

State of California
AIR RESOURCES BOARD

**Final Statement of Reasons for Rulemaking,
Including Summary of Comments and Agency Response**

PUBLIC HEARING TO CONSIDER MINOR MODIFICATIONS TO THE ZERO EMISSION
VEHICLE REGULATION

Public Hearing Date: October 24, 2013
Agenda Item No.: 13-9-4

I. GENERAL

- A.** At its October 24, 2013 public hearing, the Air Resources Board (ARB or Board) approved for adoption proposed amendments to the California Code of Regulations title 13, sections 1962.1 and 1962.2, and the associated test procedures. These regulations relate to the Board's Zero Emission Vehicle (ZEV) program, which requires auto manufacturers to develop and commercialize ZEV technologies.

The Staff Report: Initial Statement of Reasons for Rulemaking (staff report), 2013 Minor Modifications to the Zero Emission Vehicle Regulation, released September 4, 2013, is incorporated by reference herein. The staff report contained a description of the rationale for the proposed amendments. On August 29, 2013, all references relied upon and identified in the staff report were made available to the public.

Staff's proposal addressed four issues:

- 1) Adjust the optional Section 177 state¹ compliance path as committed to by the Section 177 states and the manufacturers;
- 2) Maintain a minimum ZEV credit requirement, regardless of model year and use of non-ZEV credits earned in the regulation;
- 3) Correct grammatical and California Code of Regulation reference errors; and
- 4) Amend the fast refueling definition for determining ZEV types.

¹ "Section 177 state" means a state that is administering the California ZEV requirements pursuant to section 177 of the federal Clean Air Act (42 U.S.C. § 7507).

Based on comments received during the 45-day comment period and public testimony, the Board also directed staff to incorporate further modifications to ensure fast refueling credit for Type IV and V ZEVs² through 2017 model year was awarded based on fast refueling use and fuel neutrality.

B. MANDATES AND FISCAL IMPACTS TO LOCAL GOVERNMENTS AND SCHOOL DISTRICTS

The Board has determined that this regulatory action will not result in a mandate to any agency or school district the costs of which are reimbursable by the state pursuant to Part 7 (commencing with section 17500), Division 4, Title 2 or the Government Code.

C. CONSIDERATION OF ALTERNATIVES

For the reasons set forth in the Staff Report, in staff's comments and responses at the hearing, and in this Final Statement of Reasons (FSOR), the Board determined that no alternative considered by the agency would be more effective in carrying out the purpose for which the regulatory action was proposed, or would be as effective as and less burdensome to affected private persons, or would be more cost-effective to affected private persons and equally effective in implementing the statutory policy or other provisions of law than the action taken by the Board.

II. MODIFICATIONS MADE TO THE ORIGINAL PROPOSAL

A. MODIFICATIONS APPROVED AT THE BOARD HEARING AND PROVIDED FOR IN THE 15-DAY COMMENT PERIODS

The following summarizes the substantive modifications and the rationale for making such modifications as released on April 3, 2014 (First Notice), for public comment.

The Board directed staff to retain fast refueling accreditation for ZEVs, so long as it is based on real-world use of the fast refueling and maintains fuel neutrality.

Staff initially modified the existing language to require manufacturers to submit fast refueling usage data in order to qualify for fast refueling credits. Over a 12 month period, manufacturers seeking to earn fast refueling credits are required to submit the miles attributed to fast refueling and total miles driven of all vehicles in the vehicle model. The modifications specify a calculation for fast refueling credits that make such credits proportional to the miles attributed to fast refueling as a fraction of the total miles driven of all vehicles in that vehicle model.

² A "type IV" ZEV is a 200 mile or greater range zero emission vehicle that is fast refueling capable. A "type V" ZEV is a 300 mile or greater range zero emission vehicle that is fast refueling capable.

The data submission requirement did not apply to manufacturers of fuel cell electric vehicles (FCEV), because all miles are attributed to fast refueling hydrogen fueling stations.

After consideration of the public comments received in response to the First Notice, additional modifications of the regulatory text were released for a public comment period on May 8, 2014 (Second Notice). The regulatory text was simplified to award a manufacturer with fast refueling credit for each fast refueling event that occurs within the eligible fleet, not to exceed the total number of fast refueling capable battery electric vehicles (BEV).

B. MINOR MODIFICATIONS

Subsequent to the First and Second Notices mentioned above, staff identified the following additional non-substantive changes to the regulation:

Minor Modifications for the 2009 through 2017 Test Procedure:

Section 4.4(e)(3): The “s” in Section 177 state has been capitalized for correctness, in two separate corrections within the language.

Section 4.4(e)(3)(A): The “s” in Section 177 state has been capitalized for correctness, in two separate corrections within the language.

Section 4.4(e)(3)(E): The “s” in Section 177 state has been capitalized for correctness.

Section 4.4(e)(3)(F): The “s” in Section 177 state has been capitalized for correctness.

Minor Modifications for 1962.2 and incorporated test procedures

1962.2(d)(5)(E)1.e.: The “s” in Section 177 state has been capitalized for correctness.

Section 4.4(e): The “s” in Section 177 state has been capitalized for correctness.

Section 4.5(e)(1)(A): The “s” in Section 177 state has been capitalized for correctness.

Section 4.5(e)(1)(B): The “s” in Section 177 state has been capitalized for correctness.

The above described modifications constitute non-substantial changes to the regulatory text because they more accurately reflect the numbering of a section and correct spelling and grammatical errors, but do not materially alter the requirements or conditions of the proposed rulemaking action.

III. DOCUMENTS INCORPORATED BY REFERENCE

The regulation and the incorporated test procedures adopted by the Executive Officer incorporate by reference the following documents:

1. "California Exhaust Emission Standards and Test Procedures for 2009 through 2017 Model Zero-Emission Vehicles and Hybrid Electric Vehicles in the Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicle Classes", xxxx, xxx, xxxx, http://www.arb.ca.gov/msprog/levprog/test_proc.htm
2. "California Exhaust Emission Standards and Test Procedures for 2018 and Subsequent Model Zero-Emission Vehicles and Hybrid Electric Vehicles in the Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicle Classes", xxxx, xx, xxxx. http://www.arb.ca.gov/msprog/levprog/test_proc.htm
3. SAE J2481 "Utility Factor Definitions for Plug-In Hybrid Electric Vehicles Using 2001 U.S. DOT National Household Travel Survey Data," as revised in September 2010, available at the California Environmental Protection Agency Headquarters, in Sacramento, California.

These documents were incorporated by reference because it would be cumbersome, unduly expensive, and otherwise impractical to publish them in the California Code of Regulations. In addition, some of the documents are copyrighted, and cannot be reprinted or distributed without violating the licensing agreements. The documents are lengthy and highly technical test methods and engineering documents that would add unnecessary additional volume to the regulation. Distribution to all recipients of the California Code of Regulations is not needed because the interested audience for these documents is limited to the technical staff at a portion of reporting facilities, most of whom are already familiar with these methods and documents. Also, the incorporated documents were made available by ARB upon request during the rulemaking action and will continue to be available in the future. The documents are also available from college and public libraries, or may be purchased directly from the publishers.

IV. SUMMARY OF COMMENTS AND AGENCY RESPONSE

Below is a list of those who submitted comments during the 45-day comment period, at the October 24 Board Hearing, or gave oral testimony at the Board Hearing:

<u>Commenter</u>	<u>Affiliation</u>
Barker, David	Subaru, supporting comments from IVM group (IVM)
Baron, Debbie	Mendocino Alcohol Fuel Group (MAFG)
Barrett, Will	American lung Association of California (ALA)
Beach, Brennan	Voltronix (Voltronix)
Becker, Joanna	Private citizen (Becker)
Bienenfeld, Robert*	American Honda Motor Company (Honda)
Blair, Clinton	Jaguar Land Rover, supporting comments from IVM group (IVM)
Cassidy, Bob	Nissan North America (Nissan)
Daniel, Ryan*	Intermediate Volume Manufacturers, including Jaguar Land rover, Mazda, Mitsubishi Motors, Subaru, and Volvo (IVM)
Douglas, Steven*	Alliance of Automobile Manufacturers (Alliance)
Hartrick, Michael*	Chrysler Group LLC (Chrysler)
Hernandez, Paul	California Center for Sustainable Energy (CCSE)
Huss, Christopher	BMW of North America (BMW)
Lord, Michael	Toyota Motor Engineering and Manufacturers North America (Toyota)
Mackle, Trina	Private citizen (Mackle)
McCarthy, Eric	Proterra (Proterra)
Morgan, Ken	Tesla Motors (Tesla)
Mui, Simon	Natural Resources Defense Council (NRDC)
O'Connell, Diarmuid	Tesla Motors (Tesla)
Patterson, David	Mitsubishi Motors R&D of North America, supporting comments from IVM group (IVM)
Rege, Julia*	Global Automakers (Global)
Reichmuth, David*	Union of Concerned Scientists (UCS)
Siefkes, Don*	E100 Ethanol Group (E100)
Siefkes, Don*	Representing E100 Ethanol Group (E100) and Mendocino Alcohol Fuel Group (MAFG)
Solomon, Matt	Northeast States for Coordinated Air Management representing Connecticut Maryland, Massachusetts, New York, Oregon, Rhode Island, Vermont (Signatory States)
Tutt, Eileen	California Electric Transportation Coalition (CaETC)
Webber, Kevin	Toyota Motor Engineering and Manufacturers North America (Toyota)
Wilhelm, Lee	Private citizen (Wilhelm)
Woodard, Tracy	Nissan North America (Nissan)
Yehl, Katherine	Volvo, supporting comments from IVM group (IVM)

The commenters listed above with a single asterisks (*) submitted written comments and gave oral testimony at the October 24 Board Hearing. ARB received multiple

comments from various commenters with the same affiliations. All comments with the same affiliation have been grouped, regardless of the commenter.

During the first 15-day supplemental comment period, the Board received written comments from:

<u>Commenter</u>	<u>Affiliation</u>
Block, Jerome	Private citizen (Block)
Chen, James	Tesla Motors (Tesla)
Douglas, Steven	Alliance of Automobile Manufacturers (Alliance)
Jungreis, Jason	Private citizen (Jungreis)
Kryztopik, Gary	Private citizen (Kryztopik)
Rege, Julia	Global Automakers (Global)
Rhodes, Lawrence	Private citizen (Rhodes)
Siudzinski, Joe	Private citizen (Siudzinski)
van der Water, Cor	Private citizen (van der Water)

During the second 15-day supplemental comment period, the Board received written comments from:

<u>Commenter</u>	<u>Affiliation</u>
Babik, Robert	General Motors (GM)
Beinenfeld, Robert	American Honda Motor, Co (Honda)
Douglas, Steven and Julia	Alliance of Automobile Manufacturers and Association of Global Automakers, Inc (Alliance and Global)
Rege	Tesla Motors (Tesla)
Morgan, Ken	Tesla Motors (Tesla)
Reichmuth, David and Simon	Union of Concerned Scientists and Natural Resources Defense Council (UCS and NRDC)
Mui	

Set forth below is a summary of each objection or recommendation made regarding the specific adoption, amendment, or repeal proposed, together with an explanation of how the proposed action has been changed to accommodate each objection or recommendation, or the reasons for making no change. Only objections or recommendations directed at the agency's proposed action or the procedures followed by the agency in proposing or adopting the action are summarized as permitted by Code of California Regulations, title 2, section 11346.9. Repetitive or irrelevant comments have been aggregated and summarized as a group. A comment is "irrelevant" if it is not specifically directed at the agency's proposed action or to the procedures followed by the agency in proposing or adopting the action. The comments have been grouped by topic whenever applicable.

When comments have been grouped, a brief summary of the comment is given to relay the content of all the comments in the group. All other comments are taken verbatim from documents submitted during the 45-day and 15-day comment periods, or from the October 24, 2013 Board Hearing transcript. Acronyms exclusively used by commenters have been defined by [brackets] throughout this section.

COMMENTS AND TESTIMONY PRESENTED PRIOR TO, OR AT THE OCTOBER 24, 2013 HEARING

A. Comments of Support

1. Comment: Strong support for the goals of the ZEV program. (Proterra)

Support for ARB's proposed amendments to the ZEV regulation. (Nissan, UCS, Signatory States, ALA, Chrysler)

Support for the proposed amendments to the optional Section 177 state compliance path. (Alliance, BMW, Toyota, Chrysler)

Specific support for staff's changes to the pooling provision within the optional Section 177 state compliance path. (Global)

Continued strong support of the ZEV mandate through regulation that encourages all zero emission technologies on a level playing field, and through demonstrating an unwavering commitment to the ZEV mandate as enacted and as recently strengthened. (Tesla)

Agency Response: ARB appreciates support for the staff's recommended changes to the ZEV regulation. The Board adopted the recommended changes to the regulation, with some modification to the fast refueling definition proposal, at its October 24, 2013 hearing.

B. Cap on non-ZEV Credits

2. Comment: Opposition to the proposed cap provision. The cap provision will burden manufacturers unnecessarily by reducing the flexibilities needed to ensure compliance with the ZEV mandate both in California and Section 177 states. (BMW)

Agency Response: The regulatory language adopted as part of the Advanced Clean Car rulemaking in March 2013 did not specify how non-pure ZEV credits could be used in combination to meet a manufacturer's ZEV requirement. Therefore, it is incorrect to assume a reduction in regulatory flexibility. The cap adopted by the Board at the October 24, 2013 board hearing is in line with other caps already in the ZEV regulation.

3. Comment: Strong disagreement with the staff assessment that not placing an overall cap on the use of "non-ZEV" credits might result in a lack of ZEVs in California in certain model years. The so-called "non-ZEV" credits generated by placement in service of BEVx [range extended battery electric vehicles] vehicles in the market or through placement of intelligent car sharing services of ZEVs both target customer groups and market segments which would otherwise shy away from the purchase or lease of a ZEV. If the goal of the ZEV regulation is successful commercialization of ZEVs in California, limiting the compliance flexibility provided by transportation system ZEV credits and BEVx [range extended battery electric vehicles] credits will impede the penetration of consumer demographics these alternative technologies and services would serve, thus reducing substantially ZEV miles traveled by the overall California fleet. (BMW)

Agency Response: The Board does not agree that the cap will reduce the number of ZEVs or the number of ZEV miles traveled, due to the ambiguity in the regulatory language. The ambiguity corrected with the adoption of this cap will ensure a minimum number of pure ZEVs in a given compliance year, and does not restrict a manufacturer from generating non-pure ZEV credits. Additionally, transportation system credits are only allowed to be generated through model year 2017, prior to the implementation of the adopted cap on non-pure ZEV credits. Therefore it is false to assume ZEVs will be promoted in car sharing services due to the existence of the cap, since those credits will not be available to be generated in 2018 and subsequent model years.

4. Comment: Both the transportation system ZEVs and BEVx [range extended battery electric vehicles] require long-term investments, costly advanced technologies, and efforts in establishment of new products in the market place. These compliance flexibilities in the current ZEV mandate involve substantial costs for manufacturers and serve as "fall back" solutions should the pure ZEV market not be as large as mandated by the regulation. The existing caps of 10% for transportation system ZEV credits and 50% for BEVx [range extended battery electric vehicles] credits in fulfilling the minimum ZEV floor are already strong.

Putting a 50% overall cap on the bundle of these provisions only limits manufacturer's flexibility should the BEV and FCV [hydrogen fuel cell vehicle] demand not be as high as hoped for by those manufacturers heavily investing in these new products. (BMW)

Opposition to staff's proposal to introduce an aggregated cap on manufacturers' use of non-ZEV alternatives to help meet the ZEV requirement after 2018. We support the level of flexibility in the current regulation not only because it will encourage early and meaningful action that achieves ZEV program goals, but also because we believe this flexibility is essential for meeting the dramatic increase in overall requirements of the program, particularly after 2018. (Toyota)

Agency Response: Manufacturers are given numerous flexibilities in complying with the ZEV regulation. The ambiguity corrected with the adoption of this cap will ensure a minimum number of pure ZEVs in a given compliance year, and does not restrict a manufacturer from generating non-pure ZEV credits. The Board agrees that some flexibility in a given model year might be limited by this change, however, non-pure ZEV credits will likely be used for compliance more evenly through the life of the regulation.

5. Comment: We disagree with the rationale underlying this proposed change – that the value of alternatives is fundamentally less than that of pure ZEVs. In particular, Toyota believes that so-called “transitional” ZEVs (i.e. PHEVs [plug-in hybrid electric vehicles]), may likely deliver greater aggregate air quality, greenhouse gas reductions and fuel switching benefits over the coming decade than other ZEV alternatives. (Toyota)

Agency Response: The cap for TZEVs was not proposed to be modified at the October 24, 2013 hearing. Staff acknowledges the more favorable treatment of pure ZEVs in the regulation. ZEVs remain essential to obtaining California's long term air quality and climate change goals.

C. **Fast Refueling Definition**

6. Comment: Opposition to the staff's proposed change to the definition of fast refueling. The removal of this credit earning opportunity could set back a program that is only now starting to gain real traction in the original goal of introducing commercially viable ZEVs in the mainstream market. To prohibit a specific technology from earning credits not only fails to solve the problem, it discourages research and development in an area that has great potential to transform the ZEV market - the ultimate goal of the ZEV mandate. We

recommend an alternative to staff's proposal of removing battery swap from fast refueling eligibility. Instead, we propose that manufacturers wishing to receive fast refueling designation submit data on an annual basis to ARB staff showing that their fast refueling technology is both available and in use by customers. ARB staff will then review the submissions and grant fast refueling designations when the goal of the mandate is clearly being fulfilled. Given the nascent stage of this technology, we recommend the Board leave fast refueling designation open to ARB's review, and only consider criteria once the market potential is more clearly understood. (Tesla)

Recommend that alternative to removing battery swap from fast refueling eligibility, manufacturers wishing to receive fast refueling designation should submit annual data to ARB showing that their fast refueling technology is available and in use. (CCSE)

If ARB considers changing their proposal on fast refueling, we would ask that information that actual demonstration of the extended use of those vehicles, electric miles, be demonstrated in a manner that's consistent with sort of the principles established with the extended range battery electric vehicle question that came up during the Advanced Clean Car rulemaking last year. (NRDC)

On the issue of the battery swapping, the crediting issue related to this is important to review in light of the lack of on-the-ground demonstration. Credits that don't result from the direct placement of vehicles certainly don't deserve more credits that aren't based on real world results. So companies that are looking for these types of credits should be required in the future to demonstrate on-the-ground results if they are to receive these types of credit in the future. (ALA)

Should the Board consider allowing ZEV credits for a vehicle with battery swapping capability, recommend the credits be based on a metric related to actual use of the battery swap feature – not solely on vehicle attributes. (Nissan)

Agency Response: Comments noted. The Board voted to retain the fast refueling accreditation for battery swapping, so long as it is based on real-world use of the fast refueling and maintains fuel neutrality. Manufacturers will earn fast refueling credit for fast refueling events within the eligible fleet supported by appropriate documentation. This requirement does not apply to manufacturers of FCEVs.

7. Comment: Support for staff's proposed amendments to the fast refueling provision. (Nissan, Toyota, Global, UCS)

Agency Response: See response to Comment 6.

8. Comment: Issues with the fast fueling proposal by staff because it excludes plug-in electric vehicles. And it does so in two ways by eliminating the opportunity for battery swap in the future and also by restricting the time to recharge to ten minutes rather than 15 (for Type III vehicles) and by saying that the battery or the fuel cell battery has to be 95 percent charged in 15 minutes. For fast charging for electric vehicles, that would destroy the battery. We would like to see the Board and staff consider making sure that the amendment is not exclusive. So we need to make sure that both fuel cell vehicles and battery electric vehicles get the fast fueling credits. (CaIETC)

Agency Response: Comments noted. The fast refueling definition was established to most closely resemble the fast refueling and essentially unlimited daily range experienced with conventional internal combustion engine vehicles. As such, fast charging capable BEVs that take 20 to 30 minutes to regain 80-percent of the vehicle's range do not closely mimic the fueling and range experience of conventional vehicles. See response to Comment 6.

D. Miscellaneous

9. Comment: IVMs [intermediate volume manufacturers] propose the development of a voluntary program that would serve to move IVMs [intermediate volume manufacturers] toward technological and credit equity with the LVMs [large volume manufacturers] through regulatory incentives. This could parallel the regulatory path the LVMs [large volume manufacturers] used to comply with the ZEV Mandate and build credit balances. ARB staff should study the development of a path to compliance and credit equity with LVMs [large volume manufacturers]. Propose some form of transition period to full LVM [large volume manufacturers] status for any OEM [original equipment manufacturer] that falls in between the new more stringent sales criteria. ARB staff should study lengthening the ZEV deficit recovery period. ARB staff should provide some regulatory support for developing an alternative way for IVMs [intermediate volume manufacturers] to participate in the Section 177 state compliance path. Proposed changes to the regulation should be brought back to the Board for action in 2014 to allow maximum planning time for companies once amended regulations are finalized. (IVM)

Agency Response: Comment noted. Resolution 13-41 directs staff to review how the regulation affects intermediate volume manufacturer (IVM) transitioning into large volume manufacturer (LVM) requirements in 2018 and subsequent model years and to return to the Board by December 31, 2014, with a recommendation regarding more fair treatment of these manufacturers.

E. Comments Outside the Scope of the Rulemaking

10. Comment: ARB should consider a formal review of the ZEV regulations, specifically focusing on ZEV sales and use both in California and in the states that have adopted the ZEV regulations. We believe it is appropriate to begin a formal assessment of the ZEV program, including the technology and market of ZEV and near ZEV technologies. We believe a focus should be that despite identical requirements, the sales rate in the Section 177 states is not equal to the rate in California, and the Board and ZEV Staff should assess this potential issue and determine whether adjustments might be appropriate in the future. (Alliance, BMW, Toyota)

Agency Response: The Board did not consider including a review of the regulations in its regulatory proposal, and therefore this comment is outside the scope of the rulemaking.

11. Comment: Please reconsider your ZEV portfolio by allowing bicycles to count. Please provide the citizens of California with an equitable, affordable, healthy, and truly zero-emissions transportation option. (Wilhelm)

Cycling should not be left out of the ARB's Zero Emission Vehicle Program. (Mackle)

Agency Response: The ZEV regulation applies to manufacturers who produce new vehicles in California. Bicycles do not receive, nor are proposed to receive any credit and accordingly are outside the scope of this rulemaking.

12. Comment: To allow EV [electric vehicle] conversions, altering this model is required, and we believe relatively simple changes to the ZEV program that allow battery companies or other aggregators to generate and sell ZEV credits on behalf of customers who make the conversions could be implemented in a way that preserves the program's integrity. We believe strict qualifying criteria can be established for entries seeking to register and sell ZEV credits. We can also lay out precise eligibility requirements for what type of conversion would and would not qualify. We can make it clear that vehicles getting ZEV credits are equivalent

to what is regulated under the ZEV program. The State DMV [California Department of Motor Vehicles] could issue a “conversion certificate” when a converted car is ready to go back on the road which would trigger the issuance of a ZEV certificate which could be negotiate through a clearing house or one of the vendors involved in the conversion. It is also possible a third party – perhaps with experience already running state energy and environmental programs – could also be enlisted to carry out this function. (Voltronix)

Agency Response: The ZEV regulation applies to manufacturers who produce new vehicles in California. Converted electric vehicles do not receive, nor are proposed to receive any credit and accordingly are outside the scope of this rulemaking.

13. Comment: The ARB needs to include life cycle CO₂ [carbon dioxide] emissions from motor fuel in the ZEV program. The simplest, lowest way to do this is a mandate that 50% of all light-duty vehicles sold in California after January 1, 2017, be E100 [ethanol-100] capable with strict mileage requirements. (E100, MAFG)

Agency Response: This comment addresses a new regulatory structure based on non-ZEV technologies. The Board did not consider a new regulatory structure, and therefore this comment falls outside the scope of the rulemaking.

14. Comment: Please make E100 [ethanol-100] fuel an option for zero emissions in California. (Becker)

Consider granting ZEV status to optimized ethanol engines running on E98 [ethanol-98] Ethanol fuel. (MAFG)

Agency Response: The Board did not consider a proposal to change the definition of a ZEV, and therefore this comment fall outside the scope of this rulemaking.

15. Comment: The ARB should consider modifications to the ZEV program to apply to medium- and heavy-duty vehicles over 14,000 pounds, as large vehicles contribute the majority of on-road, cancer-causing, toxic diesel particulate pollution and associated exposures affecting communities in California. Refining the ZEV program to include zero-emission vehicles over 14,000 pounds would achieve the greatest tons per dollar reductions associated with the program and accelerate the program’s health benefits. Allowing the ZEV program to include

larger vehicle will leverage private dollars to help modernize the fleet and eliminate toxic diesel emissions, thus cleaning the air and alleviating toxic exposures. (Proterra, EVI)

Agency Response: The ZEV regulation applies to light- and medium-duty vehicles, not heavy-duty vehicles. Heavy-duty vehicles do not receive, nor are proposed to receive any credits in the ZEV regulation and are accordingly outside the scope of this rulemaking.

16. Comment: Allowing auto manufacturers to purchase ZEV credits from manufacturers of larger ZEVs and allowing these credits to fulfill light-duty manufacturers' ZEV requirements will provide a substantial net air quality benefit. (Proterra)

Agency Response: The ZEV regulation applies to light- and medium-duty vehicles, not heavy-duty vehicles. Heavy-duty vehicles do not receive, nor are proposed to receive any credits in the ZEV regulation and are accordingly outside the scope of this rulemaking.

COMMENTS PRESENTED DURING THE FIRST POST-BOARD HEARING COMMENT PERIOD

Regulatory Comments

Comments grouped in this section responded to specific changes made available on April 4, 2014 through April 18, 2014.

1. Comment: I urge CARB to abandon its misguided proposals to change its ZEV credit system. (Jungreis)

Agency Response: The purpose of modifications to the fast refueling definition was to prevent gaming and awarding credit for technology not in actual use. The Board agreed, and directed staff to ensure all fast refueling credits are given based on usage, rather than mere capability. This direction makes sense as it provides for a technology neutral approach to awarding fast refueling designation. The final modifications ensure fast refueling capability and use are verified before additional credits are awarded.

2. Comment: Your recent changes to the rules have the net effect of decreasing \$ (sic) credits to Tesla Motor Company. Your rule changes cause decreased availability of \$ (sic) credits to Tesla are foolish and ill-advised. Tesla Motor Company is at an early stage in its development. You must give this company further financial incentives to allow it to thrive. This development takes time. We strongly protest your actions. (Block)

Agency Response: The Board directed staff to ensure all fast refueling credits are given based on usage, rather than just on capability. The final modifications ensure fast refueling capability and use are verified before additional credits are awarded.

3. Comment: I respectfully request the Board to reconsider the change to the rules that only credits will be given for vehicles capable of refueling within 15 minutes, since this new requirement has no benefit for the air quality and it will lead to more peak load to the electric grid, so it will cause a problem that does not exist today with fast charging in the order of ½ hour period. The shortening of the charging time has no benefits and causes higher stresses on EV [electric vehicle] batteries and grid, making it more difficult to implement and thus hindering the availability of clean air vehicles that are so successful today, the EVs [electric vehicle]. I request you to remove the 15 minute limit for fast charging. (van de Water)

Agency Response: The purpose of the modifications to the fast refueling definition was to address qualification by battery swap, not by quick charging capability. There is no proven negative impact to vehicles or batteries capable of battery swap within the 15 minute limit. Additionally, the fast refueling provision does not require BEVs to fast charge.

4. Comment: This “minor” change appears to be an intentional hurdle thrown into the EV industry, which should have all of our support. (Kryztopik)

Agency Response: See response to 15-day Comment 1.

5. Comment: Fast refueling, especially at the UDDS [urban dynamometer drive schedule]/time rates identified, is a metric that is irrelevant to Zero Emissions, and should not be part of the requirements. Please shift your paradigm away from the “gasoline station” concept – it belongs in the last century! (Sludzinski)

Agency Response: No modifications were made to the 15-minute and 10-minute time qualification as fast refueling capable. These limits are appropriate to ensure hydrogen fuel cell vehicles are held to relevant technical standards.

6. Comment: Support for ARB’s 15-day modification proposal. Specifically, support for credits that incentivize innovative technologies or processes that enhance the customer’s use of their ZEV. Support for crediting vehicles based on use and supporting evidence. Support for the exception for the proposed reporting and data collection requirements for fast refueling for fuel cell vehicles. (Global)

Support for the concept that fast refueling credits should be proportional to the amount of driving that utilizes fast refueling. Support for ARB’s recommendation for FCVs [hydrogen fuel cell electric vehicles] receiving full fast refueling credit with no data submission required. (Alliance)

Agency Response: ARB appreciates support for its first 15-day proposal. However, based on comments received during the first 15-day comment period, requirements were simplified, and rely upon individual fast refueling events, instead of miles accumulated. These modifications are in-line with the principles of the Board's direction and first 15-day modifications, and further simplify reporting requirements.

7. Comment: The reporting requirements proposed in the regulation are unnecessarily burdensome and recommend changes that would reduce this burden while still providing the ARB confidence in the fast refueling credit. Instead of the prescriptive requirements proposed in the regulation, we recommend the Executive Officer approve a demonstration plan, which includes total fleet miles attributed to fast refueling based on good engineering judgment that includes statistical samples and documentation on fast refueling. Commenter provided specific regulatory language in comment. (Alliance)

ARB's proposed amendment, on the other hand would create a significant administrative burden associated with earning the fast refueling credits. As proposed, Tesla would be required to identify by VIN [vehicle identification number], each vehicle in the state of California that may utilize battery swap. The Company must log each of these events cross-referencing to VIN [vehicle identification number] and tracing the mileage for each vehicle. Tracking swap information, pulling mileage information from vehicle logs, decoding the logs and cross-referencing by VIN [vehicle identification number] will require many administrative man-hours and dedicated firmware and hardware resources. (Tesla)

Agency Response: Comments noted. ARB believes the further simplified reporting requirements, made available during the second 15-day comment period are in-line with the Board's direction. These requirements are necessary to collect the information needed to make the determination of the applicable number of fast refueling credits to be awarded to a manufacturer.

8. Comment: We do not believe the staff proposal provides sufficient incentive for manufacturers to install fast refueling systems, in our case, a battery swap network. An opportunity to increase ZEV sales by improving their utility with the expanded availability of fast recharging would be lost if the staff proposal were finalized. ARB staff's current proposal would award credits based on battery swap's (sic) usage relative to that of well-established BEV charging methods such as home and public stations. If the goal of the fast refueling provision is to create an incentive for manufacturers to invest in new technologies that improve the ZEV ownership experience, then ARB should not base its fast refueling incentive on implementation relative to much more established technologies. The incentive should be based, instead, on the implementation milestones of the new technology by itself, and not tied to the success of other technologies. By making the comparison of available and in use ARB establishes a structure

whereby the success of Tesla's Supercharger network actually takes away from our ability to earn ZEV credits. Every incremental Supercharger mile would mean less credits earned from our battery swap miles. This is counterproductive and does not further the goals of the mandate to maximize ZEV adoption. (Tesla)

Agency Response: Comment noted. The modified fast refueling definition bases credits on individual fast refueling events. This will ensure credit is given to the appropriate fast refueling technology.

9. Comment: Require a manufacturer to achieve a percentage of refueling events (e.g., battery swaps) based on the eligible fleet in a given model year in order to earn fast refueling credits for the entire eligible fleet. The required percentage of refueling events to earn credits would increase each year, 2015 through 2017. For example, Tesla recommends a threshold of 5% swaps for the eligible fleet for model year 2015. No fast refueling credits would be earned by the manufacturer until that threshold is met. Under this approach, a manufacturer delivering 10,000 fast refueling capable ZEVs in California would need to perform at least 500 fast refueling events before it could obtain a fast refueling designation for the fleet. Our proposal provides a stronger incentive for available only if fast refueling is actually used. This approach is consistent with the Board's direction. In addition to providing a simpler and objective measure that encourages innovative technology introduction and use, our proposal also minimizes administrative burdens in implementation by tying credits to the number of fast refueling events, rather than miles. (Tesla)

Agency Response: The suggested approach would not guarantee usage by the capable fleet. The Board directed staff to ensure capability and usage before awarding credit. Therefore, the suggested approach is outside the direction of the Board and Resolution 13-41.

COMMENTS PRESENTED DURING THE SECOND POST-BOARD HEARING COMMENT PERIOD

Regulatory Comments

Comments grouped in this section responded to specific changes made available on May 8, 2014 through May 23, 2014.

1. Comment: Manufacturers should be able to earn credits across multiple calendar years. Proposed section 1962.1(d)(5)(B)(1)(b) states that fast refueling capability will be assigned to a given model year based on the total number of fast refueling events performed "*during the year*". This language appears to establish that, for a given model year, a manufacturer only has one calendar year in which to earn credits for fast refueling. However, such limits do not further the

goal of increasing ZEV miles over the entire useful life of a ZEV. All fast refueling events constitute “use” and increase total electric miles travelled. Therefore, no time restrictions should be placed on the ability to count these events. There is clearly an incentive for manufacturers to promote the use of fast refueling technology as soon as possible, as credits are not earned until after the events are performed. (Tesla)

Agency Response: The Board believes the final fast refueling definition and requirements for qualification strikes a balance of allowing flexibility and placing limits to ensure the appropriate number of vehicles are credited as fast refueling capable via battery swap. The limit of one year of reporting to earn this credit is balanced with the flexibility of a 25-fast refueling event cap for one vehicle.

2. Comment: All fast refueling events should count toward a manufacturer’s total. Proposed section 1962.1(d)(5)(B)(1)(b)(C) establishes that only the first twenty five fast refueling events performed on an individual ZEV will count toward the manufacturer’s total. This restriction unfairly removes credit for all fast refueling events occurring after the individual vehicle cap is reached. We believe that the “in use” requirement should be considered satisfied whenever electric miles are enabled by a fast refueling event, and that no arbitrary limits should be placed on the number of eligible fast refueling events per vehicle. Therefore, within a given model year it should not matter which vehicles are performing the fast refueling events, since each event increases the number of electric miles travelled regardless of which ZEV is utilizing the capability. Moreover, it is likely that the majority of battery swap electric miles will result from high-frequency applications such as livery fleet use. These high-frequency use cases fulfill the goals of the ZEV mandate and have the potential to offset large amounts of CO₂ [carbon monoxide] emissions. With this in mind, we encourage ARB to revise its language to count fast refueling events on a vehicle-neutral basis. (Tesla)

Agency Response: Each fast refueling event is treated as though it is earned by a unique individual vehicle. ARB is providing flexibility by allowing an individual vehicle to earn credits for multiple fast refueling events. This flexibility is appropriate, given some vehicles will use this service more than others, depending on trip route. The 25 fast refueling event cap was determined to be the appropriate limit per car because only a small percentage of trips on average will need fast refueling. According to the SAE J2841 (revised Sep 2010), about 3% to 6% percent of trips cannot be made with the range of the fast refuel capable ZEV. Translated over the course of a year, that means about 10 and 20 times per year a car would need fast refueling. Placing a cap is appropriate to prevent gaming.

3. Comment: All ZEVs utilizing fast refueling stations in California should count toward a manufacturer’s total number of fast refueling events. Section 1962.1(d)(5)(B)(1)(b) states that the fast refueling event count is segmented based on the model year of the vehicles performing the events. We would like ARB to confirm that in practice the total event count will not be limited to vehicles that were originally delivered and placed into service in California. For example, if

a vehicle of a given model year was originally placed in Nevada but travels to California and uses battery swap infrastructure in California, the manufacturer should be able to count this fast refueling event toward its total. This approach is justified as a battery swap performed in California leads to electric miles in the state and clearly demonstrates that the fast refueling infrastructure is “in use”. (Tesla)

Agency Response: Only vehicles delivered for sale and placed in service in California will be eligible for fast refueling credit. Vehicles delivered for sale and placed in service in a non-Section 177 state are not eligible for any credit within the ZEV regulation and will not qualify for fast refueling credits, even if fast refueling events occur within California or a Section 177 state. The “eligible fleet” only refers to those vehicles placed within California or a Section 177 state. Therefore vehicles with VINs not found in the applicable DMV registration database would not be considered part of the “eligible fleet”. To be able to track and verify the validity of the submitted fast refueling event data, it would not be appropriate to allow events performed by vehicles not part of the “eligible fleet”.

4. Comment: We believe that ARB should create an incentive for manufacturer’s to develop a comprehensive network of fast refueling stations by adding a utilization target whereby the entire fleet qualifies for fast refueling credits. Under this scenario a manufacturer would still receive credit for each fast refueling event as currently proposed, however, if a manufacturer achieves the target utilization level with its fast refueling infrastructure ARB would issue a revised executive order qualifying the entire model year for fast refueling credits. For example, if a manufacturer performs MY2017 fast refueling events equal to 20% of its total MY2017 California fleet, the manufacturer should receive an executive order classifying the MY2017 fleet as eligible for fast refueling credits. This creates an incentive for manufacturers to achieve a high level of adoption of the technology. In order to avoid “double counting” of credits under this approach, ARB should continue to enforce the maximum ZEV credit ceiling as described in section 1962.1(d)(5)(B)(1)(b)(A). Given the wide range of convenient refueling options available to BEV owners, as well as the relatively narrow use case that battery swap addresses, we believe that the 20% threshold for MY2017 would represent a successful implementation of swap technology. By comparison, Tesla’s Supercharger network is considered widely successful given its availability and use during long-distance travel. However, these charging events represent only a small portion of the total charging events performed by our customers. This is not due to a lack of utility, but rather the fact that the majority of customer travel is for short distances where home charging is the preferred refueling method. Regardless, these Supercharger stations make a positive impact on the environment and further the goal of increasing EV [electric vehicle] adoption by assuring consumers that Tesla’s long-range EVs [electric vehicles] can satisfy 100% of their driving needs. Implementing the threshold for full model year qualification will greatly encourage investments in battery swap technology and

infrastructure, and will help strengthen the case for consumer adoption of BEVs. (Tesla)

Agency Response: The Board does not believe that such a threshold would be appropriate given the direction of the Board for the credits to be awarded based on actual usage. Given that the first 25 fast refueling events performed on any individual vehicle shall count towards the total number of events, a 20% threshold could mean that as little as 0.8% of the fleet would need to be fast refueling in order for 100% of the fleet to be eligible for fast refueling credits. For example, assuming 10,000 vehicles are sold in a given model year, 2,000 fast refueling events are needed to reach the threshold; in which case only 80 vehicles, each fast refueling 25 times within the year (or roughly 13 round trips), would allow for all 10,000 vehicles to earn the fast refueling credits. Thus, credits would be awarded based on only the actual usage of a fraction of the vehicles, which is inconsistent with the Board's direction.

5. Comment: GM believes it is appropriate for the ARB to provide additional credit for fast refueling. Fast refueling results in more electric miles traveled and makes ZEVs more competitive with conventional vehicles, both of which are important toward meeting the overall goals of the ZEV regulation. We believe the opportunity to earn fast refueling credit should be technology neutral, including not just fuel cell and battery swap, but also fast charge at recharge rates that can be met by today's electric vehicles that have DC [direct current] fast-charge capability. (GM, Alliance and Global)

ARB should ensure that whatever usage metric is chosen applies equally to fast charge as it does to battery swap, consistent with ARB's long-held policy of technology-neutrality. (GM)

Consistent with the principle of technology neutrality, we request that current DC [direct current] fast charge also be considered for fast refueling credit provided that adequate usage can be shown. (Alliance and Global)

Agency Response: Fast-charge capability via direct current charging is not prohibited from meeting the definition of a fast refueling capable vehicle, as long as the fueling event occurs within the allotted time limits. To amend the definition of the fast refueling time limit or miles regained would be beyond the direction of the Board provided at the October 2013 Board Meeting.

6. Comment: We believe the amount of credit should be more closely aligned with usage than the ARB has proposed in the Second Notice. Based on our understanding of the Second Notice, credit could be given to vehicles that are capable of fast refueling but rarely if ever use fast refueling in the real world. Specifically, the Second Notice proposes that each fast refueling event that occurs during the year provides fast refueling credit for one vehicle that is capable of fast refueling, regardless of whether or not that particular vehicles

receiving credit for a maximum of 25 fast refueling events. This means that a manufacturer that produces 2500 ZEVs capable of fast refueling in a model year could get fast refueling credit for all 2500 of them if just 100 vehicles actually use fast refueling 25 times each. In other words, 2400, or 96% of the vehicles would never use fast refueling at all but would still receive credit. Alternatively, if each of the 2500 vehicles use fast refueling just one time, the manufacturer would receive full credit for fast refueling. Assuming the average EV [electric vehicle] owner recharges once per day using either 110V [volt] or 220V [volt], this would mean that one in 365 over the course of the year, or just .27%, are fast refueling and yet full fast refueling credit would be given. While battery swap and fast charge are not going to have the same 100% fast refueling rate as fuel cell vehicles, we believe fast refueling should be readily available and used consistent with EV [electric vehicle] drivers needs for fast refueling in order to justify full credit. (GM)

Based on our understanding of the Second Notice, credit could be given to vehicles that are capable of fast refueling but never use fast refueling. Specifically, the Second Notice proposes that each fast refueling event that occurs during the year provides fast refueling credit for one vehicle that is capable of fast refueling, regardless of whether or not the vehicle receiving credit actually uses fast refueling. The only limitation is that any one vehicle can only receive credit for a maximum of 25 fast refueling events. Under this scenario, the use of fast refueling capability on as low as 4% of the vehicles in a potentially capable fleet provides credit for all of the vehicles in that fleet. Looked at another way, a single vehicle could generate up to 125 ZEV credits. (Alliance and Global)

The 2nd 15-day proposed ZEV rule changes allows for a single vehicle to generate fast refueling credits up to 25 times, effectively allowing a single vehicle to qualify other vehicles that did not have a fast refueling event. We urge ARB to strengthen this metric so that credits are awarded on a vehicle-basis, allowing vehicles that have utilized fast refueling to generate the additional credit for the vehicle only. As an example of the potential impacts, this metric would allow a single vehicle, that would otherwise be classified as a Type III and be awarded 4 ZEV credits, to gain an additional 125 credits by swapping 25 times, equivalent to the number of credits generated by sales of 42 battery electric vehicles with 125 miles of range. As another example, this metric would allow a manufacturer to fast refuel as little as 4% of a ZEV fleet to qualify all vehicles of that type as fast refueling. In addition, not all of the miles of those 4% would need to be enable by fast refueling to garner the maximum allowable credit, such that fast refueling could enable as little as 2% of the fleet vehicle miles and yet the entire fleet would receive credit as fast refueled vehicles. As such, the allowance of credits to vehicles that do not actually fast refuel fails to meet the “strong metrics’ that the Board requested. (NRDC and UCS)

Agency Response: The 25-vehicle limit recognizes not all fast refueling capable (via battery swap) vehicles in a fleet will perform a fast refueling event in a given year. The changes made in the 2nd 15-day notice are aimed at striking a reasonable and appropriate balance between a strict credit based on miles attributed to fast refueling approach and simple capability to fast refuel approach. Staff's first proposal was based on the first approach, but it was to some degree flawed as it limited the credit unfairly. FCEVs are fast refuel capable and fast refuel all the time, but would not need to all the time if they had other convenient methods of refueling (home fueling like home charging for example). On the other hand providing all ZEVs with the capability if some of them demonstrate the actual use is also not appropriate since it does not take into account the availability, convenience and value of the fast refuel method. So by allowing fast refuel designation based on fast refuel events with a limit of 25 per vehicle was determined to be the best balance between the two extremes.

7. Comment: This second revision is, perhaps, too generous. Allowing a single battery-swap event to represent the utility envisioned by the agency is simply too low of a threshold. It seems that the Air Resources Board could create a formula to determine the number of battery swaps necessary to approximate the conventional vehicle utility that is being sought. By using SAEJ2841 (Revised Sep 2010) it can be estimated what percent of days and trips cannot be achieved by the EV's [electric vehicle's] range. If we assume that days and trips exceeding an EV's [electric vehicle's] range are candidates for battery swap, we can arrive at the number of battery swaps that would approximate conventional vehicle parity. Higher range vehicles should need fewer battery swaps and lower range vehicles should require significantly more battery swaps. Another factor at play, of course is the ubiquity of the battery swap stations. (Honda)

Agency Response: Commenter makes an interesting suggestion that would require additional evaluation before we can determine whether it merits further changes. At this time, the Board does not believe the suggested changes are warranted and believes the changes as specified in the second 15-day notice represent a reasonable and appropriate approach to ensure the credits provided are tied to actual fast refueling events. Therefore, no additional changes were made; staff may consider the points made by the commenter for possible incorporation into the ZEV regulation when additional amendments are evaluated in a future rulemaking.

8. Comment: The current structure of the ARB's proposed fast refueling language could actually have the perverse effect of crediting a technology rarely if ever used and provide zero credit to one that regularly uses a DC [direct current] fast charger. By focusing on the outcome and by looking to actual versus theoretical or potential use, CARB will achieve its goal of more electric miles driven with an abundance of confidence that the electric miles driven with a fast charge are real and not just conceptual. (GM)

The demonstration of capability should more closely reflect a broader real-world usage in the fleet than ARB proposed in the Second Notice. Allowing multiple vehicle credit generation by a single vehicle does not ensure designs are acceptable to a broad range of customers. This is also not consistent with other ZEV credit mechanisms that operate more on a per vehicle basis, even though mechanisms might recognize that actual use need not occur on a regular basis for any particular vehicle. (Alliance and Global)

Agency Response: The Board recognizes the benefits of increased ZEV miles over a vehicle's life. However, the purpose of the fast refueling definition is to credit those vehicles that are comparable in refueling time to a gasoline vehicle. Additionally, the Board directed staff to develop modified requirements that fast refueling functionality is based on usage, which the final language achieves.

9. Comment: The entire MY 2015-2017 annual requirements are roughly 80,000 ZEV credits needed for ZEVs and TZEVs based on our estimates. As we have noted elsewhere last October, the number of industry credits already banked enough (sic) credits to comply through MY 2017 purely on banked credits. We are strongly concerned that, based on our calculations, that as little as 640 Type V vehicles that received the full 25 swap credits each under the current amendments could be enough to meet the entire industry's annual ZEV standards between MY 2015 – 2017. We believe two options are to either create strong metrics to limit the total credits from fast refueling or, otherwise, make the ZEV requirements significantly stronger to offset potential sales that are undercut. (NRDC and UCS)

Agency Response: The Board believes the final fast refueling definition and requirements for qualification strikes a reasonable and appropriate balance of allowing flexibility and placing limits to ensure the appropriate number of vehicles are credited as fast refueling capable via battery swap. However, staff may consider the points made by the commenter for possible incorporation into the ZEV regulation when additional amendments are evaluated in a future rulemaking.

10. Comment: ARB should adopt a minimum number of fast refueling events that must occur for each vehicle in order for that individual vehicle to receive a Type IV or V credit. The proposed regulation allows a vehicle to have a single fast refueling event and yet qualify for the highest level of ZEV credit (Type V). This is also far short of a "strong" metric". The threshold level to receive credits needs to be set a level high enough to prevent credits from being generated by one or two battery swaps, such as might occur as part of a maintenance procedure. (NRDC and UCS)

Agency Response: A minimum number (1) has been established for qualification under this modified fast refueling definition. It is reasonable to assume long distance trips might only be taken once a year for some drivers.

11. Comment: ARB should ensure that adequate documentation is provided on all fast refueling events. Finally, ARB should also require a manufacturer that is submitting documentation of potential qualifying fast refueling events to disclose all fast refueling events that occurred with that vehicle. This disclosure is needed in order for ARB to determine whether a particular battery swap enabled increased electric miles. Multiple battery swaps in a short time period would indicate that the battery swap was not a qualifying fast refueling event. However, ARB will be unaware of multiple rapid swaps if a manufacturer chooses to disclose only some of the swap events. (NRDC and UCS)

While we support fast refueling credits, we believe it is important for ARB to consider the range of applications upon which fast-refueling credits could be generated. It is clear that the credits earned from fast refueling have significant value, and may result in unusual incentives. Combining a fast-refueling event with a tire rotation or other inexpensive service, for example, could generate credits in a way not originally envisioned by the Board. (Honda)

Agency Response: Comment noted. The Board believes the language adopted as modified provides specificity for ARB to determine that fast refueling events are attributed to miles driven from that refueling event.