

State of California  
AIR RESOURCES BOARD

Resolution 03-4

April 24, 2003

Agenda Item No.: 03-02-4

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, section 39667 of the Health and Safety Code directs the Board to consider revisions to the ARB's emissions standards for vehicular sources to achieve the maximum possible reduction in public exposure to substances that the Board has identified as toxic air contaminants pursuant to section 39662 of the Health and Safety Code; such regulations affecting new motor vehicles are to be based on the most advanced technology feasible for the model year and may include but are not limited to the required installation of vehicular control measures on new motor vehicles;

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” (the ZEV Standards and Test Procedures) – 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 nominally be ZEVs, beginning with the 2003 model year;

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, following a January 2001 hearing, the ARB adopted amendments to the ZEV regulations designed to maintain progress towards the commercialization of zero emission vehicles while recognizing the near-term constraints due to cost, lead-time, and technical challenges; the amendments preserved the fundamental ZEV requirement but established credits for early introduction, greater range, improved efficiency, and advanced technology and served to reduce the number of vehicles needed beginning in 2003;

WHEREAS, one element of the 2001 amendments is a mechanism under which a large manufacturer may meet one half of its pure ZEV obligation with vehicles called “advanced technology PZEVs” or “AT PZEVs”; this includes several potential vehicle technologies, including gasoline hybrid-electric vehicles (HEV) that in the long term would have their credit value based on the extent to which their fuel economy exceeded the average fuel economy of their vehicle class;

WHEREAS, pure ZEVs are often referred to as the “gold” category as they reduce both criteria and toxic pollutant emissions to the maximum feasible extent; AT PZEVs are referred to as the “silver” category and PZEVs are referred to as the “bronze” category;

WHEREAS, in June 2002, a federal district judge issued a preliminary injunction that prohibited the ARB from enforcing the 2001 ZEV amendments with respect to the sale of new motor vehicles in the 2003 or 2004 model years, based on a finding that AT PZEV provisions pertaining to HEVs related to fuel economy standards and were preempted by the Energy Policy and Conservation Act of 1975 – the law directing the National Highway Traffic Safety Administration to establish corporate average fuel economy (CAFE) standards – and a further finding that those AT PZEV provisions were not severable from the rest of the 2001 ZEV amendments;

WHEREAS, one of the elements of the 2001 ZEV amendments is a six-year phase-in, over the 2007-2012 model years, of a new requirement that the percentage ZEV requirements also apply to the “LDT2” category that includes most sport utility vehicles (SUV), minivans, and larger pickup trucks; this reflected a modification to the originally proposed amendments and some parties have asserted that this change was not permitted without a new rulemaking notice and hearing;

WHEREAS, the staff held a workshop in December 2002 to solicit input from interested stakeholders on strategies and approaches for addressing issues raised by industry litigation and accounting for the current conditions and trends in zero and near-zero emissions technology development;

WHEREAS, in conjunction with a public hearing notice published January 10, 2003, staff proposed substantial amendments to the zero-emission vehicle regulation, as set forth in Attachment A hereto, and to the ZEV Standards and Test Procedures, as set forth in Attachment B hereto;

WHEREAS, the hearing on the proposal, originally scheduled for February 27, 2003, was postponed to March 27-28, 2003, pursuant to a notice of postponement dated February 14, 2003;

WHEREAS, in response to comments from interested parties made after publication of the original staff proposal, staff on March 5, 2003 released suggested modifications to the original proposal, as set forth in Attachment C hereto; as modified on March 5, the proposal included the following elements:

Restarting the ZEV percentage requirements in the 2005 model year while allowing manufacturers to earn and bank for future use credits from vehicles produced prior to the 2005 model year;

Amending the AT PZEV calculation methods to remove all references to fuel economy or efficiency, and changing the criteria for determining if a HEV earns advanced ZEV componentry allowances; a hybrid-electric PZEV would have to exhibit traction drive boost, regenerative braking and idle start/stop in order to qualify at one of three levels: (1) a low voltage, low power HEV (less than 60 volts and at least four kilowatt (kW) motor power) would not receive an additional

AT PZEV allowance but its base 0.2 PZEV allowance could be used in the AT PZEV category through model-year 2008; (2) a high voltage HEV (60 volts or more and minimum 10 kW motor power) would earn an advanced componentry allowance of 0.4, reduced in stages in the 2012 and 2015 model years to 0.25; and (3) a high voltage, high power HEV (60 volts or more and minimum 50 kW motor power) would earn an advanced componentry allowance of 0.5, reduced in stages in the 2012 and 2015 model years to 0.35;

Increasing the AT PZEV allowances for advanced componentry high pressure gaseous fuel or hydrogen fuel storage systems, for zero emission range (including grid-connected HEVs), and for low fuel-cycle emissions, such as those achieved by compressed natural gas (CNG) vehicles;

Revising the way that credits from ZEVs are calculated, by removing the efficiency multiplier and specifying the number of credits earned each model year by each of five "types" of pure ZEVs: NEVs (neighborhood electric vehicles), Type 0 (utility low-range ZEVs), Type I (mid-range "city electric vehicles"), Type II (full function battery electric vehicles) and Type III (fuel cell vehicles);

Allowing large volume manufacturers the option of complying either with "base compliance path" percentage ZEV requirements identical to those in the 2001 ZEV amendments, or with an "alternative compliance path" under which allowances from AT PZEVs may be used to meet gold obligations, provided that any manufacturer using the alternative path in the 2005-2008 model years would have to place into service its market share of 250 2001-2008 model-year Type III (fuel cell) ZEVs; staff also recommends that the Board establish an independent expert review panel to advise the Board on technology advances made in pure ZEV technologies, in order for the Board to consider changes to the requirements for the 2009 and subsequent model years;

Requiring that any 2001 or 2002 model-year ZEV be placed in service in California by September 30, 2003 in order to qualify for the ZEV phase-in multiplier of 4.0; thereafter in order to qualify for the ZEV credits applicable to ZEVs produced in a specified model year, a ZEV must be placed in service by June 30 of the following model year;

Allowing Type III ZEVs placed in any state that is administering the California ZEV program pursuant to section 177 of the federal Clean Air Act (a section 177 state) to count towards the ARB's ZEV requirement, with the effect that the ZEV requirements of any section 177 state will have to allow the counting of Type III ZEVs placed in California or other section 177 states;

Making other miscellaneous changes related to warranty, timing for transportation systems credits, and other elements of the ZEV regulation;

WHEREAS, after receiving all oral and written comment at the March 27-28 hearing, on March 28 the Board continued its deliberations on the matter until April 24, 2003;

WHEREAS, at the April 24, 2003 continued hearing, the staff presented additional modifications as set forth in Attachment D hereto; these additional modifications include adding production targets for Type III ZEVs under the alternative compliance path during the 2009-2011, 2012-2014 and 2015-2017 model years reflecting "10X" growth by stages with elimination of the alternative compliance path after the 2017 model year; providing each manufacturer on the alternative compliance path the option of meeting up to one-half of its Type III ZEV obligation with a substantially higher number of credits from Type I or Type II battery EVs; providing a 1.25 multiplier for all Type I and Type II ZEVs that are either sold to motorists or are leased with the option to purchase or re-lease; increasing the credit for ZEVs or grid-connect PZEVs being operated beyond the first three years of service, and sunsetting after the 2011 model year the provisions on counting Type III ZEVs placed in a section 177 state; the proposal reflecting the modifications identified in Attachments C and D is referred to as the final modified proposal;

WHEREAS, the hearing notice for the proposed 2003 ZEV amendments stated that the Board would accept comment on whether it should reaffirm the phase-in of the requirement that LDT2 vehicles be included in the base for calculating a manufacturer's ZEV obligation;

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:

It is necessary and appropriate to restart the ZEV requirements at the earliest practical time in order to maintain momentum towards ZEV commercialization and to take advantage of technologies now in production to achieve near-term air quality benefits and build a manufacturing and supplier base for pure ZEV technologies; given the significant numbers of ZEV credits and PZEV allowances that manufacturers have already generated or will be generating in the near term, it is feasible to restart the percentage ZEV requirements in the 2005 model year;

The Battery Technology Advisory Panel established as part of the Board's 2000 biennial review of the ZEV program concluded that nickel metal hydride batteries for full function electric vehicles (EV) would cost approximately \$7,000 to \$9,000 each at production levels exceeding 100,000 battery packs per year, and more at lower production levels; based on these assessments staff in 2001 estimated the near term incremental cost for battery EVs at roughly \$8,000 for a City EV and \$17,000 for a full function EV;

Although there have been some recent advances in battery performance, in particular with regard to cycle life, the fundamental cost challenges for battery EVs identified in 2000 remain, and the sustainable demand for such vehicles appears to be small, at least in the near term;

Fuel cell EV technology shows great promise and manufacturers appear to believe there is a business case for the technology, but fuel cell EVs are much more costly than battery EVs in their current stage of development, and they present significant cost, manufacturing and performance challenges involving durability, cold weather performance and other factors; the pace of future fuel cell EV development is difficult to predict;

An AT PZEV fueled with CNG is in commercial production; while none of the three different HEV models currently being marketed in California are yet certified as AT PZEVs, future versions of these and other announced HEV models are expected to qualify as AT PZEVs; ten different vehicle models are currently being marketed in California as PZEVs, including high production models such as the four cylinder Honda Accord and Toyota Camry;

Maintaining the base compliance path with the percentage ZEV requirements that applied under the preexisting ZEV regulation is necessary and appropriate to assure that a manufacturer that has taken compliance action to date based on those requirements is able to continue relying on the availability of those provisions if it wishes to do so;

The alternative compliance path in the final modified proposal will enable a large manufacturer to comply with the ZEV requirements by aggressively pursuing fuel cell EV commercialization if that is the manufacturer's preferred path; if this path is taken by all large manufacturers, it would lead to approximately 250 Type III ZEVs in the 2001-2008 model years, which is sufficient to satisfy the need for the next logical step towards commercialization for fuel cell vehicles – small-scale demonstration programs;

The Type III ZEV targets for the 2009-2011, 2012-2014, and 2015-2017 model years in the alternative compliance path provisions in the final modified proposal appropriately reflect anticipated development stages for fuel cell vehicles, which

proceed from technical feasibility demonstrations to controlled fleet demonstrations under real-world conditions to commercial readiness demonstrations to final commercialization;

The provisions of the final modified proposal allowing fresh credits from Type I or II ZEVs to be used to meet up to one-half of a manufacturer's minimum floor requirements for Type III ZEVs under the alternative compliance path provides an incentive for the production of full function and City battery EVs, with the credit ratio for the 2005-2008 model years such that there is a limited cost advantage to using credits from battery EVs;

The additional modifications in Attachment D create additional incentives for manufacturers to satisfy current driver demand by keeping battery EVs on the road for a longer period;

The purpose of the provisions allowing HEVs to qualify for AT PZEV allowances or treatment as AT PZEVs – as well as the AT PZEV provisions pertaining to high pressure gaseous fuel or hydrogen storage systems – is to further the development, use and production efficiencies of technologies and components that contribute to the commercialization of pure ZEV vehicles, including battery EVs and fuel cell vehicles; for example, HEVs and pure ZEV technologies such as fuel cells share many of the same electric drive components, especially traction motors and motor controllers, and hybridizing fuel cell vehicles adds electric storage devices and regenerative braking systems to the list of common components;

Near-term incentives for low-voltage HEV systems that have an electric motor size of at least four kilowatts will advance electric drive technology to the extent that the systems might be applicable on selected low-power ZEV applications and will help develop consumer recognition of HEV technology; it is appropriate to limit the eligibility of HEVs with such systems for the AT PZEV category to model years 2008 and earlier because the systems are expected to become commonplace in standard automobiles and reach technical maturity faster than more robust systems;

High voltage and high voltage/high power HEV componentry will more significantly advance the technology and manufacturing base for ZEVs, and some hybrid electric vehicle motors may have sufficiently high power ratings to meet or exceed the power requirements of small ZEVs;

The use of an HEV electric drive system can reduce tailpipe emissions of NMOG, NO<sub>x</sub> and CO, by reducing the incidence of engine operating conditions that are associated with increased emissions of NMOG and NO<sub>x</sub> and by providing quicker starts with reduced start-up emissions, and the use of an idle start/stop feature will eliminate all tailpipe emissions during idling modes; thus while AT

PZEVs with qualifying electric drive systems and PZEVs without such systems are subject to the same exhaust and evaporative emissions standards, stimulating the development of such systems will also aid manufacturers in certifying a broader range of vehicles – particularly heavier and higher-power vehicles – to the PZEV standards with a resulting emissions benefit;

While two mechanisms in the 2001 ZEV amendments for awarding ZEV allowances to hybrid electric PZEVs – the efficiency and CO2 reduction methods – were based directly or indirectly on the degree to which the fuel economy of a particular PZEV model was greater than the average fuel economy of vehicles in its class, the scoring mechanism in the revised staff proposal neither refers to nor is in any way dependent on the fuel economy or relative fuel economy of the vehicles being evaluated; for instance, there can be situations where a low voltage HEV has better fuel economy than a high voltage HEV in the same vehicle class;

Moreover, the primary performance-related motivation for a manufacturer to employ hybrid electric technologies qualifying for AT PZEV treatment may be advances in horsepower and acceleration rather than improved fuel economy, as evidenced by manufacturer statements regarding the hybridization of the Lexus RX 330 and the Toyota Highlander;

The phased addition of LDT2 vehicles to the vehicle base to which the percentage ZEV requirements are applied is necessary and appropriate because while a large percentage of vehicles in the LDT2 category have traditionally been used for work purposes, it is now very common for the SUVs, minivans and pickup trucks making up the category to be used primarily for personal transportation, i.e., as passenger cars, and as such should be treated as the equivalent to passenger cars for purposes of the ZEV regulation just as they are in the LEV II program; moreover, permanent exclusion of the LDT2 category from the ZEV requirements encourages manufacturers to sell more large vehicles in order to reduce the number of zero and near-zero vehicles it must produce;

It is the Board's intent that if any provision of the ZEV regulation as amended in this rulemaking is found invalid for any reason, then the remainder of the regulation shall remain in full force and effect; this is evidenced by the text in section 1962(c)(4)(B)5. and (k) of the staff's modified proposal,

While the amendments being adopted in this rulemaking – particularly the optional compliance requirements of section 1962(b)(2)(B), and the section 1962(c)(4)(B) provisions on the advanced ZEV componentry PZEV allowance for use of a qualifying HEV electric drive system – offer manufacturers substantial additional flexibility in progressing towards pure ZEV commercialization, the Board remains committed to that ultimate objective; if either or both of the above provisions are found to be in whole or part preempted by federal law, the Board



chooses to enforce the remainder of the amended regulation over the prospect of retaining the current ZEV regulation when its enforcement has been enjoined;

Overall, the modified amendments 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;

WHEREAS, the Board further finds that:

Although a number of commenters have asserted that the staff's proposed amendments will impair air quality due to reductions in the number of ZEVs required, these commenters have not specifically disputed the emissions analyses in the supplemental staff report released March 5, 2003 indicating that if all manufacturers choose the alternative compliance option, the March 5, 2003 modified proposal would be expected to result in a 2010 net decrease of about 0.09 tons per day of direct emissions of reactive organic gases and oxides of nitrogen combined in the South Coast Air Basin compared to implementation of the current ZEV regulation; a comparable analysis of the final modified proposal indicates it would not result in a net increase in direct emissions of reactive organic gases and oxides of nitrogen in 2010 in the South Coast Air Basin;

As compared to a no ZEV program baseline, the supplemental staff report released March 5, 2003 indicated that the modified staff proposal would be expected to reduce approximately 1.4 and 5.5 tons per day of combined direct emissions of reactive organic gases and oxides of nitrogen by 2010 and 2020 respectively in the South Coast Air Basin;

Reductions in emissions of reactive organic gases resulting from this rulemaking would also be associated with reductions in emissions of benzene and 1, 3 butadiene, which have been identified as toxic air contaminants for which the Board has found no threshold level of exposure below which no significant adverse health effects are anticipated from exposure;

The January 10, 2003 Initial Statement of Reasons and the supplemental staff report released March 5, 2003 did not identify any other adverse environmental impact that would result from the original or modified staff proposals;

A commenter has asserted that without major cost reductions in excess of what is currently foreseen, the March modified proposal is likely to result in emissions disbenefits in the South Coast Air Basin, due to the "fleet turnover" effect under which an increase in new vehicle prices attributable to the ZEV requirements will slow the replacement of older, more polluting vehicles by new very clean ones; given that the final modified proposal will significantly reduce the cost burden faced by manufacturers as compared to the situation under the 2001 amendments, and that staff's analysis of the fleet turnover effect under the 2001

amendments using ARB assumptions found that the effect would be small, it is expected that the fleet turnover effect, properly analyzed, will not significantly change the emission benefits of the final modified proposal;

A commenter has asserted that excess emissions associated with the production and marketing of hydrogen fuel for fuel cell vehicles have not been accounted for in staff's analysis of the environmental impacts of amendments to the ZEV regulation; in the near term, such emissions will be insignificant because the number of fuel cell vehicles to be fueled is small – the 2750 fuel cell vehicles through the 2011 model year expected with full use of the alternative compliance path would result in a 0.3 percent change in the oxides of nitrogen emission benefit of the program; as the fleet expands there will be a number of refueling options to be explored and ample opportunity to review and optimize their environmental performance;

Some comments, primarily comments submitted the day of the public hearing, have identified potential environmental issues which should be more fully addressed prior to final action in this rulemaking;

WHEREAS, the Board further finds that:

Compared to full implementation of the current ZEV regulation, the expected savings to manufacturers resulting from the originally proposed amendments over the 2005-2011 model years would range from about \$375 million to more than \$3.60 billion; this range reflects uncertainties regarding each manufacturer's compliance strategy, but the savings would primarily be the result of the reduced number of pure ZEVs required;

Compared to having no ZEV regulation, the direct cost of compliance with a ZEV regulation reflecting staff's originally proposed amendments would range from \$710 million to \$2.0 billion over the seven-year period from the 2005 through the 2011 model years, using worst case assumptions regarding manufacturer use of banked ZEV credits (i.e., no trading);

The PZEV element of the ZEV regulation reflecting the amendments approved herein has the objective of achieving near term emission reductions; with an estimated incremental cost of \$100 per vehicle, the cost-effectiveness of emissions reductions attributable to the introduction of PZEVs is approximately \$44,400 per ton;

The AT PZEV elements of the ZEV regulation reflecting the amendments approved herein have the dual objectives of advancing the technology and manufacturing base for ZEVs, and achieving near term emission reductions; with an estimated incremental per vehicle cost of \$2,300 in the 2005 model year, \$500 in the 2006-2008 model years, and \$200 in the 2009-2011 model years,

the cost-effectiveness attributable to the introduction of PZEVs is approximately \$575,000, \$125,000, and \$50,000 per ton in those three periods;

The elements of the ZEV regulation that must be met by pure ZEVs have the long term objective of accelerating the development of pure ZEV technology to achieve significant future air quality benefits; with fuel cell ZEVs still in the research and development stage, the estimated incremental per vehicle cost of a fuel cell ZEV is \$1 million in the 2005 model year, \$300,000 in the 2006-2008 model years, \$120,000 in the 2009-2011 model years, and \$10,000 in the 2012 model years; thus the cost-effectiveness attributable to the introduction of fuel cell ZEVs is approximately \$64 million, \$19.2 million, \$7.7 million, and \$640,000 in those periods;

While the above dollars per ton cost-effectiveness values greatly exceed those for other air pollution control measures, they must be viewed in the context of the Board's essential objective of maintaining significant pressure on manufacturers to continue ZEV technology development; the Board knows of no other mechanism that can accomplish this objective to the same degree in a more economical fashion;

Moreover, the Board expects that the long-term cost of ZEV technology will decline beyond the above cost estimates, based on overall experiences with prior vehicular air pollution control programs and the level of automakers' multi-billion dollar investments in developing fuel cell technology, which would not exist or continue without a belief on the part of automakers that there is a long-term business case to be made for the profitable mass production of fuel cell vehicles.

NOW, THEREFORE, BE IT RESOLVED that, subject to further environmental analysis, the Board is initiating steps towards final adoption of (1) the amendments to title 13, California Code of Regulations, section 1962, set forth in Attachment C hereto (reflecting the staff's suggested modifications made available March 5, 2003) with the further modifications set forth in Attachment D hereto, and (2) the amendments to the "California Exhaust Emission Standards and Test Procedures for 2005 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 described in Attachment C hereto as further modified by the modifications described in Attachment D hereto.

BE IT FURTHER RESOLVED that, subject to further environmental analysis, the Board is inclined to reaffirm the provisions in section 1962(b)(1)(C) phasing in ZEV requirements for vehicles in the LDT2 category over the 2007 through 2012 model years.

BE IT FURTHER RESOLVED that the Board directs the Executive Officer to compile the amendments described above, with such additional conforming modifications as

may be appropriate, in a form showing all modifications to the original proposal, and make that regulatory text available for a supplemental comment period of at least 15 days on the modifications.

BE IT FURTHER RESOLVED that the Executive Officer shall consider all relevant comments submitted during the supplemental comment period, and incorporate into the amendments any additional modifications she determines appropriate, making the modifications available for additional public comment if required by the California Administrative Procedure Act.

BE IT FURTHER RESOLVED that the Executive Officer shall then take appropriate final action adopting amendments in this rulemaking, after preparing a written response to all comments received that have raised significant environmental issues, and assuring that all feasible mitigation measures or feasible alternatives available that would substantially reduce any significant adverse environmental impacts have been incorporated into the final action.

BE IT FURTHER RESOLVED that the Board shall appoint an Independent Expert Review Panel, whose members shall not have financial ties to motor vehicle manufacturers, to report to the Board on the status of ZEV technologies and the readiness of various technologies for market and consumer acceptance, after consulting with members of the California Fuel Cell Partnership and other experts in connection with its review; that the Panel Report should be received by the Board in time for the Board to consider it and other information in determining the appropriate regulatory approach on the commercialization of pure ZEVs in the 2009 and subsequent model years; and that it is the intent of the Board that the Panel not make recommendations on regulatory action, and only the Board itself shall decide whether amendments to the regulatory requirements are to be made.

BE IT FURTHER RESOLVED that the Independent Expert Review Panel shall also review and report to the Board on the extent to which the development and production of AT PZEVs have contributed towards commercialization of fuel cell vehicles, whether economies of scale have largely been achieved and technology largely optimized, and the potential that future increases in the number of AT PZEVs produced pursuant to the ZEV regulation as amended in this rulemaking will further contribute to the commercial success of fuel cell ZEVs.

BE IT FURTHER RESOLVED that the staff shall report back in three months on the appropriate process for incentivizing station car projects, hydrogen infrastructure, and integrating such efforts with related transportation management programs including but not limited to intelligent transportation and "smart corridor" programs, and on the implications of providing ZEV credits for stationary fuel cells.

BE IT FURTHER RESOLVED that the staff shall report to the Board annually on the status of implementation of the ZEV regulation as amended in this rulemaking.

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 03-4, as adopted by the Air Resources Board.

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Stacey Dorais, Clerk of the Board

Resolution 03-4

March 27, 2003

**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 released January 10, 2003.
- 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 released January 10, 2003.
- Attachment C:** Staff’s Suggested Modifications to the Proposed Regulation Order, as set forth in Appendix A to the “Description and Rationale for Staff’s Additional Proposed Modifications to the January 10, 2003 ZEV Regulatory Proposal” dated March 5, 2003.
- Attachment D:** Additional Modifications to the 2003 Amendments to the California Zero Emission Vehicle Regulation, as presented by the Air Resources Board staff at the April 24, 2003 continued hearing.

## **ADDITIONAL MODIFICATIONS TO THE 2003 AMENDMENTS TO THE CALIFORNIA ZERO EMISSION VEHICLE REGULATION**

### **Presented by Air Resources Board Staff at the April 24, 2003 Continued Hearing**

The modifications set forth below to the 2003 amendments to the California Zero Emission Vehicle (ZEV) regulation would be in addition to those reflected in the March 5, 2003 modified text contained in Attachment C to the Resolution.

- 1. Alternative Compliance Path – Minimum floor for production of Type III ZEVs after the 2008 model year.** Add a requirement that a large volume manufacturer electing to be subject to the alternative compliance path during model years 2009 through 2011 must produce, deliver for sale and place in service in California enough 2009 through 2011 model-year Type III (fuel cell vehicles) to generate a specified level of ZEV credits. The specified level would be sufficient to result in the production of approximately 2500 Type III ZEVs (fuel cell vehicles) during those model years if all large volume manufacturers were to participate in the alternative compliance path during those model years. The requirement would be expressed in a manner similar to that used for the 2005-2008 model years in the modified proposed amendments released March 5, 2003. Credits from 2001 through 2008 model year Type III ZEVs could be used to satisfy this requirement to the extent they had not previously been used to meet the alternative compliance path minimum floor requirements for the 2005 through 2008 model years.

Similar requirements would be established for the 2012-2014 model years and the 2015-2017 model years, designed to result in approximately 25,000 and 50,000 Type III ZEVs respectively in those two sets of three model years. The alternative compliance path would no longer be available after the 2017 model year.

- 2. Alternative Compliance Path – Option to meet up to one-half of the minimum floor requirements with credits from Type I or II ZEVs.** Modify the provisions on the minimum floor for production of Type III ZEVs under the alternative compliance path to allow credits from 2003 and subsequent model Type I ZEVs (City battery electric vehicles) and Type II ZEVs (full function battery electric vehicles) to satisfy up to one-half of a large volume manufacturer's minimum floor for production of Type III ZEVs. The credit ratios would be such that 20 Type I ZEVs, or 10 Type II ZEVs, would equal 1 Type III ZEV in the 2005-2008 model years. Appropriately adjusted credit ratios would apply after that time.

Credit earned by in-use Type I and Type II ZEVs in 2003 and beyond under the mechanism described in item 4 below could also be applied towards the contribution from Type I and II ZEVs, using for each additional year of service a credit ratio of 33 Type I or Type II ZEVs to 1 Type III ZEV.

3. **Multiplier for Type I and II ZEVs sold or leased with consumer option to purchase or release.** Add a new provision granting a 1.25 multiplier to 2003 and subsequent model Type I and Type II ZEVs that are either sold to motorists or are leased for three or more years to motorists who are given the option to purchase or re-lease the vehicle at the end of the first lease term.
4. **Expand the in-service warranty multiplier for 2001-2004 ZEVs or PZEVs with 10 miles or more zero range.** (a) Under section 1962(f), 2001-2004 model-year ZEVs and grid-connect hybrid PZEVs that are still covered by the original warranty and continue to be registered in California after three years of service currently qualify the manufacturer for an additional credit for each additional full year the vehicle remains registered and covered by the warranty. The current additional credit for each additional full year is 0.1 times the credit the vehicle would earn if marketed as a new vehicle that year. The modification would double that credit to 0.2 times. (b) In addition, 2001-2004 ZEVs that do not remain under warranty would qualify for the additional credit after the first three years of service for each additional year during which the manufacturer can demonstrate that the vehicle was in use for the full year.
5. **Sunset the “travel” provision after model year 2011.** Modify section 1962(d)(5)(C) on counting a Type III ZEV placed in a section 177 state so that the provision no longer applies after 2011 model year. The provision would also be modified to make clear that it applies to the minimum floor requirements for Type III ZEVs under the alternative compliance path.