State of California
AIR RESOURCES BOARD

Resolution 07-18

May 24, 2007

Agenda Item No.: 07-5-5

WHEREAS, sections 39600 and 39601 of the Health and Safety Code authorize the Air Resources Board (ARB or the Board) 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 Board's California State Implementation Plan for ozone establishes the state strategy for attaining the ambient air quality standard for ozone in all areas of the state 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 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" (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;

WHEREAS, the Board directed at its April 2003 Board hearing the appointment of an Independent Expert Panel (Panel), whose members are without 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 was the intent of the Board that the Panel not make recommendations on regulatory action, as only the Board itself would decide whether amendments to the regulatory requirements are to be made;

WHEREAS, the Board also directed the Panel to report to the Board on the extent to which the development and production of advanced technology partial zero emission vehicles (AT PZEV) 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 would further contribute to the commercial success of fuel cell ZEVs;

WHEREAS, the Panel spent much of 2006 gathering technical information and cost data, as well as analysis and opinions, from leading developers of components and major automakers through correspondence and site visits;

WHEREAS, the information collected underwent a critical and thorough assessment by the Panel in an effort to fully understand the current status and prospects for commercialization of each of the technologies evaluated. The Panel published a report containing the major conclusions that:

While the challenges facing fuel cell vehicles are not trivial, the past rate of success and the massive intellectual and financial resources being devoted to technology, ensures that fuel cell vehicles remain a promising candidate for a future mass market full performance ZEV;

Progress has been made in batteries that could be used for battery electric vehicles (BEV), especially smaller vehicles. Several battery chemistries appear to provide performance and life cycle performance necessary for customers. However, full-sized battery electric vehicles are still not likely to be a mass market technology in the foreseeable future due to high cost of the batteries;

Plug-in hybrid electric vehicles (PHEV) offer direct societal benefits to the consumer and are likely to become commercially available in the near future. The incremental cost of the small battery pack should be offset by the lower operating cost of the technology;

Automaker interest in the use of hydrogen internal combustion engines is not widespread. While developing conversions of conventional vehicles to use hydrogen is far easier than producing fuel cell vehicles, issues regarding hydrogen storage and infrastructure are the same or worse than those facing fuel cell vehicles;

Commercially available hybrid electric vehicles appeal to the mass market customer willing to pay a premium. The production of these vehicles continues to reduce the cost of electric drive components and systems - but cost is still an issue and future market success and volume of hybrid electric vehicles is largely dependent on the price of gasoline, and;

A limited market for neighborhood electric vehicles appears to have had some commercial success. While neighborhood electric vehicles provide some emissions benefits, the technology does not promote full function ZEVs due to simple technology and performance limitations;

WHEREAS, the ARB staff held a two and one-half day ZEV Technology Symposium to solicit information related to the program. The key findings from the Symposium are that:

Fuel cell development is progressing with newer generations of technology, but higher pressure hydrogen storage systems are needed to increase vehicle range, and overall system cost is still a concern;

Lithium ion battery technology is showing promising development results for plug-in hybrid electric vehicles and extended all-electric driving range, but further material and battery production research is still needed;

Further testing results on battery durability and cycle life are also needed, and;

Low volume manufacturers of battery electric vehicles will begin production in the near term, helping to push new battery electric vehicle technologies into the California market;

WHEREAS, ARB has found that manufacturers are concerned that insufficient infrastructure will be available in the short term to meet the needs of their next generation vehicle placements; although there are a healthy number of stations in California, many have either limited or no public access; ARB also found that the State continues to play a role in coordinating and supporting infrastructure rollout;

WHEREAS, ARB has found that while some changes to the ZEV regulation are potentially needed, overall, the program remains effective and useful in reducing both near-term and long-term emissions for mobile sources.

NOW, THEREFORE, BE IT RESOLVED that ARB staff shall consider the findings on technologies needed to address the state of technology noted above and proposed modifications to the ZEV regulation. The proposed changes shall reflect the following considerations:

In the event that staff determines that changes are needed in the Alternative Path provisions in order to address timing and quantity issues, staff is directed to address these issues by changing other compliance options (including the treatment of BEVs and PHEVs and actions pertaining to infrastructure) which strengthen the program; staff is directed to assure that the program is not backsliding;

The volume requirements for the first two phases of fuel cell development are appropriate; however, additional generations of fuel cell vehicles may need to be demonstrated in limited numbers before ramping up to higher production volumes; also the requirements for timing and quantities of vehicles under the Alternative Path may need modification to allow for continued progress towards the fuel cell stack life and cost goals;

Although cost and utility are still significant barriers to full commercialization of BEVs, more even treatment of battery electric vehicles (i.e., more credit) is appropriate to encourage manufacturers to pursue technology;

PHEVs, including blended-mode PHEVs, have the potential to provide significant direct benefits and foster future mass market ZEVs by stimulating battery development and conditioning customers to accept plugging in; as such, adjustments to the ZEV regulation should be considered to encourage their commercialization; PHEVs should not, however, receive pure ZEV credit;

Given the air quality benefits associated with NEVs, it is appropriate to consider increasing the credit value for this class of vehicle;

The "travel provision," a component of the regulation that allows vehicles placed in California to count towards compliance with other state programs, does not apply after model-year 2011 vehicles; given the state of fuel cell vehicle development, consideration should be given to extending the provision; and

Some auto companies have indicated their ability to significantly reduce conventional vehicle emissions far below PZEV standards; staff should evaluate this information and determine how to best encourage the production of such vehicles.

BE IT FURTHER RESOLVED that ARB staff shall return to the Board by the end of calendar year 2007 with proposed modifications based on the above findings.

BE IT FURTHER RESOLVED that ARB staff is directed to take a broad legal view regarding the "disclosure of credits" issue in order to achieve a transparent public process.

I hereby certify that the above is a true and correct copy of Resolution 07-18, as adopted by the Air Resources Board.

Lori Andreoni

Lori Andreoni, Clerk of the Board