

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER G-03-069

Relating to Public Hearing to Consider the 2003 Amendments to the California Zero-Emission Vehicle Regulation

WHEREAS, on March 27-28 and April 24, 2003, the Air Resources Board (ARB or Board) conducted a public hearing to consider proposed amendments to the California Zero-Emission Vehicle (ZEV) regulations;

WHEREAS, following the public hearings, on April 24, 2003, the Board adopted Resolution 03-4, in which the Board, subject to further environmental analysis, initiated steps towards final adoption of (1) the amendments to title 13, California Code of Regulations, section 1962, set forth in Attachment C thereto (reflecting the staff's suggested modifications made available March 5, 2003) with the further modifications set forth in Attachment D thereto, 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 thereto, with the modifications described in Attachment C thereto as further modified by the modifications described in Attachment D thereto;

WHEREAS, in Resolution 03-4 the Board 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;

WHEREAS, Resolution 03-4 directed 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;

WHEREAS, Resolution 03-4 further directed the Executive Officer to consider all relevant comments submitted during the supplemental comment period, and to 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;

WHEREAS, Resolution 03-4 directed the Executive Officer to 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;

WHEREAS, by August 8, 2003, the modified regulatory text, reflecting the amendments upon which the Board initiated action, with other changes made to best reflect the intent of the Board at the hearing, were made available for public comment for a period of at least 15 days, with the changes to the originally proposed text clearly indicated, in accordance with the provisions of title 1, California Code of Regulations, section 44; at the same time, the public was also provided an opportunity to comment on material being added to the rulemaking file;

WHEREAS, 70 written comments on the modified text and material added to the rulemaking file were received during the supplemental comment period which ended August 25, 2003;

WHEREAS, by October 10, 2003, additional modifications prepared in response to the comments were made available for public comment for a period of at least 15 days, with the changes to the previously proposed text clearly indicated, in accordance with the provisions of title 1, California Code of Regulations, section 44; 19 additional comment letters were timely received by the end of the additional comment period on October 27, 2003;

WHEREAS, Attachment 1 hereto shows amendments to sections 1962 and 1900, title 13, California Code of Regulations, reflecting the proposed amendments made available by August 8, 2003, with the further modifications made available by October 10, 2003; Attachment 2 hereto shows amendments to the incorporated "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," reflecting the proposed amendments made available by August 8, 2003, with the further modifications made available by October 10, 2003; both attachments also reflect a few nonsubstantive corrections identified in Attachment 3 hereto;

WHEREAS, I find that the amendments of the ZEV regulation adopted herein are consistent with the direction of the Board at the April 24, 2003 hearing;

WHEREAS, the rationale for the modifications to the original proposal are described in the Final Statement of Reasons prepared for this rulemaking, and based on that rationale and the findings in Resolution 03-04, I find that the amendments adopted herein are necessary and appropriate;

WHEREAS, I further find 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 net decrease of about 0.03 and 0.06 tons per day of direct emissions of reactive organic gases and oxides of nitrogen respectively in the South Coast Air Basin in 2010 compared to implementation of the current ZEV regulation, and in a 2020 net decrease of 0.04 and 0.17 tons per day respectively; the modifications to the March 5, 2003 supplemental proposal that are reflected in the adopted amendments will not appreciably change those projected decreases;

As compared to a no ZEV program baseline, the modified staff proposal released March 5, 2003 was expected to reduce approximately 1.4 and 5.5 tons per day of combined direct emissions of reactive organic gases and oxides of nitrogen in 2010 and 2020 respectively in the South Coast Air Basin, and the modifications to the March 2003 supplemental proposal that are reflected in the adopted amendments will not appreciably change those projected decreases;

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 impacts 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 adopted amendments 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 amended regulation;

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;

Attachment 4 hereto summarizes all of the comments raising significant environmental issues in this rulemaking, and the written responses to those comments, prepared by staff;

Compared to the emissions impacts from the currently applicable ZEV regulation, the ZEV requirements as amended herein will not have a significant adverse emissions or other environmental impact.

WHEREAS, I further find that:

Under the amendments adopted herein, a large volume manufacturer has the option in the 2005 and subsequent model years to use the primary ZEV compliance option under which the manufacturer's compliance costs would be essentially the same as its compliance costs under the preexisting regulation; although 20 percent of the manufacturer's ZEV obligation would have to be met with "gold" ZEVs, because of banked ZEV credits and multipliers, most manufacturers would probably not have to produce any new "gold" ZEVs until the 2009 model year; up to 60 percent could be met with credits from "bronze" partial ZEV allowance vehicles (PZEVs) and the remaining 20 percent of the ZEV obligation would have to be met with credits from "silver" Advanced Technology PZEVs (AT PZEVs);

The amendments adopted herein allow a large volume manufacturer to choose the alternative compliance path under which the manufacturer may meet part of its ZEV requirement by producing its sales-weighted market share of approximately 250 fuel cell or other Type III ZEVs over the 2005-2008 model years and 2500 Type III fuel cell vehicles over the 2009-2011 model years; the remainder of the manufacturer's ZEV obligation could initially be met with a credit mix of 4 percent from AT PZEVs and 6 percent from AT PZEVs or PZEVs;

While the near-term incremental cost to produce a battery electric vehicle (BEV) of about \$17,000 is far less than the incremental cost to produce a fuel cell ZEV – estimated to be \$1 million per vehicle through the 2008 model year, and \$120,000 per vehicle in model-years 2009-2011 – all major manufacturers are aggressively pursuing fuel cell research and development and have ceased production planning for BEVs battery; this indicates that manufacturers see a better potential business case for profitable production of fuel cell ZEVs and do not believe that the fundamental cost challenges of BEVs can be overcome;

The alternative compliance path allows a manufacturer wishing to do so to devote all of its ZEV efforts to development of fuel cell and other Type III ZEVs rather than BEVs even though the near-term costs of BEVs are lower; a

manufacturer has the additional option of meeting up to one half of its alternative compliance path Type III ZEV obligations with credits from new or re-leased BEVs on a cost-equivalent basis;

Given the variety of options and uncertainties, it is difficult to estimate the cost impacts of the amendments adopted herein; if manufacturers did not have banked credits and chose to comply with their total ZEV obligations entirely with fuel cell vehicles, the estimated cost savings under the amendments adopted herein compared to the preexisting regulation would be approximately \$4,900 million over the 2005 through 2011 model years, although the actual savings would be much lower due to the existence of banked credits and the unlikelihood that manufacturers would produce larger numbers of extremely expensive developmental fuel cell vehicles in the near term under the ZEV regulation as amended in 2001;

The PZEV element of the ZEV regulation as amended 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 of reactive organic gases plus oxides of nitrogen ROG + NO_x) reduced;

The AT PZEV elements of the ZEV regulation as amended 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 as amended herein 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 adopted air pollution control measures, which have typically not exceeded \$20,000 per ton, they must be viewed in the context of the ARB's essential objective of maintaining significant pressure on manufacturers to continue ZEV technology development; I know of no other mechanism that can accomplish this objective to the same degree in a more economical fashion, and

in the context of these considerations the ZEV regulation as amended herein is cost-effective;

I expect 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; and

WHEREAS, the Executive Officer further finds that no alternative considered would be more effective at carrying out the purposes for which the amendments are proposed, or would be as effective and less burdensome to affected private persons and businesses than the amendments.

NOW, THEREFORE, IT IS ORDERED that the recitals and findings contained in Resolution 03-04 are incorporated herein.

IT IS FURTHER ORDERED that I hereby approve each of the written responses in Attachment 4 hereto to comments raising significant environmental issues in this rulemaking.

IT IS FURTHER ORDERED that sections 1962 and 1900, title 13, California Code of Regulations, are amended as set forth in Attachment 1 hereto, and the incorporated "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," is amended as set forth in Attachment 2 hereto.

IT IS FURTHER ORDERED that 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 are hereby reaffirmed.

Executed this 19th day of December, 2003, at Sacramento, California.

/s/

Catherine Witherspoon
Executive Officer

Attachments