



**2018 BIENNIAL REPORT TO THE LEGISLATURE ON THE  
AB 118 AIR QUALITY IMPROVEMENT PROGRAM,  
FISCAL YEARS 2016-17 and 2017-18**

This report can be viewed at: <https://ww2.arb.ca.gov/legislatively-mandated-reports>. To order a hard copy of this report, please contact Sydney Vergis, Ph.D., at (916) 322-8520 or via email at [Sydney.Vergis@arb.ca.gov](mailto:Sydney.Vergis@arb.ca.gov).

# TABLE OF CONTENTS

<b>Executive Summary</b> .....	1
<b>I. Introduction</b> .....	3
<b>A. AQIP and Assembly Bill (AB) 118</b> .....	3
<b>B. Implementation of AQIP</b> .....	4
<b>C. Funding Sources</b> .....	5
<b>D. Reporting Requirements</b> .....	5
<b>II. AQIP Projects Funded in FY 2016-17 and 2017-18</b> .....	6
<b>A. Truck Loan Assistance Program</b> .....	8
<b>B. Low NOx Engine Incentives</b> .....	13
<b>C. Agricultural Equipment Trade-Up Pilot Project in San Joaquin Valley</b> .....	16
<b>III. Recommendations for Future Action</b> .....	18
<b>Appendix A: Projects Receiving AQIP Funding Prior to FY 2016-17</b> .....	A-1

## Executive Summary

This document provides the required biennial update on the implementation of the Air Quality Improvement Program (AQIP). Health and Safety Code Section 44274 requires the California Air Resources Board (CARB) to submit to the Legislature a report containing details of projects funded, expected benefits of projects in promoting clean fuels and vehicle technologies, the impact that projects have on reaching air quality goals, and recommendations for future actions.

During this report's status update period covering fiscal year (FY) 2016-17 and 2017-18, 80 percent of AQIP-specific funds were directed to the Truck Loan Assistance Program. Fourteen percent supported Low Oxides of Nitrogen (NOx) Engine Incentives through the Hybrid Truck and Bus Voucher Incentive Project (HVIP). Five percent went to the Agricultural Equipment Trade-up Pilot in the San Joaquin Valley. This report focuses on these three projects AQIP funded in the two years covered by this biennial report.

In the early years of AQIP, CARB focused investments on technology advancing projects that support California's long-term air quality and climate change goals in addition to providing immediate emissions benefits. These projects included the Clean Vehicle Rebate Project (CVRP) which provides rebates to consumers who buy zero emission vehicles (ZEVs), truck and bus vouchers through HVIP, and advanced technology freight demonstrations. The flexibility allowed within AQIP allowed CARB to pilot concepts that became the core part of its incentive portfolio. In recent years, CVRP, HVIP and advanced technology freight demonstrations have been funded through the Low Carbon Transportation Program, and AQIP funds have primarily been directed to the Truck Loan Assistance Program. More details on these projects can be found in the Annual Report to the Legislature on California Climate Investments Using Cap-and-Trade Auction Proceeds at: <http://www.caclimateinvestments.ca.gov>.

Since AQIP's inception, the Truck Loan Assistance Program, which enables small fleets affected by the Truck and Bus Regulation to secure financing to upgrade older vehicles in their fleets, has provided funding for over 19,000 cleaner trucks. Low NOx Engine Incentives have supported the purchase of over 200 low NOx engines. The Agricultural Equipment Trade-Up Pilot Project 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 cleaner, previously used and reconditioned piece of equipment with a certified Tier 2 or Tier 3 engine at little or no out-of-pocket cost. Since the inception of the Trade-Up Pilot Project in FY 2015-16, 23 equipment transactions were completed, resulting in 38 tractor replacements. As of June 30, 2018, 19 additional equipment transactions were continuing under contract from FY 2016-17 funding.

Emission benefits<sup>1</sup> attributable to AQIP-specific funds between July 1, 2016 and June 30, 2018 are described in this report. The deployment of vehicles from these

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<sup>1</sup> See Table 1 for details.

funds has resulted in emission reductions of approximately 3,700 tons of NO<sub>x</sub> and 4.2 tons of fine particulate matter (PM<sub>2.5</sub>).

The Truck Loan Assistance Program is available to small fleets with ten or fewer trucks at the time of application. More than 95 percent of enrolled loans have been issued to fleet owners with ten or fewer employees and a significant portion of enrolled loans have been issued to fleets in disadvantaged communities. For FY 2018-19 ninety percent of the AQIP funding, \$25.6 million, was approved for the Truck Loan Assistance Program; however, forecasted demand for this program is expected to exceed the capacity of AQIP funds. The Truck Loan Assistance Program will likely face unprecedented future demand as truck owners take action to meet truck replacement requirements and CARB increases its enforcement efforts.

## I. Introduction

### A. AQIP and Assembly Bill (AB) 118

AQIP is a voluntary incentive program administered by CARB to reduce smog and diesel particulate pollution, with concurrent reductions in greenhouse gas (GHG) emissions. AQIP was created under the *California Alternative and Renewable Fuel, Vehicle Technology, Clean Air, and Carbon Reduction Act of 2007* (AB 118, Núñez, Chapter 750, Statutes of 2007). Originally scheduled to sunset in 2015, the passage of AB 8 (Perea, Chapter 401, Statutes of 2013) extended the funding for AB 118 programs until January 1, 2024. For additional background on AB 118, please see the 2016 Biennial Report to the Legislature at: <https://ww2.arb.ca.gov/legislatively-mandated-reports>.

AQIP has invested approximately \$268 million in nine project categories from program inception in FY 2008-09 through 2017-18. Specific funding categories have included financing for heavy-duty diesel trucks, incentives for clean cars, hybrid trucks, electric lawnmowers, zero emission agricultural work vehicles, and demonstration projects for cleaner marine and locomotive engines. All of the projects funded through AQIP have supported the expansion of advanced clean technologies in vehicles or equipment in the California marketplace.

During the status update period, AQIP invested a total of approximately \$56 million in three project categories. These project categories included the Truck Loan Assistance Program, Low NOx Engine Incentives (now supported through HVIP), and the Agriculture Equipment Trade-Up Pilot Project in the San Joaquin Valley. The emission benefits generated during the status update period from these three AQIP projects are illustrated in Table 1.

**Table 1: Statewide Criteria Pollutant and Precursor Emission Reductions  
Attributable to AQIP<sup>1</sup>**

Funding Category	Time Period	AQIP Funding (millions)	NOx <sup>2</sup> (tons)	ROG <sup>2</sup> (tons)	PM 2.5 <sup>2</sup> (tons)
Truck Loan Assistance Program	FY 2016-17 and 17-18 <sup>3</sup>	\$45	3,648	57	-- <sup>6</sup>
	Cumulative <sup>4</sup>	\$117	16,148	529	-- <sup>6</sup>
Low NOx <sup>5</sup>	FY 2016-17 and 17-18	\$8	--	--	--
	Cumulative <sup>4</sup>	\$70	56	--	--
Ag Equipment Trade-Up	FY 2016-17 and 17-18 <sup>3</sup>	\$3	58	7.9	4.2
	Cumulative <sup>4</sup>	\$3.5	91	11.0	6.2

<sup>1</sup> Low NOx Engine Incentives have received funding from AQIP and Low Carbon Transportation appropriations. However, emission benefits have only been calculated for monies attributable to AQIP funding.

<sup>2</sup> Criteria pollutant emission reductions are calculated for exhaust emissions only. Reactive Organic Gas (ROG).

<sup>3</sup> Emissions based on approximately 8,700 trucks for the Truck Loan Assistance Program and 23 Agriculture (Ag) equipment trade-up transactions between July 1, 2016 and June 30, 2018.

<sup>4</sup> Cumulative through June 30, 2018.

<sup>5</sup> During the status update, no fleets applied for the \$8 million in funding for Low NOx Engines. Cumulative NOx emission reductions attributable to AQIP are from 218 engines funded from FY 2015-16 funds.

<sup>6</sup>PM reductions are not included in the table as attributable to the Truck Loan Assistance Program because the In-Use Truck and Bus Regulation already requires PM reductions from trucks.

## **B. Implementation of AQIP**

CARB adopted regulations that establish the administrative procedures for implementing AQIP. As required in Health and Safety Code (HSC) Section 44274(a), the Board adopted regulatory guidelines in 2009. Central to the guidelines is the requirement for a Board-approved annual funding plan developed with public input.

The funding plan is each year's blueprint for expending AQIP funds appropriated to CARB in the annual State Budget. The funding plan describes the projects CARB intends to fund, establishes funding targets for each project, and provides the justification for these decisions. The funding plan is updated and presented to the Board for its approval each year. CARB staff holds a series of workgroup meetings and public workshops during the development of each funding plan to solicit feedback and recommendations. For funding plan details see: <https://www.arb.ca.gov/aqip/aqip.htm>.

### **C. Funding Sources**

Funding for AQIP comes primarily from the smog abatement fee assessed annually by the Department of Motor Vehicles (DMV) during a vehicle's first six registration years in lieu of a biennial smog inspection. Of the \$20 collected for each vehicle at the time of annual registration, \$4 is allocated to CARB for AQIP. A small portion of AQIP funding comes from two additional sources: an initial registration fee for new watercraft and a special equipment identification plate fee for certain types of equipment. The fees identified above generate approximately \$25-\$30 million on an annual basis.

In addition to the fees above, AQIP has received \$108 million in additional funding from other sources since program inception to support the growing demand of AQIP projects. This includes \$15 million CARB added to AQIP at the end of FY 2017-18 to support the Truck Loan Assistance Program. For details on the other funding please see the 2016 Biennial Report to the Legislature at: <https://ww2.arb.ca.gov/legislatively-mandated-reports>.

Beginning in FY 2013-14, funds from the Greenhouse Gas Reduction Fund (GGRF) were appropriated by the Legislature for Low Carbon Transportation (LCT) investments in HVIP and Low NOx Engines and CVRP. Since then, per the FY 2018-19 Funding Plan, Low Carbon Transportation appropriations in these programs have totaled \$743 million. Nearly all AQIP funds are now directed to the Truck Loan Assistance Program for helping small business truckers affected by the In-Use Truck and Bus Regulation to secure financing for clean trucks and diesel exhaust retrofits, but it will not be enough to address forecasted demand. AQIP is the only source of CARB funding available to fund the Truck Loan Assistance Program.

### **D. Reporting Requirements**

There are three separate reporting requirements for AQIP.

First, HSC Section 44274(d) requires CARB to submit a biennial report to the Legislature on the implementation of AQIP. The report is required to include a list of funded projects, the benefits of these projects, and recommendations for future actions.

Second, CARB's regulation for implementing AQIP requires CARB staff to report to the Board biennially on progress in implementing the program. The regulation provides that this report may be combined with the required report to the Legislature. (Title 13, Chapter 8.2, California Code of Regulations Section 2358.)

Third, HSC Section 44274.7(f) requires CARB to report to the Legislature annually on the implementation of the Truck Loan Assistance Program established in the FY 2008-09 State Budget with AQIP funds.



This report is intended to fulfill all of these requirements. Project status update information provided in this report covers current AQIP projects funded in FY 2016-17 and 2017-18. A list of past projects is also included in Appendix A.

## **II. AQIP Projects Funded in FY 2016-17 and 2017-18**

### *Overview*

AQIP projects support the demonstration and deployment of near-zero and zero emission vehicles and equipment, and other advanced technologies that provide emission reductions and are critical to meeting California's longer-term air quality and climate change goals. Three categories, the Truck Loan Assistance Program, Low NOx Engine Incentives, and Agricultural Equipment Trade-Up Pilot Project in the San Joaquin Valley, have received AQIP funding during the status update period of FY 2016-17 and 2017-18.

Table 2 provides a summary of the funding (from AQIP, Low Carbon Transportation, and other appropriations) provided to the above categories starting from inception in FY 2008-09 through FY 2017-18 along with key project outcomes. This is followed by an overview of individual projects with project benefits, current status (as of June 30, 2018), and future direction. Emission benefits shown in this report have only been calculated for monies attributable to AQIP funding.

**Table 2: AQIP Project Funding (millions)**

Project Category	Funding Source	Prior Years								Status Update Period		Cumulative through June 30, 2018	Comments
		08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18		
Truck Loan Assistance Program	AQIP	\$30	--	--	--	\$4	\$10	\$10	\$18	\$25	\$20	\$117	-Launched April 2009 -Nearly 19,000 loans issued -\$25.6 million in FY 18-19 for AQIP -CARB added \$15 million in FY 17-18
	Other	--	--	--	--	--	\$10	--	--	--	15	\$25	
HVIP and Low NOx Engine Incentives	AQIP	--	\$20	\$19	\$11	--	\$5	\$5	\$2	--	\$8	\$70	-HVIP launched Feb 2010 -Low NOx launched in FY 2015-16 and joined with HVIP in FY 17-18 -AQIP Allocation of \$8 million for Low NOx Engine Incentives in FY 17-18 -218 Low NOx Engine purchases overall from AQIP
	LCT	--	--	--	--	--	\$10	\$5	\$5	\$41	180	\$241	
	Other	--	--	\$4	--	--	--	--	--	--	--	--	
Ag Equipment Trade-Up in the San Joaquin Valley	AQIP	--	--	--	--	--	--	--	\$0.5	\$3	--	\$3.5	-Launched in FY 2015-16 -Program will continue under the FARMER Program -23 transactions completed -38 tractor replacements

Funding plan details for LCT Investments and AQIP can be found at <https://www.arb.ca.gov/aqip/aqip.htm>.

## **A. Truck Loan Assistance Program**

### *Overview*

Launched in 2009, the Truck Loan Assistance Program utilizes AQIP funds to help small-business fleet owners affected by CARB's In-Use Truck and Bus Regulation to secure financing for upgrading their fleets with newer trucks or with diesel exhaust retrofits. This program is an on-going and successful incentive option that leverages public funding with private investments from participating lending institutions.

Implemented in partnership with the California Pollution Control Financing Authority (CPCFA) through its California Capital Access Program, the Truck Loan Assistance Program creates financing opportunities for truck owners who fall below conventional lending criteria and are unable to qualify for traditional financing. The program is available for small fleets with 10 or fewer trucks at the time of application. In the current program, AQIP funds are set aside (based on a percentage of each enrolled loan amount) in each participating lender's loan loss reserve account to cover potential losses resulting from loan defaults. The interest rate is capped at 20 percent. However, the average interest rate for issued loans is about 13 percent.

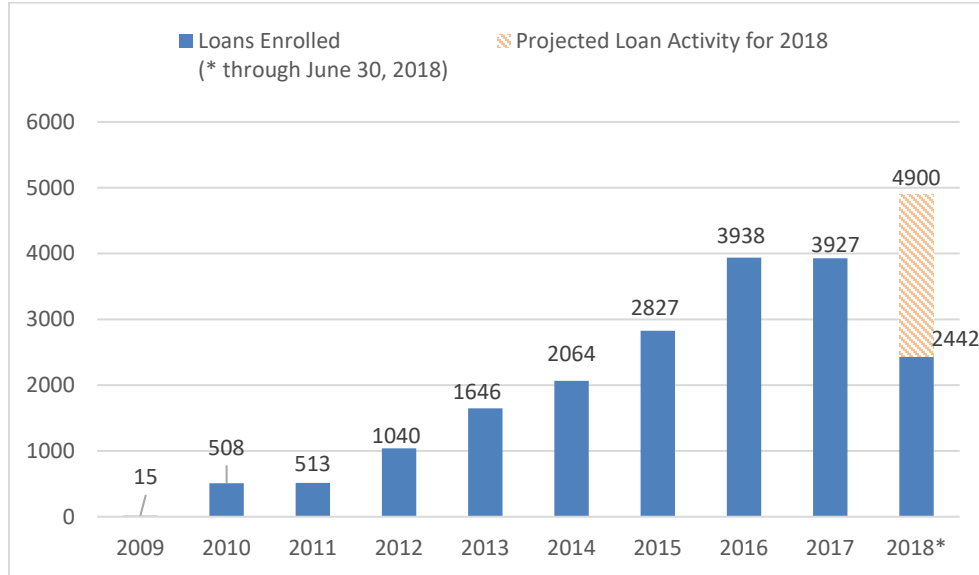
### *Project Benefits*

This program primarily reduces criteria and toxic air contaminant emissions by helping small business truckers secure financing to purchase newer trucks or retrofits to comply with the In-Use Truck and Bus Regulation. The cleaner trucks reduce health risks from exposure to diesel PM (a toxic air contaminant), particularly in disadvantaged communities where exposure can be substantial. Cleaner trucks also emit less NOx. Reducing NOx emissions from diesel engines are important because they can undergo chemical reaction in the atmosphere leading to formation of PM2.5 and ozone.

### *Project Status as of June 30, 2018*

Approximately \$99.8 million allocated to the project has been leveraged to provide nearly \$1.2 billion in financing for the purchase of nearly 20,400 cleaner trucks, exhaust retrofits, and trailers. Demand by truck owners continues to increase each year as shown in Figure 1. Program growth has been driven by increased lender and borrower awareness and utilization of the program, increased cost of new diesel trucks, and increased enforcement of the In-Use Truck and Bus Regulation.

**Figure 1: Loan Activity by Calendar Year**



CARB allocated \$25 million during FY 2016-17, and allocated \$20 million for the program for FY 2017-18. Due to concerns from forecasted funding shortfalls, at the end of FY 2017-18, CARB allocated an additional \$15 million of its own funds to the Truck Loan Assistance Program.

In 2017, CARB staff successfully worked with CPCFA to establish incremental recapture procedures. This mechanism redirects older contributions back to the Truck Loan Assistance Program to support future enrollments and makes the program more self-sustaining by reinvesting funds from matured loans. Active lenders enrolled in the program on or after August 15, 2017 are subject to recapture. Based on loan activity from program inception in 2009 through June 30, 2017, approximately \$6 million in recaptured funds have been collected to reinvest into the program. The quantity of recaptured funds from matured loans will be determined after the conclusion of each fiscal year.

Table 3 summarizes financing provided to date. About 35 percent of enrolled loans have been issued to owner operators with one truck, and about 96 percent of enrolled loans have been issued to fleet owners with 10 or fewer employees. The Truck Loan Assistance Program is not subject to disadvantaged community investment requirements. However, it is worth noting much of the Truck Loan Assistance Program funding has been spent within and benefiting individuals living in disadvantaged and low-income communities.

**Table 3: Truck Loan Assistance Program Status – Vehicles/Equipment Financed**

Program	Number of Loans Issued <sup>1</sup>	Number of Projects Financed	Project Type	\$ Spent	Total Amount Financed
Truck Loan Assistance Program	18,917	19,344	Truck Purchases	\$99.8M	\$1.2 Billion
		608	Exhaust Retrofits		
		417	Trailers		

<sup>1</sup>Total number of loans issued does not equal the number of projects financed because some loans included multiple projects.

Figure 2 on the next page shows the number of truck loans issued within each air district through June 2018. The program has broad statewide appeal, including rural regions.

*Emission Benefits*

AQIP funds have been used to finance the retrofit of trucks with CARB-verified diesel emission control devices or the replacement of trucks with model year 2007 or newer engines. Emission reductions are achieved because the retrofitted trucks and the air pollution controls installed by manufacturers on new engines have lower emissions. PM reductions are not included in the table below because the In-Use Truck and Bus Regulation already requires PM reductions from trucks. Table 4 shows emission benefits of the Truck Loan Assistance Program based on 19,300 cleaner trucks supported by this program through FY 2017-2018.

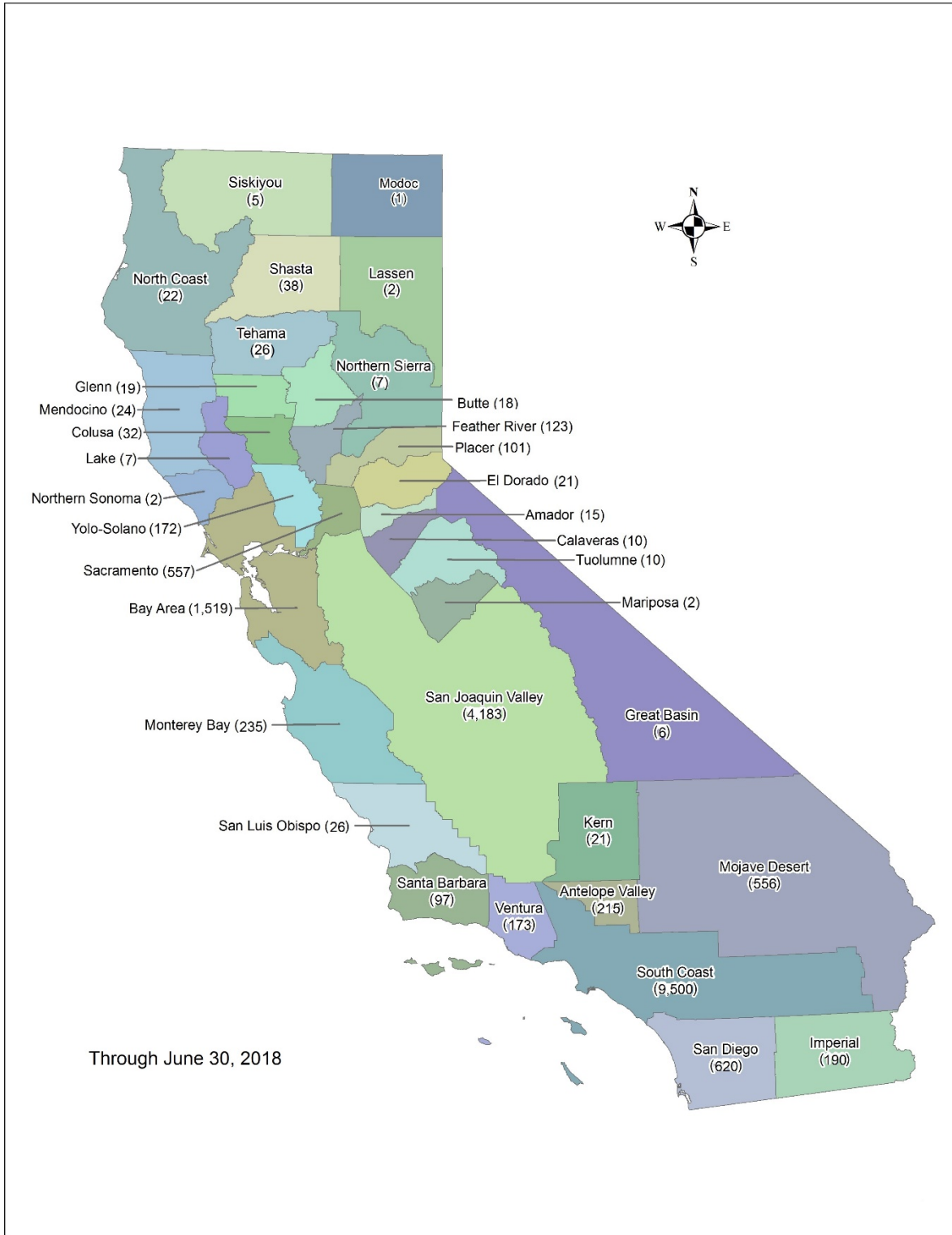
**Table 4: Statewide Truck Loan Assistance Program Criteria Pollutant and Precursor Emission Reductions**

Time Period	Estimated trucks funded	NOx <sup>1</sup> (tons)	ROG <sup>1</sup> (tons)
FY 2016-17 and 17-18	8,700	3,648	57
Cumulative <sup>2</sup>	19,300	16,148	529

<sup>1</sup> Emission reductions are calculated for exhaust, or “tailpipe” emissions only.

<sup>2</sup> Cumulative through June 30, 2018

**Figure 2: Truck Loans in California by Air District**



### *Future Direction*

CARB approved an allocation of \$25.6 million from AQIP for the Truck Loan Assistance Program to meet expected demand for FY 2018-19. CARB remains committed to meet the growing demand of small fleets as they take steps to meet the ongoing compliance requirements of the Truck and Bus Regulation.

Program need and popularity is expected to grow more in the coming years because the Road Repair and Accountability Act of 2017 (SB 1, Beall, Chapter 5, Statutes of 2017), beginning in 2020, will only allow clean trucks in compliance with CARB's Truck and Bus Regulation to be registered by the Department of Motor Vehicles (DMV). The Truck and Bus Regulation requires most heavy-duty vehicles to be equipped with 2010 or newer model year engines between 2020 and 2023. There are approximately 60,000 vehicles currently out of compliance with the regulation. In addition, there are approximately 190,000 currently compliant vehicles that will need to be replaced or repowered with a compliant engine between now and 2023. Current compliance rates with the Regulation are approximately 70 to 75 percent. This is not sufficient to ensure the clean, healthy air requirement in the Regulation.

CARB has begun an aggressive enforcement process in preparation for upcoming replacement deadlines and SB 1. It is a streamlined process that will substantially increase the number of Notices of Violation and vehicle registration holds received by non-compliant fleets. For many small fleets, this loan program may offer the only viable option to achieve compliance.

Though nearly all AQIP funds are directed to the Truck Loan Assistance Program, and staff continues to pursue actions to further leverage funds, forecasted demand is expected to exceed available AQIP funds before 2020. Staff expects the Truck Loan Assistance Program will likely face unprecedented demand in future fiscal years as truck owners take action to meet truck replacement requirements and come into compliance due to CARB's streamlined enforcement process. Staff will continue to closely monitor program demand and work with CPCFA staff, participating lenders, and other stakeholders to balance available funding with meeting the needs of fleets.

## **B. Low NOx Engine Incentives**

### *Overview*

CARB's optional low NOx standards allow manufacturers the ability to certify heavy-duty vehicle engines to NOx emission levels that are up to 90 percent lower than today's mandatory diesel emission standards. In FY 2015-16, the Cummins Westport 8.9-liter low NOx engine became commercially available. Heavy-duty vehicles using the 8.9-liter Cummins Westport engine were added to CARB's portfolio of incentives. The release of the 11.9-liter Cummins Westport low NOx engine occurred in early 2018. This engine brought low NOx technology to Class 8 trucks.

Low NOx Engine Incentives are implemented through HVIP, which is a streamlined first-come, first-served project providing incentive funding via vouchers on a statewide basis. HVIP has been funded by AQIP in the past; please see the 2016 Biennial Report to the Legislature at: <https://ww2.arb.ca.gov/legislatively-mandated-reports> for more details. HVIP continues to be funded by Low Carbon Transportation appropriations. Please see the funding plan at: <https://www.arb.ca.gov/aqip/aqip.htm> for details.

HVIP and Low NOx Engine Incentives provide fleets the ability to secure a voucher through their local participating dealership. This streamlined approach, with eligible vehicles and preset voucher amounts, has proven popular with vehicle dealers, manufacturers, and California fleets. Incentives are intended to fund the incremental cost of a low NOx heavy-duty vehicle engine above the purchase and installation costs of a conventional heavy-duty vehicle engine.

Low NOx voucher amounts for FY 2017-18 are \$10,000 for the Cummins Westport 8.9-liter low NOx engine and \$40,000 for the Cummins Westport 11.9-liter low NOx engine. Both engine repowers (also known as engine replacements) and new vehicle purchases are eligible for Low NOx engine vouchers.

### *Project Benefits*

HVIP and Low NOx Engine Incentives drive manufacturing production and fleet acceptance of advanced heavy-duty vehicle technologies that California must deploy to meet its long-term air quality and climate goals. Low NOx Engine Incentives, funded with AQIP funding, is an integral part of the successful deployment of low NOx engines as an important strategy for achieving near-term reductions of criteria pollutant emissions in the heavy-duty sector, and growing the market for low NOx engines.

HVIP and Low NOx Engine Incentives continue to assist with achieving widespread commercialization of advanced technologies and low NOx engines in heavy-duty vehicles. Due to the success of HVIP and Low NOx Engine Incentives, and its streamlined approach, the project is currently being duplicated in other parts of the nation.



*Program Status as of June 30, 2018*

Low NOx Engine Incentives have supported the purchase of 1,015 low NOx engines by California fleets through June 30, 2018. This is inclusive of low NOx engines funded with GGRF funding. During FY 2015-16, the \$2 million of allocated AQIP funding provided vouchers for 218 low NOx trucks. Demand for trucks (mostly refuse) with low NOx engines, for larger fleets, has remained steady. For FY 2017-18, \$8 million in AQIP was allocated to HVIP and Low NOx Engine Incentives to fund vouchers for small fleets of 3 or less. This allowed small fleets to forgo the renewable natural gas requirement that large fleets must adhere to. Unfortunately, no small fleets have applied for Low NOx Engine Incentives funding. Later in this section under “Future Direction”, changes to Low NOx Engine Incentives will be addressed.

The HVIP webpage, at <http://www.californiahvip.org/>, provides an interactive data tool for funded vehicles, real-time accounting of voucher funds remaining, on-line application, list of eligible vehicles, and other project information.

*Emission Benefits*

Low NOx Engine Incentives have been funded through a combination of AQIP and Low Carbon Transportation funds beginning in FY 2015-16. However, funding for the two incentive types were combined, on a first-come, first-served basis, and for all eligible technologies, and funded by Low Carbon Transportation starting in FY 2017-18. Table 5 identifies the emission benefits from Low NOx Engine Incentives over the life of funded projects based on vouchers funded only by AQIP monies.

**Table 5: Statewide Low NOx Engine Incentives Criteria Pollutant Emission Reductions Attributable to AQIP**

Time Period	NOx (tons)	ROG (tons)	PM 2.5 (tons)	CO <sub>2</sub> (MTCO <sub>2</sub> e)
Program Cumulative <sup>1</sup>	56	0	0	0

<sup>1</sup>Based on approximately 218 engines funded.

*Future Direction*

In the FY 2017-18 Funding Plan, the Board approved \$8 million of AQIP funding to provide small fleets, with three or fewer vehicles, the option to utilize conventional, non-renewable fuel and receive Low NOx engine vouchers funded by AQIP for the 11.9-liter Cummins Westport low NOx engine. There have not been any voucher requests from fleets of three or fewer vehicles. In the FY 2018-19 Funding Plan, staff carried over the unspent \$8 million in AQIP funding, and increased the minimum fleet size to 10 or fewer, which parallels the small fleet provision for the Truck Loan Program. No renewable fuel will be required. Fleets of 10 or less are eligible for voucher funding in

the amount of \$45,000 for new purchases or repowers. The voucher amount of \$45,000 applies to both the Cummins Westport 8.9-liter and 11.9-liter low NOx engine.

## **C. Agricultural Equipment Trade-Up Pilot Project in the San Joaquin Valley**

### *Overview*

The Agricultural Equipment Trade-Up Pilot Project in the San Joaquin Valley (Trade-Up Pilot Project) provides CARB an opportunity to evaluate the feasibility of a new incentive model for mobile agricultural equipment intended for owners of high-emitting equipment. These owners have traditionally not been well served by existing incentive programs that only provide funding for new equipment purchases. 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 equipment with a certified Tier 2 or Tier 3 engine at little or no out-of-pocket cost. This used equipment comes from another owner that relinquishes it for an incentive to purchase brand new equipment that employs the cleanest engine technology (Tier 4 Interim or Tier 4 Final certification).

This project concept was introduced in FY 2015-16 with \$500,000 of AQIP funding and an additional \$3 million was allocated for FY 2016-17 to build upon the project.

### *Project Benefits*

Emissions from mobile off-road agricultural equipment are among a number of significant sources of air pollution in the San Joaquin Valley. Incentive programs and regulations are already reducing emissions from a wide variety of diesel engines in the region; however, a continuing transition to the cleanest technologies is needed to meet federal ozone standards in 2023 and 2032. Targeting this investment in the San Joaquin Valley aids in accelerating needed adoption of cleaner diesel engine technologies in mobile agricultural equipment and in reducing the legacy fleet of high-emitting equipment in this heavily agricultural, non-attainment air basin.

### *Project Status as of June 30, 2018*

CARB selected the San Joaquin Valley APCD, via competitive solicitations, to administer this project using FY 2015-16 and 2016-17 funds. This project was initially launched in June 2016. Project goals include assessing the feasibility of this new project category, evaluating the near-term and potential long-term cost-effectiveness of a large-scale program in the San Joaquin Valley, developing a project implementation plan that would include methodology to quantify potential emission reductions and requirements needed to enable emission reductions resulting from trade-up transactions to be creditable under the State Implementation Plan (SIP)<sup>2</sup>, implementing procedures to facilitate multi-step trade-up transactions, and assessing the owner/user experience and acceptance of incentivized equipment.

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<sup>2</sup> The State Implementation Plan (SIP) is California's blueprint to meet the federally mandated National Ambient Air Quality Standards as required by the Clean Air Act

The FY 2015-16 Trade-Up Pilot Project was completed in February 2018 and provided funding for 19 transactions, resulting in 38 tractor replacements. Continuing this project with funding from FY 2016-17, 4 more transactions have been completed as of June 30, 2018, with 19 additional transactions under contract.

*Future Direction*

CARB received funding specifically for agricultural vehicles and equipment in FY 2017-18 and developed the Funding Agricultural Replacement Measures for Emission Reductions (FARMER) Program (<https://ww2.arb.ca.gov/our-work/programs/farmer-program>). Funding for the Trade-Up Pilot Project will be continued under the FARMER Program and CARB will report on the results of this project category in future reports to the Legislature.

### **III. Recommendations for Future Action**

AQIP's emphasis is on providing financing assistance to small-business fleet owners for upgrading their heavy-duty trucks through the Truck Loan Assistance Program. Staff expects the program will likely face unprecedented demand as early as FY 2018-19 as truck owners take action to meet truck replacement requirements. The demand for the program is expected to surpass the capacity for AQIP to keep the program funded. AQIP is the only source of funding for this program. In order to address the need of funding, CARB invested \$15 million of its own funds into the program at the end of FY 2017-18 but more will be needed.

AQIP has provided funding for the Truck Loan Assistance Program, HVIP and Low NOx engine incentives, demonstrations for advanced emission reduction vehicle technologies, and CVRP since 2009. However, demand for advanced technology demonstration and deployment funding has far exceeded AQIP's budget. Fortunately, the availability of Low Carbon Transportation appropriations since FY 2013-14 has allowed the HVIP and Low NOx engine incentives and CVRP programs to be primarily funded from this source.

The technology advancing projects funded through AQIP marked an important step in bringing the next generation of vehicles such as hybrid-electric trucks and ZEVs to California's roadways today. AQIP investments have helped start the fundamental transformation of the California fleet to zero and near-zero emission vehicles that will be needed to meet California's post-2020 SIP commitments and 2020, 2030 and 2050 climate change goals. These investments also help position the State for green job growth.

With the success and popularity of AQIP to date, and the forecasted shortfall in funding for the Truck Loan Assistance Program, CARB recommends an augmentation in AQIP funding. CARB will continue implementing the program under the existing statutory framework with the funding available. The majority of AQIP funds are now directed to cleaning up the diesel fleet. The focus is helping small-business fleet owners affected by CARB's In-Use Truck and Bus Regulation secure financing for upgrading their fleets with newer and cleaner trucks. This focus will continue in FY 2018-19 with the Truck Loan Assistance Program receiving nearly all of the funding.

## Appendix A: Projects Receiving AQIP Funding Prior to FY 2016-17

Five project categories received a total of \$77.9 million in AQIP funding between FY 2009-10 and FY 2015-16. These projects are complete and did not receive additional AQIP funding during the status update period of FY 2016-17 and 2017-18. Table 7 provides a summary of the funding provided to these project categories. The projects in Table 7 are described in the 2016 Biennial Report to the Legislature which is available at: <https://ww2.arb.ca.gov/legislatively-mandated-reports>.

**Table 7: Summary of AQIP Projects (FY 2008-09 to FY 2015-16)**

Project Category	Funding Source	Fiscal Years (in millions)										Comments
		08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	
CVRP	AQIP	--	\$4	\$5	\$16	\$24	\$10	\$5	\$3	--	--	-Launched March 2010. -\$572 million spent and over 256,000 rebates issued through FY 2017-18
	LCT	--	--	--	--	--	\$20	\$109	\$75	\$133	\$165	
	Other	--	--	\$2	--	\$12	\$60	\$5	--	--	--	
Advanced Technology Demonstrations	AQIP	--	\$1.9	\$1.7	\$1.6	\$1	--	--	--	--	--	Project will be funded from LCT appropriations in FY 2018-19
	LCT	--	--	--	--	--	--	\$49	--	\$49	\$140	
Lawn & Garden Equipment Replacement	AQIP	--	\$1.6	\$1	--	--	--	--	--	--	--	No funding subsequent to FY 2010-11
Hybrid Off-Road Equipment Pilot	AQIP	--	--	\$2	--	--	--	--	--	--	--	No funding subsequent to FY 2010-11
Zero-Emission Agricultural Utility Terrain Vehicle Rebates	AQIP	--	\$0.1	--	--	--	--	--	--	--	--	No funding subsequent to FY 2009-10