

State of California
AIR RESOURCES BOARD

Resolution 01-1

January 25, 2001

Agenda Item No.: 01-01-1

WHEREAS, sections 39600 and 39601 of the Health and Safety Code authorize the Air Resources Board (the Board or ARB) to adopt standards, rules and regulations and to do such acts as may be necessary for the proper execution of the powers and duties granted to and imposed upon the Board by law;

WHEREAS, in section 43000 of the Health and Safety Code, the Legislature has declared that the emission of air pollutants from motor vehicles is the primary cause of air pollution in many parts of the State, and sections 39002 and 39003 of the Health and Safety Code charge the Board with the responsibility of air pollution control from motor vehicles;

WHEREAS, sections 43013, 43101, and 43104 of the Health and Safety Code authorize the Board to adopt emission standards and test procedures to control air pollution caused by motor vehicles;

WHEREAS, section 43018(a) of the Health and Safety Code directs the Board to endeavor to achieve the maximum degree of emission reduction possible from vehicular and other mobile sources in order to accomplish the attainment of state ambient air quality standards at the earliest practicable date;

WHEREAS, section 43018(c) of the Health and Safety Code provides that in carrying out section 43018, the Board shall adopt standards and regulations that will result in the most cost-effective combination of control measures on all classes of motor vehicles and motor vehicle fuel, including but not limited to reductions in motor vehicle exhaust and evaporative emissions, and reductions in in-use vehicular emissions through durability and performance improvements;

WHEREAS, the California State Implementation Plan (SIP) for ozone, adopted by the Board in November 1994, establishes the state strategy for attaining the ambient air quality standard for ozone in all areas of the state by 2010 as required by federal law; this plan includes, as part of the mobile source element developed by the ARB, the California Low-Emission Vehicle (LEV) program, which was approved by the Board in

1990 to provide significant reductions of ozone precursor pollutant emissions from passenger cars and light-duty trucks;

WHEREAS, the California LEV program includes a zero-emission vehicle (ZEV) element – now contained in section 1962, title 13, California Code of Regulations and the incorporated “California Exhaust Emission Standards and Test Procedures for 2003 and Subsequent Model Zero-Emission Vehicles, and 2001 and Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes” – under which at least 10 percent of the passenger cars and lightest light-duty trucks produced by a large or intermediate-volume manufacturer and delivered for sale in California must be ZEVs, beginning in model year 2003;

WHEREAS, large-volume manufacturers are permitted to satisfy up to 6 percent of the 10 percent ZEV requirement with larger numbers of partial ZEV allowance vehicles (PZEVs) reflecting near-zero emitting technologies, and intermediate volume manufacturers may meet the entire 10 percent obligation via that route; the ZEV regulation also includes a number of credit generation and trading components that provide significant flexibility in meeting the requirements;

WHEREAS, with respect to the environment, ZEVs are the "gold standard" for vehicular air pollution control as they reduce both criteria and toxic pollutant emissions to the maximum feasible extent; high-efficiency ZEVs and hybrid electric near-ZEVs also cut emissions of carbon dioxide and other greenhouse gases;

WHEREAS, in Resolution 90-58 approving adoption of the regulations creating the California LEV program, the Board directed the staff to consult with the regulated industry and other interested parties and to prepare a report regarding the status of the implementation of the LEV program – including the ZEV requirement – for submission to the Board at least every two years;

WHEREAS, in March and May of 2000, ARB staff held public workshops to solicit information regarding the status and issues related to the ZEV program such as vehicle and battery technology, infrastructure, marketability, cost, and environmental benefits as part of the biennial review process;

WHEREAS, the ARB staff evaluated the vehicle technologies and concluded that there are no technological barriers to building battery powered ZEVs but issues of cost and consumer acceptance remain; with regard to near-zero emission vehicles, technology exists which allows vehicles to achieve the required level of performance;

WHEREAS, to obtain the best available information on battery advances, costs and future trends, the ARB contracted with a Battery Panel composed of three outside

experts; the Panel concluded that nickel metal hydride (NiMH) batteries are the most promising advanced technology – having both high performance and the longest useful life – but also that NiMH battery costs are high and that mass production and further technological development is needed to reduce those costs;

WHEREAS, staff's cost analysis concludes that both the initial and lifecycle costs of battery electric vehicles will significantly exceed those of comparable conventional vehicles in the 2003 timeframe; however, with volume production and improved technology, battery electric vehicles could ultimately become competitive on a lifecycle cost basis;

WHEREAS, at its September 7-8, 2000 meeting, the Board in Resolution 00-29 directed the staff to develop and propose regulatory modifications and other steps that address the challenges associated with the successful long-term implementation of the ZEV program – in particular the need for product availability and market stability, the need to greatly enhance public awareness and education of the attributes and benefits of ZEV technologies, and the need to reduce or mitigate the high initial costs of vehicles and batteries in low-volume production – and that result in a sustainable market for ZEVs;

WHEREAS, the staff held a workshop in October 2000 to solicit input from industry and interested stakeholders on strategies and approaches for addressing the Board's September 2000 resolution;

WHEREAS, in conjunction with a public hearing notice dated December 8, 2000, the staff has proposed a comprehensive set of amendments to the zero-emission vehicle regulation and related regulatory definitions; the initially proposed amendments are set forth in Attachment A hereto and include the following primary elements:

The establishment of phase-in multipliers for the introduction of ZEVs and partial ZEV allowance vehicles that would provide a smooth introduction in the early years; ZEVs introduced before the 2006 model year would receive multipliers of 4.0 for the 2001 and 2002 model years and 1.25 for the 2003-2005 model years, and the proposed phase-in level for PZEVs is 25 percent of the current requirement in 2003, 50 percent in 2004, 75 percent in 2005, and 100 percent in 2006;

A reduction in credits earned by neighborhood electric vehicles, which have a top speed of no more than 25 miles per hour; credits for such vehicles would be reduced to 0.5 for the 2004 and 2005 model years and 0.15 for 2006 and subsequent years;

An increase in the amount of PZEV allowance to 0.25 for vehicles with advanced ZEV components; a PZEV power-assist hybrid-electric vehicle would earn an allowance of 0.45, before any phase-in multipliers;

Modification of the ZEV extended range multiplier to reduce the minimum range needed for multiple credits to 50 miles; as range increases from 50 miles to 275 miles, the credit would increase from 1 to 10 in a linear fashion;

The opportunity for hybrid-electric vehicles (HEVs) that have an all electric range of 20 miles or more, and also meet the basic PZEV requirements, to satisfy the 4 percent pure ZEV requirement; the credits earned by such vehicles would be calculated according to their zero emission range and adjusted to reflect the fact that the effective range of such vehicles is greater than that of pure battery electric vehicles due to their hybrid powertrains;

The opportunity for advanced technology PZEVs, and credits from ZEVs or extended range HEVs placed as part of a transportation system, to satisfy up to one half of the 4 percent portion of the pure ZEV requirement; the advanced technologies would include both PZEVs qualifying for an allowance of 0.4 or more and allowances earned by manufacturers placing ZEVs or extended range HEVs within a "transportation system;"

Providing additional credits for ZEVs and extended range HEVs in California service for more than three years with an extended battery/fuel cell stack warranty; these vehicles would receive an additional credit of 0.1 times the original credit value of the vehicle for each year that a vehicle remains in service in California past three years with extended warranty coverage on the battery or fuel cell stack;

Providing a credit multiplier based on vehicle efficiency, phased in beginning in 2005; the efficiency multiplier would be limited to ZEVs and advanced technology PZEVs;

Requiring vehicle placement in order to earn multiple allowances, making the sales volume used to determine manufacturers' ZEV obligation in a given year a function of vehicle sales in a prior three year period, and freezing the volume number for three years at a time;

Increasing the maximum size cut-off for an intermediate volume manufacturer from 35,000 to 60,000 new light- and medium-duty vehicles per model year; providing that when a manufacturer transitions from intermediate to large volume manufacturer, there would be no "pure" ZEV obligation for the manufacturer until

the sixth model year after three consecutive model years over the large manufacturer threshold; and exempting an independently owned manufacturer with California sales of light- and medium-duty vehicles not exceeding 10,000 per year from the ZEV requirement; and

An increase in the 10 percent ZEV requirement for large and medium-volume manufacturers to 11 percent for the 2009-2011 model years, 12 percent for the 2012-2014 model years, 14 percent for the 2015-2017 model years, and 16 percent for 2018 and subsequent model years; as the ZEV requirement increases starting in the 2009 model year, the portion that could be satisfied by 0.2 allowance PZEVs is held at 6 percent and the pure ZEV portion that can be satisfied by advanced technologies is limited to 50 percent of the total;

WHEREAS, at the January 25, 2001 hearing on the proposal, staff has suggested several modifications to the original proposal; these modifications are set forth in Attachment C hereto and include changing the way the high efficiency multiplier is calculated, making the new ZEV multiplier provisions applicable to 2000 model year vehicles, and correcting the ZEV multiplier calculation;

WHEREAS, the California Environmental Quality Act and Board regulations require that no project which may have significant adverse environmental impacts be adopted as originally proposed if feasible alternatives or mitigation measures are available to reduce or eliminate such impacts;

WHEREAS, a public hearing and other administrative proceedings have been held in accordance with the provisions of Chapter 3.5 (commencing with section 11340), Part 1, Division 3, Title 2 of the Government Code;

WHEREAS, the Board has considered the effect of the proposed amendments on the economy of the State;

WHEREAS, the Board finds that:

Although significant strides have been made toward improving California's air quality, health-based state and federal air quality standards continue to be exceeded in regions throughout California; the federal 1-hour ozone standard is exceeded in the South Coast Air Basin, San Diego County, the San Joaquin Valley, the Southeast Desert, the greater Sacramento area and Ventura County, and more areas of the State are likely to be designated as being in nonattainment of the new federal eight-hour ozone standard;

Ozone in the lower atmosphere is created by the photochemical reaction of ROG and NO_x, and leads to harmful respiratory effects including lung damage, chest pain, coughing, and shortness of breath, especially affecting children and persons with compromised respiratory systems;

ZEVs represent the cleanest, most advanced technologies available; the commercialization of ZEVs through regulatory requirements and other incentives is critical to the long-term success of California's clean air program;

The amendments approved herein to the rate and timing required for the introduction of ZEVs and PZEVs are needed to better reflect the availability of PZEVs and the emerging market for ZEVs and to take advantage of the air quality benefits afforded by the technologies;

The amendments approved herein to the ZEV and PZEV incentive structure provide increased flexibility for manufacturers to pursue specific strategies that in their view offer long term promise;

The phased reduction in available credits for neighborhood electric vehicles is necessary and appropriate because their overall functionality is much less than is the case for full function ZEVs;

The amendments approved herein increasing the percentage ZEV requirements for the 2009 and subsequent model years are necessary and appropriate to further expand the ZEV fleet with its attendant emissions benefits;

Overall, the amendments approved herein represent the most effective path towards maintaining progress towards commercialization of ZEVs while recognizing the near term constraints due to cost, lead time, and technical challenges; and

The LEV and ZEV program biennial review mechanism has recently resulted in needless uncertainty and delay as interested parties have awaited completion of the review process.

WHEREAS, the Board further finds that:

The amendments approved herein are expected to result in a 2010 net increase of about 0.14 tons per day of direct emissions of ROG and NO_x combined in the South Coast Air Basin, with this increase almost entirely due to changes in the PZEV phase in provisions; indirect 2010 emissions would increase by about 0.05 tons per day of ROG + NO_x; and 2020 direct emissions of ROG + NO_x are

expected to decrease by about 0.08 tons per day in the South Coast Air Basin; overall, this will not constitute a significant adverse environmental impact; and

The amendments approved herein will not have any significant adverse impacts on the environment in areas other than air quality.

WHEREAS, the Board further finds that:

The expected savings resulting from the proposed amendments in model year 2003 range from about \$130 million (if vehicle manufacturers were to meet their collective ZEV obligations with 100 percent NEVs under both the current and amended regulation) to more than \$400 million (if vehicle manufacturers were to meet their collective ZEV obligations with 100 percent full function EVs under both scenarios); the savings in model year 2004 would be less than in 2003, due to the increased volume of PZEV production required as the PZEV phase-in multiplier is reduced; and

While the amendments approved herein will significantly improve the cost-effectiveness of the ZEV requirements, they will still result in higher costs per ton of pollution reduced than any other ARB regulatory measure; nevertheless, the amended ZEV regulations remain an essential component of the State's long-term air quality strategy because of the promise and ultimate necessity of zero-emission technologies.

NOW, THEREFORE, BE IT RESOLVED that the Board hereby approves the amendments to title 13, California Code of Regulations, sections 1900, 1960.1(k), 1961 and 1962, set forth in Attachment A hereto, and approves the amendments to the "California Exhaust Emission Standards and Test Procedures for 2003 and Subsequent Model Zero-Emission Vehicles, and 2001 and Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes" as set forth in Attachment B hereto, with the modifications to both that are set forth in Attachment C hereto, and with the following additional modifications, consistent with reflecting the "red line" full-function electric vehicle plus City EV introduction scenario shown as "2x staff proposal phase-in in '07" in Attachment D hereto:

Compared to the modified staff proposal and accounting for increased numbers of ZEVs resulting from the other modifications listed below, approximately double the number of ZEVs required by the 2012 model year, with the ramp up beginning in the 2007 model year;

Add light-duty trucks with a loaded vehicle weight of 3751 pounds or more (the "LDT2" class, which includes most sport utility vehicles) to the current passenger

car and LDT1 classes that form the baseline of vehicles against which the ZEV percentage requirements are applied, phasing in this additional element during the 2007 through 2012 model years;

For the large volume manufacturer requirements, do not allow extended range HEVs to be counted towards meeting the core 20 percent of the manufacturer's percentage ZEV requirement that can otherwise only be satisfied by ZEVs or credits from ZEVs; however, along with allowing extended range HEVs to be counted towards the next 20 percent of the manufacturer's percentage ZEV requirement, allow an appropriate level of enhanced credit, to be identified in the modified regulatory language by the Executive Officer, in order to incentivize these vehicles;

Eliminate the modification proposed by staff that allowed 2000 model-year vehicles to receive ZEV phase-in multipliers; and

Revise the credit relationship between fuel cell vehicles and battery electric vehicles in the later implementation years, to address the current disparity under which a manufacturer could comply with far fewer fuel cell vehicles than would be the case with battery electric vehicles.

BE IT FURTHER RESOLVED that the Board directs the Executive Officer to incorporate into the approved amendments the modifications described above, with such other conforming modifications as may be appropriate, and then to adopt the modified amendments, after making the modified regulatory language available for public comment for a period of 15 days, provided that the Executive Officer shall consider such written comments regarding the modified text as may be submitted during this period, shall make modifications as may be appropriate in light of the comments received, and shall present the regulations to the Board for further consideration if he determines that this is warranted.

BE IT FURTHER RESOLVED that, notwithstanding the positive efforts made to date by ZEV advocacy groups and others to educate the public about ZEVs, additional public education will be a necessary part of the successful implementation of the ZEV program; the Board directs staff to continue to work with all ZEV stakeholders in developing and implementing an outreach and public education plan for ZEVs, building on the work already done.

BE IT FURTHER RESOLVED that the Board directs staff to initiate, and take the necessary steps for, the formation of a statewide working group to assess the need for additional incentive or subsidy programs to reduce or mitigate the high initial costs of vehicles and batteries in low-volume production, and to identify and prioritize

appropriate mechanisms for providing such programs, if needed; staff is directed to provide coordination and administrative support for the efforts of the statewide working group, and to additionally explore ways in which purchases or leases of ZEVs by state and local government fleet operators can be substantially expanded.

BE IT FURTHER RESOLVED that the Board directs staff to initiate the formation of a statewide working group to address a variety of infrastructure issues including the development of programs that support, maintain and expand public infrastructure for electric vehicles, and the assessment of additional incentives to offset the costs of infrastructure installation, with a particular focus on incentives for workplace infrastructure.

BE IT FURTHER RESOLVED that the Board shall work to establish an implementation partnership focusing on incentives for station cars and encouraging sustainable transportation systems.

BE IT FURTHER RESOLVED that the Board directs staff to begin the regulatory process for the standardization of charging technologies, including soliciting input from stakeholders, holding a public workshop, and bringing a regulatory proposal for the Board's consideration later this year.

BE IT FURTHER RESOLVED that the staff shall no longer routinely report to the Board at least every two years regarding the status of the implementation of the LEV and ZEV programs; however, staff shall continue to monitor implementation progress and report to the Board when appropriate.

BE IT FURTHER RESOLVED that the Executive Officer is directed to expand and institutionalize an environmental justice program in which lower income communities of color are actively solicited to participate in the Board's rulemaking programs.

BE IT FURTHER RESOLVED that the Executive Officer shall immediately work with representatives of the four states that have adopted the California ZEV requirements pursuant to section 177 of the Clean Air Act, and with other stakeholders including motor vehicle manufacturers, to assure that the ZEV requirements are implemented in those states in a workable way that recognizes the particular challenges faced by manufacturers introducing ZEVs in the Northeast during the initial years of the program, and that contributes to a successful long term ZEV program.

BE IT FURTHER RESOLVED that the Executive Officer shall investigate whether the definition of zero-emission vehicle should be expanded to include electric motorcycles and the degree to which credits generated by such vehicles should be available for use in complying with the percentage ZEV requirements, and shall report back to the Board

on this matter this summer.

BE IT FURTHER RESOLVED that the Executive Officer shall investigate appropriate mechanisms under which credits from heavy-duty ZEVs having a gross vehicle weight exceeding 14,000 pounds could be generated for use in complying with the percentage ZEV requirements, and shall propose regulatory amendments to implement such mechanisms as appropriate.

BE IT FURTHER RESOLVED that the Board hereby determines that the regulations approved herein will not cause California motor vehicle emission standards, in the aggregate, to be less protective of public health and welfare than applicable federal standards.

BE IT FURTHER RESOLVED that the Board hereby finds that separate California emission standards and test procedures are necessary to meet compelling and extraordinary conditions.

BE IT FURTHER RESOLVED that the Board finds that the California emission standards and test procedures as approved herein will not cause the California requirements to be inconsistent with section 202(a) of the Clean Air Act and raise no new issues affecting previous waiver determinations of the Administrator of the Environmental Protection Agency pursuant to section 209(b) of the Clean Air Act.

BE IT FURTHER RESOLVED that the Executive Officer shall, upon adoption, forward the amended regulations to the U.S. Environmental Protection Agency with a request either for a waiver of federal preemption pursuant to section 209(b) of the Clean Air Act, or a confirmation that the amendments are within the scope of previous waivers.

I hereby certify that the above is a true and correct copy of Resolution 01-1, as adopted by the Air Resources Board.

Marie Kavan
Marie Kavan, Clerk of the Board

Marie Kavan
Clerk of the Board

01-1-103

Resolution 01-1

January 25, 2001

Identification of Attachments to the Resolution

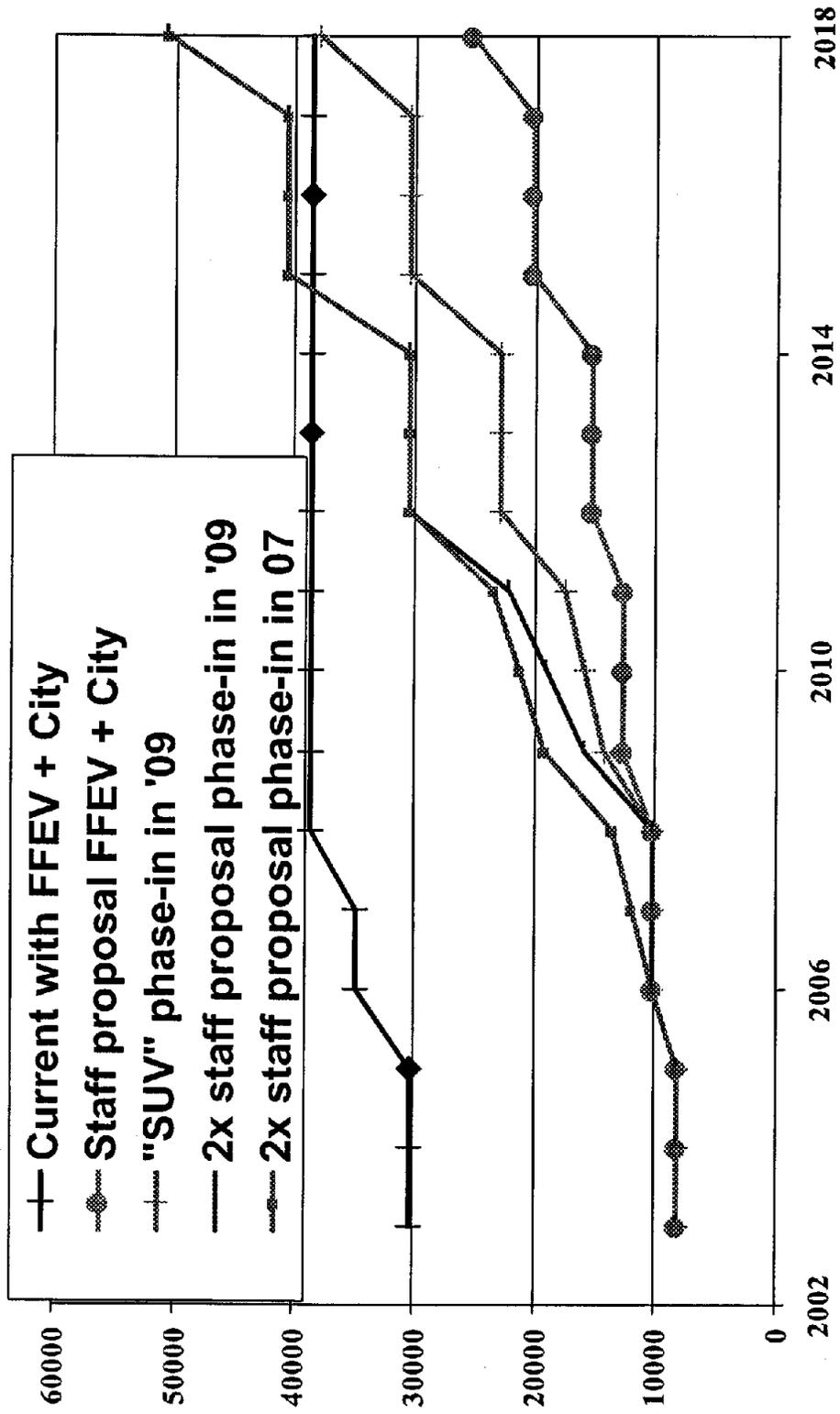
Attachment A: Proposed Regulation Order, as set forth in Appendix A-1 of the Staff Report: Initial Statement of Reasons

Attachment B: Proposed Amendments to the "California Exhaust Emission Standards and Test Procedures for 2003 and Subsequent Model Zero-Emission Vehicles, and 2001 and Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes," as set forth in Appendix A-2 of the Staff Report: Initial Statement of Reasons

Attachment C: "Staff's Suggested Modifications to the Original Proposal," as presented at the January 25, 2001 hearing

Attachment D: "FFEV + City Scenarios" graph presented by staff at the January 25, 2001 hearing, showing five alternative implementation scenarios: Current with FFEV + City; Staff proposal FFEV + City; "SUV" phase-in in '09; 2x staff proposal phase-in in '09; and 2x staff proposal phase-in in '07

FFEV + City Scenarios



* "FFEVs": full function electric vehicles

State of California
AIR RESOURCES BOARD

**Notice of Decision and
Response to Significant Environmental Issues**

Item: NOTICE OF PUBLIC HEARING TO CONSIDER AMENDMENTS TO THE
CALIFORNIA ZERO-EMISSION REGULATIONS

Approved by: Resolution 01-1

Adopted by: Executive Order G-02-009
Executed: April 12, 2002

Agenda Item No.: 01-01-1

Public Hearing Date: January 25, 2001

Issuing Authority: Air Resources Board (ARB or Board)

Staff Report: The Staff Report: Initial Statement of Reasons contained a chapter analyzing the environmental impacts of the proposed amendments pursuant to section 60005, title 13, California Code of Regulations (CCR). The originally proposed amendments made substantial changes to the Board's zero-emission vehicle (ZEV) regulation (section 1962, title 13, CCR) as last amended in the 1998-99 "LEV II" rulemaking. The ZEV regulation's percentage ZEV requirements now apply starting in the 2003 model year, but manufacturers have been taking various steps to comply – including generating early introduction credits – for some time.

Consistent with past ARB practices, the Staff Report compared the anticipated environmental impacts of the proposed amendments to the environmental conditions if no amendments were adopted and manufacturers were accordingly required to comply with the outstanding ZEV regulation. The ZEV requirements were originally adopted in a 1990-1991 rulemaking, and then were amended in rulemakings conducted in 1992-1993, 1996, and 1998-1999. In each rulemaking the Board had conducted environmental reviews of the amendments. If a project such as a rulemaking is amending previously adopted regulations that were subject to environmental reviews, an agency may appropriately conduct its new environmental review solely on

the impact of the amendments on the preexisting regulation. See *Black Property Owners Association v. City of Berkeley*, 22 Cal.App. 974, 985-986 (1994), *Benton v. Board of Supervisors*, 226 Cal.App. 3d 1467, 1475-1482 (1991) and *Temecula Band of Luisino Mission Indians v. Rancho California Water Dist.*, 43 Cal.App. 4th 425, 437-438 (1996).

The originally proposed amendments had the overall effect of significantly reducing the overall number of ZEVs that needed to be marketed, particularly in the nearer term. The proposed amendments phased in the production of vehicles generating partial ZEV allowances (PZEVs). The Staff Report estimated that the proposed amendments would increase direct emissions of reactive organic gases plus oxides of nitrogen (ROG + NOx) by 0.14 tons per day in the South Coast Air Basin in 2010. In 2020, the comparable figure was a net decrease of 0.08 tons per day of ROG + NOx.

Comments and Responses:

In written comments submitted two days before the January 25 hearing, General Motors (GM) argued that the ARB should consider the environmental impacts of the proposed amendments compared to not having any ZEV requirements. It further asserted that the amended ZEV requirements would actually increase emissions of ROG + NOx in the state. This was because GM claimed the ZEV requirements would result in price increases for new California vehicles that would cause the public to keep older, higher emitting vehicles on the road longer, and the increased emissions from the reduction in "fleet-turnover" would more than offset the emission benefits from the new vehicle fleet resulting from the ZEV program. GM's claims of increased emissions were largely based on a January 2001 report by National Economic Research Associates, Inc. and Sierra Research, Inc. entitled "Impacts of Alternative ZEV Sales Mandates on California Motor Vehicle Emissions: A Comprehensive Study" (the NERA/Sierra Report). It presented a number of emission scenarios, with the "base case" showing an increase in emissions of 2.72 tpd ROG + NOx in the South Coast Air Basin in 2010, with a 1.63 tpd increase in 2020.

On October 31, 2001, the ARB announced it was adding to the rulemaking record a comprehensive ARB Staff Review of the NERA/Sierra Report. This Staff Review is attached to

the Final Statement of Reasons for this rulemaking, which, along with its three supplements, is incorporated herein. The Staff Review identified a number of respects in which NERA/Sierra's incremental cost assumptions were too high based on current information. Using more reasonable staff assumptions rather than the assumptions used in the NERA/Sierra analysis, the NERA/Sierra model projected an average per vehicle increased cost of roughly \$25 to \$40 per vehicle for the fleet of new vehicles whose prices would be affected by the ZEV requirements – compared to the \$250 to \$400 estimated in the NERA/Sierra Report. The staff concluded that at these modest levels, such increases would have an insignificant effect on vehicle sales. Even if one accepts the NERA/Sierra premise that any price increase, no matter how small, will reduce vehicle sales in accordance with the NERA/Sierra model, staff's emissions analysis using the EMFAC 2001 ver. 2.07 draft emissions model indicated that that the ZEV program as amended in this rulemaking – when compared to having no ZEV requirements – will result in an emission decrease rather than the emission increase alleged in the NERA/Sierra Report.

On November 15, 2001, GM submitted comments prepared by NERA/Sierra on the cost estimates in the Staff Review, and on November 30 GM and the Alliance of Automobile Manufacturers submitted comments on the staff's emissions analyses. These comments updated the modeling work presented in the January NERA/Sierra report to reflect the most recent regulatory modifications, discussed various points made by ARB staff in its Staff Review, and again asserted the ZEV program as amended would lead to an emission increase rather than decrease. But the most recent NERA/Sierra analysis shows an emissions increase from the ZEV program as amended herein only for scenarios that reject or nullify two major cost reductions identified by ARB staff, which together accounted for nearly 40 percent of the purported price increase. NERA/Sierra has not presented results for a scenario that incorporates all ARB cost assumptions and therefore has not demonstrated that the modified program results in an emission increase when using those assumptions. The incorporated Final Statement of Reasons contains the staff's response to these additional comments.

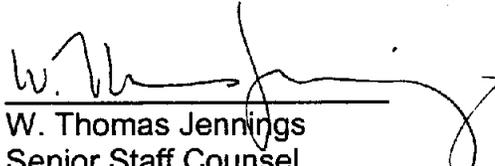
On February 25, 2002, three parties submitted a *Supplemental Critique of the California Zero Emissions*

Vehicle Mandate Regulatory Changes Proposed by the California Air Resources Board Staff in October and November 2001, prepared by NERA/Sierra. The comments in the Critique and the ARB's responses are contained in the Third Supplement to the Final Statement of Reasons, which is incorporated herein.

A few additional comments identifying significant environmental issues were received. These comments are summarized and responded to in the Final Statement of Reasons.

Resolution 01-1 and Executive Order G-02-009 are incorporated herein and attached hereto. In those documents the ARB made various findings pertaining to potential environmental impacts of the amendments. The ARB found that the proposed regulations would not have any significant adverse environmental impacts.

Certified:



W. Thomas Jennings
Senior Staff Counsel

Date:

April 12, 2002

Rec'd By
Office of the Secretary

APR 12 2002

Resources Agency of California

Resolution 01-1

January 25, 2001

Identification of Attachments to the Resolution

Attachment A: Proposed Regulation Order, as set forth in Appendix A-1 of the Staff Report: Initial Statement of Reasons

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State of California
AIR RESOURCES BOARD

**Notice of Decision and
Response to Significant Environmental Issues**

Item: NOTICE OF PUBLIC HEARING TO CONSIDER AMENDMENTS TO THE
CALIFORNIA ZERO-EMISSION REGULATIONS

Approved by: Resolution 01-1

Adopted by: Executive Order G-01-058
Executed: December 7, 2001

*Rec'd By
Office of the Secretary*

Agenda Item No.: 01-01-1

DEC - 7 2001

Public Hearing Date: January 25, 2001

Resources Agency of California

Issuing Authority: Air Resources Board (ARB or Board)

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Consistent with past ARB practices, the Staff Report compared the anticipated environmental impacts of the proposed amendments to the environmental conditions if no amendments were adopted and manufacturers were accordingly required to comply with the outstanding ZEV regulation. The ZEV requirements were originally adopted in a 1990-1991 rulemaking, and then were amended in rulemakings conducted in 1992-1993, 1996, and 1998-1999. In each rulemaking the Board had conducted environmental reviews of the amendments. If a project such as a rulemaking is amending previously adopted regulations that were subject to environmental reviews, an agency may appropriately conduct its new environmental review solely on

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In written comments submitted two days before the January 25 hearing, General Motors (GM) argued that the ARB should consider the environmental impacts of the proposed amendments compared to not having any ZEV requirements. It further asserted that the amended ZEV requirements would actually increase emissions of ROG + NO_x in the state. This was because GM claimed the ZEV requirements would result in price increases for new California vehicles that would cause the public to keep older, higher emitting vehicles on the road longer, and the increased emissions from the reduction in "fleet-turnover" would more than offset the emission benefits from the new vehicle fleet resulting from the ZEV program. GM's claims of increased emissions were largely based on a January 2001 report by National Economic Research Associates, Inc. and Sierra Research, Inc. entitled "Impacts of Alternative ZEV Sales Mandates on California Motor Vehicle Emissions: A Comprehensive Study" (the NERA/Sierra Report). It presented a number of emission scenarios, with the "base case" showing an increase in emissions of 2.72 tpd ROG + NO_x in the South Coast Air Basin in 2010, with a 1.63 tpd increase in 2020.

On October 31, 2001, the ARB announced it was adding to the rulemaking record a comprehensive ARB staff review of the NERA/Sierra Report. This Staff Review is attached to

the Final Statement of Reasons for this rulemaking, which is incorporated herein. The Staff Review identified a number of respects in which NERA/Sierra's incremental cost assumptions were too high based on current information. Using more reasonable staff assumptions rather than the assumptions used in the NERA/Sierra analysis, the NERA/Sierra model projected an average per vehicle increased cost of roughly \$25 to \$40 per vehicle for the fleet of new vehicles whose prices would be affected by the ZEV requirements – compared to the \$250 to \$400 estimated in the NERA/Sierra Report. The staff concluded that at these modest levels, such increases would have an insignificant effect on vehicle sales. Even if one accepts the NERA/Sierra premise that any price increase, no matter how small, will reduce vehicle sales in accordance with the NERA/Sierra model, staff's emissions analysis using the EMFAC 2001 ver. 2.07 draft emissions model indicated that that the ZEV program as amended in this rulemaking – when compared to having no ZEV requirements – will result in an emission decrease rather than the emission increase alleged in the NERA/Sierra Report.

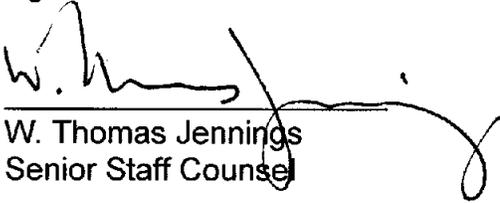
On November 15, 2001, GM submitted comments prepared by NERA/Sierra on the cost estimates in the Staff Review, and on November 30 GM and the Alliance of Automobile Manufacturers submitted comments on the staff's emissions analyses. These comments updated the modeling work presented in the January NERA/Sierra report to reflect the most recent regulatory modifications, discussed various points made by ARB staff in its Staff Review, and again asserted the ZEV program as amended would lead to an emission increase rather than decrease. But the most recent NERA/Sierra analysis shows an emissions increase from the ZEV program as amended herein only for scenarios that reject or nullify two major cost reductions identified by ARB staff, which together accounted for nearly 40 percent of the purported price increase. NERA/Sierra has not presented results for a scenario that incorporates all ARB cost assumptions and therefore has not demonstrated that the modified program results in an emission increase when using those assumptions. The incorporated Final Statement of Reasons contains the staff's response to these additional comments.

A few additional comments identifying significant environmental issues were received. These comments are

summarized and responded to in the Final Statement of Reasons.

Resolution 01-1 and Executive Order G-01-058 are incorporated herein and attached hereto. In those documents the ARB made various findings pertaining to potential environmental impacts of the amendments. The ARB found that the proposed regulations would not have any significant adverse environmental impacts.

Certified:



W. Thomas Jennings
Senior Staff Counsel

Date:

December 7, 2001

ATTACHMENT C

PUBLIC HEARING TO CONSIDER PROPOSED AMENDMENTS TO THE CALIFORNIA ZERO EMISSION VEHICLE PROGRAM REGULATIONS

Staff's Suggested Modifications to the Original Proposal

TO BE PRESENTED AT THE JANUARY 25, 2001 HEARING
OF THE AIR RESOURCES BOARD

The following text contains staff's suggested modifications to the originally proposed amendments to the California zero emission vehicle (ZEV) regulation, and the incorporated "California Exhaust Emission Standards and Test Procedures For 2003 and Subsequent Model Zero-Emission Vehicles, and 2001 And Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck And Medium-Duty Vehicle Classes." The text of the originally proposed amendments is shown in underline to indicate additions and ~~strikeout~~ to indicate deletions. The modifications now proposed by staff are shown in double underline to indicate additions and ~~double-strikeout~~ to show deletions. The italicized commentaries provide explanations of the reasons for the suggested modifications to the original proposal and are not part of the regulations. All proposed modifications will be made available to the public for a supplemental fifteen-day comment period prior to final adoption.

PROPOSED REGULATION ORDER

AMENDMENTS TO THE CALIFORNIA ZERO-EMISSION VEHICLE REGULATION

Amend section 1962, title 13, California Code of Regulations, to read as follows:

§ 1962. Zero-Emission Vehicle Standards for New 2003 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles.

Zero-Emission Vehicle Standards

(a) *ZEV Emission Standard.* The Executive Officer shall certify new 2003 and subsequent model passenger cars, light-duty trucks and medium-duty vehicles as ZEVs if the vehicles produce zero exhaust emissions of any criteria pollutant (or precursor pollutant) under any and all possible operational modes and conditions. Incorporation of a fuel-fired heater shall not preclude a vehicle from being certified as a ZEV provided: (1) the fuel-fired heater cannot be operated at ambient temperatures above 40°F, (2) the heater is demonstrated to have zero fuel evaporative emissions under any and all possible operational modes and conditions, and (3) the emissions of any pollutant from the fuel-fired heater when operated at an ambient temperature between 68°F and 86°F do not exceed the emission standard for that pollutant for a ULEV under section 1961(a)(1).

A vehicle that would meet the emissions standards for a ZEV except that it uses a fuel-fired heater that can be operated at ambient temperatures above 40°F, that cannot be demonstrated to have zero fuel evaporative emissions under any and all possible operation modes and conditions, or that has emissions of any pollutant exceeding the emission standard for that pollutant for a ULEV under section 1961(a)(1), shall be certified based on the emission level of the fuel-fired heater.

(b) *Percentage ZEV Requirements*

(1) *General Percentage ZEV Requirement.* The minimum percentage ZEV requirement for each manufacturer in 2003 and subsequent model years is listed that at least 10% in the table below as the percentage of the PCs and LDT1s produced by the manufacturer and delivered for sale in California that must be ZEVs, subject to the conditions in this section 1962(b). A manufacturer's volume of PCs and LDT1s produced and delivered for sale in California will be averaged for the 1997, 1998, and 1999 model years to determine the California PC and LDT1 production volume for the 2003 to 2005 ZEV requirements. For subsequent three-year periods following 2003 to 2005, a manufacturer's California PC and LDT1 production volume will be based on a three-year average of the manufacturer's volume of PCs and LDT1s produced and delivered for sale in California in the prior fourth, fifth and sixth years (e.g. 2006 to 2008 model-year ZEV requirements will be based on California PC and LDT1 production volumes for 2000 to 2002 model years). This production averaging is used to determine ZEV requirements only, and has no effect on a manufacturer's size determination. In applying the ZEV requirement, a PC or LDT1 that is produced by a small volume manufacturer, but is

marketed in California by another manufacturer under the other manufacturer's nameplate, shall be treated as having been produced by the marketing manufacturer.

<i>Model Years</i>	<i>Minimum ZEV Requirement</i>
<u>2003 through 2008</u>	<u>10 percent</u>
<u>2009 through 2011</u>	<u>11 percent</u>
<u>2012 through 2014</u>	<u>12 percent</u>
<u>2015 through 2017</u>	<u>14 percent</u>
<u>2018 and subsequent</u>	<u>16 percent</u>

(1)(2) Basic Requirements for Large Volume, Intermediate Volume, Independent Low Volume, and Small Volume Manufacturers.

(A) *Large Volume Manufacturers.* In 2003 and subsequent through 2008 model years, a large-volume manufacturer must meet at least ~~40%~~ 20% of its ZEV requirement with ZEVs, ~~full ZEV allowance vehicles, extended range HEVs, or ZEV credits generated by such vehicles, and at least another 20% with ZEVs, extended range HEVs, advanced technology PZEVs, or credits generated by such vehicles.~~ The remainder of the large-volume manufacturer's ZEV requirement may be met using ~~partial ZEV allowance vehicles~~ PZEVs or credits generated by such vehicles. As the ZEV requirement increases over time (from 10% in 2003 to 16% in 2018), the maximum portion of the ZEV requirement that may be satisfied by 0.2 allowance PZEVs, or credits generated by such vehicles, is limited to 6% of the manufacturer's applicable California PC and LDT1 production volume; advanced technology PZEVs or credits generated by such vehicles may be used to meet up to one half of the manufacturer's remaining ZEV requirement.

(B) *Intermediate Volume Manufacturers.* In 2003 and subsequent model years, an intermediate volume manufacturer may meet its ZEV requirement with up to 100 percent partial ZEV allowance vehicles or credits generated by such vehicles.

(C) *Small Volume Manufacturers and Independent Low Volume Manufacturers.* A small volume manufacturer or an independent low volume manufacturer is not required to meet the percentage ZEV requirements. However, a small volume manufacturer or an independent low volume manufacturer may earn and market credits for the ZEVs, extended range HEVs or ~~ZEV allowance vehicles~~ PZEVs it produces and delivers for sale in California.

(2)(3) Counting ZEVs, Extended Range HEVs, and ZEV Allowance Vehicles PZEVs in Fleet Average NMOG Calculations. ~~Vehicles certified as ZEVs and as full ZEV allowance vehicles shall be counted as ZEVs~~ For the purposes of calculating a manufacturer's fleet average NMOG value and NMOG credits under sections 1961(b) and (c), a vehicle certified as a ZEV or as an extended range HEV is counted as one ZEV, and a Partial ZEV allowance vehicles shall be PZEV is counted as one SULEVs certified to the 150,000 mile standards for the purpose of calculating a manufacturer's fleet average NMOG value and NMOG credits under sections 1961(b) and (e), regardless of any ZEV or PZEV multipliers.

~~(3)~~(4) *Implementation Prior to 2003 Model Year.* Prior to the 2003 model year, a manufacturer that voluntarily produces vehicles meeting the ZEV emission standards applicable to 2003 and subsequent model year vehicles may certify the vehicles to those standards and requirements for purposes of calculating fleet average NMOG exhaust emission values and NMOG credits under sections 1961(b) and (c), and for calculating ZEV credits as set forth in section 1962(d)(g).

(4)(5) *Changes in Small Volume, Independent Low Volume, and Intermediate Volume Manufacturer Status.* In 2003 and subsequent model years, if a small volume manufacturer's average California production volume exceeds 4,500 units of new PCs, LDTs, and MDVs based on the average number of vehicles produced and delivered for sale for the three previous consecutive model years, or if an independent low volume manufacturer's average California production volume exceeds 10,000 units of new PCs, LDTs, and MDVs based on the average number of vehicles produced and delivered for sale for the three previous consecutive model years, or if an intermediate volume manufacturer's average California production volume exceeds ~~35,000~~ 60,000 units of new PCs, LDTs, and MDVs based on the average number of vehicles produced and delivered for sale for the three previous consecutive model years, the manufacturer shall no longer be treated as a small volume, independent low volume, or intermediate volume manufacturer, as applicable, and shall comply with the ZEV requirements for independent low volume, intermediate volume or large volume manufacturers, as applicable, beginning with the ~~fourth~~ sixth model year after the last of the three consecutive model years. If a manufacturer's average California production volume falls below 4,500, 10,000 or ~~35,000~~ 60,000 units of new PCs, LDTs, and MDVs, as applicable, based on the average number of vehicles produced and delivered for sale for the three previous consecutive model years, the manufacturer shall be treated as a small volume, independent low volume, or intermediate volume manufacturer, as applicable, and shall be subject to the requirements for a small volume, independent low volume, or intermediate volume manufacturer beginning with the next model year. In determining small volume manufacturer status, vehicles produced by one manufacturer and marketed in California by another manufacturer under the other manufacturer's nameplate shall be treated as part of the California production volume of the sales of the marketing manufacturer.

(c) *Partial and Full ZEV Allowance Vehicles (PZEVs).*

(1) *Introduction.* This section 1962(c) sets forth the criteria for identifying vehicles delivered for sale in California as ~~partial or full ZEV allowance vehicles~~ PZEVs. A ~~partial ZEV allowance vehicle~~ PZEV is a vehicle that is ~~delivered for sale in California and that cannot be certified as a ZEV but qualifies for a partial PZEV allowance of at least 0.2 but less than 1.0.~~ A full ZEV allowance vehicle is a vehicle that is delivered for sale in California and that qualifies for a ZEV allowance of 1.0. An extended range HEV is not treated as a PZEV, and is instead subject to the ZEV multipliers in section 1962(d).

(2) *Baseline Partial PZEV Allowance.* In order for a vehicle to be eligible to receive a ~~partial or full~~ PZEV allowance, the manufacturer must demonstrate compliance with all of the following requirements. A qualifying vehicle will receive a baseline ~~partial~~ PZEV allowance of 0.2.

(A) SULEV Standards. Certify the vehicle to the 150,000-mile SULEV exhaust emission standards for PCs and LDTs in section 1961(a)(1) (for model years 2003 through 2006, existing SULEV intermediate compliance standards shall apply to all PZEVs);

(B) Evaporative Emissions. Certify the vehicle to the evaporative emission standards in section 1976(b)(1)(E) (“zero” evaporative emissions standards);

(C) OBD. Certify that the vehicle will meet the applicable on-board diagnostic requirements in section 1968.1 for 150,000 miles; and

(D) Extended Warranty. Extend the performance and defects warranty period set forth in sections 2037(b)(2) and 2038(b)(2) to 15 years or 150,000 miles, whichever occurs first. For all HEVs, the battery must be included as a warranty item.

Commentary: Subsection headings are added here and later in the document for clarity. The added language under Extended Warranty makes clear staff’s intent that the 150,000-mile warranty applies to the batteries used in HEVs.

(3) Zero-Emission VMT Partial PZEV Allowance.

(A) Equation. A vehicle that meets the requirements of section 1962(c)(2) and has zero-emission vehicle miles traveled (“VMT”) capability will generate an additional PZEV allowance, not to exceed 0.6, according to the following equation:

$$\text{Zero-Emission VMT Partial PZEV Allowance} = 0.6 \times \text{Zero-Emission VMT Factor}$$

where zero-emission VMT factor is the ratio of the zero-emission miles the vehicle travels to the total miles traveled per trip.

(B) Calculation of Zero Emission VMT Factor. The zero-emission VMT factor in the above equation is to be calculated as follows, with the urban all-electric range (AER) determined in accordance with section E.3.(2)(a) of the “California Exhaust Emission Standards and Test Procedures for 2003 and Subsequent Model Zero-Emission Vehicles, and 2001 and Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes,” incorporated by reference in section 1962(e)(h):

<i>Urban All-Electric Range</i>	<i>Zero-emission VMT Factors:</i>
< 20 miles	0.0
20 miles to < 100 50 miles	$(30 \underline{5} + [0.5 \times \text{Urban AER}]) / 80 \underline{30}$
100 50 miles	1.0

(C) Alternative Procedures. As an alternative to determining the zero-emission VMT factor in accordance with the preceding section 1962(c)(3)(B), a manufacturer may submit for

Executive Officer approval an alternative procedure for determining the zero-emission VMT potential of the vehicle as a percent of total VMT, along with an engineering evaluation that adequately substantiates the zero-emission VMT determination. For example, an alternative procedure may provide that a vehicle with zero-emissions of one regulated pollutant (e.g. NOx) and not another (e.g. NMOG) will qualify for a zero-emission VMT factor of 0.5. Upon approval of the alternative procedure, the Executive Officer shall assign a zero-emission VMT factor not to exceed 1.0.

(D) Additional Allowances for Qualifying HEVs. The Executive Officer shall approve an additional 0.1 zero-emission VMT partial ZEV allowance for an HEV with an all-electric range greater than 20 miles if the manufacturer demonstrates to the reasonable satisfaction of the Executive Officer that the HEV is equipped with software and/or other strategies that would promote maximum use of off-vehicle charging, and that the strategies employed are reasonably reliable and tamper-proof. In no event, however, may the total zero-emission VMT ZEV allowance for an HEV under section 1962(c)(3) exceed 0.6.

(4) Partial PZEV Allowance for Advanced ZEV Componentry. A vehicle that does not qualify for any zero-emission VMT ~~partial~~ PZEV allowance under section 1962(c)(3) shall qualify for an advanced componentry ~~partial~~ PZEV allowance of ~~0.1~~ 0.25, if the manufacturer demonstrates to the reasonable satisfaction of the Executive Officer that the vehicle is equipped with advanced ZEV componentry such as an advanced battery integral to the operation of the vehicle power-train or an electric power-train.

(5) Partial PZEV Allowance for Low Fuel-Cycle Emissions. A vehicle that uses fuel(s) with very low fuel-cycle emissions shall receive a ~~partial~~ PZEV allowance not to exceed 0.2. In order to receive the fuel-cycle ~~partial~~ PZEV allowance, a manufacturer must demonstrate to the Executive Officer, using peer-reviewed studies or other relevant information, that NMOG emissions associated with the fuel(s) used by the vehicle (on a grams/mile basis) are lower than or equal to 0.01 grams/mile. Fuel-cycle emissions must be calculated based on near-term production methods and infrastructure assumptions, and the uncertainty in the results must be quantified. The fuel-cycle ~~partial~~ PZEV allowance is calculated according to the following formula:

$$\text{Partial PZEV Fuel Cycle Allowance} = 0.2 \times [(\text{percent of VMT using fuel(s) meeting the requirements of the preceding paragraph}) / 100]$$

A manufacturer's demonstration to the Executive Officer that a vehicle qualifies for a fuel-cycle ~~partial~~ PZEV allowance shall include test results and/or empirical data supporting the estimate of the relative proportion of VMT while operating on fuel(s) with very low fuel-cycle emissions.

Commentary: The nonsubstantive modifications make the terminology consistent.

(6) Calculation of Combined PZEV Allowance for a Vehicle. The combined PZEV allowance for a qualifying vehicle in a particular model year is the sum of: the PZEV allowances listed in this section 1962(c)(6), multiplied by any PZEV introduction phase-in multiplier or

PZEV high efficiency multiplier listed in section 1962(c)(7) (if a 2005 model-year PZEV qualifies for both multipliers listed in section 1962(c)(7), the product of the two multipliers is used as the PZEV multiplier).

(A) Baseline PZEV Allowance. The baseline PZEV allowance of 0.2 for vehicles meeting the criteria in section 1962(c)(2);

(B) Zero Emission VMT PZEV Allowance. The zero-emission VMT PZEV allowance, if any, determined in accordance with section 1962(c)(3), not to exceed 0.6;

(C) Advanced ZEV Componentry PZEV Allowance. The advanced ZEV componentry PZEV allowance, if any, determined in accordance with section 1962(c)(4), not to exceed 0.1 0.25; and

(D) Fuel-cycle Emissions PZEV Allowance. The fuel-cycle emissions PZEV allowance, if any, determined in accordance with section 1962(c)(5), not to exceed 0.2.

(7) PZEV Multipliers.

(A) PZEV Introduction Phase-In Multiplier. Each 2000 through 2005 model-year PZEV that is produced and delivered for sale in California qualifies for a PZEV introduction phase-in multiplier as follows:

	<u>MY 2000-2003</u>	<u>MY 2004</u>	<u>MY 2005</u>
<u>Multiplier</u>	<u>4.0</u>	<u>2.0</u>	<u>1.33</u>

(B) PZEV High-Efficiency Multiplier. A PZEV qualifies for a full high-efficiency multiplier in accordance with section 1962(e) starting with the 2005 model year.

~~(d) Generation and Use of ZEV Credits; Calculation of Penalties. A manufacturer that produces and delivers for sale in California ZEVs, full ZEV allowance vehicles, or partial ZEV allowance vehicles in a given model year exceeding the manufacturer's ZEV requirement set forth in section 1962(b) shall earn ZEV credits in accordance with this section 1962(d).~~

~~(1)(d) Qualification for ZEV Multipliers.~~

~~(A)(1) 1996-1998 Model-Year ZEV Multipliers.~~

~~1.(A) 1996-1998 Model-Year ZEV Multiplier Based on Vehicle Range. 1996-1998 model-year ZEVs shall qualify for a ZEV multiplier based on vehicle range as follows:~~

ZEV Multiplier	Vehicle Range (miles)	
	Model Years 1996 and 1997	Model Year 1998
2	any	>100
3	70	>130

Range shall be determined in accordance with section 9.f.(2)(a) of the "California Exhaust Emission Standards and Test Procedures for 1988 Through 2000 Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles," incorporated by reference in section 1960.1(k).

2.(B) *1996-1998 Model-Year ZEV Multiplier Based on Specific Energy of Battery.* 1996-1998 model-year ZEVs shall qualify for a ZEV multiplier based on specific energy of the battery as follows:

ZEV Multiplier	Specific Energy of Battery (w-hr/kg)
2	any
3	>40

3.(C) *Election of Multiplier.* A 1996-1998 model-year ZEV may qualify for a ZEV multiplier according to section 1962(d)(1)(A)1. or section 1962(d)(1)(A)2.(B), but not both. ~~For purposes of calculating a manufacturer's fleet average NMOG value under section 1960.1(g)(2), each ZEV that qualifies for a ZEV multiplier shall be counted as one vehicle.~~

(B)(2) *1999-2007 ~~2000~~ Model-Year ZEV Multiplier Calculation for Extended Electric Range Vehicles.* 1. Each ZEV ~~and full ZEV allowance vehicle~~ that is produced and delivered for sale in California in the 1999 ~~to~~ 2007 ~~2000~~ model years and that has an extended electric range shall qualify for a ZEV multiplier as follows:

All-electric range	MY 1999-2000	MY 2001-2002	MY 2003-2005	MY 2006-2007
100-175	6-10	4-6	2-4	1-2

ZEV multipliers under the above schedule will be determined by linear interpolation between the values shown in the above schedule. Range shall be determined in accordance with ~~S~~section E.3.(2)(a) of the "California Exhaust Emission Standards and Test Procedures for 2003 and Subsequent Model Zero-Emission Vehicles, and 2001 and Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes," incorporated by reference in section 1962(e)(h). ZEVs that have a refueling time of less than 10 minutes and a range of 100 miles or more shall be counted as having unlimited all-electric range, and shall consequently earn the maximum allowable ZEV multiplier for a specific model

year. ZEVs that have a range of 80 to 99 miles shall qualify for ZEV multipliers in the 1999-2002 2000 model years in accordance with the following equation:

$$\text{ZEV multiplier} = (\text{minimum allowable ZEV multiplier per above table for a model year } \underline{6}) \times (\text{AER equivalent to a 10 minute recharge}/100) \times 0.5.$$

(b) For purposes of calculating a manufacturer's fleet average NMOG value under sections 1960.1(g)(2) and 1961(b) and (c), title 13, CCR, each extended electric range ZEV shall be counted as one vehicle.

(3) ZEV Multipliers for ~~2001~~ 2000 and Subsequent Model Years.

(A) ZEV Phase-In Multiplier. Each ~~2001~~ 2000 to 2005 model-year ZEV and extended range HEV that is placed in service in California qualifies for a ZEV phase-in multiplier as follows:

	<u>MY 20002001-2002</u>	<u>MY 2003-2005</u>
<u>Multiplier</u>	<u>4.0</u>	<u>1.25</u>

Commentary: Under the original staff proposal, ZEVs introduced in model years 1999 and 2000 earn credit according to the preexisting regulation, and ZEVs introduced in model years 2001 and beyond earn credit according to the new provisions. Due to the operation of the credit calculation mechanisms, this would result in ZEVs introduced in model year 2000 earning fewer credits than identical vehicles introduced in either model year 1999 or model year 2001. This would occur because under the existing regulation model year 1999 vehicles benefit from a large NMOG multiplier, which is reduced for model year 2000. To correct this disparity, and have the credits earned by vehicles in the various early introduction years be roughly comparable, the modifications make the staff proposal credit mechanism retroactive to model year 2000 placements. This also is consistent with the treatment of the PZEV phase-in multiplier, which is retroactive to model year 2000 placements.

(B) ZEV Discount Multiplier for NEVs. Each 2004 and subsequent model-year NEV that is produced and delivered for sale in California is subject to a ZEV discount multiplier for NEVs as follows:

	<u>MY 2004 - MY 2005</u>	<u>MYs 2006 and Subsequent</u>
<u>Discount Multiplier</u>	<u>0.5</u>	<u>0.15</u>

(C) ZEV Extended Electric Range Multiplier.

1. Basic Multiplier Schedule. Each 2001-2000 and subsequent model-year ZEV and extended range HEV that is placed in service in California and that has an extended urban electric range qualifies for a ZEV extended electric range multiplier as follows:

<u>Urban All-Electric Range</u>	<u>Multiplier</u>
<u>< 50 miles</u>	<u>1</u>
<u>> 50 miles to < 275 miles</u>	<u>(Urban AER-25)/25</u>
<u>> 275 miles</u>	<u>10</u>

To determine the applicable ZEV range for an extended range HEV, the tested urban all-electric range shall be multiplied by a factor of 3.5.

Commentary: See the preceding commentary.

2. Fast refueling.

a. Full Fueling in 10 Minutes or Less. A 2008 and earlier model-year ZEV with the demonstrated capability to accept fuel or electric charge until achieving at least 95% SOC or rated fuel capacity in 10 minutes or less when starting from all operationally allowable SOC or fuel states is counted as having unlimited zero emission range and qualifies for the maximum allowable ZEV extended electric range multiplier.

b. At Least 60-Mile Range in Less Than 10 Minutes. A 2008 and earlier model-year ZEV with the demonstrated capacity to accept fuel or electric charge equivalent to at least 60 miles of UDDS range when starting from 20% SOC in less than 10 minutes is counted as having 60 additional miles (up to a 275 mile maximum) of UDDS range in the range multiplier determination in section 1962(d)(3)(C)1.

Commentary: The original staff proposal provided permanent additional credits for fast refueling. Upon further consideration staff concluded that while these provisions are appropriate in the early years, in later years they would result in too few vehicles being required under compliance scenarios that rely on hydrogen fuel cell vehicles.

3. Multiplier Phase Down. Starting with the 2005 model year, the ZEV extended electric range multiplier is phased down to ~~one-half~~ four tenths of its value in accordance with section 1962(e)(4).

Commentary: This change conforms the language in this section to the changes described in section 1962(e)(4) below.

(D) Combined ZEV Multiplier. Starting with the 2001 model year, the combined ZEV

multiplier for each ZEV and extended range HEV in a specific model year is the product of:

1. The ZEV phase-in multiplier if any as set forth in section 1962(d)(3)(A); times
2. In the case of a NEV, the ZEV discount multiplier for NEVs if any as set forth in section 1962(d)(3)(B); times
3. The extended electric range multiplier if any as set forth in section 1962(d)(3)(C);
~~and 4. plus the high efficiency multiplier if any as set forth in section 1962(f)(e).~~

Commentary: The change to the calculation method corrects a mistake in the method used to calculate the combined effect of the range and efficiency multipliers. Under the original staff proposal these two factors were multiplied together. Because the value of the efficiency multiplier is low in 2005 and 2006 as it first phases in, this resulted in combined credit values in those years that were lower than intended. Under the revised language these factors are added together and then the sum is multiplied times the other applicable multipliers. This results in more appropriate credit scores.

Adding the word "times" makes the originally intended effect clearer. The change to the section citation corrects an inaccurate cross-reference.

~~(2)(E)~~ *Effect of ZEV Multipliers.* In calculating the number of ZEVs and full ZEV allowance vehicles extended range HEVs produced and delivered for sale in California by a manufacturer in a model year and the ZEV credits from such vehicles, the number of ZEVs and full ZEV allowance vehicles extended range HEVs qualifying for a particular ZEV multiplier shall be multiplied by the combined ZEV multiplier.

(e) ZEV and Advanced Technology PZEV High Efficiency Multipliers

(1) Eligibility. Beginning with the 2005 model year, both ZEVs and advanced technology PZEVs are eligible for a high efficiency multiplier. ~~A NEV or other vehicle unable to maintain the speed and time tolerances contained in 40 CFR 86.115-00 (b)(1) and (2) (as effective July 1, 2000) for at least one cycle of both the UDDS and HFEDS is not eligible to earn an efficiency multiplier.~~ A vehicle earning an efficiency multiplier value of less than 1.00 pursuant to section 1962~~(ee)~~(3) will be treated as having an efficiency multiplier of 1.

Commentary: The modifications reflect staff's original intent that the efficiency multiplier applies to ZEVs and AT PZEVs only. In addition, staff's intent is that the efficiency multiplier be available to City EVs. The deleted language would have prevented City EVs from qualifying.

(2) Calculation of CMPEG Rating. For all vehicle types, a CMPEG (California miles per equivalent gallon) rating is determined as follows:

(A) For gasoline-fueled vehicles and HEVs with <20 mile zero-emission range, $CMPEG = \text{Combined Fuel Economy determined in accordance with 40 CFR Part 600} = 1 / [.55 / (\text{EPA city mpg, unadjusted}) + .45 / (\text{EPA highway mpg, unadjusted})]$.

(B) For BEVs and off-vehicle charge capable HEVs with >20 mile zero emission range, $CMPEG = [33,705 \text{ AC whr/gal} / (.55 (\text{AC whr/mile UDDS}) + .45 (\text{AC whr/mile HFEDS}))]$ where AC whr/ mile values are determined in accordance with section E.3. "Determination of All-Electric Range-Urban," and "Determination of All-Electric Range-Highway" of the "California Exhaust Emission Standards and Test Procedures for 2003 and Subsequent Model Zero-Emission Vehicles, and 2001 and Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes," as incorporated by reference in section 1962(h). Qualifying HEV CMPEG determination shall be based solely on electric mode operating efficiency for vehicles that are able to maintain test cycle speed and time tolerances for the entire zero-emission range test.

(C) For vehicles operating on an alternative fuel, including CNG, alcohol, or hydrogen, CMPEG = Combined Fuel Economy as determined in accordance with 40 CFR Part 600. Alternate fuel vehicle CMPEG shall not be compensated with the federal (1/0.15) "fuel content" factor used in determining average fuel economy.

(D) For flexible-fuel or dual-fuel vehicles, CMPEG is the lowest of the federal combined fuel economy values determined for any fuel or fuel mixture on which the vehicle is certified to operate.

~~(2) Determining the high efficiency multiplier. A high efficiency multiplier is determined based on the following table.~~

<i>Vehicle Type</i>	<i>Efficiency Multiplier</i>
PCs or LDTs 0-3750 lbs. loaded vehicle weight And fewer than 4 designated passenger seats	$E = CMPEG / (1.6 * 27.5)$
PCs or LDTs 0-3750 lbs. loaded vehicle weight And with 4 or more designated passenger seats	$E = CMPEG / (1.4 * 27.5)$
LDTs 3751-5750 lbs. loaded vehicle weight And fewer than 4 designated passenger seats	$E = CMPEG / (1.25 * 27.5)$
LDTs 3751-5750 lbs. loaded vehicle weight And with 4 or more designated passenger seats	$E = CMPEG / (1.05 * 27.5)$
LDTs and LEV LMDVs 5751 lbs. loaded vehicle weight to 8500 lbs. gross vehicle weight	$E = CMPEG / (0.75 * 27.5)$

(3) Vehicle classes.

(A) List of vehicle classes. Efficiency multipliers will be determined based on assignment of a vehicle to one of the following vehicle classes; interior volume is determined in accordance with SAE Recommended Practice J1100 and U.S. EPA Fuel economy regulations, 40 CFR 600.315-82.

<u>Vehicle Class</u>	<u>Class Description</u>
<u>Subcompact PC</u>	<u>Interior volume up to 99 ft³</u>
<u>Compact PC</u>	<u>Interior volume 100-109 ft³</u>
<u>Midsize PC</u>	<u>Interior volume 110- 119 ft³</u>
<u>Large PC</u>	<u>Interior volume over 120 ft³</u>
<u>Small Truck</u>	<u>LDT 1</u>
<u>Medium Truck</u>	<u>LDT 2</u>
<u>Large Truck</u>	<u>LDT 3 & 4</u>

(B) Assignment of derivative or converted vehicles. A derivative station wagon shall be placed in the same class as the sedan on which it is based. A minivan shall be placed in the appropriate truck category based on adjusted or adjusted loaded vehicle weight. A derivative or conversion ZEV that shares a production platform with one or more gasoline engine versions shall be placed in the same class as the smallest or lightest gasoline version of the same platform for that model year.

(4) High efficiency multipliers for the 2005-2006 model years. For model years 2005-2006, the efficiency multiplier for each vehicle class is determined according to the following table:

<u>Vehicle Class</u>	<u>Efficiency Multiplier</u> <u>MY 2005-2006</u>
<u>Subcompact PC</u>	<u>CMPEG/ (1.5 * 30.6)</u>
<u>Compact PC</u>	<u>CMPEG/ (1.5 30.4)</u>
<u>Midsize PC</u>	<u>CMPEG/ (1.5 x 27.0)</u>
<u>Large PC</u>	<u>CMPEG/ (1.5 x 25.6)</u>
<u>Small Truck</u>	<u>CMPEG/ (1.5 x 25.0)</u>
<u>Medium Truck</u>	<u>CMPEG/ (1.5 x 21.4)</u>
<u>Large Truck</u>	<u>CMPEG/ (1.5 x 18.2)</u>

(5) High efficiency multipliers for the 2007-2014 model years. For model years 2007-2014, the efficiency multiplier for each vehicle class is determined in accordance with the following equation:

$$\text{Efficiency multiplier} = \text{CMPEG} / (1.5 * \text{Baseline Fuel Economy})$$

Where: Baseline Fuel Economy for model years 2007-2010 is the model year 2004 unadjusted-combined federal sales-weighted fuel economy for the vehicle class as determined by U.S. EPA.

Baseline Fuel Economy for Model Years 2011-2014 is the model year 2008 unadjusted-combined federal sales-weighted fuel economy for the vehicle class as determined by U.S. EPA.

Commentary: The revised language redefines the vehicle categories and baseline efficiency benchmarks used to calculate the efficiency credit. The modified proposal is based on vehicle categories used in U.S. EPA fuel economy labeling. These categories are more familiar to manufacturers and the public, and provide for somewhat finer differentiation across vehicle types. The mileage figures used in the model year 2005-2006 calculations are based on U.S. EPA's unadjusted-combined sales-weighted fuel economy values for MY 2000. The modified proposal also uses benchmarks based upon a 50 percent improvement over the sales-weighted fuel economy of vehicles in each category. This is a more consistent and easily understood approach.

These modifications are intended to improve the calculation methodology, but not significantly affect the resulting scores. Because the passenger car group is split into four categories under the modified proposal, as opposed to the two original categories, there would be a greater spread of benchmark values for passenger cars. As a result, the benchmarks for small passenger cars ("subcompact" and "compact" using the revised categories) are higher here than under the original staff proposal. Such vehicles therefore receive somewhat lower efficiency scores under the modified proposal.

As is shown in the following table, however, the estimated efficiency scores obtained under the modified method in general are similar to those obtained under the original staff proposal:

<i>Vehicle</i>	<i>CMPEG</i>	<i>Class</i>	<i>Class MPG</i>	<i>Efficiency Multiplier (revised)</i>	<i>Efficiency Multiplier (original)</i>
<i>Insight</i>	76.5	<i>Subcompact</i>	30.6	1.67	1.74
<i>Prius</i>	57.7	<i>Compact</i>	30.4	1.27	1.5
<i>Escape</i>	41.2	<i>Medium Truck</i>	21.4	1.28	1.43
<i>eCom</i>	127.4	<i>Subcompact</i>	30.6	2.78	2.90
<i>RAV4 EV</i>	102.6	<i>Small Truck</i>	25.0	2.74	2.68
<i>2000 Altra</i>	121.9	<i>Large</i>	25.6	2.86	2.85

(4) Phasing in the High Efficiency Multiplier for ZEVs. For ZEVs and extended range HEVs, the high efficiency multiplier is phased in, and the extended electric range multiplier is phased down to ~~one-half~~ four-tenths of its initial value, by multiplying the multipliers by the values in the following schedule:

	<i>MY 2004</i>	<i>MY 2005</i>	<i>MY 2006</i>	<i>MY 2007</i>	<i>MYs 2008 and Subsequent</i>
<u>Range Multiplier</u>	<u>1.0</u>	<u>0.875</u> <u>0.85</u>	<u>0.75</u> <u>0.7</u>	<u>0.625</u> <u>0.55</u>	<u>0.5</u> <u>0.4</u>
<u>Efficiency Multiplier</u>	<u>0.0</u>	<u>.25</u>	<u>.5</u>	<u>.75</u>	<u>1.0</u>

Commentary: Under the original staff proposal the final phase-out value of the range multiplier was set at 0.5. The intent in choosing this level was to keep the number of required vehicles roughly equivalent both before and after the introduction of the efficiency multiplier. The 0.5 level was selected because the value of the efficiency scores appeared to be about one-half of the range scores. Staff has determined that typical efficiency scores in fact will be somewhat greater than one-half of the range scores. This means that under the original staff proposal, on average, the combined range plus efficiency scores would be higher after the introduction of the efficiency multiplier than before, resulting in fewer required vehicles. Therefore in order to "calibrate" the efficiency phase-in mechanism we needed to further discount the final value of the range multiplier. Using the value of 0.4 results in "before and after" scores that on average are more nearly equal. The results for specific vehicles will of course depend on their individual range and efficiency characteristics.

(f) In-Service Warranty Multiplier for ZEVs and PZEVs With ≥ 20 Mile Zero Emission Range. Except in the case of a NEV, an additional ZEV or PZEV-multiplier will be earned by a ZEV or a PZEV with ≥ 20 mile zero emission range whose zero-emission energy storage or conversion system is under an original warranty from the vehicle manufacturer beyond three years of service and is registered for operation on public roads in California. Manufacturers will receive 0.1 times the original ZEV credit earned by the vehicle (including

multipliers other than the ZEV phase-in multiplier in section 1962(d)(3)(A) and the PZEV introduction phase-in multiplier in section 1962(c)(7)) on a year-by-year basis beginning in the fourth year. The warranty multiplier is reported and earned in the year following each continuous year of service.

Commentary: Staff will review in-use battery performance in future years and propose adjustments to this credit as appropriate.

(g) Generation and Use of ZEV Credits; Calculation of Penalties

(1) Introduction. A manufacturer that produces and delivers for sale in California ZEVs or PZEVs in a given model year exceeding the manufacturer's ZEV requirement set forth in section 1962(b) shall earn ZEV credits in accordance with this section 1962(g).

(3)(2) ZEV Credit Calculations.

(A) Credits from ZEVs and Full-ZEV Allowance Vehicles Extended Range HEVs. An full-ZEV allowance vehicle extended range HEV shall be is treated as a ZEV in calculating and applying ZEV credits. The amount of ZEV credits earned by a manufacturer in a given model year from ZEVs shall be expressed in units of g/mi NMOG, and shall be equal to the number of ZEVs produced and delivered for sale in California that the manufacturer applies towards meeting the ZEV requirements for the model year (at least 40% of the ZEV requirement for a large volume manufacturer) subtracted from the number of ZEVs produced and delivered for sale in California by the manufacturer in the model year and then multiplied by the NMOG fleet average requirement for PCs and LDT1s for that model year.

(B) Credits from Partial-ZEV Allowance Vehicles PZEVs. The amount of ZEV credits from partial-ZEV allowance vehicles PZEVs earned by a manufacturer in a given model year shall be expressed in units of g/mi NMOG, and shall be equal to the total number of PZEV allowances from partial-ZEV allowance vehicles PZEVs produced and delivered for sale in California that the manufacturer applies towards meeting its ZEV requirement for the model year (a number not to exceed 60% of the ZEV requirement for large volume manufacturers) subtracted from the total number of PZEV allowances from partial-ZEV allowance vehicles PZEVs produced and delivered for sale in California by the manufacturer in the model year and then multiplied by the NMOG fleet average requirement for PCs and LDT1s for that model year.

(C) Separate Credit Accounts. The number of credits from a manufacturer's [i] ZEVs and full-ZEV allowance vehicles extended range HEVs, [ii] advanced technology PZEVs, and [iii] all other PZEVs shall each be maintained separately from the number of credits from the manufacturer's partial-ZEV allowance vehicles.

(4)(3) ZEV Credits for MDVs and LDTs other than LDT1s. ZEVs, extended range HEVs and PZEVs classified as MDVs or as LDTs other than LDT1s may be counted toward the ZEV requirement for PCs and LDT1s, and included in the calculation of ZEV credits as specified in this section 1962(d)(g) if the manufacturer so designates.

(4) ZEV Credits for Advanced Technology Demonstration Programs. A vehicle placed in a California advanced technology demonstration program may earn ZEV credits even if it is not "delivered for sale." To earn such credits, the manufacturer must demonstrate to the reasonable satisfaction of the Executive Officer, prior to certification, that the vehicles will be regularly used in applications appropriate to evaluate issues related to safety, infrastructure, fuel specifications or public education. Such a vehicle is eligible to receive the same allowances and credits that it would have earned if placed in service.

(5) ZEV Credits for Transportation Systems. A ZEV or extended range HEV placed as part of a transportation system may earn additional ZEV credits, which may be used in the same manner as credits from advanced technology PZEVs. To earn such credits, the manufacturer must demonstrate to the reasonable satisfaction of the Executive Officer, prior to certification, that the vehicle will be used as a part of an innovative transportation system that will effectively link homes, transit systems and jobs (e.g. a station car). Such systems are to be designed to evaluate the benefits and issues related to the shared use of ZEVs, and the application of new technologies such as reservation management, card systems, depot management, location management, charge billing and real-time wireless information systems. The additional ZEV credit may not exceed the original ZEV credit earned by the vehicle, including multipliers other than the ZEV phase-in multiplier in section 1962(d)(3)(A).

(5)(6) Submittal of ZEV Credits. A manufacturer may meet the ZEV requirements in any given model year by submitting to the Executive Officer a commensurate amount of ZEV credits consistent with section 1962(b). These credits may be earned previously by the manufacturer or acquired from another manufacturer. The amount of ZEV credits required to be submitted shall be calculated according to the criteria set forth in this section 1962(d)(g).

(6)(7) Requirement to Make Up a ZEV Deficit.

(A) General. A manufacturer that produces and delivers for sale in California fewer ZEVs than required in a given model year shall make up the deficit by the end of the next model year by submitting to the Executive Officer a commensurate amount of ZEV credits, except that credits generated from PZEVs may be used to offset deficits for two model years. The amount of ZEV credits required to be submitted shall be calculated by (A) [i] adding the number of ZEVs and extended range HEVs produced and delivered for sale in California by the manufacturer for the model year to the number of ZEV allowances from partial ZEV allowance vehicles produced and delivered for sale in California by the manufacturer for the model year (~~not to exceed 60% of for a large volume manufacturer's ZEV requirement, not to exceed that permitted under section 1962(b)(2)~~), (B) [ii] subtracting that total from the number of ZEVs required to be produced and delivered for sale in California by the manufacturer for the model year, and (C) [iii] multiplying the resulting value by the fleet average requirements for PCs and LDT1s for the model year in which the deficit is incurred.

(B) Additional Time to Make Up ZEV Deficits for the 2003-2004 Model Years.

1. Model-Year 2003 ZEV Deficits. A manufacturer that produces, and delivers for sale in California, model-year 2003 or earlier PZEVs that generate at least twice as many credits

as are necessary to take full advantage of the manufacturer's 60% PZEV option for the 2003 model year has through the 2007 model year to fully exercise its option to meet an additional 20% of its ZEV requirement for the 2003 model year with credits from advanced technology PZEVs.

2. Model-Year 2004 ZEV Deficits. A manufacturer that qualifies under section 1962(g)(7)(B)1., and produces, and delivers for sale in California, model-year 2004 or earlier PZEVs that generate at least twice as many credits as are necessary to take full advantage of the manufacturer's 60% PZEV option for the 2003 and 2004 model years, has through the 2008 model year to fully exercise its option to meet an additional 20% of its ZEV requirement for the 2004 model year with credits from advanced technology PZEVs.

~~(7)~~(8) *Penalty for Failure to Meet ZEV Requirements.* Any manufacturer that fails to produce and deliver for sale in California the required number of ZEVs or submit an appropriate amount of ZEV credits and does not make up ZEV deficits within the specified time period shall be subject to the Health and Safety Code section 43211 civil penalty applicable to a manufacturer that sells a new motor vehicle that does not meet the applicable emission standards adopted by the state board. The cause of action shall be deemed to accrue when the ZEV deficits are not balanced by the end of the specified time period. For the purposes of Health and Safety Code section 43211, the number of vehicles not meeting the state board's standards shall be calculated according to the following equation, provided that ~~no more than 60%~~ the percentage of a large volume manufacturer's ZEV requirement for a given model year that may be satisfied with partial ZEV allowance vehicles or ZEV credits from such vehicles may not exceed the percentages permitted under section 1962(b)(2)(A):

(No. of ZEVs required to be produced and delivered for sale in California for the model year) - (No. of ZEVs produced and delivered for sale in California for the model year) - (No. of ZEV allowances from partial ZEV allowance vehicles produced and delivered for sale in California for the model year) - [(Amount of ZEV credits submitted for the model year) / (the fleet average requirement for PCs and LDT1s for the model-year)].

~~(e)~~(h) *Test Procedures.* The certification requirements and test procedures for determining compliance with the this section 1962 are set forth in "California Exhaust Emission Standards and Test Procedures for 2003 and Subsequent Model Zero-Emission Vehicles, and 2001 and Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes," adopted by the state board on August 5, 1999, and last amended [Insert date of amendment], which is incorporated herein by reference.

(i) *ZEV-Specific Definitions.* The following definitions apply to this section 1962.

(1) "Advanced technology PZEV" means any PZEV with an allowance of 0.4 or higher (before the application of any multipliers).

(2) "Battery electric vehicle" means any vehicle that operates solely by use of a battery or battery pack, or that is powered primarily through the use of an electric battery or

battery pack but uses a flywheel or capacitor that stores energy produced by the electric motor or through regenerative braking to assist in vehicle operation.

(3) “Extended range HEV” means an HEV that meets the criteria in section 1962(c)(2) for a PZEV allowance of 0.2 and has a minimum urban zero-emissions range of at least 20 miles attributable to off-vehicle recharging.

(4) “Neighborhood electric vehicle” means a motor vehicle that meets the definition of Low-Speed Vehicle either in section 385.5 of the Vehicle Code or in 49 CFR 571.500 (as it existed on July 1, 2000), and is certified to zero-emission vehicle standards.

(5) “Placed in service” means having been sold or leased to an end-user and not to a dealer or other distribution chain entity, and having been individually registered for on-road use by the California Department of Motor Vehicles.

(f)(i) *Abbreviations.* The following abbreviations are used in this section 1962:

“AER” means all-electric range.

“BEV” means battery electric vehicle.

“CMPEG” means California miles per equivalent gallon.

“HEV” means hybrid-electric vehicle.

“HFDES” means highway fuel economy driving cycle.

“LDT” means light-duty truck.

“LDT1” means a light-truck with a loaded vehicle weight of 0-3750 pounds.

“MDV” means medium-duty vehicle.

“Non-Methane Organic Gases” or “NMOG” means the total mass of oxygenated and non-oxygenated hydrocarbon emissions.

“NEV” means neighborhood electric vehicle.

“NOx” means oxides of nitrogen.

“PC” means passenger car.

“PZEV” means any vehicle that is delivered for sale in California and that qualifies for a partial ZEV allowance of at least 0.2.

“SOC” means state of charge.

“SULEV” means super ultra-low-emission-vehicle.

“UDDS” means urban dynamometer driving cycle.

“ULEV” means ultra-low emission vehicle.

“VMT” means vehicle miles traveled.

“ZEV” means zero-emission vehicle.

Note: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43104 and 43105, Health and Safety Code. Reference: Sections 39002, 39003, 39667, 43000, 43009.5, 43013, 43018, 43100, 43101, 43101.5, 43102, 43104, 43105, 43106, 43107, 43204, and 43205.5, Health and Safety Code.

Amend title 13, CCR, section 1900 to read as follows:

§1900. Definitions.

[Subsections (a)(1) through (17) -- No change]

(18) "Intermediate volume manufacturer" means any pre-2001 model year manufacturer with California sales between 3,001 and ~~35,000~~ 60,000 new light- and medium-duty vehicles per model year based on the average number of vehicles sold by the manufacturer each model year from 1989 to 1993; any 2001 through 2002 model year manufacturer with California sales between 4,501 and ~~35,000~~ 60,000 new light- and medium-duty vehicles per model year based on the average number of vehicles sold by the manufacturer each model year from 1989 to 1993; and any 2003 and subsequent model year manufacturer with California sales between 4,501 and ~~35,000~~ 60,000 new light- and medium-duty vehicles based on the average number of vehicles sold for the three previous consecutive model years for which a manufacturer seeks certification. For a manufacturer certifying for the first time in California, model year sales shall be based on projected California sales.

(19) "Large volume manufacturer" means any 2000 and subsequent model year manufacturer that is not a small volume manufacturer, or an independent low volume manufacturer, or an intermediate manufacturer.

(20) "Independent low volume manufacturer" means a manufacturer with California annual sales of less than 10,000 new passenger cars, light-duty trucks and medium-duty vehicles following aggregation of sales pursuant to this section 1900(a)(20). Annual sales shall be determined as the average number or sales sold for the three previous consecutive model years for which a manufacturer seeks certification; however, for a manufacturer certifying for the first time in California, annual sales shall be based on projected California sales for the model year. The annual sales from different firms shall be aggregated in the following situations:

(A) Vehicles produced by two or more firms, one of which is 10% or greater part owned by another;

(B) Vehicles produced by any two or more firms if a third party has equity ownership of 10% or more in each of the firms;

(C) Vehicles produced by two or more firms having a common corporate officer(s) who is (are) responsible for the overall direction of the companies;

(D) Vehicles imported or distributed by all firms where the vehicles are manufactured by the same entity and the importer or distributor is an authorized agent of the entity.

Note: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, and 43104 Health and Safety Code.
Reference: Sections 39002, 39003, 39010, 39500, 40000, 43000, 43013, 43100, 43101, 43101.5, 43102, 43104, 43106, and 43204, Health and Safety Code.

Amend section 1960.1(k), Title 13, California Code of Regulation, to read as follows:

(k) The test procedures for determining compliance with these standards are set forth in "California Exhaust Emission Standards and Test Procedures for 1981 through 1987 Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles," adopted by the state board on November 23, 1976, as last amended May 20, 1987, and in "California Exhaust Emission Standards and Test Procedures for 1988 through 2000 Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles," adopted by the state board on May 20, 1987 as last amended August 5, 1999, both which are incorporated herein by reference, and in "California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles," as incorporated by reference in section 1961(d). The test procedures for determining the compliance of 2001 through 2006 model-year hybrid electric vehicles with the standards set forth in this section are set forth in "California Exhaust Emission Standards and Test Procedures for 2003 and Subsequent Model Zero-Emission Vehicles, and 2001 and Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes, as incorporated by reference in section 1962(e)(h).

* * * *

Note: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43104 and 43105, Health and Safety Code. Reference: Sections 39002, 39003, 39667, 43000, 43009.5, 43013, 43018, 43100, 43101, 43101.5, 43102, 43104, 43105, 43106, 43107, 43204, and 43205.5, Health and Safety Code.

Amend section 1961(a)(8)(B) and 1961(d), title 13, California Code of Regulations, to read as follows:

(8) *Requirements for Vehicles Certified to the Optional 150,000 Mile Standards.*

(A) *Requirement to Generate Additional Fleet Average NMOG Credit.* A vehicle that is certified to the 150,000 mile standards in section 1961(a) shall generate additional NMOG fleet average credit as set forth in 1961(b)(1) or additional vehicle equivalent credits as set forth in 1961(b)(2) provided that the manufacturer extends the warranty on high cost parts to 8 years or 100,000 miles, whichever occurs first, and agrees to extend the limit on high mileage in-use testing to 105,000 miles.

(B) *Requirement to Generate a Partial ZEV Allowance.* A vehicle that is certified to the 150,000 mile SULEV standards shall also generate a partial ZEV allocation according to the criteria set forth in section C.3 of the "California Exhaust Emission Standards and Test Procedures for 2003 and Subsequent Model Zero-Emission Vehicles, and 2001 and Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes," incorporated by reference in section 1962(e)(h)."

* * * *

(d) *Test Procedures.* The certification requirements and test procedures for determining compliance with the emission standards in this section are set forth in the "California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model

Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles,” adopted on August 5, 1999, which is incorporated herein by reference. In the case of hybrid electric vehicles, the certification requirements and test procedures for determining compliance with the emission standards in this section are set forth in the “California Exhaust Emission Standards and Test Procedures for 2003 and Subsequent Model Zero-Emission Vehicles, and 2001 and Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes,” incorporated by reference in section 1962(e)(h).

* * * *

Note: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43104 and 43105, Health and Safety Code. Reference: Sections 39002, 39003, 39667, 43000, 43009.5, 43013, 43018, 43100, 43101, 43101.5, 43102, 43104, 43105, 43106, 43107, 43204, and 43205.5, Health and Safety Code.

**PROPOSED AMENDMENTS TO
"CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR
2003 AND SUBSEQUENT MODEL ZERO-EMISSION VEHICLES, AND 2001 AND
SUBSEQUENT MODEL HYBRID ELECTRIC VEHICLES, IN THE PASSENGER CAR,
LIGHT-DUTY TRUCK AND MEDIUM-DUTY VEHICLE CLASSES"**

* * * *

C. Zero-Emission Vehicle Standards.

[Incorporate all modifications suggested for title 13, California Code of Regulations, section 1962, "Zero-Emission Vehicle Standards for New 2003 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles."]

* * * *

E. Test Procedures

* * * *

3. All-Electric Range Test. *[No amendments or modifications to first paragraph]*

* * * *

(1) 3.1 Cold soak. The vehicle shall be stored at an ambient temperature not less than 68°F (20°C) and not more than 86°F (30°C) for 12 to 36 hours. During this time, the vehicle's battery shall be charged to a full state-of-charge.

(2) 3.2 Driving schedule.

(a) 3.2.1 Determination of All-Electric Range-Urban.

(a) At the end of the cold soak period, the vehicle shall be placed, either driven or pushed, onto a dynamometer and operated through successive Urban Dynamometer Driving Schedules (UDDS), 40 CFR, Part 86, Appendix I, which is incorporated herein by reference, ~~until the vehicle is no longer able to maintain the speed or time tolerances contained in 40 CFR § 86.115-00(b)(1) and (2).~~ A 10-minute soak shall follow each UDDS cycle.

(b) For vehicles with a maximum speed greater than or equal to the maximum speed on the UDDS cycle, this test sequence shall be repeated until the vehicle is no longer able to maintain either the speed or time tolerances in 40 CFR § 86.115-00 (b)(1) and (2), or the manufacturer determines that the test should be terminated for safety reasons, e.g. excessively high battery temperature, abnormally low battery voltage, etc. For off-vehicle charge capable hybrid electric vehicles, this determination shall be performed without the use of the auxiliary power unit.

(c) For vehicles with a maximum speed less than the maximum speed on the UDDS cycle, the vehicle shall be operated at maximum available power (or full throttle) when the vehicle cannot achieve the speed trace within the speed and time tolerances specified in 40 CFR § 86.115-00(b)(1) and (2). The test shall be terminated when the vehicle speed when operated at maximum available power (or full throttle) falls below 95 percent of the maximum speed initially achieved on the UDDS cycle or when the battery state-of-charge is depleted to the lowest level allowed by the manufacturer, or the manufacturer determines that the test should be terminated for safety reasons, e.g. excessively high battery temperature, abnormally low battery voltage, etc., whichever occurs first. For off-vehicle charge capable hybrid electric vehicles, this determination shall be performed without the use of the auxiliary power unit.

Commentary: Under the existing all electric range-urban test procedure, City EVs that cannot meet the high speed portion of the test requirement have the test terminated immediately and are assigned an inaccurately low range. The revised language would allow such vehicles to continue the test cycle and would result in more representative range test results.

~~(b)~~ 3.2.2 **Determination of All-Electric Range-Highway.**

(a) At the end of the cold soak period, the vehicle shall be placed, either driven or pushed, onto a dynamometer and operated through two successive Highway Fuel Economy Driving Schedules (HFEDS), ~~found in 40 CFR, Part 600, Appendix I, which is incorporated herein by reference, the speed or time tolerances contained in 40 CFR~~ ~~§ 86.115-00(b)(1) and (2)~~. There shall be a 15 second zero speed with key on and brake depressed between two cycles and a 10-minute soak following the two HFEDS cycles.

(b) For vehicles with a maximum speed greater than or equal to the maximum speed on the HFEDS cycle, this test sequence shall be repeated until the vehicle is no longer able to maintain either the speed or time tolerances in 40 CFR § 86.115-00 (b)(1) and (2), or the manufacturer determines that the test should be terminated for safety reasons, e.g. excessively high battery temperature, abnormally low battery voltage, etc. For off-vehicle charge capable hybrid electric vehicles, this determination is optional and shall be performed without the use of the auxiliary power unit.

(c) For vehicles with a maximum speed less than the maximum speed on the HFEDS cycle, the vehicle shall be operated at maximum available power (or full throttle) when the vehicle cannot achieve the speed trace within the speed and time tolerances

specified in 40 CFR § 86.115-00(b)(1) and (2). The test shall be terminated when the vehicle speed when operated at maximum available power (or full throttle) falls below 95 percent of the maximum speed initially achieved on the HFEDS cycle or when the battery state-of-charge is depleted to the lowest level allowed by the manufacturer, or the manufacturer determines that the test should be terminated for safety reasons, e.g. excessively high battery temperature, abnormally low battery voltage, etc., whichever occurs first. For off-vehicle charge capable hybrid electric vehicles, this determination shall be performed without the use of the auxiliary power unit.

(d) NEVs are exempt from the all-electric range highway test.

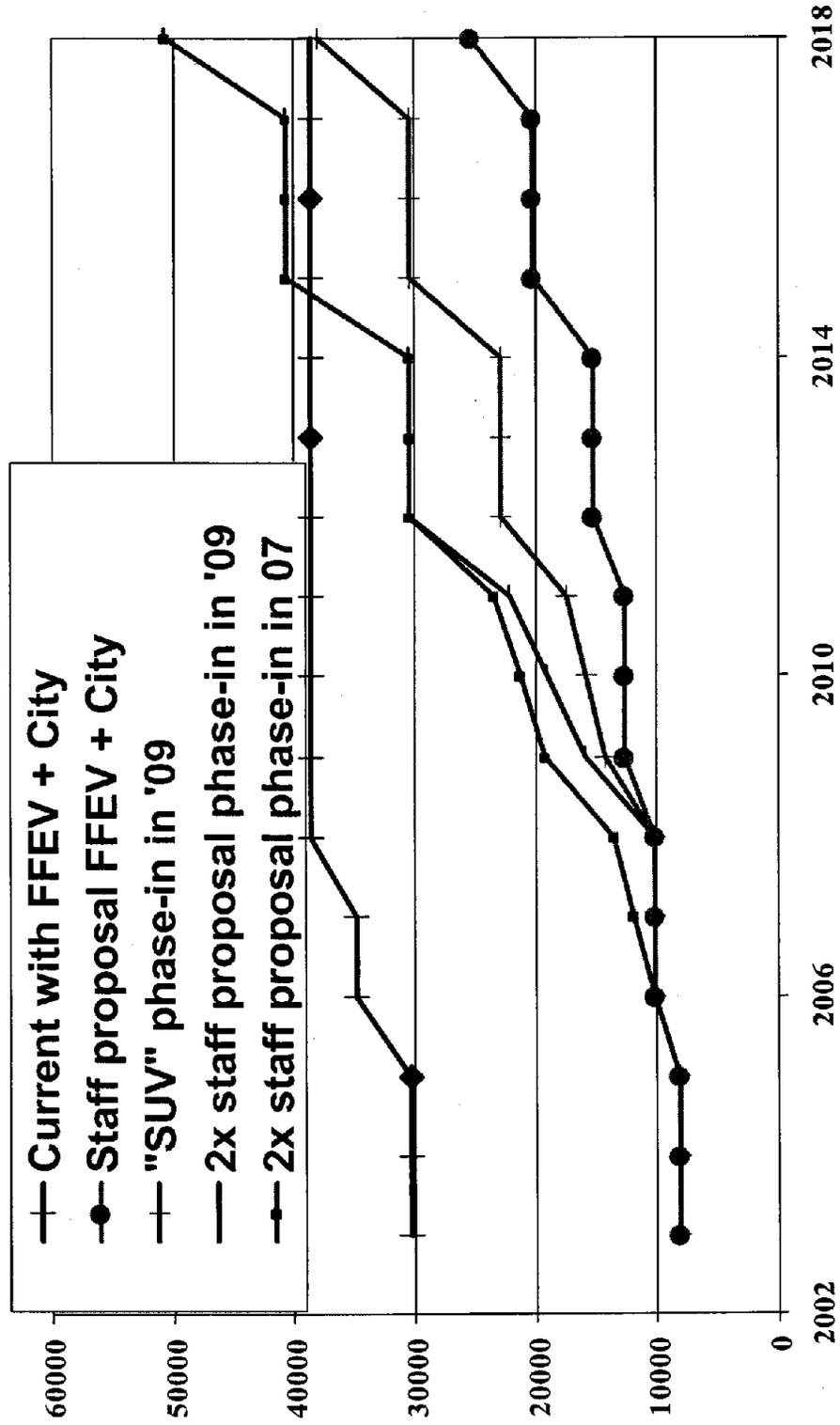
Commentary: See above. In addition, the exclusion for NEVs is added to the highway range test procedure because such vehicles will not be used on the highway.

~~(3)~~ 3.2.3 **Recording requirements.** *[No other amendments]*

~~(4)~~ 3.2.4 **Regenerative braking.** *[No other amendments]*

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FFEV + City Scenarios



* "FFEVs": full function electric vehicles