

Second public workshop
on the development of the

Assembly Bill (AB) 118
Air Quality Improvement Program (AQIP) Funding Plan and
Funding Recommendations for Low-Carbon Transportation
Greenhouse Gas Reduction Fund (GGRF) Investments
For Fiscal Year (FY) 2014-15

DISCUSSION DOCUMENT

THURSDAY, APRIL 3, 2014

9:30 A.M. TO 4:00 P.M.

California Environmental Protection Agency (Cal/EPA) headquarters building
Byron Sher Hearing Room, 2nd floor
1001 I Street
Sacramento, California 95814

3:30 p.m. Truck Loan Assistance Program 42

Introduction

Air Resources Board (ARB, Board) staff estimates that about \$20 million in fees authorized to support AQIP will be available for projects in FY 2014-15. Additionally, the Governor's FY 2014-15 proposed budget identifies \$200 million from the State's share of auction proceeds under ARB's Cap-and-Trade program that are deposited in the GGRF for low carbon transportation projects that reduce greenhouse gas (GHG) emissions. This year, the AQIP funding plan will be combined with recommended investments from the GGRF. ARB proposes to administer the new GGRF funding in FY 2014-15 under the auspices of the AQIP program, with adjustments to increase the benefits to disadvantaged communities.

At the April 3, 2014 workshop, staff is seeking public comment on the draft proposed recommendations provided within this discussion document. This discussion document was developed to complement the workshop agenda by providing background and analysis to support project discussions. Along with the public input provided from individual work group meetings, formal workshops, written submissions, and individual meetings with stakeholders, staff will develop final proposed recommendations for Board consideration. Final proposed recommendations will be available for public comment at the end of May 2014 and presented to the Board at a public hearing on June 26, 2014.

Air Quality and Climate Change Goals: The Need for Incentives

The South Coast and San Joaquin Valley air basins are the only two areas in the nation in extreme non-attainment of the national ambient air quality standard for ozone. Meeting the federal air quality standard will require both the South Coast and the San Joaquin Valley to reduce their oxides of nitrogen (NOx) emissions by around 80 percent from 2010 levels by 2023 and by almost 90 percent by 2032. Attainment in the two areas to meet the two scheduled milestones will require the extensive use of zero-emission technologies, which are the same technologies called for in the Cap-and-Trade Auction Proceeds Investment Plan¹ to help achieve the State's near-term and longer-term GHG emission reduction goals. A fundamental transformation of the vehicle fleet will need to occur in order to meet all of the following goals:

- Reduce GHG emissions to 80 percent below 1990 levels by 2050²
- Expand the zero emission vehicle (ZEV) market share to over 1.5 million (vehicles and trucks) by 2025³

¹ Cap-and-Trade Auction Proceeds Investment Plan: Fiscal Years 2013-14 through 2015-16, released May 14, 2013, *available at* http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/final_investment_plan.pdf. See also 2013 ZEV Action Plan, which was cited to in the Investment Plan and further describes the GHG benefits of implementing zero-emission technologies.

² Governor's Executive Order S-3-05 (June 1, 2005). <http://gov.ca.gov/news.php?id=1861>

- Fulfill the 2007 State Alternative Fuels Plan, which envisions a 2050 vehicle fleet where 40 percent of California transportation fuel is electricity or hydrogen
- Successfully implement the 2012 Advanced Clean Cars regulation, which requires 1 of 7 new cars purchased in 2025 be zero-emission or plug-in hybrid

To meet these multiple long-term air quality and climate goals, California must accelerate development and deployment of the cleanest feasible vehicle technologies for all vehicle and equipment sectors, from light-duty passenger cars to heavy-duty line-haul trucks.

AQIP

AQIP is authorized to fund a variety of air quality incentive projects, including low-emission vehicle and equipment projects, air quality research, and advanced energy technology workforce training. AQIP funds have traditionally supported the development and deployment of the advanced technologies needed to meet California's longer-term, post 2020 State Implementation Plan (SIP) goals, and to fund projects that do not fit within the statutory framework of other ARB incentive programs.

AB 8 (Perea, Chapter 401, Statutes of 2013) extended the fees that support AQIP through 2023 and directed ARB to evaluate AQIP projects based on benefit-cost scores and other criteria to guide funding decisions. Further, in response to Board direction in July and September of 2013, ARB staff recommends establishing a long-term vision for AQIP that identifies areas of investment needed through 2023 to coincide with SIP deadlines and funding availability through AQIP. Additional details about AB 8 scoring criteria and the AQIP long-term vision are in the next section of this discussion document.

The Governor's FY 2014-15 proposed State budget includes about \$26 million in expenditures for AQIP, provided sufficient revenues are generated. After considering uncertainties in revenues and administrative costs, ARB staff estimates that about \$20 million will be available for projects in FY 2014-15.

GGRF Investments

In 2012, the Legislature passed and Governor Brown signed into law 3 bills – AB 1532 (Pérez, Chapter 807), Senate Bill (SB) 535 (de León, Chapter 830), and SB 1018 (Budget and Fiscal Review Committee, Chapter 39) – that establish the GGRF to receive Cap-and-Trade auction proceeds and to provide the framework for how the auction proceeds will be administered in furtherance of the purposes of AB 32 (Nunez, Chapter 488, Statutes of 2006).

³ Governor's Executive Order B-16-2012 (March 23, 2012). <http://gov.ca.gov/news.php?id=17472>

In enacting the implementing statute, the Legislature stated its intent to direct resources to the State's most impacted and disadvantaged communities, in order to provide economic benefits as well as health benefits through additional emission reductions. Specifically, SB 535 directs at least 25 percent of funding from GGRF be allocated toward projects that benefit disadvantaged communities and at least 10 percent be allocated toward projects located in disadvantaged communities. Cal/EPA is responsible for identifying disadvantaged communities.

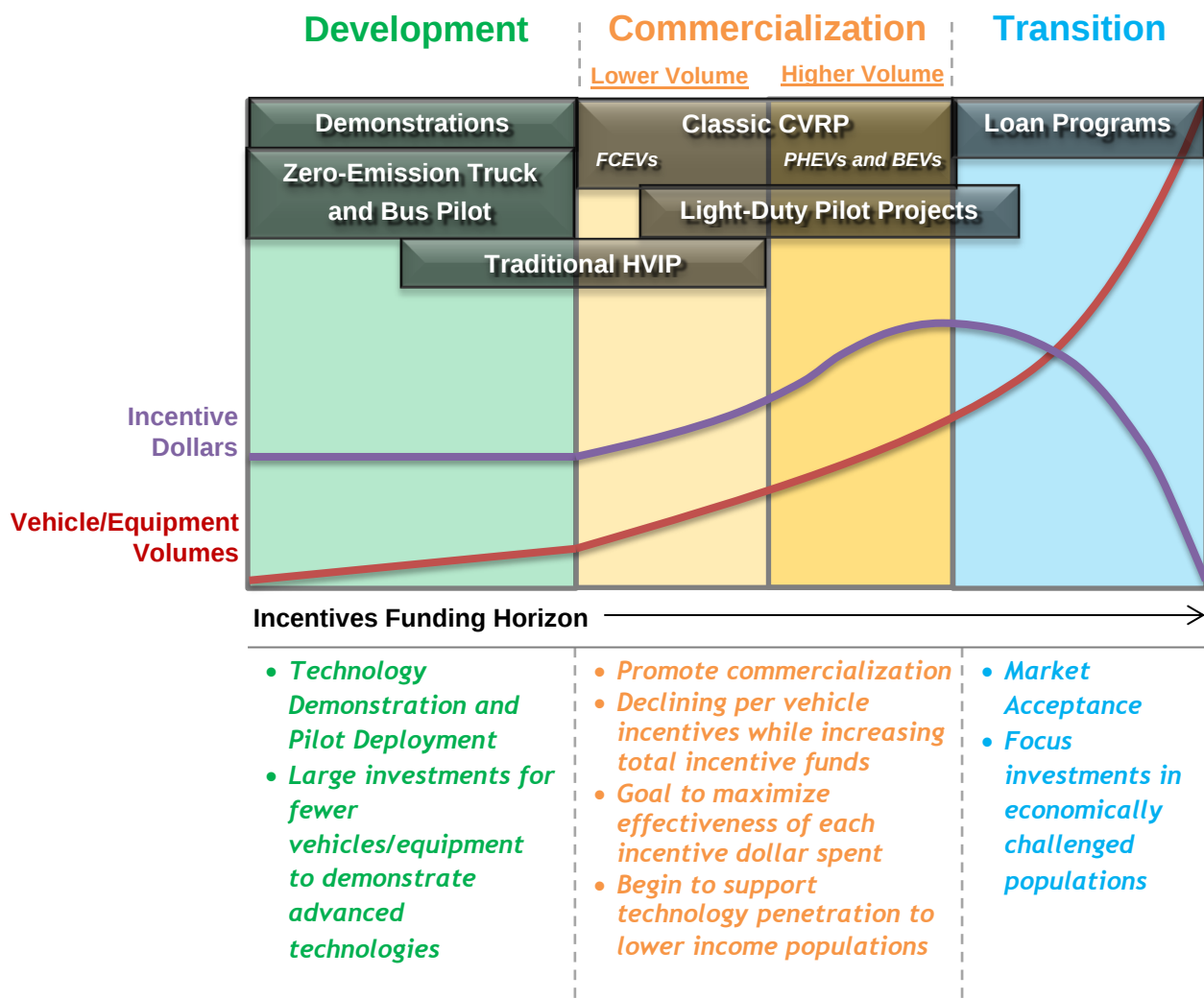
The Governor's Proposed Budget for FY 2014-15 includes \$200 million for low carbon transportation projects that expand existing efforts. Consistent with the investment plan, low carbon transportation projects must reduce GHG emissions through the development of state-of-the-art systems to move goods and freight, advanced technology vehicles and vehicle infrastructure, advanced biofuels, and low-carbon and efficient public transportation.

AQIP Long Term Vision & Guiding Principles

Transitioning to advanced technologies in the mobile source sector is challenging. To meet this challenge, ARB adopts regulations designed to require the development and manufacture of cleaner advanced new technologies, and provides incentive funding to encourage the purchase and use of these new technologies. Incentive funding is a critical element of the program because it helps bridge the price gap between conventional and advanced technologies until advanced technologies can be commercialized and manufactured at economies of scale that make them price competitive in the market. Early support and investment of advanced technologies is critical to achieve the pace of technology advancement needed to meet California's emission reduction and climate change goals. AQIP is designed to meet these goals.

Staff proposes the following concept that identifies how funding is provided to support three phases of technology advancement: development, commercialization, and transition to widespread deployment. This proposed concept is illustrated in Figure 1 below.

Figure 1. Conceptual Evolution of the Role of Incentives



In the technology development phase, manufacturers are developing, testing, and proving technologies. Incentives are provided to help fund the development of these advanced technologies through demonstration projects focused on single vehicle prototypes or 1-10 vehicle demonstration and testing projects. Funding is also provided for pilot projects on the order of 10-50 vehicles to help the technology evolve to the commercialization phase. In the development phase, per-vehicle incentives are high because manufacturing is not standardized and is focused on smaller batches of vehicles. Higher levels of incentives per vehicle are needed to help entrepreneurs cover the costs of technology development. While per vehicle incentives are larger for demonstration projects, these investments are crucial because advanced technologies often would not evolve to the commercialization phase without this public funding.

In the commercialization phase, incentives are provided to encourage consumer adoption of the advanced technologies. Most of AQIP's funding to date has been focused in this phase of advanced technology deployment, with the CVRP spurring market growth of passenger ZEV and plug-in hybrid electric vehicles (PHEVs) and HVIP spurring market growth of hybrid and zero-emission trucks. The commercialization phase can be broadly separated into lower volume and higher volume production phases. In the lower volume commercialization phase, sales volumes generally start out low, but grow over time as consumer acceptance increases and manufacturing costs decrease with economies of scale. In the lower volume commercialization phase, per vehicle incentives are high.

As sales grow and economies of scale are achieved, incentive funding levels and vehicle eligibility requirements can be adjusted to reduce per vehicle funding to ensure maximum incentive efficiency in each dollar spent by better targeting incentive funding on strategies that effectively motivate consumer uptake. In this higher volume commercialization phase, while per vehicle incentives are decreasing, total sales are increasing and as a result total incentive funding commitments increase. For example, in the light-duty sector, per-vehicle incentive amounts are beginning to shift from a focus on widely growing PHEVs and battery electric vehicle (BEV) options to early commercial introduction of fuel cell electric vehicles (FCEVs). As a technology moves from lower volume commercialization to a fuller more mature higher volume commercialization, the incentive funding goals shift from a pure focus on technology development to a more specific focus on moving the technology from early adopters to mainstream consumers and disadvantaged communities. The light-duty pilot projects proposed for FY 2014-15 are examples of project types intended to realize this shift.

As a technology moves from commercialization into the transition phase, incentives should be adjusted to focus specifically on moving the technology into new consumer demographic segments and on building upon earlier benefits in disadvantaged communities. In the transition phase, AQIP incentives are targeted directly to foster technology advancement in these communities. The Truck Loan Program is an example of this type of incentive, providing loan assistance to help small trucking fleets access financing to upgrade their trucks in advance of regulatory deadlines. ARB's other incentive programs – the Carl Moyer Program and the Proposition 1B Goods Movement Incentive Program also focus much of their investments in these areas.

AQIP incentives have historically been prioritized and structured in a way that accelerate the advancement of vehicle technologies (1) in the demonstration and commercialization phases, and (2) from the light-duty sector, where commercialization is likely to initiate, to heavier vehicle sectors. These key roles will continue with the proposed FY 2014-15 investments. Today some technologies, like passenger BEVs and PHEVs are clearly entering the higher volume commercialization phase. Incentive funding outlays are increasing to promote further market development, and per vehicle incentives can be decreased as economies of scale increase, while still ensuring incentive program effectiveness. Incentive funding, while still focused on

commercialization, can now also be focused to help ensure everyone has access to these technologies, including low-income consumers and disadvantaged communities.

Other technologies, like passenger FCEVs and battery-electric / fuel cell heavy-duty vehicles are beginning to emerge into the lower volume commercialization phase. Thus, just as was the case when PHEV and BEVs were first introduced, larger per-vehicle incentives are needed to help transition this technology into the higher volume stage of commercialization. Prototypes and small-scale demonstration projects have been completed and the technology is expected to be released commercially by several major automobile manufacturers. Building on this, AQIP will continue to foster the development and transfer of advanced technologies from the light-duty to the heavy-duty sector through projects focused on the freight sector.

At the same time, AQIP is focused on ensuring that mature low emissions technologies, like clean conventional combustion cars, and clean trucks, generate emissions benefits that can be enjoyed by everyone. To that end several aspects to the proposed funding plan focus specifically on moving these clean technologies to low income consumers to both support purchases, and to ensure these clean vehicles are benefiting disadvantaged communities that need emissions reductions today.

AB 8 Project Scoring Criteria

AB 8 refined the evaluation criteria for projects, such as CVRP and HVIP, funded by fees that support AQIP. Staff's initial analysis described below was developed specifically in response to AB 8 and intended for evaluation of such projects funded by AB 8 authorized fees. Staff conducted similar analysis of those projects proposed for funding from GGRF and is continuing to evaluate those projects in more detail. *The final proposed Funding Plan will include a more detailed final analysis of AB 8 scoring criteria and how criteria was applied to both AQIP funded projects and GGRF funded projects.*

The purpose of AQIP is to fund air quality improvement projects that:

- Are related to fuel and vehicle technologies;
- Reduce criteria air pollutants;
- Improve air quality; and
- Provide funding for research to determine and improve the air quality impacts of alternative transportation fuels and vehicles, vessels, and equipment technologies⁴.

As required by AB 8, when considering projects for funding, preference must be given to *projects with higher benefit-cost scores that maximize the purposes and goals of AQIP*⁵. Benefit-cost score is defined as the "reasonably or expected potential criteria emission reductions achieved per dollar awarded by the board for the project"⁶. Additional criteria may also be used, including a project's proposed or potential reduction of criteria or toxic air pollutants, contribution to regional air quality improvement, ability to promote the use of clean alternative fuels, ability to achieve climate change benefits, and ability to support market transformation, and ability to leverage private capital investments⁷.

To determine the benefit-cost score for potential projects to be funded during FY 2014-15, staff developed a standardized metrics analysis for the several projects that are being considered for funding under AQIP. As discussed in greater detail below, the benefit-cost score methodology for assigning preference to projects includes the following:

- Criteria Emissions Reduction Analysis
- Project Cost Analysis
- Benefit-Cost Score Analysis
- Additional Preference Criteria
- Total Benefit Index

⁴ Health & Safety Code (HSC) Section 44274(a)

⁵ HSC Section 44274(b)

⁶ HSC Section 44270.3(e)(1)

⁷ HSC Section 44274(b)

Criteria Emissions Reduction Analysis

Staff determined that a well-to-wheels analysis for emissions reduction is the most appropriate methodology to determine emissions benefits. A well-to-wheels emission analysis allows staff to analyze the emissions produced from the production and usage of the different fuel types (including any associated tailpipe emissions) to better reflect the overall benefits of advanced clean vehicles funded by the program. As part of the analysis, near-term emission reductions (i.e., the direct emission reductions expected from the project) and potential long-term emissions benefits (i.e., those expected to be realized in the future as a result of current project investments), when applicable, were quantified for each proposed project. In projects where new fuels and advanced technologies are not involved, such as loan guarantees for diesel trucks, analysis of exhaust emissions was performed because the fuel sources are identical. For the analysis, staff calculated the near-term and expected future NO_x, PM 2.5, and HC emissions, for project funding preference under AB 8, along with greenhouse gas (GHG) emissions benefits for vehicle technologies/fuel types in each project.

Project Cost Analysis

Since AQIP is intended to support long-term market transformation toward clean technologies, staff analyzed both the expected near-term and the potential long-term cost of the projects. Because AQIP project funding levels are directly related to the incremental cost of advanced technologies, staff estimated potential future incremental cost reductions of advanced technologies based on available information for light-duty⁸ and heavy-duty vehicles⁹. The analysis then considered lowered future incentive per-project funding levels to reflect potential long-term project-specific cost reductions.

Cost-Effectiveness/Benefit-Cost Score Analysis

To develop the cost-effectiveness scores for each project, the near-term and potential long-term emissions NO_x and HC reductions and costs were applied to a well-established incentive cost-effectiveness calculation methodology (consistent with that used in the Carl Moyer Program). Additionally, and also consistent with the Carl Moyer Program, PM_{2.5} emissions were given a greater weighting in the calculation to account for the fact that it has been identified as a toxic air contaminant with significant health risk. The cost-effectiveness scores are in units of dollars per ton of criteria emissions reduced (\$/ton). Per AB 8, the cost-effectiveness scores were converted to a benefit-cost score with the units of pound of criteria emissions benefit per dollar (lbs/\$). Finally, the cost-effectiveness scores for each project were then scaled from 1-5 consistent with the "Total Benefit Index" score, for project selection, described below.

⁸2012 Proposed Amendments to the California Zero Emission Vehicle Program Regulations, Staff Report: Initial Statement of Reasons (<http://www.arb.ca.gov/regact/2012/zev2012/zevisor.pdf>)

⁹ Regulatory Impact Analysis of the Final Rulemaking to Establish Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles (<http://www.epa.gov/otaq/climate/documents/420r11901.pdf>)

Additional Preference Criteria

Staff also evaluated additional criteria identified in AB 8 and determined a scaling score of 1-5 for each. The data and rationale used to establish each of the criteria weighting factors will be described in greater detail in the final proposed Funding Plan. The additional preference criteria are described below:

1. Proposed or potential reduction of criteria or toxic air pollutants – This analysis considers the magnitude of emission reductions by quantifying the direct lifetime criteria emissions reduction achieved per average vehicle or equipment supported under each program, independent of the associated incentive amounts. Staff quantified the criteria emissions reductions for the proposed projects and then scored them based on the following scale:
 - 5 points: ≥ 2 tons of Criteria Emissions /vehicle
 - 4 points: 1.51 – 2 tons of Criteria Emissions /vehicle
 - 3 points: 1.01 – 1.5 tons of Criteria Emissions /vehicle
 - 2 points: .51 – 1 tons of Criteria Emissions /vehicle
 - 1 points: .01 – .05 tons of Criteria Emissions /vehicle
 - 0 points: 0 tons of Criteria Emissions /vehicle
2. Contribution to regional air quality improvement – Staff developed a scale based on the ARB emissions inventory for extreme non-attainment areas, and ranked sources of emissions contribution by highest emitting to lowest emitting. The sources of emissions contribution were ranked based on the following scale:
 - 5 points: category contributes ≥ 40 tons of NO_x/day
 - 4 points: category contributes 31-40 tons of NO_x/day
 - 3 points: category contributes 21-30 tons of NO_x/day
 - 2 points: category contributes 11-20 tons of NO_x/day
 - 1 point: category contributes 1-10 tons of NO_x/day
3. Ability to promote the use of clean alternative fuels and vehicle technologies – This qualitative analysis ranked projects by whether or not they used a clean alternative or renewable fuel. Staff scored this preference criterion based on the following:
 - 5 points: technologies that use clean alternative fuels
 - 0 points: technologies that do not use clean alternative fuels
4. Ability to achieve GHG reductions – Similar to the methodology established in the first preference criterion, staff conducted a well-to-wheels analysis for GHG emissions for the vehicles supported by the proposed projects for the life of the vehicles or equipment. The GHG emissions reductions were then scored based on the following scale:
 - 5 points: > 400 tons of GHG/vehicle
 - 4 points: 301 – 399 tons of GHG/vehicle

3 points: 201 – 300 tons of GHG/vehicle
2 points: 101 – 200 tons of GHG/vehicle
1 points: 1 – 100 tons of GHG/vehicle
0 points: 0 tons of GHG/vehicle

5. Ability to support market transformation – Similar to number 3 above, this qualitative analysis ranked projects by whether or not they supported technologies that support market transformation. Staff used ARB's document "Vision for Clean Air: A Framework for Air Quality and Climate Planning" as a key reference in scoring technologies for this evaluation¹⁰. Light-duty PHEVs, BEVs, and FCEVs, for example, are considered transformative technologies that will help the State meet its air quality goals. Staff scored this preference criterion based on the following:
 - 5 points: technologies that support market transformation
 - 0 points: technologies that do not support market transformation
6. Ability to leverage private capital investments – Staff is not proposing to include this criterion for FY 2014-15 as staff is working 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 years.

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. Staff developed the "Total Benefit Index" score that preferentially weights the benefit-cost score (at 75 percent of the total weighting) with additional preference scores (weighted at 25 percent). Staff weighted the cost-effectiveness/benefit-cost scores more because AB 8 directly identified the benefit-cost score as the metric by which to assign funding preference to for proposed projects. Table 1 summarizes the projects currently proposed to receive AQIP funding from AB 118/AB 8 fees in FY 2014-15 based on the Total Benefit Index score.

¹⁰ http://www.arb.ca.gov/planning/vision/docs/vision_for_clean_air_appendix_public_review_draft.pdf

Table 1. Summary of Benefit-Cost Scores and Total Benefit Index for Proposed AB 118/AB8 AQIP Projects

	Proposed AQIP Projects		
	Truck Loans	CVRP	HVIP
Cost Effectiveness Score¹ (2014 \$/ton)	\$7,100	\$9,800	\$26,000
Scale 5: ≤\$20,000/ton 4: \$20,001-\$39,999 3: \$40,000-\$59,999 2: \$60,000-\$79,999 1: >\$80,000	5	5	4
Benefit Cost Score (lbs/\$)	0.280	0.204	0.086
Additional Preference Criteria: Scale (1-5)			
1) Proposed or potential reduction of criteria or toxic air pollutants	3	1	2
2) Contribution to regional air quality improvement	5	2	4
3) Ability to promote the use of clean alternative fuels and vehicle technologies	0	5	5
4) Ability to achieve climate change benefits	0	1	2
5) Ability to support market transformation	0	5	5
6) Ability to leverage private capital investments			
Preference Criteria Average Score	1.6	2.8	3.6
Total Benefit Index²	4.2	4.5	3.9

¹ "Cost Effectiveness Score" is dollars per reasonably expected or potential criteria pollutant emission reductions.

² "Total Benefit Index" is the sum of the weighted Cost Effectiveness Scale (75 percent) and the Preference Criteria Average Score (25 percent).

GGRF Incentives

Staff used the same analysis methodology described above to also evaluate projects for funding under the proposed Low Carbon Transportation GGRF Investments. Because the focus for funding under GGRF is primarily GHG emission reductions, and not criteria pollutant reductions, staff calculated a GHG Cost-Effectiveness Score in addition to a Criteria Emissions Cost-Effectiveness Score to see how proposed projects compared to one another. In addition to carbon dioxide, the GHG emissions analysis includes other short-lived climate forcers, such as nitrous oxide, hydrofluorocarbons, and methane. Table 2 below provides both cost-effectiveness scores for the proposed projects selected for funding in FY 2014-15 from GGRF investment dollars. Staff also intends to

conduct the full analysis for Additional Preference Criteria and Total Benefit Index for inclusion in the Draft Proposed Funding Plan.

Table 2. Cost-Effectiveness of AB 8 and GGRF Projects

Criteria Emissions and Greenhouse Gas Reductions Cost Effectiveness (2014 Dollars)¹		
	Criteria Emissions (\$/ton)	Greenhouse Gas (\$/ton)²
Truck Loans	7,100	N/A
CVRP	9,800	20
HVIP	26,000	190
EFMP with EV Replacement Pilot	50,000	70
Zero-Emission Public Fleet Pilot	55,000	70
Zero-Emission Drayage Truck Pilot	79,000	210
Zero-Emission Yard Hostler Pilot	170,000	660
Zero-Emission Transit Bus Pilot	250,000	660
Car Share Pilot	760,000	430

¹ Cost-effectiveness based on emission reductions for the assumed life of the vehicle with a 2 percent discount rate applied.

² Does not include black carbon.

Proposed Project Categories

Table 3 outlines Staff's draft proposed project categories and funding allocations for the FY 2014-15 AQIP Funding Plan and Low-Carbon Transportation GGRF Investments.

Table 3: FY 2014-15 Approximate Proposed Project Allocations (in millions)

Table G-1. 2021-2031 Approximate Projected Investments (in millions)			
	AQIP Funding from AB 118/AB8 Fees	GGRF Investments	
		Total	Percentage of Total Proposed to Benefit Disadvantaged Communities
Light-Duty Vehicle Projects – up to \$125			
• Classic CVRP	\$5M	\$111	10% = \$11
• Pilot Projects in Disadvantaged Communities	-	\$9	100% = \$9
Heavy-Duty Vehicle and Equipment Projects – up to \$95			
• HVIP	\$5	\$5-\$10	100% = \$10
• Zero-Emission Truck and Bus Pilot		\$20-\$25	100% = \$20
• Truck Loan Assistance Program	\$10	-	
• Advanced Technology Freight Demonstrations	-	\$50	100% = \$50
Reserve for Revenue Uncertainty	\$2		
Total	\$22	\$200	50% = \$100

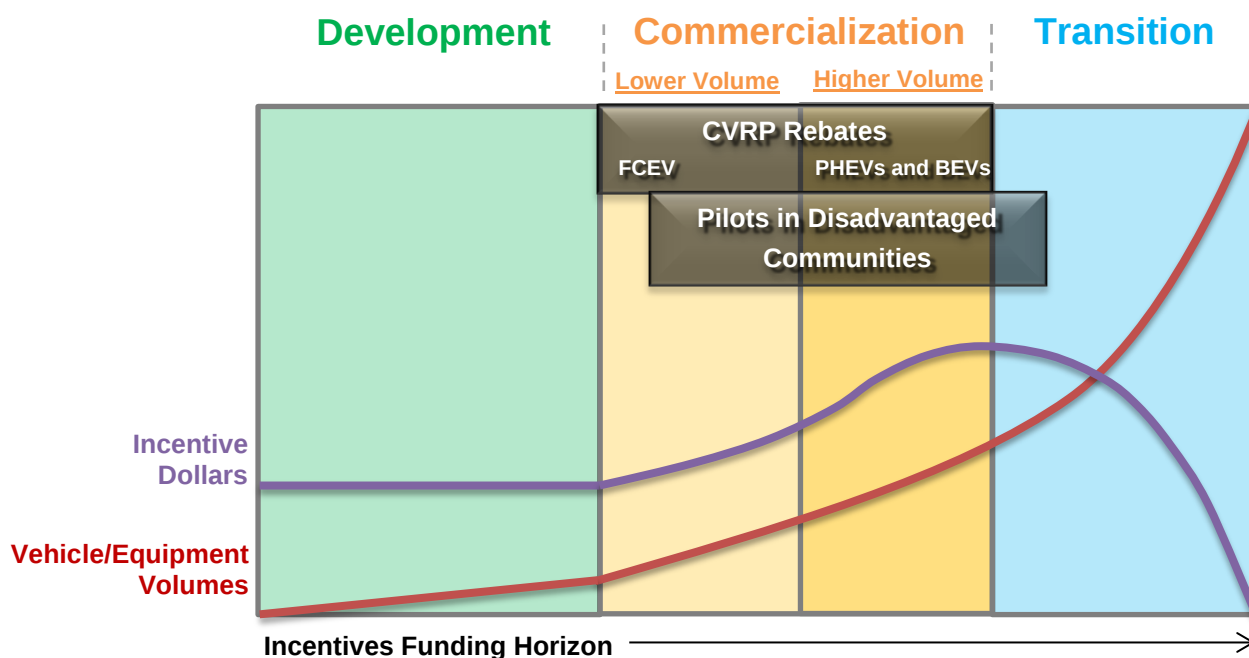
The California Energy Commission (CEC) is also proposing \$5 million in funding to support Classic CVRP from the Alternative and Renewable Fuel and Vehicle Technology Program. This investment, coupled with significant investments in fueling infrastructure to support both electric and hydrogen vehicles, builds upon the continued partnership between the agencies to invest in technologies critical to meeting the State's long-term air quality and climate change goals.

For ARB's low carbon transportation program, we are targeting 50 percent of investments to benefit disadvantaged communities, with a significant portion of these funds spent on projects based in those communities. This investment in projects to benefit disadvantaged communities is consistent with the requirement for GGRF funds per SB 535. As part of program implementation, ARB will develop metrics, such as reductions in criteria pollutant and air toxics emissions, that can be used to identify benefits to communities and methodologies to quantify these benefits. Staff welcomes public comment on how to determine, and quantify, benefits to disadvantaged communities from GGRF low carbon transportation investments.

Light Duty Vehicle Projects

Currently, light-duty vehicles are in the commercialization phase, as the advanced technology vehicles have been in production with increasing consumer demand, such as PHEVs and BEVs, or are being introduced in limited quantities, such as FCEVs. The light-duty vehicle projects proposed have been established to help encourage consumer adoption of advanced technology passenger vehicles through two pathways. First, “classic CVRP” provides first come, first served rebates to encourage consumer adoption of advanced technology passenger vehicles and to spur market growth. Secondly, the proposed pilot projects have been established to increase penetration of advanced clean vehicles in disadvantaged communities to increase technology acceptance in areas most impacted by air pollution. The following section provides information on the two types of proposed projects.

Figure 1a. FY 2014-15 Light Duty Investments



Several projects are being proposed for AQIP and GGRF low-carbon transportation investments to more effectively move the advanced technology light-duty vehicle market forward, reduce GHG emissions, and increase the benefits of such investments to disadvantaged communities. For FY 2014-15, total funding for light-duty projects is proposed at about \$125 million.

Classic CVRP

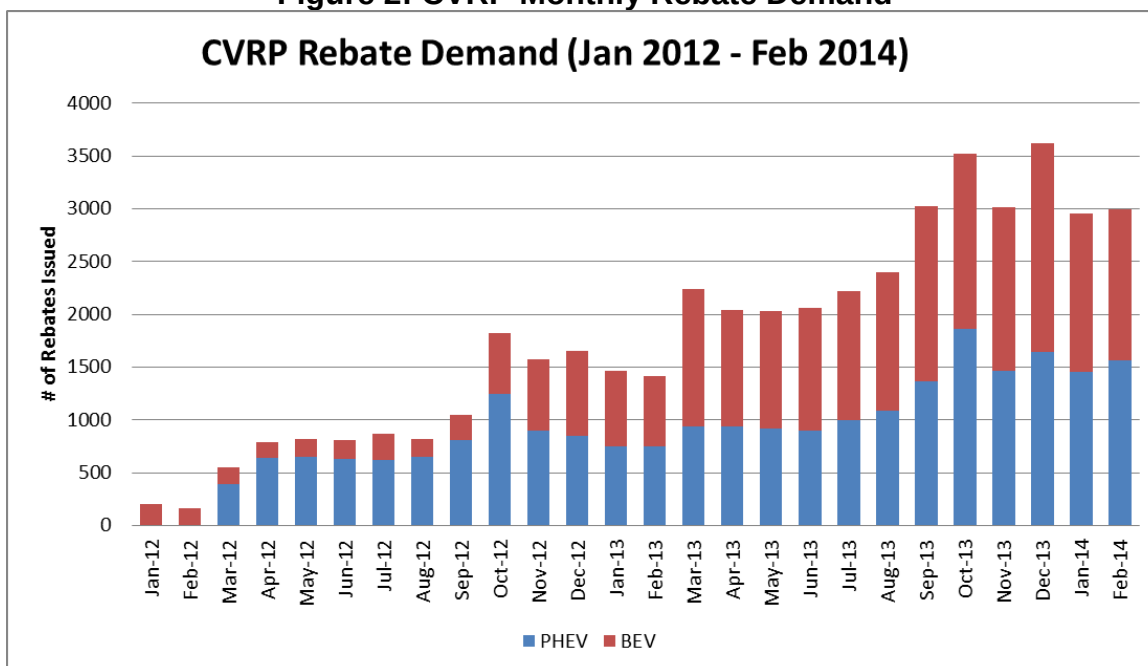
Project Goals

“Classic CVRP” is the current AQIP funded CVRP program that provides first come, first serve rebates to consumers for the purchase of passenger near-zero and ZEVs. Since its inception, the objective of CVRP has been to seed the market for widespread commercialization of the cleanest vehicles available today by helping to drive consumer purchasing decisions. The project has supported this simple goal by ensuring continued acceleration of ZEV purchases with an incentive strategy that is easy to understand and implement. Further, CVRP is intended to support the goal of 1.5 million ZEVs by 2025, consistent with California ZEV regulations and the Governor’s Executive Order B-16-2012, accelerate production economies of scale, and encourage co-investment in infrastructure and workforce training. Staff recommends continuing these goals by proposing to further prioritize the most advanced technologies in addition to increasing benefits to disadvantaged communities.

Current Project Status

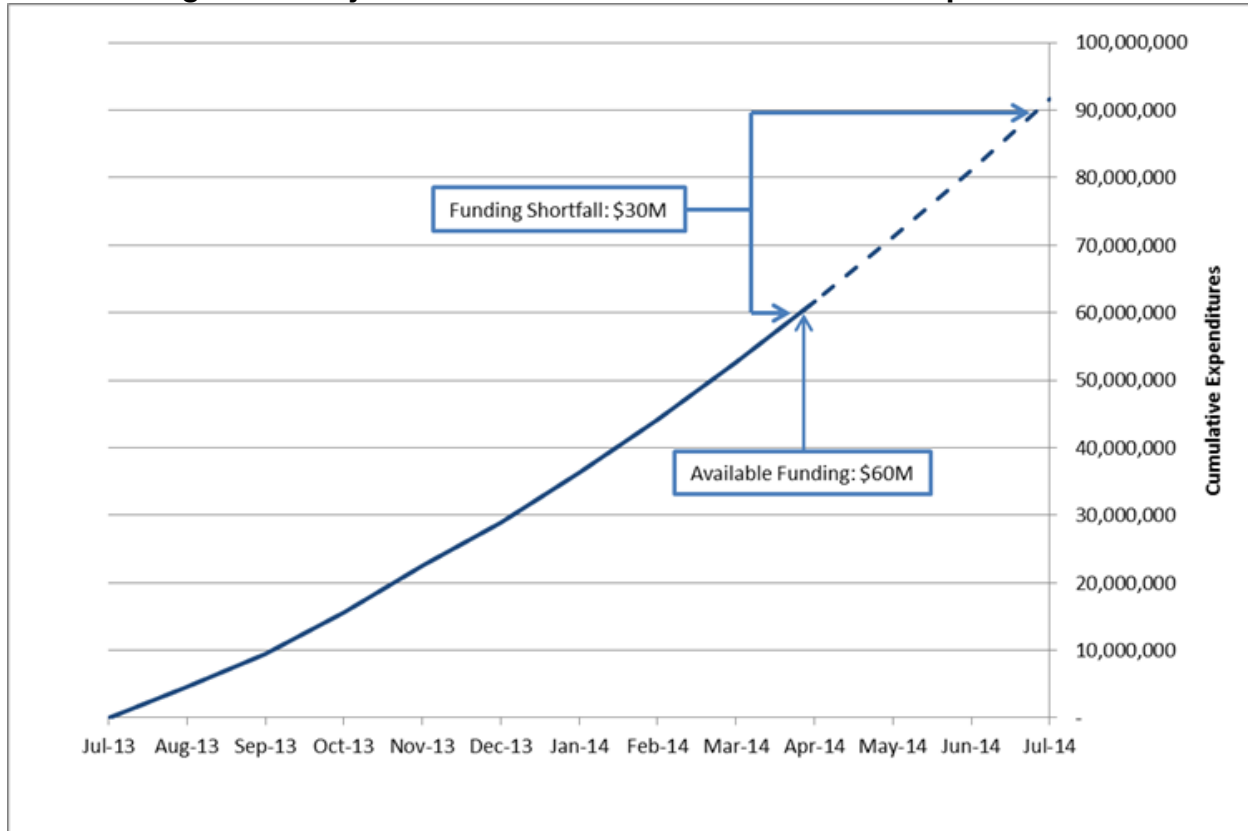
Rebates for about 49,000 vehicles totaling about \$100 million have been issued through January 2014. In FY 2013-14, CVRP experienced a rapid rise in rebate activities, with over 160 percent increase in rebate reservations in 2013 compared to 2012. In December of 2013, a new record was set, with over 3,700 rebates reserved in a single month. Figure 2 illustrates monthly rebate demand since January 2012.

Figure 2: CVRP Monthly Rebate Demand



Because of this increased activity, staff is projecting a potential funding shortfall of about \$30 million for the current FY (Figure 3).

Figure 3: Projected FY 2013-14 CVRP Cumulative Expenditures

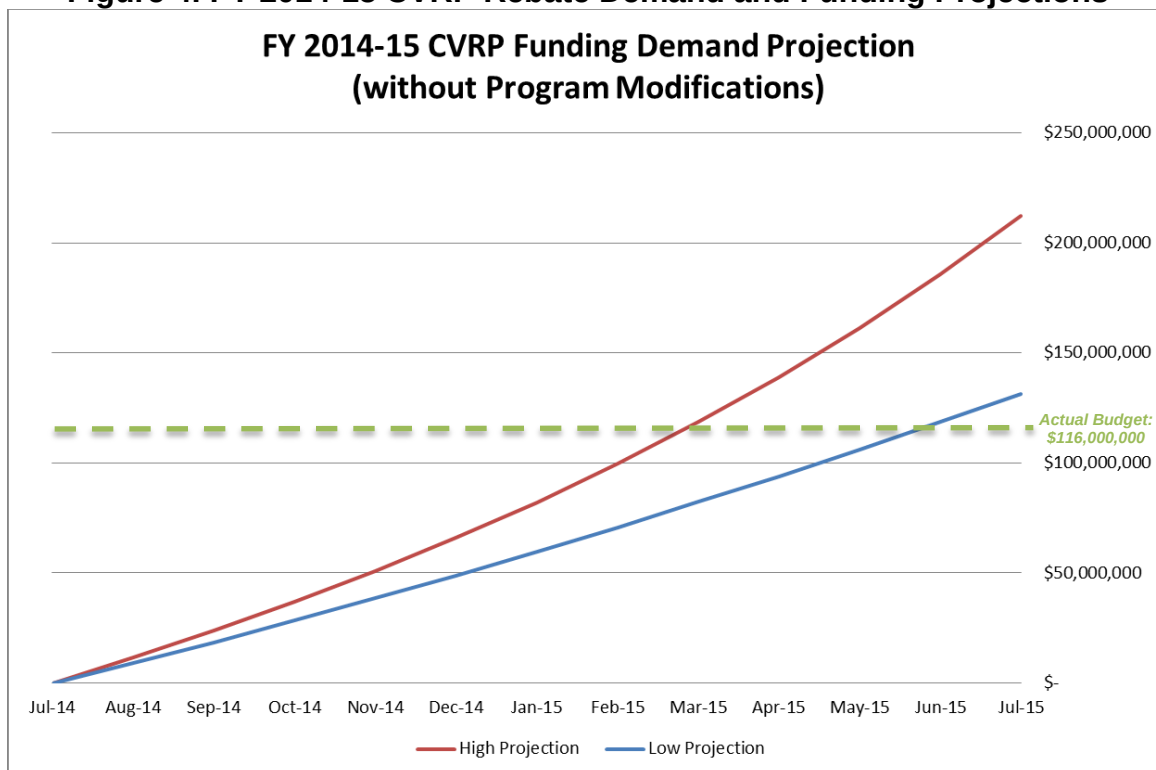


Note: \$15 million of the available funding comes from AB 118 (ARB and the California Energy Commission) with about \$25 million provided by AB 101 and another \$20 million authorized by SB 359.

Based on these projections, CVRP has enough funding to carry the project to early April of 2014, as long as no other unexpected demand spikes occur. After evaluating several options, staff intends to seek Board approval in April of 2014 to establish a \$30 million (in total) waiting list against expected FY 2014-15 AQIP revenue, with the intent that those funds will be paid by an alternative source, which staff is working to secure. Rebate applicants placed on the waiting list during FY 2013-14 will receive a rebate under current FY 2013-14 levels and restrictions.

Projected Funding Demand for FY 2014-15: Under the current program structure without modifications, CVRP funding demand in FY 2014-15 is projected to be significantly greater than previous fiscal years at over \$130 million (Figure 4) to a high projected demand of slightly over \$200 million. However, based on available funding, staff is proposing up to \$116 million for CVRP and is proposing changes to align the project with expected funding levels.

Figure 4. FY 2014-15 CVRP Rebate Demand and Funding Projections



Near-term Project Modifications for FY 2014-15

The California clean car market is growing rapidly and CVRP rebates will ensure sustained and healthy market growth. ARB staff and stakeholders recognize that changes to CVRP are essential in order to align project needs with budgetary limitations, program effectiveness, and to provide market certainty. Because of this, ARB staff evaluated various potential project modifications for FY 2014-15, in conjunction with the long-term plan and with a focus on the following project goals:

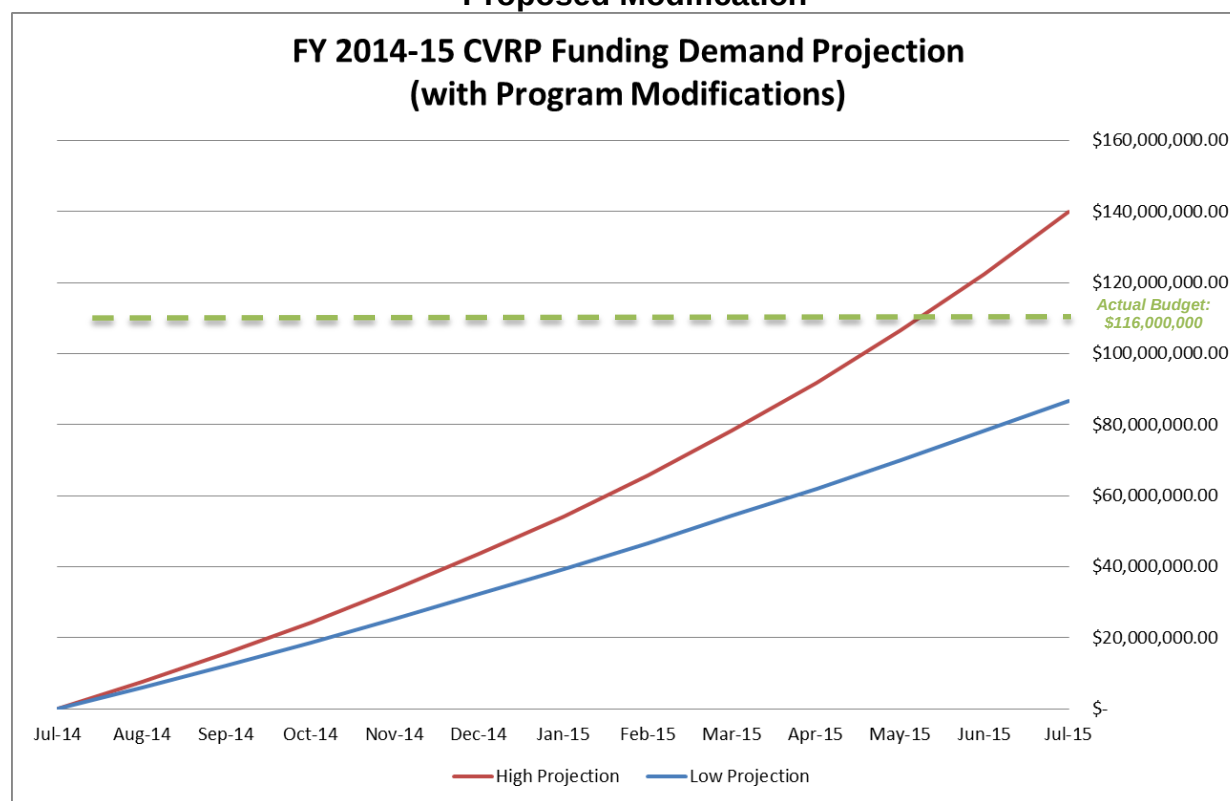
- Effectively motivate consumer purchasing decisions toward advanced technologies instead of conventional vehicles
- Ensure the continued acceleration of advanced clean vehicle purchases
- Increase benefits to disadvantaged communities
- Leverage funding in related programs (car scrap, local sources, etc.)
- Maximize co-benefits associated with the deployment of advanced clean cars
- Modifications remain easy to implement and simple for consumers to understand

Based on the assessment for FY 2014-15, using the best available data, staff determined that a combination of changes is necessary to meet the objectives above, and ensure that the program can operate within the specified budget over the full fiscal year without interruption. Specifically, staff recommends implementing reducing rebate amounts by \$500 for BEVs and PHEVs and a Manufacturer Suggested Retail Price

(MSRP) cap of \$60,000, based on the analysis provided below. The combination of the two changes is expected to reduce overall project funding need by about 40 percent while strategically increasing the effectiveness of per-vehicle rebates in a program with a limited budget.

With these changes, staff anticipates a funding need between about \$85 million and \$140 million for FY 2014-15 based on current market trends (Figure 5). This does not include the FY 2013-14 funding shortfall of \$30 million, a potential portion of which could impact the FY 2014-15 budget. In addition, this preliminary projection does not consider unannounced or unexpected changes to the market at this time. Staff proposes to monitor the project and implement contingency measures that provide flexibility for midyear adjustments in order to ensure program continuity and fiscal solvency.

Figure 5. FY 2014-15 CVRP Rebate Demand and Funding Projections with Proposed Modification



FCEV Rebates

FCEV technology, while in early stages of commercialization for light-duty vehicles, is not as available in the market place as BEVs or PHEVs. Until manufacturers are able to deliver increased vehicle volumes and options, and until early adopters begin to accept the technology, these vehicles remain in the lower phase of commercialization. Because of this, staff recommends offering rebates for FCEVs at \$5,000, consistent

with the rebate levels offered to BEVs when these vehicles were in that same stage of commercialization. FCEVs would also not be subject to the MSRP cap, consistent with the initial introduction of BEVs.

Reduced Rebate Amounts for BEVs and PHEVs

CVRP currently offers rebate amounts of \$2,500 for BEVs and \$1,500 for PHEVs. Staff recommends lowering the rebate amounts for BEVs and PHEVs by \$500 to \$2,000 and \$1,000, respectively, based on the findings below:

- A greater reduction (33 percent under staff's proposal) in the PHEV rebate amount relative to BEVs is appropriate given the stronger growth in the PHEV market.
- Staff anticipates only a minimal short-term impact in the growth of sales of eligible vehicles due to the lower rebate amounts. However, the budget savings associated with the short-term market delay will more than offset this impact by providing rebates for about 41 percent more vehicles during fiscal year 2014-15 under a fixed budget (Table 4).

Table 4. Additional vehicles supported with reduced rebate amounts

	EV	PHEV	Total
Funding Level	\$58M	\$58M	\$116M
# cars supported w/o modification (\$2,500 for BEVs and \$1,500 for PHEVs)	23,200	38,666	61,866
# cars supported with reduced rebates (\$2,000 for BEVs and \$1,000 for PHEVs)	29,000	58,000	87,000
% increase in the amount of rebates available	25%	50%	41%

- In calculating this, staff first assumed an equal split in funding between PHEVs and BEVs. Staff then calculated the number of rebates which could be issued under both the current and proposed rebate levels. Finally, staff determined the percent increase in vehicle rebates for the full project.
- As discussed further below, staff expects the new rebate amounts to remain effective in influencing BEV and PHEV sales as the reduction in rebate amounts are still influential relative to the MSRP of eligible vehicles.

Market Impact: Looking at the effects of rebates and excluding other external variables, such as reduced manufacturing costs and the number of rebates available, reducing rebates by \$500 for BEVs and PHEVs may result in slight slowing to the continued

expected growth of the California PEV market. Conversely, with a limited budget of \$116 million, staff expects reducing rebate amounts will extend rebate funding over the course of the full 2014-15 fiscal year, thereby supporting the deployment of more vehicles. This will more than counter the significantly negative market uncertainties and impacts associated with making no rebate level changes, resulting in rebate funding likely being exhausted before the end of FY 2014-15.

MSRP Cap of \$60,000

In addition to reduced rebates, staff is recommending an MSRP cap of \$60,000. As shown in Table 5 below, currently, rebate-eligible vehicles with an MSRP over 60,000 are the Tesla Model S, a BEV, and the Cadillac ELR, a PHEV.

Table 5. Eligible Vehicles by MSRP

CVRP Eligible Vehicles	2013 Base Model MSRP
Smart Electric Drive	\$ 25,000
Chevy Spark	\$ 27,495
Nissan Leaf	\$ 28,800
Mitsubishi i-MiEV	\$ 29,125
Toyota Prius Plug-in	\$ 30,495
Fiat 500e	\$ 31,800
Ford C-Max Energi	\$ 33,350
Honda Fit EV	\$ 36,625
Chevy Volt	\$ 36,665
Ford Focus Electric	\$ 37,200
Ford Fusion Energi	\$ 39,100
Honda Accord PHEV	\$ 39,780
BMW i3	\$ 41,350
Toyota RAV4 EV	\$ 49,800
Tesla Model S	\$ 69,900
Cadillac ELR	\$ 75,995

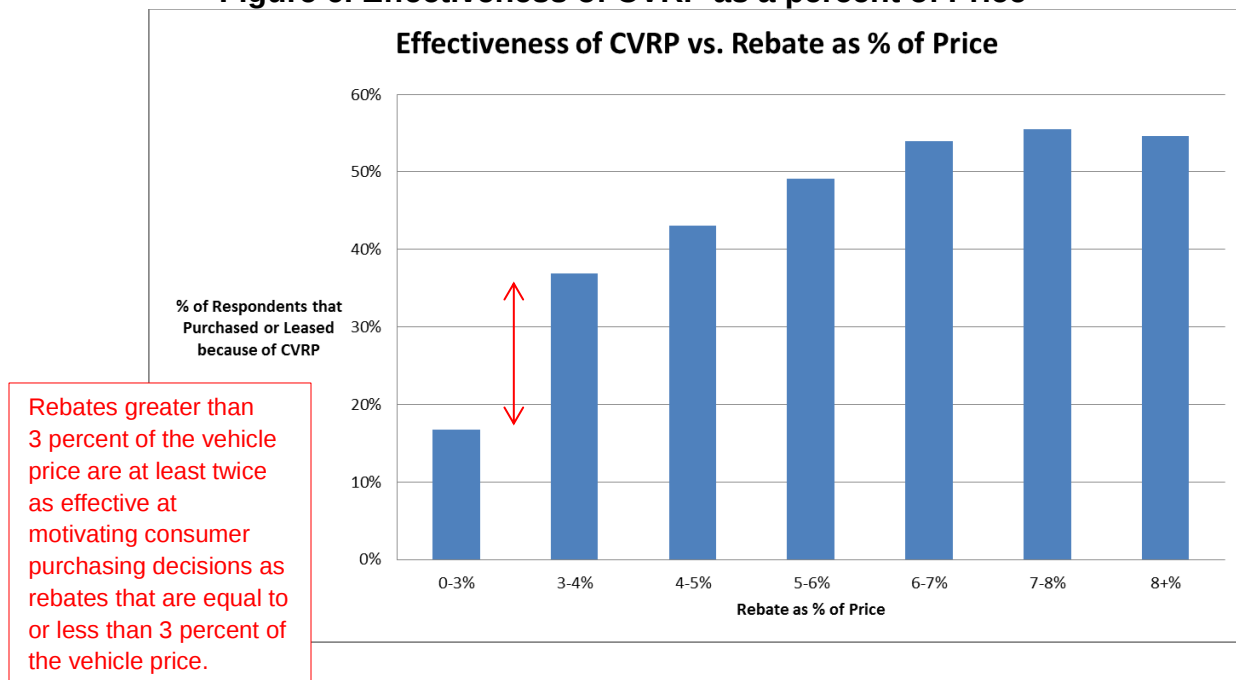
Staff estimated the effects of an MSRP cap by analyzing consumer purchase decisions as reported in CVRP survey results¹¹ and through internal analysis. Responses from more than 5,000 plug-in electric vehicle (PEV) drivers were gathered in the CVRP survey, providing a snapshot of demographics and vehicle purchase motivations of CVRP rebate recipients. The analysis performed showed the following:

¹¹ The Center for Sustainable Energy (CCSE), ARB's grantee that administers CVRP, conducts periodic surveys of CVRP recipients in order to understand trends in the PEV market, including the drivers of adoption, vehicle use, as well as vehicle charging infrastructure use and satisfaction.

- There is a direct relationship between the effectiveness of rebates and the percentage of the rebate amount relative to the price of the vehicle
- Overall, CVRP rebates are more effective in influencing purchase decisions related to vehicles with a MSRP lower than \$60,000
- Setting a lower MSRP cap level can provide a greater reduction in program funding demand but would generate a greater negative impact to the market, as it will restrict lower-priced vehicles where rebates are more effective
- Implementing an MSRP cap of \$60,000 for BEVs and PHEVs for fiscal year 2014-15 will result in a minimal impact of less than 2 percent to the market but will allow the program to be more effective in influencing consumer purchase decisions

Rebate Effectiveness - Relationship between Rebate Amount and MSRP: Not accounting for household income, CVRP survey results show that CVRP rebates are almost three times more effective in influencing purchase decisions on vehicles with a MSRP lower than \$60,000 (Figure 6). A \$60,000 MSRP cap applied to a reduced rebate of \$2,000 reflects a 3.3 percent rebate to MSRP ratio, which is consistent with the optimal rebate effectiveness demonstrated by the analysis. The survey results also showed that rebates are more effective in influencing purchase decisions for mainstream consumers. Moreover, the influence of rebates across all income levels is significant for vehicles with a MSRP lower than \$60,000, but not for vehicles over this amount.

Figure 6. Effectiveness of CVRP as a percent of Price



Market Impact: Staff estimated potential market impact by analyzing sales projections based on CVRP data and DMV vehicle registration data, and CVRP participant survey results. An MSRP cap of \$60,000 is expected to decrease funding demand by about 10 percent, but will likely only impact the California advanced clean car market by less than 2 percent. Table 6 summarizes the impact of implementing an MSRP cap at \$60,000.

Table 6. Estimated Market Impact of an MSRP Cap

MSRP Cap Amount	Reduction in CVRP Demand	Reduction in CVRP Purchase Decisions	Reduction in CA PEV Market Sales
\$60,000	10%	1.7%	~1.25%

Because some stakeholders have suggested an income cap, rather than an MSRP cap, would be more appropriate, staff also analyzed the market impact of such a change. Comparing the MSRP cap of \$60,000 to an income eligibility cap shows that restricting households with higher annual incomes will have a significantly greater impact on the California PEV market. Using a similar methodology as for the MSRP cap, staff evaluated the reduction in CVRP demand and impact to the market at various household income levels. The results of this analysis are listed in Table 7 below.

Table 7. Estimated Market Impact of an Income Cap at various Income Levels

Household Income Level	Reduction in CVRP Demand	Reduction in CVRP Purchase Decisions	Reduction in CA PEV Market Sales
\$300K	18%	4.0%	3.0%
\$250K	25%	6.6%	5.0%
\$200K	36%	11%	8.2%
\$150K	55%	19%	14%

As the PEV market matures and rebate demand increases dramatically, adjusting the MSRP cap may ultimately be effective as a mechanism to lower the program funding demand. Or conversely, the MSRP cap could be raised if unexpected market shortfalls occur. In addition, this option is easy for consumers to understand and easy to implement, keeping the project's streamlined model in tact, which has been a cornerstone to the project's success.

Other Administrative Changes

Adjust Maximum Number of Rebates per Consumer Type: In response to limited rebate availability, last year the Board approved an adjustment to the maximum number of rebates per consumer type for each funding year as shown in Table 8.

Table 8. Maximum Number of Rebates per Consumer Type

Consumer Type	Maximum Number of Rebates Proposed
Individual	2
Public Fleet	30
Rental Fleet	20
Car Share	20

Historically, most individuals have not applied for more than two rebates. Because CVRP is intended to encourage consumers to invest in these newer, advanced technologies, staff is proposing to limit the number of rebates to individuals to two overall, beginning July 1, 2014. This limitation would only apply to individuals and businesses, not fleet or car share vehicles. Staff is also proposing an exemption for individuals who were previously rebated and wish to upgrade to a FCEV. Staff believes that two rebates overall, in addition to a FCEV exemption, is consistent with the overall goals and objectives of the program.

Contingency Measures

As mentioned previously, the California clean car market is growing very dynamically and various factors cause unpredictability in project demand. In order to counter a sudden increase in project demand that may outstrip available funding or address any unexpected market shortfalls, staff proposes to include potential mid-year contingency measures. Specifically, contingencies could affect the number of rebates issued for certain technologies by adjusting project modifications, such as further changing the MSRP cap to restrict or allow higher-priced vehicles to be eligible for a rebate. The MSRP cap, because of its simplicity with regard to implementation, could serve as a simple and relatively timely “lever” to address budgetary needs as a result of sudden changes in the market. Further, adjustments in the rebate amounts or other vehicle eligibility criteria could be considered. Staff proposes to conduct quarterly evaluations while continuing to develop and refine projections; however, should CVRP experience a sudden increase in demand, staff proposes that the Executive Officer have the ability to offset those increases by making adjustments to the project (i.e., such as reducing the MSRP cap) to avoid interruptions in the program. Staff is seeking input on the parameters for contingency measures and will include proposed contingencies in the draft Funding Plan.

Metrics of Success

Given the success of the project and the anticipated growth in demand, metrics are necessary for evaluating continued effectiveness of the project and determining when advanced technology light-duty vehicle incentives are no-longer needed. Staff believes a set of metrics can be useful in determining if, and how quickly, a specific vehicle technology is becoming a mainstream purchase option where rebates are no longer needed or another incentive would be more effective.

Staff has identified three potential metrics to determine the success of the project. For each of the three primary metrics, staff included sample indicators that could be used to conduct an evaluation. Staff welcomes public comment on the following metrics and measurement indicators, or others not included, for the light-duty vehicle sector:

- State of Advanced Clean Car Market:
 - ZEVs sold as a percent of total California car market
 - ZEVs sold as a percent of total market in other states administering ZEV requirements
 - Demand of CVRP rebates
- Household Ownership Patterns:
 - Number of *new* households purchasing ZEV technology to demonstrate market expansion
 - Purchaser income distribution (relative to new car purchases)

- Manufacturer Achievements:
 - Manufacturer and vehicle model diversity
 - Number of manufacturers with more than a certain number of vehicles sold

Staff expects that utilizing metrics of success to inform CVRP's long-term plan will allow the project to be as effective as possible in encouraging continued transformation of California's clean vehicle market, supporting early compliance of the ZEV mandate, continuing development of necessary supporting infrastructure, and supporting the State's long-term air quality and climate change goals. Further, the metrics help ensure that the project is sustainable and can adapt to a changing market with increasing participant demand. As such, staff intends to include a discussion of metrics and the progress various technologies are making towards reaching those metrics, as part of the annual funding plans moving forward. Staff also recommends pursuing research to determine the effectiveness of various incentives based on vehicle technology types currently available in the market. The research will help inform the ongoing evaluation of the project and provide valuable information on how to adjust the project moving forward.

Long-term Plan for CVRP

Consistent with the above stated goals and metrics for measuring the project's success, staff proposes the following evaluation milestones for CVRP:

- Evaluate the state of technology for each of the three main technology types as they approach specific levels:
 - Set initial targets of 150,000 rebates for BEVs, 150,000 rebates for FCEVs, and 75,000 rebates for PHEVs starting in FY 2014-15.
 - Staff developed the initial targets based on rebate demand projections, projected passenger car sales, and when staff believes the vehicle technologies may be adopted by more mainstream consumers and thus the need for CVRP rebates may no longer be necessary.
 - More specifically, at the targets listed above, advanced clean cars will be around 5 percent of total new passenger car sales in California and shift advanced clean cars out of the early adopter market (1-2 percent of sales) and fast-follower (2-5 percent of sales) market segment¹². Once the advance car market reaches beyond the fast-follower market, vehicle prices may be reduced enough where CVRP rebates may not be necessary.
 - Evaluations should begin once vehicle volumes reach the halfway point for each initial target

¹² National Research Council. Overcoming Barriers to Electric-Vehicle Deployment: Interim Report. Washington, DC: The National Academies Press, 2013.

- Staff expects to reevaluate each technology types with the metrics of success, described above, to determine whether to make further adjustments, such as reducing rebate amounts further for specific technologies.
- Use project modifications, such as a MSRP cap, as a mechanism to annually adjust rebates to adapt to changing market conditions, rebate demand, and project budget.

Staff is continuing to conduct analysis with regard to the targets identified above and the evaluations that will occur upon reaching specified stages of rebate disbursement. The draft Funding Plan will provide more detail on the assumptions used to support these recommendations.

Pilot Projects in Disadvantaged Communities

Project Goals

In order to meet the goals of SB 535, staff recommends allocating up to \$9 million of the overall light-duty vehicle budget to administer advanced clean vehicle pilot projects that reduce GHG emissions in or to directly benefit disadvantaged communities. This focused investment will allow ARB to investigate the viability of these pilot projects in assisting lower-income households and disadvantaged communities.

Proposed Light-Duty Pilot Projects for FY 2014-15

Staff recommends the following projects and is seeking feedback on the parameters of each project as well as additional projects for consideration. Each of these proposed projects will continue to be developed, with public input, over the next several months, and Staff expects to stagger grant solicitations or project agreements throughout the year based on the needs of each of the projects.

Targeted Car Sharing in Disadvantaged Communities

Car sharing allows an individual to benefit from the use of a private automobile without the responsibility of car ownership costs. Staff is proposing to allocate funding to establish hybrid and advanced clean car sharing fleets in disadvantaged communities to offer an alternate mode of transportation and encourage the use of clean cars. The pilot would be used to gather data that could help support larger scale advanced technology car share programs.

Staff plans to establish a work group to determine the needs and parameters of the project. Staff envisions that the remainder of 2014 will be used to further develop this pilot project and the corresponding solicitation, with a target timeframe of early 2015 for actual project solicitation.

Increased Incentives for Public Fleets in Disadvantaged Communities

Public fleets are not eligible for additional incentives to bring down the higher prices associated with advanced clean cars. As a result, combined with other barriers, local and state government fleets make up a very small number of the total number of rebates reserved. Staff is proposing to offer rebates to public fleets of up to \$10,000 per vehicle for public fleets located in disadvantaged communities. The vehicles will be required to operate in disadvantaged communities and the communities will experience the direct benefits of the vehicle operating on their roads. This pilot project could be administered as a separate grant, or as a set-aside within the classic CVRP structure.

Enhanced Fleet Modernization Program (EFMP) Plus-up

This pilot program will focus on promoting advanced technology vehicle replacements (both new and used) by providing additional financial assistance for cleaner vehicles under EFMP or other vehicle retirement programs. To determine a sustainable replacement vehicle solution for low-income participants in federal extreme non-attainment areas, staff believes that different approaches must be evaluated and tested. This assistance could be in the form of increased incentive amounts, new incentives for used advanced technology vehicles, or could be provided in alternative ways, such as transit subsidies or low-cost loans.

Staff anticipates establishing a work group during spring of 2014 to further develop this concept, including defining the possible suite of incentives to offer, identifying replacement vehicles or eligible vehicle types, defining incentive amounts, and considering other program parameters. Staff is targeting Fall of 2014 to finalize project parameters, including specifics of project administration.

Financing Assistance Programs

For some individuals, vehicle financing is a significant barrier to vehicle ownership. Staff proposes to evaluate the feasibility of programs that provide financing assistance, such as a loan loss guarantee for financial institutions or programs that buy down interest rates for consumers, in order to improve financing options for low-income individuals interested in moving into a cleaner vehicle. These programs may help some consumers that would not typically qualify for conventional financing to better afford an advanced technology vehicle. Further, as more hybrids and advanced clean cars enter the used car market, financing assistance for used vehicles may help to increase the number of cleaner vehicles in disadvantaged communities.

Consistent with the pilots listed above, staff proposes to begin further evaluation of this pilot through a work group process, that would include financial institutions, automotive dealers, community groups, and others, in order to determine which financing assistance options might offer the best benefits to low-income consumers purchasing advanced technology vehicles. This pilot will be further developed throughout the Summer and Fall of 2014, and staff is targeting early 2015 to finalize project parameters, including specifics of project administration.

Metrics of Success

These projects are focused on expanding the market of advanced clean passenger vehicles to individuals that otherwise might not have an opportunity to use these technologies at the individual level. Because each of these pilots uses a different mechanism to engage and assist low-income and disadvantaged individuals, staff proposes to develop specific metrics of success throughout the workgroup process

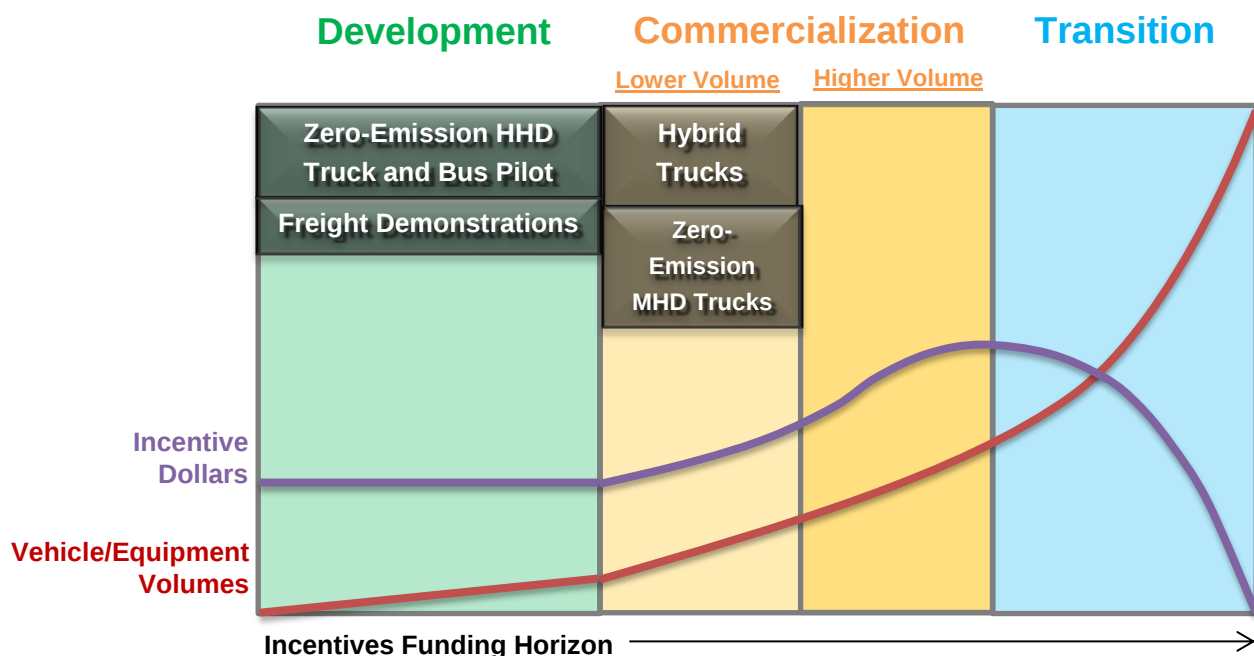
identified above for each project, and where applicable, include metrics within project solicitations.

Heavy-Duty Advanced Technology Vehicle and Equipment Projects

AQIP investments in medium heavy-duty (MHD) hybrid and zero-emission trucks and buses have resulted in successful vehicle deployments throughout California in far greater numbers than the rest of the nation as a result of incentive funding, though at a much lower rate than light-duty vehicles supported by AQIP. However, heavier duty advanced technology trucks and buses (i.e. heavy heavy-duty (HDD)) are at an earlier stage of commercialization and pilot deployments to validate the efficacy of the technologies are still necessary.

Further, the funding of demonstration projects to showcase the functionality and commercial aspects of advanced technology projects remains critical for meeting our long-term air quality and climate change goals. Demonstration projects by their very nature have a certain level of risk and costs are often higher than compared to commercialized technology. While there are risks associated with assisting industry toward zero and partial-zero emission freight technologies, the risk can be properly mitigated through coordination with knowledgeable input technology demonstrators, and engaged stakeholders with an eye toward the prospects of commercialization. These investments will help move these technologies toward the goal of a low carbon future for freight movement in California.

Figure 1b. FY 2014-15 Heavy-Duty Advanced Technology Investments



To address the need for AQIP and GGRF low-carbon transportation investments in the medium-, heavy-, and off-road sectors, staff is proposing up to \$95 million for trucks, buses, and freight sector demonstrations and deployment. These investments will reduce GHG emissions and be focused significantly in disadvantaged communities.

HVIP

Project Goals

The hybrid and zero-emission heavy-duty vehicle market is less mature than the market for passenger cars, and does not benefit from a manufacturer ZEV mandate. HVIP is intended to encourage truck and bus manufacturers to offer, and California fleets to purchase, progressively cleaner advanced technology vehicles in an increasing number of vehicle vocations, as needed to help California meet its long-term air quality and climate goals. Hybrid urban delivery vehicles are intended to pave the way for zero-emission trucks and buses in a variety of vocations, with the ultimate goal of zero-emission short-, medium- and long-haul trucks.

Current Project Status

California fleets have utilized HVIP vouchers to help purchase over 350 zero-emission and 1,200 hybrid trucks and buses over the past four years. A limited number of large fleets are responsible for most zero-emission truck demand thus far, while smaller fleets purchases of Hino hybrid trucks have driven recent hybrid truck demand increases. While HVIP is responsible for over half of the national hybrid and zero-emission truck purchases, deployment must accelerate significantly for California to meet GHG targets and attain federal ozone standards in the South Coast and San Joaquin Valley air basins.¹³ HVIP funding has been exhausted since May 2013. The FY 2013-14 HVIP (\$15 million) will launch in spring of 2014.

Proposed Program Modifications for FY 2014-15

Staff proposes \$10 million to \$15 million be provided to continue the traditional for statewide first-come, first-served HVIP voucher program. Funding for the traditional HVIP would derive from a combination of AQIP and GGRF funds, with at least half of these funds targeted towards benefits in disadvantaged communities. HVIP has disproportionately funded vehicles located in disadvantaged communities over the past four years, with over forty percent of HVIP funds thus far going to the ten percent of zip codes identified as disadvantaged by CalEnviroScreen 1.0. This may be because the dense, urban environments that are often identified as disadvantaged also provide for the greatest hybrid truck fuel economy benefits. Staff believes this trend will continue, and that if over forty percent of vehicles are typically domiciled in disadvantaged communities, well over fifty percent of funds will benefit disadvantaged communities. However, staff will also monitor achievement of this fifty percent target during project implementation and adjust as necessary to ensure it is met. Adjustments could include dealer outreach, targeting the last vouchers to disadvantaged communities, or other

¹³ Vision for Clean Air: A Framework for Air Quality and Climate Planning; Public Review Draft, June 27, 2013; <http://www.arb.ca.gov/planning/vision/vision.htm> .

strategies. Staff is also evaluating updated HVIP-eligibility criteria to ensure expected emission benefits of hybrid trucks are achieved, including requiring full ARB vehicle certification, in-use emissions testing, or other strategies.

While both hybrid and zero-emission vehicles would be eligible for the traditional HVIP, staff believes zero-emission truck demand will mostly be served by the Zero-Emission Truck and Bus Pilot described in the next section, while the vast majority of large fleets that typically purchase zero-emission trucks would opt for the higher voucher amounts and infrastructure funds offered by this new project.

Metrics of Success

Staff believes metrics of hybrid and zero-emission truck and bus market success can eventually help illustrate when specific heavy-duty vehicle technologies becomes self-sustaining. However, the heavy-duty hybrid and zero-emission vehicle market is at a far earlier early stage of development than that for passenger cars, and defining metrics of success at this point would be premature. Staff believes few manufacturers would offer significant numbers of hybrid or zero-emission trucks for sale with neither a regulatory driver nor public incentives. And fleets often view it as risky to purchase advanced technology vehicles with which they are unfamiliar. For this reason, over the next several years incentives will remain a critical tool to encourage manufacturers to offer and California fleets to consider purchasing hybrid and zero-emission heavy-duty trucks and buses.

Staff proposes development of metrics to gauge hybrid and zero-emission truck and bus market health. These could include metrics such as: number of hybrid (or battery electric) trucks sold per vehicle vocation; hybrid powertrains sold per manufacturer; and number of vehicles old in states without public incentives. These metrics are unlikely to drive a decision to sunset funding for hybrid or zero-emission trucks or buses in the near term. Instead, such a decision will be driven more by desire to promote purchase of a new, even cleaner available technology. This could take the form of phasing out basic hybrid truck eligibility in favor of new commercially available plug-in hybrids.

Proposed concepts for HVIP program structure and possible metrics of market health identified above will be discussed more in depth with stakeholders at the next HVIP public work group meeting in April of 2014.

Zero Emission Truck and Bus Pilot

Project Goals

Advanced technologies in heavy-duty vehicles such as heavy-duty trucks and buses have been in development and demonstrated in the field. Typically, the demonstration of advanced technologies usually consists of a very limited number of vehicles. However, to transition out of the developmental and demonstration phases, a larger number of vehicles or equipment will need to be deployed to validate the technologies on a larger scale. The proposed technology pilot projects are proposed to bridge the transition between technology demonstration and initial deployment.

Proposed Pilot Project for FY 2014-15

Staff is proposing to provide up to \$20 million to \$25 million in zero-emission truck and bus (transit and school) projects via competitive solicitation, with 100 percent of funding to benefit disadvantaged communities. This would place a significant number of zero-emission trucks and buses in a handful of strategic freight, delivery or bus hubs, encouraging advanced technology clusters with infrastructure, marketing, workforce training, and other synergies. Staff believes incentive amounts exceeding incremental cost and charging/refueling infrastructure funding may be needed to target demand within a few specific locations. Bus projects, for example, could target extended range or fast charge battery-electric zero-emission or hydrogen fuel cell zero-emission buses. The most competitive project proposals would: deploy the most advanced available zero-emission technologies; leverage significant third party co-funding; be located in the South Coast Air Basin or San Joaquin Valley; include multiple fleets and vehicle types; and incorporate a significant public or consumer awareness element. Funding for zero-emission trucks and buses would derive exclusively from GGRF Investments.

Metrics of Success

As mentioned earlier, zero-emission truck and bus technology is at an early stage of market penetration, and widespread consumer acceptance of zero-emission trucks and buses without incentives is still years away. However, metrics can help illustrate the success of this pilot project in accelerating technology deployment and achieving consumer acceptance within targeted zero-emission hubs. Metrics will focus on achievement of technology price reductions, manufacturer diversity and consumer acceptance. Staff proposes to develop metrics of success and include them within the project's solicitation.

Advanced Technology Freight Demonstration Projects

Project Goals

Demonstrations of advanced technologies for the movement of freight within and through California will be the focus of Advanced Technology Demonstrations in FY 2014-15. The targeting of significant funding for pre-commercial demonstrations of advanced freight technologies can have a direct and immediate impact on the current state of technology and has the potential to provide real benefits to communities that are located near facilities that are the backbone of California's freight network. It is the goal of this proposed demonstration plan to significantly transform the technologies used in freight transport with substantial and targeted investments in freight movement technologies and strategies.

All projects funded under this proposed plan will be required to significantly reduce GHG emissions compared to conventional technologies and will be demonstrated in disadvantaged communities that have historically borne a disproportionate burden from freight movement in the State. The projects will showcase technologies with commercial viability and suitability for the California marketplace. Further, the co-benefit of reduced criteria pollutants and toxics emissions from advanced freight technologies will be considered a high priority when selecting categories for funding and in the assessment and scoring of submitted applications for demonstration project funding.

Proposed Freight Demonstration Projects for FY 2014-15

In order to take advantage of those freight technologies that are currently ready for large pre-commercial demonstrations, staff is recommending that there be a concerted focus on two large project categories that are in a promising stage of development for the first year of this program. Those two categories are zero-emission drayage trucks and multi-source facility projects at warehouse, distribution center, and intermodal facilities. Therefore, staff's proposed recommendation is to allocate up to \$50 million from the GGRF for investments in FY 2014-15 that facilitate demonstrations of advanced freight technology in the following project categories:

- Zero-Emission Drayage Trucks: \$20 to \$25 million to demonstrate zero-emission drayage trucks. Potential applicants to the zero-emission drayage project solicitation should consider the following elements:
 - Potential projects in this category will be required to completely eliminate truck tailpipe emissions of greenhouse gases and will concurrently eliminate criteria pollutants and toxic particulate matter (PM) emissions.

- Potential projects will need to show strong commercialization prospects with the potential to transform the drayage truck industry toward zero-emission technologies.
 - It is anticipated that projects funded under this category should field a large enough fleet of trucks during the demonstration to help transition technologies from the demonstration to the commercialization stage.
- Multi-Source Facility Projects: \$20 to 25 million to demonstrate zero- and near zero-emission technologies at distribution centers, warehouses and intermodal facilities throughout the State.
 - Potential projects in this category could include zero- and near zero-emission yard and regional haul trucks, advanced transportation refrigeration units, and other equipment used in the distribution center, warehouse and intermodal environment. Additionally, fueling/charging infrastructure to facilitate the successful demonstration of technologies, and logistics/operations efficiency improvements would be considered.
 - It is the intent of this category to facilitate the demonstration in one facility of multiple types of equipment that employ advanced emission reducing or eliminating technologies to synergistically demonstrate the practicality and economic viability of wide-spread adoption of advanced technology in one facility.
 - Multiple projects in this category could be funded concurrently so that technologies are demonstrated at multiple facilities throughout the State.
- Other Freight Projects: Up to \$10 million to demonstrate advanced freight technologies in the following categories:
 - Line-Haul and regional-haul truck demonstrations.
 - Locomotive and other rail projects which could include reducing emissions as well as increasing efficiency in freight movement.
 - Marine Vessel projects, such as the hybridization of tugboats or other vessels and other promising advanced marine vessel technologies that have the potential to significantly reduce emissions and/or increase efficiency.
 - Cargo Handling Equipment demonstrations that can show zero- and near zero-emission technology for cargo handling equipment that significantly advance the state of technology in this sector with the potential for broad applicability to many industries in the State. Projects will need to significantly reduce or eliminate tailpipe emissions from equipment compared to convention technologies now employed.
 - Near Dock Container Movement demonstrations such as automated container movement technologies that facilitate the movement of freight from the State's ports to near-port warehouses, distribution centers or intermodal facilities.
 - Emerging Technology demonstrations for other advanced freight technologies not discussed above.

All projects funded with Advanced Technology Freight Demonstration funds will need to show the potential for widespread commercialization that will significantly transform the industry while benefitting disadvantaged communities. Specific funding amounts and project focus for each of the demonstration categories above will be vetted through category-specific public workgroup meetings with technology demonstrators, public agencies, community representatives and other interested stakeholders to be held after the June 26, 2014 Board Hearing.

It is anticipated that additional Cap-and-Trade Auction Proceeds for advanced technology demonstrations will be forthcoming in future years. Therefore, FY 2014-15 funds should be viewed as a first installment on a much larger vision for advanced technology demonstrations. The focus of future years' funds may be directed at specific segments of freight movement like significantly reducing GHG emissions from long-haul trucks or focusing on technologies that may transform the locomotive and rail segment, or in other non-freight segments like zero-emission transit buses or advanced agricultural equipment. However, the focus of future years' funding for demonstration projects is not yet established, but future demonstration project funding will be directed at taking advantage of those technologies that are on the cusp of transformative advances in technologies that significantly reduce GHG emissions. ARB may employ a Request for Information (RFI) process to illicit input from industry and stakeholders to help identify potential large scale projects for FY 2015-16 funding and to assess the current state of the technology for certain categories like rail and long-haul trucking.

Cost Sharing Requirements

Past AQIP Advanced Technology Demonstration Projects have required cost sharing from the technology demonstrator, grantee and/or the fleet or equipment end-user to successfully apply for demonstration funding. The cost share requirement historically has required a match in funding from the applicant team of at least 50 percent of the total project cost with higher than the proposed match scoring higher than those applications that only meet the minimum 50 percent cost match requirement. Staff proposes to increase the maximum cost share for state funds for Advanced Technology Freight Demonstrations from 50 percent of the total project cost to a maximum of 75 percent of the total projects cost, but maintain that those applications that propose a higher overall match toward the project above the minimum 75 percent will score higher than those that only propose the minimum match. This proposed change to the minimum match requirement from applicants is an acknowledgment of the anticipated magnitude of projects that staff anticipates will be submitted and ARB's commitment to facilitating an expeditious movement toward zero and near-zero emission technology in the freight transport sector.

Administration of Projects

It is anticipated that the Advanced Technology Freight Demonstration program will be administered in a similar fashion to past AQIP demonstration projects, which have historically required that a California-based public agency act as the projects grantee, submit the application for funding, and administer the day-to-day operations of the project. However, it is proposed that additional flexibility be considered for freight demonstration that may allow non-public agencies to be considered as the grantee if that is in the best interest for successful completion of a specific project. However, it should be understood that any potential grantee in future freight demonstration projects needs to have the requisite experience and knowledge in implementing demonstration projects in the category to which their application is directed and can act as an unbiased party to the project.

Solicitation Process

ARB will issue solicitations that clearly identify for which project category applications are being requested, the amount of funding that is anticipated to be available for demonstration projects in each category, and the anticipated number of projects that will be funded. More than one category may be presented in a single solicitation, but specific categories outlined in a solicitation will not compete directly against other discreet categories in the same solicitation. The solicitation will also outline the scoring criteria that will be used to evaluate potential applications for funding. Scoring criteria will be used to numerically score submitted applications, and then applications will be ranked in order of the highest scored projects to the lowest. The highest scoring projects will be awarded funding. In past AQIP Advanced Technology Demonstration solicitations, scoring criteria have included specific metrics such as cost effectiveness of the technology, or whether the commercialized technologies will benefit Environmental Justice communities. Many of the same criteria that have been used in past AQIP Advanced Technology Demonstrations will be carried over into the FY 2014-15 Advanced Technology Freight Demonstration solicitations. Some of the proposed new scoring criteria that will be employed will include the ability to significantly reduce emissions of greenhouse gases, and benefits to disadvantaged communities.

Specific scoring criteria for each of the proposed project categories will be developed after the Board approval of the AQIP Funding Plan and after the passage of the State's FY 2014-15 Budget. Additional details on the scope and amount of funding available for specific demonstration project categories will also be developed after Board approval of the Funding Plan. Staff will also develop specific project results for specific categories, refine the timeline for the issuance of solicitations, and outline special provisions for match requirements or other competitive process. All of the post Board Hearing tasks will be informed by the ongoing Advanced Technology Freight Demonstration work group process that will convene after Board approval of the Funding Plan as has been done historically under past iterations of AQIP's Advanced Technology Demonstration Program.

Solicitations will be issued in a staggered fashion to manage workload and to accommodate the nature of GGRF revenue accumulation. It is anticipated that the first solicitation for Advanced Technology Freight Demonstration could be issued in the winter of 2014 through summer of 2015 timeframe.

Future Demonstration Projects

It is the intent of staff to use a RFI process to poll interested stakeholders and technology demonstrators on the current state of technology in specific categories, such as line-haul trucks and locomotive and rail technologies. The RFI process may begin as early as fall of 2014 to inform the process of determining focuses for Advanced Technology Demonstration project in FY 2015-16 and beyond.

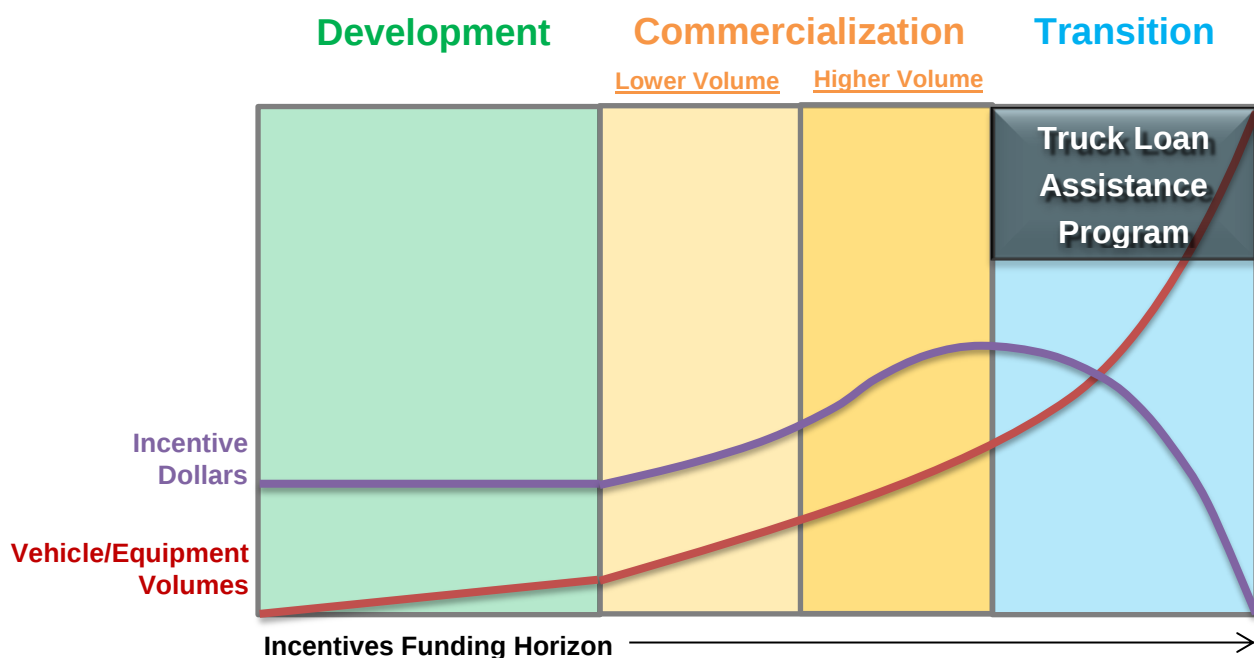
Metrics of Success

Staff recommends that the metrics of success for specific Advanced Technology Freight Demonstrations be closely aligned with the stated goals and required results for each specific solicitation. Success toward meeting the goals illustrated for each technology category and demonstration project's guiding principles should also be included. Applications for demonstration project funding will detail the individual project's metrics for success and compare the results of each project with the applications stated goals, the requirements of the solicitation and the Funding Plan. Successful projects will demonstrate the potential for cost-effective emission reductions in the specific demonstration project category with the potential for widespread commercial acceptance.

Loan Assistance Programs

In addition to supporting technology development and advancement through commercialization, AQIP funding has also historically been targeted to advance technologies into new consumer demographics and among disadvantaged communities. Over twenty percent of AQIP funds to date have been allocated toward the Truck Loan Assistance Program, which is aimed at assisting low-income and small business truckers obtain financing for truck upgrades or retrofits. The technologies funded are well commercialized, but the need to increase penetration of these technologies in certain demographics remains.

Figure 1c. FY 2014-15 Loan Assistance Programs



Currently, the Truck Loan Assistance Program is the only program funded by AQIP in the transitional phase of technology advancement. However, as discussed in the light-duty vehicle section, staff is proposing a new light-duty financing assistance pilot project for FY 2014-15. Consistent with the incentive needs within the transitional phase of commercialization, the light-duty financing assistance pilot project would be designed to offer financing options to low-income or disadvantaged individuals in disadvantaged communities that are unable to obtain financing through conventional sources.

Truck Loan Assistance Program

Project Goals

The Truck Loan Assistance Program aids small business truckers affected by ARB's In-Use Truck and Bus Regulation by providing financing assistance for fleet owners to upgrade their fleets with newer trucks or with diesel exhaust retrofits. It is specifically tailored to truck owners that experience challenges obtaining conventional financing because they don't conform to traditional underwriting standards.

Current Project Status

Throughout 2012 and 2013, participation in the Truck Loan Assistance Program progressed rapidly in response to approaching regulatory compliance deadlines. As of February 26, 2014, about \$38 million in Truck Loan Assistance Program funding has been leveraged to provide about \$273 million in financing to small business truckers for the purchase of over about 4,700 cleaner trucks, exhaust retrofits, and trailers.

Table 7 (below) provides a breakdown of financing offered. Historically, nearly 80 percent of enrolled loans have been issued to owner operators with one truck, and 93 percent of enrolled loans have been issued to fleet owners with 10 or fewer employees. The program continues in 2014 with \$10 million provided by SB 359 (Corbett, Chapter 415, Statutes of 2013), and any remaining AQIP funds allocated to the Truck Loan Assistance Program in 2013.

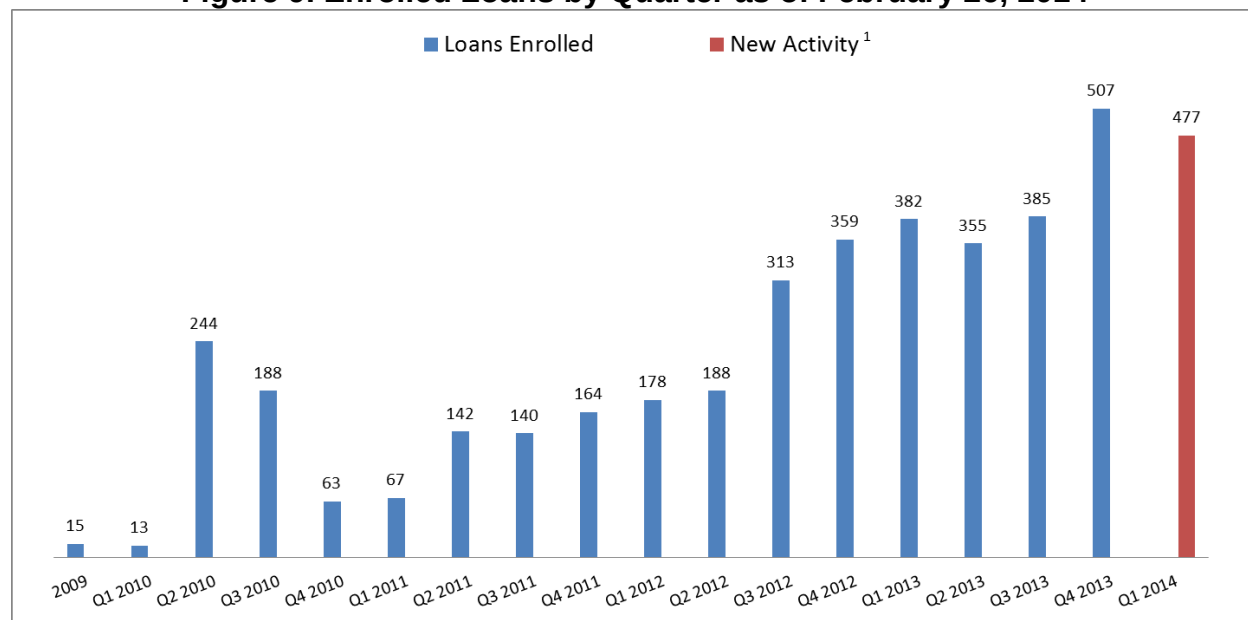
**Table 7: Truck Loan Assistance Program Status;
Vehicles/Equipment Financed as of February 26, 2014**

Program	Number of Loans Issued ¹	Number of Projects Financed	Project Type	\$ Spent	Total Amount Financed
ARB/California Pollution Control Financing Authority (CPCFA) Truck Loan Assistance Program	4,143	4,400	Truck Purchases	\$38M	\$273M
		281	Exhaust Retrofits		
		26	Trailers		

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

Figure 9 below shows the historical quarterly activity for loans enrolled in the program.

Figure 9. Enrolled Loans by Quarter as of February 26, 2014



¹ Activity identified in Q1 of 2014 is for a partial quarter.

With ongoing regulatory deadlines in the 2014 through 2016 timeframe for ARB's diesel vehicle regulations, ARB staff expects a continued strong demand for program funding to assist the small business trucking sector in financing truck upgrades.

Proposed FY 2014-15 Funding Needs

Projections based on historical program activity indicate an annual baseline funding need of at least \$20 million. With \$10 million from SB 359 projected to fill half of the baseline annual funding need, staff recommends an allocation of \$10 million from the FY 2014-15 AQIP Funding Plan to extend the program through 2014.

Because loan enrollment rates have increased significantly, resulting in a 30 percent increase in loan loss reserve contributions in 2013 (over 2012 contribution levels) and a sustained accelerated demand in 2014, this funding level is necessary to continue support for truck upgrades for small fleet owners. Staff will continue to monitor the program for on-going accelerated activity that may affect the overall funding need.

Metrics of Success

The Truck Loan Assistance Program helps small business truckers affected by the In-Use Truck and Bus Regulation. The majority of participants are small-business fleet owners with one truck that need to comply with the regulation. The regulatory requirements include extended compliance deadlines for the smallest fleets, with the first requirement for a PM filter beginning on January 1, 2014. The second and third

trucks in a small fleet are currently required to have a PM filter by January 1, 2015 and January 1, 2016, respectively. Regulatory amendments to be considered by the Board at its April meeting would extend these deadlines by one to two years. Staff anticipates that future funding plans will maintain funding for the program to continue support for small-business fleets through the compliance deadlines ultimately approved by the Board. Staff proposes to measure the success of the program by evaluating overall small fleet compliance with final regulatory requirements. When significant compliance has been achieved (for example, less than five percent noncompliance with final regulatory requirements), staff anticipates recommending discontinuing the program.