public comment period prior to Board consideration. When developing revised FARMER Program Guidelines, staff will:

- Consider whether district funding is oversubscribed or undersubscribed and if so, whether modifications to district funding allocations are needed.

- Evaluate funded projects and consider whether the projects are oversubscribed or undersubscribed, whether continued funding should be proposed, and if so, whether modifications to the project requirements are needed.

- Evaluate and consider whether San Joaquin Valley-specific projects should be expanded to other districts.

- Reexamine the project categories not funded in FY 2017-18 and consider whether additional categories should be proposed for future funding.

- Reexamine opportunities to coordinate with other incentive programs, such as CARB's Low Carbon Transportation Incentives and AQIP.

- Evaluate projects funded with FY 2017-18 funds that assist in meeting the goals of AB 617, which addresses criteria pollutants and toxic air contaminants at the community level.

APPENDIX A: EMISSION REDUCTION QUANTIFICATION METHODOLOGY AND AB 8 ANALYSIS

This appendix estimates the emission reductions of the project categories presented in FARMER Program Guidelines and provides additional details on the methodology developed and assumptions used. This analysis was guided by Assembly Bill (AB) 8 (Perea, Chapter 401, Statutes of 2013) and published Carl Moyer Program and Greenhouse Gas Reduction Fund (GGRF) quantification methodologies.[23]

CARB anticipates updating and revising the analysis in each update to the Guidelines as new project categories are added and as new data becomes available and methodologies are refined. It is important to note that these emission reduction estimates are illustrative examples of the potential emission reductions that can be achieved with these projects. Refined emission reduction estimates will be calculated as projects are implemented and project-specific data becomes available.

CRITERIA POLLUTANT AND TOXIC AIR CONTAMINANT QUANTIFICATION METHODOLOGY

To calculate the potential criteria pollutant and toxic air contaminant emission reductions associated with each project, staff utilized Appendix C: Cost-Effectiveness Calculation Methodology and Appendix D: Tables for Emission Reduction and Cost-Effectiveness Calculations of the 2017 Carl Moyer Program Guidelines.[24]

GREENHOUSE GAS QUANTIFICATION METHODOLOGY

When calculating the potential greenhouse gas (GHG) emission reductions associated with each project, annual fuel usage is a critical component, as the value determines the GHG emissions generated per unit of fuel consumed. Fuel usage values were derived from the 2014 version of California's mobile source emission factor database (EMFAC2014) when available, or calculated based on vehicle or equipment usage and published fuel consumption rate factors.

Annual fuel usage is paired with carbon intensity (CI) values from the Low Carbon Fuel Standard (LCFS) and the lower heating value (LHV) of applicable fuels to calculate the annual GHG emissions for each project's baseline and replacement vehicle or equipment, as shown in Formula 1.

[23] Cap-and-Trade auction proceeds quantification materials are available at: https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/quantification.htm.
[24] https://www.arb.ca.gov/msprog/moyer/guidelines/current.htm.

Formula 1: Annual GHG Emissions Based on Fuel Usage

$$Annual\ GHG\ Emissions\ \left(\frac{metric\ tons\ CO2e}{year}\right)$$

$$= LCFS\ carbon\ intensity * LHV\ of\ fuel * annual\ fuel\ usage$$

The LCFS Program's carbon intensities represent the average or typical production processes for each fuel used in California. Staff assumed the following pathways for the fuels analyzed:

- Gasoline: California reformulated gasoline (CaRFG) from the LCFS Lookup Table[25];
- Diesel: ultra-low sulfur diesel (ULSD), also from the LCFS Lookup Table; and
- Electricity: California grid average mix, which meets the Renewable Portfolio Standard (RPS) requirements, from the LCFS Lookup Table.

For battery-electric vehicles and equipment, the annual conventional fuel usage was converted to electricity usage using the LHV of the baseline fuel, energy conversion factor of 3.60 mega joules (MJ) per kilowatt hour (kWh), and the energy economy ratio (EER) value, as shown in Formula 2. EER values were derived from the LCFS Program.[26]

Formula 2: Alternative Fuel Usage

$$Alternative\ Fuel\ Usage\ \left(\frac{kWh}{year}\right) = \frac{conventional\ fuel\ usage * LHV_{conventional\ fuel}}{3.60\frac{MJ}{kWh} * EER}$$

To quantify the total potential emission reductions for each project, staff must first determine the annual emission reductions per project. For each eligible project category proposed in the FARMER Program, annual emission reductions are calculated by taking the difference between the annual emissions for the representative baseline vehicle or equipment and the annual emissions for the representative replacement vehicle or equipment, as shown in Formula 3. Annual emission reductions are in units of U.S. tons per year (tpy) for criteria pollutant and toxic air contaminant emissions and in metric tons of carbon dioxide equivalent (CO2e) per year for GHG emissions.

[25] https://www.arb.ca.gov/fuels/lcfs/fuelpathways/pathwaytable.htm.
[26] https://www.arb.ca.gov/regact/2015/lcfs2015/lcfsfinalregorder.pdf.

Formula 3: Annual Emission Reductions

$$Annual\ Emission\ Reductions\ = annual\ emissions_{baseline} - annual\ emissions_{replacement}$$

Once the annual emission reductions are determined, staff multiplies the project's annual emission reductions by its project life to calculate the total potential emission reductions for each project, as shown in Formula 4. As noted in the individual project write-ups, staff has quantified emission reductions based on an illustrative example due to the uncertainty in the baseline vehicles and equipment that will be funded.

Formula 4: Lifetime Emission Reductions

$$Lifetime\ Emission\ Reductions\ (tons) = annual\ emission\ reductions * \ project\ life$$

EMISSION REDUCTION QUANTIFICATION FOR ELIGIBLE PROJECTS

To quantify the magnitude of emission reductions that can be reasonably expected for each project funded under the FARMER Program, staff relied on past project data when available, or conservative assumptions based on publicly available information. For example, with Carl Moyer Program-eligible project categories, staff used the average baseline and replacement vehicle or equipment funded through the Carl Moyer Program over the last three years to be representative of the given project category.

Carl Moyer Program-Eligible On-Road, Heavy-Duty Trucks

To quantify potential emission reductions for on-road, heavy-duty, diesel trucks used in agricultural operations, staff used a 1999 engine model year, on-road, heavy heavy-duty diesel truck as the baseline vehicle, based on the average truck replaced in the Carl Moyer Program over the last three years. Staff assumed this truck would be replaced with a new, comparable 2018 model year truck.

Staff estimated the truck would travel approximately 11,250 miles per year for the next four years, based on the annual mileage limits of the agricultural vehicle extension provision of the Truck and Bus Regulation. Staff developed annual emission rates for the baseline and replacement truck, as shown in Table A-1.

Table A-1: Annual Emissions of On-Road, Heavy-Duty Trucks

	NOx (tpy)	ROG (tpy)	PM (tpy)	GHG (metric tons CO2e per year)
1999 MY, Baseline Truck	0.2503	0.0276	0.00990	26.380
2018 MY, Replacement Truck	0.0240	0.0017	0.00006	21.905

Using the annual emission rates above, staff calculated the potential annual emission reductions per project, as shown in Table A-2.

Table A-2: Annual Emission Reductions for On-Road, Heavy-Duty Truck Projects

	NOx (tpy)	ROG (tpy)	PM (tpy)	GHG (metric tons CO2e per year)
2018 MY Replacement	0.2263	0.0260	0.0098	4.475

Carl Moyer Program-Eligible Off-Road Mobile Agricultural Equipment

To quantify potential emission reductions for off-road, mobile agricultural equipment projects, staff looked at the average off-road agricultural equipment replacement projects in the Carl Moyer Program over the last three years. Based on this information, staff used a Tier 0 (1988 model year), 132-horsepower, off-road diesel tractor as the baseline equipment, and assumed this equipment would be replaced with a new, 149-horsepower, Tier 4 final tractor.

Staff assumed the equipment would operate approximately 687 hours per year, based on Carl Moyer Program data, and developed annual emission rates for the baseline and replacement tractor, as shown in Table A-3. Because there is limited data available on fuel consumption rates of off-road equipment, staff will collect data and quantify GHG emission reductions for these project categories as FARMER Program projects are implemented.

Table A-3: Annual Emissions of Off-Road, Mobile Agricultural Equipment

	NOx (tpy)	ROG (tpy)	PM (tpy)
Baseline Tier 0 Tractor	0.6829	0.0677	0.0359
Replacement Tier 4 Final Tractor	0.0694	0.0118	0.0061

Using the annual emission rates above, staff calculated the potential annual emission reductions per project, as shown in Table A-4.

Table A-4: Annual Emission Reductions for Off-Road, Mobile Agricultural Equipment Projects

	NOx (tpy)	ROG (tpy)	PM (tpy)
Tier 4 Final Replacement	0.6136	0.0559	0.0298

Carl Moyer Program-Eligible Agricultural Irrigation Pumps

To quantify potential emission reductions for agricultural irrigation pump projects, staff looked at the average off-road agricultural irrigation pumps funded in the Carl Moyer Program over the last three years. Based on this information, staff used a Tier 1 (1997 model year), 160-horsepower, diesel agricultural pump engine as the baseline, and assumed it would be replaced with an electric motor.

Staff estimates that the irrigation pump engine will operate approximately 1,105 hours per year, based on historic Carl Moyer Program data, and developed annual emission rates for the baseline and replacement engine, as shown in Table A-7. Because the replacement engine is electric, there are no criteria and toxic emissions associated with the new engine. However, because GHG emission reductions are analyzed on a lifecycle basis, there are GHG emissions associated with electricity use for the replacement motor, which are also shown in Table A-7 below.

Table A-5: Annual Emissions of Agricultural Irrigation Pumps

	NOx (tpy)	ROG (tpy)	PM (tpy)	GHG (metric tons CO2e per year)
Baseline Tier 1 Engine	1.057	0.1226	0.0721	75.45
Replacement Electric Motor	0	0	0	22.88

Using the annual emission rates above, staff calculated the potential annual emission reductions per project, as shown in Table A-6.

Table A-6: Annual Emission Reductions for Agricultural Irrigation Pump Projects

	NOx (tpy)	ROG (tpy)	PM (tpy)	GHG (metric tons CO2e per year)
Electric Motor Replacement	1.057	0.1226	0.0721	52.57

Zero-Emission Agricultural Utility Terrain Vehicle (UTV) Project

The Zero-Emission Agricultural UTV Project is a new project intended to encourage and accelerate the use of off-road, zero-emission UTVs in agricultural operations. Because this is a new project category, staff does not have historic project data to use to determine the baseline vehicle. Therefore, staff conservatively assumes that a zero-emission UTV funded under this project would replace a new, 2018 model year, 25-horsepower, conventionally-fueled (gasoline) UTVs.

Staff assumed the agricultural UTV would operate approximately 200 hours per year and developed annual emission rates for the baseline and replacement UTVs, as shown

in Table A-7. Because the replacement UTV is zero-emission, there are no criteria and toxic emissions associated with the replacement UTV.

Table A-7: Annual Emissions of Agricultural UTVs

	NOx (tpy)	ROG (tpy)	PM (tpy)	GHG (metric tons CO2e per year)
Baseline, Gasoline UTV	0.0008	0.0004	0.0002	4.087
Zero-Emission UTV	0	0	0	1.284

Using the annual emission rates above, staff calculated the potential annual emission reductions per project, as shown in Table A-8.

Table A-8: Annual Emission Reductions for Zero-Emission UTV Projects

	NOx (tpy)	ROG (tpy)	PM (tpy)	GHG (metric tons CO2e per year)
Zero-Emission UTV	0.0008	0.0004	0.0002	2.803

Off-Road Mobile Agricultural Trade-Up Pilot Project (Ag Trade-Up Pilot Project)
The Ag Trade-Up Pilot Project is a two-step transaction in which the owner of equipment with a Tier 0 (uncontrolled) or Tier 1 certified diesel engine agrees to scrap that equipment in exchange for a previously used and reconditioned piece of cleaner diesel equipment (certified Tier 2 or Tier 3 engine), at little or no out-of-pocket cost. The used equipment comes from another owner that relinquishes it for an incentive to purchase new agricultural equipment with the cleanest engine technology (Tier 4 Interim or Tier 4 Final certification). The emission reductions for this project occur at each step of the transaction, since each equipment owner receives cleaner replacement equipment.

For this analysis, staff calculated emission reductions for the two steps of the transaction: first, from the emissions offset between the reconditioned Tier 3 equipment and the scrapped Tier 0 equipment and second, from the emissions offset between the new Tier 4 final equipment and the Tier 3 equipment that was given to the previous owner of the Tier 0 equipment. Annual emission rates for the Ag Trade-Up Pilot Project were developed for uncontrolled, Tier 0 agricultural tractors in the 20 to 119 horsepower range and Tier 3 and Tier 4 final tractors in the 100 to 174 horsepower range, as shown in Table A-9. Staff assumed the Tier 3 tractor that replaced the scrapped Tier 0 tractor would be used approximately 300 hours per year and the Tier 4 final tractor would be used approximately 800 hours per year.

Because limited data is available on fuel consumption rates of off-road equipment, staff will collect data and quantify GHG emission reductions for these project categories as FARMER Program projects are implemented.

Table A-9: Annual Emissions of Ag Trade-Up Equipment

	Engine Tier	NOx (tpy)	ROG (tpy)	PM (tpy)
Transaction 1	Tier 0	0.1610	0.0210	0.0136
	Tier 3*	0.0649	0.0081	0.0044
Transaction 2	Tier 3*	0.1787	0.0273	0.0133
	Tier 4 Final	0.0221	0.0075	0.0009

*Note: the annual emission rates of the Tier 3 equipment vary between transactions due to the differences in annual usage, which also affect emission rates due to deterioration.

Using the annual emission rates above, staff calculated the potential annual emission reductions for each step of the transaction, as shown in Table A-10.

Table A-10: Annual Emission Reductions for Ag Trade-Up Pilot Projects

	Engine Tier	NOx (tpy)	ROG (tpy)	PM (tpy)
Transaction 1	Tier 0 to Tier 3	0.0961	0.0129	0.0092
Transaction 2	Tier 3 to Tier 4 Final	0.1566	0.0198	0.0124

AB 8 Analysis

AB 8 extended the funding for the Air Quality Improvement Fund (AQIF) and the Alternative and Renewable Fuel and Vehicle Technology Fund (ARFVTF) through 2023, refined the evaluation criteria for projects supported by these funding sources, and introduced requirements that staff followed to develop project scoring criteria. Because the eligible project categories in FARMER are similar to projects historically funded through AQIF, staff is utilizing CARB's established AB 8 analysis for project assessment, as described below.

- Provide preference to projects with higher benefit-cost scores that maximize the purposes and goals of the applicable funding source when awarding funding;
- "Benefit-cost score" means the reasonably expected or potential criteria pollutant emission reductions achieved per dollar awarded by the Board for the project;[27]

[27] HSC § 44270.3.

- CARB may also give additional preference for the following criteria, as applicable:

    1. The project's proposed or potential reduction of criteria or toxic air pollutants.
    2. The project's contribution to regional air quality improvement.
    3. The project's ability to promote the use of clean alternative fuels and vehicle technologies.
    4. The project's ability to achieve GHG reductions.
    5. The project's ability to support market transformation of California's vehicle or equipment fleet to utilize low carbon or zero-emission technologies.
    6. The project's ability to leverage private capital investments.

CARB staff annually evaluates potential project categories to assign preference for projects funded by AQIF and ARFVTF, based on the criteria above and consistent with the CARB's past AB 8 analyses for vehicle and equipment projects funded through the Air Quality Improvement Program (AQIP).[28] The AB 8 analysis is fully executed for all of the proposed project categories in the FARMER Program Guidelines.

Overview

Conservative estimates for criteria pollutant, toxic air contaminants, and GHG emission reductions were developed using guidance provided in AB 8. Because criteria pollutant and toxic air contaminant emissions are geographically localized, criteria pollutant and toxic air contaminant emission reductions reported in this appendix are estimated at the tailpipe, consistent with well-established Carl Moyer Program quantification methodology. Greenhouse gas emission reductions are tabulated on a well-to-wheel (WTW) basis, as greenhouse gases are a statewide pollutant. Building upon the quantification methodology described above, this section of the appendix provides information on the following:

- Benefit-Cost Score Analysis;
- Additional Preference Criteria Scores; and
- Total Benefit Index Scores.

Benefit-Cost Score Analysis

Staff analyzed the estimated costs and developed cost-effectiveness values for each project category using well-established cost-effectiveness calculation methodologies for incentives, consistent with that used in the Carl Moyer Program. These

[28] https://www.arb.ca.gov/msprog/aqip/fundplan/fundplan.htm.

cost-effectiveness values are then converted to benefit-cost values, consistent with AB 8 requirements, and described in more detail below.

To calculate cost-effectiveness for criteria pollutant and toxic emission reductions, staff applied an appropriate discount rate and utilized a capital recovery factor (CRF) in the analysis based on 2017 Carl Moyer Program Guidelines.[29] The one percent discount rate was used and the corresponding CRF was determined based on the assumed contract period of the vehicles or equipment supported by a given project. The criteria pollutant and toxic air contaminant cost-effectiveness of a project is determined using Formula 5 below.

Formula 5: Criteria Pollutant and Toxic Emission Reductions Cost-Effectiveness

$$Cost\ Effectiveness\ \left(\frac{\$}{ton}\right) = \frac{Incentive\ Amount\ per\ Vehicle\ or\ Equipment * CRF}{Annual\ Per\ Vehicle\ Weighted\ Emission\ Reductions}$$

Weighted emission reductions are calculated using Formula 6, consistent with Carl Moyer Program Guidelines:

Formula 6: Annual Weighted Emission Reductions

$$Annual\ Weighted\ Emission\ Reductions\left(\frac{weighted\ tons}{year}\right) = NOx\ reductions + ROG\ reductions + (20 * PM\ reductions)$$

Table A-11 provides the inputs and the resulting weighted criteria pollutant and toxic air contaminant cost-effectiveness, in terms of dollars per ton of weighted emission reductions for criteria pollutant and toxic air contaminants. For Carl Moyer Program-eligible projects, the estimated costs were based on average incentive amounts in the Carl Moyer Program over the last three years. For Zero-Emission Agricultural UTVs and the Ag Trade-Up Pilot Project, costs were based on proposed FARMER Program funding levels.

[29] https://www.arb.ca.gov/msprog/moyer/guidelines/2017gl/2017_cmp_gl_volume_1.pdf.

Table A-11: AB 8 Analysis – Cost-Effectiveness of Proposed Projects

Project Category	Annual Weighted Emission Reductions (tpy)	Average Incentive ($)	Cost-Effectiveness ($/ton)
Heavy-Duty Truck Replacements	0.449	$33,574	$19,661
Off-Road, Mobile Farm Equipment Replacements	1.265	$54,125	$4,536
Agricultural Irrigation Pump Replacements	2.621	$20,724	$1,629
Zero-Emission Agricultural UTVs	0.005	$9,000	$621,822
Ag Trade-Up Pilot Project	0.512	$84,000	$17,384

Cost-effectiveness values were then converted to benefit-cost values in terms of pounds of emission reductions per dollar spent. The benefit-cost values for each project were given points based on a scale of one to five points. The bins were determined by taking the high and low resulting benefits and scaled to develop an equal distribution of scores.

Those projects with a benefit-cost value of more than 0.55-pounds of emissions reduced per dollar received a high score of five points. The remaining bins were decreased by 0.15-pound-per-dollar increments with the least cost-effective projects, those projects with a benefit-cost value of less than 0.10 pounds per dollar, receiving the lowest points possible. The benefit-cost value of each proposed project was scored based on the following scale:

5: More than 0.55 pounds per dollar
4: 0.40 to 0.54 pounds per dollar
3: 0.25 to 0.39 pounds per dollar
2: 0.10 to 0.24 pounds per dollar
1: Less than 0.10 pounds per dollar

The resulting scores from the scale shown above were then used in the “Total Benefit Index” for AB 8 project selection. The cost-effectiveness, benefit-cost value, and resulting score of each of the proposed projects are shown in Table A-12.

Table A-12: AB 8 Analysis – Benefit-Cost Scores of Proposed Projects

Project Category	Cost-Effectiveness ($/ton)	Benefit-Cost Value (lb/$)	Benefit-Cost Score
Heavy-Duty Truck Replacements	$19,661	0.102	2
Off-Road, Mobile Farm Equipment Replacements	$4,536	0.441	4
Agricultural Irrigation Pump Replacements	$1,629	1.228	5
Zero-Emission Agricultural UTVs	$621,822	0.003	1
Ag Trade-Up Pilot Project	$17,384	0.115	2

Additional Preference Criteria

Per AB 8, additional preference criteria may be used to provide additional funding preference in conjunction with the benefit-cost scores. The additional preference criteria includes:

1. The project's proposed or potential reduction of criteria or toxic air pollutants.
2. The project's contribution to regional air quality improvement.
3. The project's ability to promote the use of clean alternative fuels and vehicle technologies.
4. The project's ability to achieve GHG reductions.
5. The project's ability to support market transformation of California's vehicle or equipment fleet to utilize low carbon or zero-emission technologies.
6. The project's ability to leverage private capital investments.

Recognizing the wide range of potential benefits, staff analyzed the associated data and equally divided the results into scores between 0 and 5 for quantitative preference criteria. The quantitative preference criteria for each project includes the proposed or potential reduction of criteria and toxic air pollutants, contribution to regional air quality, and the ability to achieve GHG reductions.

Staff used the following steps to develop scoring scales and final scores for the quantitative preference criteria:

1. Quantify the results for each additional preference criteria for the proposed projects;
2. Establish scoring scale increments to generate an equal distribution in points for the proposed projects; and

3. Rank the proposed projects based on the established scoring scale, which is then used in the “Total Benefit Index”.

Staff anticipates that the scales for the quantitative additional preference criteria may change depending on the mix of projects proposed, due to differences in the range of expected benefits or when additional information becomes available to refine the evaluation. The data and rationale used to establish each of the criteria weighting factors for the associated scores are described below.

Proposed or Potential Reduction of Criteria or Toxic Air Pollutants

This analysis considered the magnitude of emission reductions by quantifying the direct criteria pollutant and toxic air contaminant emission reductions expected per average vehicle or equipment supported under each project category. With the benefit-cost score analysis primarily driven by overall project incentive amounts, this additional criteria allowed staff to make direct comparisons of the emission reductions expected by the different proposed projects, independent of the associated incentive amounts.

For this additional preference criterion, staff analyzed the direct criteria pollutant and toxic air contaminant emission benefits per project, without weighting one pollutant more than others. Resulting total lifetime emission reductions ranged from less than 0.01 tons to 6.99 tons of lifetime criteria pollutant and toxic air contaminant emission reductions per project. The scoring scale for this criterion was established by evaluating the range of lifetime tons of emission reductions between the highest and lowest value to try to have an equal distribution of scores. As a result, the bins were scaled in 2-ton increments. Projects with less than or equal to 0.1 tons of criteria pollutant and toxic air contaminant emission reductions receive one point, while those projects with greater than 6 tons of criteria pollutant and toxic air contaminant emission reductions received a score of five points. The resulting scale for criteria pollutant and toxic air contaminant emission reductions on a per project basis is shown below.

5: Greater than 6 tons of criteria and toxic emission reductions per project
4: 4 to 5.99 tons of criteria and toxic emission reductions per vehicle
3: 2 to 3.99 tons of criteria and toxic emission reductions per vehicle
2: 0.01 to 1.99 tons of criteria and toxic emission reductions per vehicle
1: Less than 0.01 tons of criteria and toxic emission reductions per vehicle

Based on the information described above, Table A-13 summarizes the results and the corresponding score for this additional preference criterion.

Table A-13: AB 8 Analysis – Potential Criteria and Toxic Emission Reductions

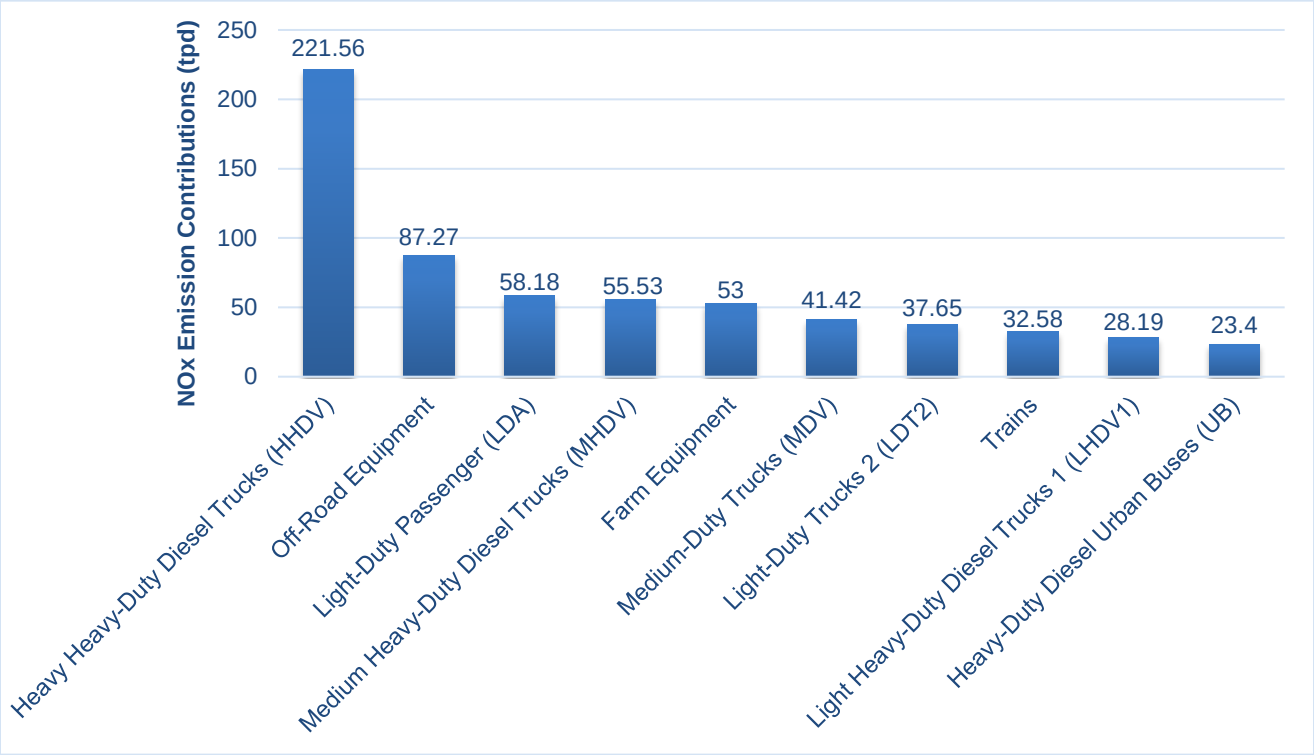
Project Category	Annual Criteria and Toxic Emission Reductions (tpy)	Project Life (years)	Total Criteria and Toxic Emission Reductions (tons)	Score
Heavy-Duty Truck Replacements	0.2621	4	1.05	2
Off-Road, Mobile Farm Equipment Replacements	0.6992	10	6.99	5
Agricultural Irrigation Pump Replacements	1.2512	5	6.26	5
Zero-Emission Agricultural UTVs	0.0015	3	0.004	1
Ag Trade-Up Pilot Project	0.1182	3	2.24	3
	0.1887	10		

Contribution to Regional Air Quality Improvement

Staff developed a scoring scale based on CARB's emissions inventory for the South Coast and San Joaquin Valley air basins, two of the state's extreme nonattainment regions with National Ambient Air Quality Standards for ozone, and ranked projects based on their corresponding emissions contributions from highest to lowest. Specifically, staff used the NOx emissions inventory in tons per day from the 2016 State Implementation Plan (SIP) emission projection data for the South Coast and San Joaquin Valley air basins.[30] The ranking scale is based on the emissions inventory shown in Figure A-1.

[30] https://www.arb.ca.gov/ei/maps/2017statemap/abmap.htm.

Figure A-1: Largest NOx Emission Sources in the South Coast & San Joaquin Valley Air Basins



The top ten NOx emission sources were ranked in tons per day for various vehicle and equipment types, ranging from heavy heavy-duty diesel trucks, at 222 tons per day, to heavy-duty diesel urban buses, at 23 tons per day. Because the HHD diesel truck category is the largest emission source by far, the scoring scale for this criterion was established for the range of NOx emissions between the second highest and lowest value. As a result, the bins were rounded and scaled in 25-ton per day increments. Projects corresponding to inventory sources with less than or equal to 25 tons of NOx per day receive one point, while those projects with greater than 100 tons of NOx per day receive five points. Each project's potential contribution to regional air quality improvement was ranked based on the scale below.

5: Category contributes more than 100 tons of NOx per day
4: Category contributes 75 to 99 tons of NOx per day
3: Category contributes 50 to 74 tons of NOx per day
2: Category contributes 25 to 49 tons of NOx per day
1: Category contributes less than 25 tons of NOx per day

Ability to Promote the Use of Clean Alternative Fuels and Vehicle Technologies

Clean alternative fuels are fuels that have lower well-to-wheel emissions compared to conventional fuels, such as electricity, hydrogen, and renewable fuels. Clean vehicle technologies are technologies that emit zero tailpipe emissions, such as battery-electric and fuel cell vehicles, or enabling technologies, such as vehicles that utilize the cleanest available emission control technology or conventional hybrid or plug-in hybrid systems. This qualitative analysis ranked projects by whether or not they used a clean low carbon alternative or renewable fuel or utilized clean vehicle technologies. Staff scored this additional preference criterion on the scale below.

5: Projects that use low carbon alternative fuels and clean vehicle technologies
3: Projects that use low carbon alternative fuels or clean vehicle technologies
1: Projects that do not use low carbon alternative fuels nor clean vehicle technologies

Ability to Facilitate GHG Reductions

Similar to the methodology established in the first preference criterion for criteria pollutant and toxic air contaminant emission reductions, staff conducted a full well-to-wheel GHG emissions analysis for the vehicles and equipment supported by the proposed projects. Staff determined expected lifetime GHG emission reductions achieved for each vehicle or equipment funded by the proposed project categories and found that GHG emission reductions ranged from over 200 metric tons of CO2e per vehicle to less than 10 metric tons CO2e per vehicle. The scoring scale for GHG emission reductions is shown below.

5: Greater than 200 metric tons of CO2e per vehicle
4: 150 to 199 metric tons of CO2e per vehicle
3: 100 to 149 metric tons of CO2e per vehicle
2: 50 to 99 metric tons of CO2e per vehicle
1: Less than 50 metric tons of CO2e per vehicle

Based on the information described above, Table A-14 summarizes the results and the corresponding score for this additional preference criterion. As noted in the individual project write-ups above, limited data is available on fuel consumption rates of off-road diesel equipment, therefore, GHG emission reductions are quantified for on-road projects and projects where the replacement equipment is battery-electric or alternative-fueled.

Table A-14: AB 8 Analysis – Ability to Achieve GHG Emission Reductions

Project Category	Potential Annual GHG Reductions (metric tons CO2e per year)	Project Life (years)	Total GHG Emission Reductions (metric tons CO2e)	Score
Heavy-Duty Truck Replacements	4.475	4	17.90	1
Off-Road, Mobile Farm Equipment Replacements	-	10	-	-
Agricultural Irrigation Pump Replacements	46.64	5	263	5
Zero-Emission Agricultural UTVs	2.803	3	8.41	1
Ag Trade-Up	-	3/10	-	-

Ability to Support Market Transformation of California's Vehicle or Equipment Fleet to Utilize Low Carbon or Zero-Emission Technologies

This qualitative analysis ranked projects by whether or not technologies with the potential for market transformation are supported by the proposed projects. Staff used CARB's Three-Year Investment Strategy for Heavy-Duty Vehicles and Off-Road Equipment from Low Carbon Transportation and AQIP Investments as a key reference in scoring technologies used for this evaluation. Low NOx engines, battery-electric, and fuel cell electric vehicle technologies, for example, are considered transformative technologies that will help the State meet its air quality goals. Staff scored this preference criterion based on the scale below.

5: Technologies that support market transformation
0: Technologies that do not support market transformation

Ability to Leverage Private Capital Investments

Staff is proposing not to include this criterion this year as staff works on developing methodologies to analyze the private capital investments leveraged by projects. Staff intends to identify information sources and may include this preference criterion in future updates.

Total Benefit Index

Staff utilized the benefit-cost/cost-effectiveness scores of the proposed projects and the additional preference criteria in the consideration of the projects to be given funding preference under AB 8. Staff developed the Total Benefit Index (TBI) score that preferentially weights the benefit-cost score (at 75 percent of the total score) with additional preference scores (at 25 percent of the total score). Staff weighted the

benefit-cost scores in this manner because AB 8 identified the benefit-cost score as the primary metric to assign funding preference for proposed projects.

Table A-15 summarizes the individual scores and the TBI scores for all of the project categories currently proposed in the FARMER Program.

Table A-15: AB 8 Analysis – Total Benefit Index Scores of Proposed Projects

Project Category	Additional Preference Criteria					25% of TBI	75% of TBI	Total Benefit Index Score
	Potential Reduction of Criteria or Toxic Air Pollutants	Contribution to Regional Air Quality Improvement	Ability to Promote Use of Clean Fuels and Technologies	Ability to Achieve GHG Emission Reductions	Ability to Support Market Transformation	Average of Additional Preference Criteria Score	Benefit-Cost Score	
Heavy-Duty Truck Replacements	2	5	3	1	0	2.2	2	2.05
Off-Road, Mobile Farm Equipment Replacements	5	3	3	-	0	2.2	4	3.55
Agricultural Irrigation Pump Replacements	5	1	5	5	5	4.2	5	4.80
Zero-Emission Agricultural UTVs	1	1	5	1	5	2.6	1	1.40
Ag Trade-Up Pilot Project	3	3	3	-	0	1.8	2	1.95

Though the TBI scores for the recommended project categories range from 1.40 to 4.80, each project category provides unique benefits and are therefore included in staff's recommendations. For instance, Zero-Emission Agricultural UTVs have a TBI score of 1.40, but provide excellent GHG reduction benefits and support market transformation to zero-emission technologies. Further, the Ag Trade-Up Pilot Project's TBI score of 1.95 is at the lower end of the spectrum. However, this project category provides owners of small and mid-size farms, who may not have accessed incentive funds in the past, an excellent opportunity to affordably upgrade their older mobile agricultural equipment. These recommendations represent a suite of project categories that a district may choose to fund based on the needs of their district.

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APPENDIX B: MAXIMIZING BENEFITS TO AB 1550 COMMUNITIES AND LOW-INCOME HOUSEHOLDS

CARB's August 2017 Draft Funding Guidelines for Agencies that Administer California Climate Investments (Draft CCI Funding Guidelines) establish requirements and recommendations for maximizing AB 1550 (Gomez, Chapter 369, Statutes of 2016) benefits for California Climate Investments.[31] Although these guidelines only apply to programs funded with Cap-and-Trade auction proceeds, CARB is also striving to maximize disadvantaged community, low-income community, and low-income household benefits for the other investments included under the FARMER Program. This appendix summarizes the steps CARB staff is taking to meet these requirements. CARB is now in the process of updating the CCI Funding Guidelines to address legislation passed in 2017 and FY 2017-18 appropriations. On February 2, 2018, CARB released a discussion document to provide an overview and solicit comments on anticipated changes.[32] These draft FARMER Program Guidelines conform to the August 2017 Draft CCI Funding Guidelines and February 2018 discussion document. The final FARMER Program Guidelines will be implemented in accordance with all requirements of the revised CCI Funding Guidelines.

The specific requirements within the Draft CCI Funding Guidelines for State agencies related to evaluating investments for AB 1550 benefits and maximizing these benefits, particularly for disadvantaged communities, are summarized below, along with the actions CARB is taking to address them.

Draft CCI Funding Guideline Requirement: Assess overall program structure for opportunities to target investments to benefit AB 1550 populations and evaluate projects for potential benefits to AB 1550 populations, using the criteria contained in Appendix 2.A of the Draft CCI Funding Guidelines.

CARB Action: CARB staff proposes that at least 55 percent of FARMER Program funds be invested in projects meeting one of the AB 1550 criteria with the following targets:

- At least 50 percent of funds for projects located within, and benefiting individuals living in, disadvantaged communities; and

[31] See Climate Changes Investments Guidelines, Volume II, Investments to Benefit AB 1550 Populations, Draft for Public Comments, August 4, 2017. https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/2017_draft_funding_guidelines.pdf.

[32] https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/funding-guidelines-discussiondoc-2018.pdf.

- At least 5 percent of funds for projects within and benefiting low-income communities or benefiting low-income households.

The subset of these funds meeting the additional AB 1550 requirement for low-income community household investments that are within ½ mile of a disadvantaged community would be determined based on program implementation and reported in future *Annual Reports to the Legislature on California Climate Investments Using Cap-and-Trade Proceeds*.

CARB considers the investment targets to be a floor and strives to exceed them. In designing project implementation requirements, CARB will consider whether there are provisions that can be incorporated to help ensure that CARB exceeds the minimum targets.

Draft CCI Funding Guideline Requirement: Target funding, to the extent feasible, for projects that are located within and benefit residents of AB 1550 communities and low-income households. When selecting projects, give priority to those that maximize benefits to disadvantaged communities.

CARB Action: CARB will pursue a number of strategies to maximize benefits to residents of AB 1550 communities and low-income households. These include directing FARMER Program funding to local air districts with higher concentrations of disadvantaged communities and increasing outreach to disadvantaged communities.

Draft CCI Funding Guideline Requirement: Provide direct outreach to disadvantaged communities and identify an agency point or contact to provide the information on funding opportunities and to coordinate with other State agencies on California Climate Investments.

CARB Action: CARB has taken multiple actions to outreach to disadvantaged communities. CARB has dedicated staff to assist with disadvantaged community and low-income household outreach on FARMER Program investments and help ensure these communities are aware of funding opportunities. Further, CARB is committed to working with local air districts to provide technical assistance to small growers in disadvantaged communities and low-income households or communities to ensure all FARMER Program application and reporting requirements are sufficiently met. Additionally, CARB is working with local air districts to provide additional outreach for FARMER Program eligible projects within disadvantaged communities.

Outreach events: CARB staff has met with various industry representatives and community-based organizations, conducted public workshops, and conducted outreach and distributed FARMER Program information at the agricultural-related events, such as the World Agricultural Expo in Tulare, California. All of these activities have directly reached disadvantaged communities.

Website: CARB has developed a website to promote FARMER Program projects and increase awareness of funding opportunities for eligible projects under the FARMER Program: www.arb.ca.gov/agincentives.

Outreach by Air Districts: Air Districts will be required to prepare outreach materials in consultation with CARB and conduct outreach to the public and agricultural equipment dealerships.

Draft CCI Funding Guideline Requirement: Create or modify program guidelines or procedures to meet or exceed AB 1550 program targets.

CARB Action: This Appendix outlines the steps CARB is taking to meet or exceed AB 1550 program targets.

Draft CCI Funding Guideline Requirement: Track and report on the AB 1550 of each investment.

CARB Action: All FARMER Program funding recipients will be required to collect and report to CARB all data necessary to determine AB 1550 benefits. This includes all information necessary to complete the evaluations specified in Appendix 2.A of the Draft CCI Funding Guidelines and the data required in Volume 3 of the Draft CCI Funding Guidelines (Reporting Requirements). CARB uses this information to provide input for the *Annual Report to the Legislature on California Climate Investments Using Cap-and-Trade Proceeds*.

Draft CCI Funding Guideline Requirement: Assess how projects benefiting AB 1550 populations meet a community or household need. The Draft CCI Funding Guidelines provides a list of common needs identified by community advocates during the development of the guidelines. Letters of community support can also be used to document that investments address a community need.

CARB Action: Staff reviewed the commonly identified needs of AB 1550 populations in the Draft CCI Funding Guidelines.[33] The needs being met by proposed FARMER Program eligible projects are listed below.

- **Reduce health harms suffered disproportionately by AB 1550 populations due to air pollutants.**

  CARB staff proposes that at least 55 percent of FARMER Program funds be invested in projects meeting one of the AB 1550 criteria. Additionally, all projects funded under the FARMER Program will reduce criteria air pollutants and/or toxic air contaminants as co-benefits, thereby reducing health harms due to air pollutants.

- **Provide educational and community capacity building opportunities through community engagement and leadership.**

  Public outreach is a required element in FARMER Program eligible projects.

- **Reduce exposure to local environmental contaminants, such as toxic air contaminants, criteria air pollutants, and drinking water contaminants**.

  A portion of FARMER Program expenditures provide incentive funding that reduces toxic air contaminants and criteria pollutants from agricultural vehicles or equipment that are registered, domiciled, or operated a majority of time in an AB 1550 community.

[33] For list of Examples of Common Needs of AB 1550 Populations (as identified by community advocates), refer to Table 2-2 of the Draft California Climate Investments Guidelines.