



January 25, 2012

Clerk of the Board  
Air Resources Board  
1001 I Street  
Sacramento, California 95814

**Subject: Advanced Clean Car Regulations**

Air Resources Board Members:

I am writing on behalf of the Alliance of Automobile Manufacturers (Alliance), a trade association of 12 car and light-truck manufacturers representing over 75 percent of the new vehicle market. Subject to the recommendations provided in this letter and the attachments, the Alliance supports the proposed criteria regulations and the harmonization of GHG regulations.

This letter does not provide an exhaustive review of the Zero Emission Vehicle (ZEV) or Clean Fuels Outlet (CFO) regulations. However, the Alliance continues to oppose ZEV offsets based on over-compliance with the federal GHG standards, as outlined in our 21-Nov-2011 letter to ARB (included as Attachment 1), and recommends removing that provision. We support the requirements in the CFO, as these are needed if automakers and California hope to realize the aggressive GHG reduction goals and those of the ZEV mandate.

The Advanced Clean Cars regulations touch every regulation and requirement impacting light-duty vehicles and the driving public for the next decade and a half. This period will unquestionably witness the most dramatic changes in automobile emission control in history. During the 2015 to 2025 model year (MY) timeframe, these regulations require manufacturers to reduce criteria emissions by 75% or more; extend durability to 150,000 miles; ensure all vehicles meet zero evaporative emission standards; reduce greenhouse gas (GHG) emissions by an average of 4.5 percent each year to achieve a 163 g/mi CO<sub>2</sub> average that would be equivalent to an average fuel economy of 54.5 miles per gallon if reductions came only from fuel economy technology; and design, develop, produce, and sell over 1.4 million plug-in hybrid electric vehicles, battery electric vehicles, and fuel cell vehicles (in California alone) while carefully monitoring the infrastructure needed for these vehicles. All of these requirements must be met with limited resources, both in industry and at the agencies. We simply do not have resources to duplicate effort, and we ask the board to recognize this and direct staff to harmonize both the GHG and the criteria emission standards.

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Given the scope, costs, and environmental impact of the proposal, the Alliance and our member companies have spent the past three years working closely with the Air Resources Board (ARB) staff and those of the U.S. Environmental Protection Agency (U.S. EPA) and the National Highway Traffic Safety Administration (NHTSA) on the different components of this regulation. Recognizing the aggressive reductions in the greenhouse gas and criteria emissions sought by the agencies, automakers have worked with staff to develop a program that allows a technically feasible and cost-effective introduction of advanced technology vehicles. Notwithstanding the research and dialogue that has taken place, it is impossible to accurately predict the pace of invention and innovation, the future fuel supply and pricing, or, most importantly, consumer purchasing behavior. The success of this regulatory package ultimately rides on these and other factors. Consequently, mid-term reviews are essential to assess the pace of invention, innovation, and consumer acceptance.

Before discussing more specific comments, we would like to acknowledge the ARB staff's willingness to work with industry in an open, transparent, and cooperative process. As ARB staff developed the regulations, they made themselves available for countless meetings, phone calls, and web meetings, and responded to hundreds of emails. While we can never hope to agree on every issue, ARB staff's professionalism and willingness to meet and discuss the issues with an open mind and in a cooperative manner directly contributed to what we believe is, for the most part, a set of regulations that properly balance the need for cleaner, more efficient vehicles with the realities of consumer demand and vehicle technology development, validation, certification, production, and use.

The remainder of this letter provides general recommendations on the greenhouse gas and criteria pollutant regulations (including certification fuels). We have attempted to include clear recommendations for Board action in this letter while placing more detailed technical comments and recommendations in attachments.

#### 1. Greenhouse Gases (GHG)

- a. Harmonization: As mentioned earlier, one of the highest priorities for this rulemaking is harmonization of federal and California regulations. ARB has recognized the importance and benefit of a single national program for GHGs. ARB's current GHG regulations (2012-2016 MY) allow manufacturers to comply with the federal program in lieu of complying with the ARB program by providing federal certification data, and ARB made the same commitment for the 2017-2025 MY regulations in a letter to U.S. EPA and NHTSA on 28-Jul-2011.

***We applaud ARB's commitment and request that the Board direct the Executive Officer to adopt regulatory changes necessary to allow manufacturers to comply with the U.S. EPA GHG regulations in lieu of compliance with California once U.S. EPA issues a final rule. Moreover, ARB should continue the practice of allowing manufacturers to certify vehicles in California by submitting federal certification test data.***

- b. Alignment with the Federal Program: ARB was an active participant in the discussions leading to the U.S. EPA 2017-2025 GHG regulations, and, for the most part, ARB's GHG regulations reflect the regulatory requirements contained in the proposed U.S. EPA regulations. However, there remain areas where the two agencies' proposed regulations diverge. For example, the California regulations would assign CO2 equivalent emissions to electric vehicles (EVs), while the U.S. EPA regulations assign EVs a value of zero grams per mile, at least until the 2022 MY.

While manufacturers are likely to show compliance with the California program by complying with the federal program, we believe the programs should align whenever and wherever possible. Consequently, Attachment 2 includes a summary of the differences between the proposed U.S. EPA regulations and the California GHG regulations and suggestions for how to better align ARB's regulations with the proposed U.S. EPA regulations.

***We recommend that the Board direct staff to work with industry to align the federal and California programs in the areas identified in Attachment 2.***

- c. Mid-term review: An automaker's compliance status with the GHG regulations will be based on the vehicles it "produced for sale." Of course, no rational manufacturer would continue producing a vehicle or including a new vehicle technology unless there is consumer demand for that vehicle or technology. The ultimate question will be whether consumers will be able and willing to purchase the technologies needed to achieve this country's fuel economy, energy security, and environmental goals – particularly as the federal and state governments phase out many of the financial incentives that were previously available.

Fifteen years into the future, consumers will be the biggest unknown. Besides fuel economy, consumers demand affordability, safety, convenience and utility. Fuel economy considerations often rank below these other attributes. Fuel prices, which are especially difficult to predict, can have a huge impact on how consumers weigh fuel economy at the dealership. All of this explains why a rigorous Mid-Term Evaluation is warranted.

Given that the greatest level of uncertainty is associated with the the 2022-2025 MY requirements, a formal review should be conducted to review the appropriateness of the standards applicable to this period. The Agencies should jointly examine progress achieved towards compliance with the standards, and assess the latest information available on key assumptions and trends used to develop the standards. Factors that should be considered should include, but not be limited to:

- ✓ Development of powertrain improvements to gasoline and diesel-powered vehicles;
- ✓ Level of employment in U.S. automotive sector;
- ✓ Availability and implementation of methods to reduce weight while assuring compliance with state and Federal safety, emissions and equipment laws and standards, and maintaining acceptable performance in consumer information crash testing and manufacturer due care testing;

- ✓ Actual and projected combined sales of alternative fuel vehicles;
- ✓ Actual and projected availability of public and private charging infrastructure for electric vehicles;
- ✓ Actual and projected availability of low carbon fuel supplies and infrastructure and adoption of clean and renewable energy standards;
- ✓ Average costs of technologies to ensure compliance with the standards, such as vehicle batteries, power electronics and mass reduction, and anticipated trends in these costs;
- ✓ Current and expected availability of state and Federal incentives/subsidies for advanced technology vehicles;
- ✓ Average payback periods for any incremental vehicle costs associated with meeting the standards, as well as up-front cost and impacts on consumer affordability;
- ✓ Costs for gasoline, diesel fuel, and alternative fuels;
- ✓ Total light-duty vehicle sales and projected fleet mix;
- ✓ Consumer demand for and customer acceptance of fuel-efficient technologies;
- ✓ End-of-life costs associated with advanced technology vehicles; and
- ✓ Any other factors that may be deemed relevant to the review.

ARB, U.S. EPA, and NHTSA should also seek expert peer-reviewed information – including the input of the National Academies of Sciences – to answer the following questions:

- ✓ Are the costs of advanced technologies coming down as expected?
- ✓ Are researchers making the kind of breakthroughs we anticipated?
- ✓ Is critical infrastructure in place to support the transition to new fuels and technologies?
- ✓ What's happening with fuel prices, and how are consumers responding?
- ✓ What impact are the new requirements having on sales and employment?
- ✓ What's happening with fuel quality? Do the liquid fuels support the fuel-efficient technologies that are being introduced?
- ✓ Is the needed charging infrastructure available to enable PHEVs, BEVs and fuel cell vehicles to penetrate the market at the levels predicted?

***ARB has committed to the Mid-Term Review. We therefore request that the Board memorialize this commitment by directing the Executive Officer to conduct a mid-term review in coordination with the U.S. EPA and NHTSA to address the questions above.***

## 2. Criteria

### a. Harmonization:

Due to the hard work and innovation of automotive engineers around the world and the standards adopted by this Board, criteria emissions from light-duty gasoline vehicles are approaching zero. In fact, today's cleanest vehicles produce about the same smog-forming emissions as an EV, or rather the same emissions as a clean utility will produce charging an EV.

As these ultra-clean vehicles replace older higher-emitting vehicles, the inventory of criteria emissions from vehicles will continue to diminish. Under the existing LEV II regulations, light-duty vehicles will be reduced to just seven percent of California's total smog forming emissions by 2030. However, we understand new ambient air quality standards present additional challenges, resulting in continuing work for the automakers and agencies to further reduce criteria emissions.

For the past three years, automakers and ARB staff worked cooperatively to develop the next generation of criteria pollutant regulations (LEV III) while considering the impact of future GHG reduction technology. These regulations will provide further emission reductions from light- and medium-duty vehicles. According to the ARB staff, when fully phased in, the average LEV III vehicle emission level "approaches the very low power plant emissions associated with the recharging of battery electric vehicles."

As we reach the absolute limit of criteria emission control, we are also turning our attention and resources even more to vehicle fuel efficiency and GHG emission reduction. Pursuing more stringent criteria emission requirements, introducing large numbers of zero emission vehicles (ZEVs), improving vehicle fuel efficiency, and lowering GHG emissions in today's resource-constrained environment requires that we eliminate non-essential requirements and duplication of effort. It requires not only harmonizing the standards, fleet averages, and phase-ins, but also the test procedures, certification processes, and fuels.

ARB and U.S. EPA have devoted considerable resources to developing what are essentially overlapping regulatory requirements, separately certifying vehicles to these different requirements, and then tracking compliance. Moreover, automakers report compliance and manage fleets not only at ARB and U.S. EPA, but also in 11 different states that have adopted the California requirements. (We appreciate and support the LEV III proposal to pool the Section 177 state emission requirements.) While there are many differences between the ARB and U.S. EPA standards that add to the cost for both agencies and industry, a couple of examples might be worthwhile.

(1) Manufacturers must use two separate databases to submit slightly different certification data to the agencies. When a manufacturer applies to certify a vehicle, it must submit a significant amount of data. In the past, this data was submitted in a paper copy or electronically. The agencies and industry recognized that an online database with consistent format would provide more efficient, effective, and timely certification. U.S. EPA developed the "Verify" program to collect and process the certification data, confirm fee payment, and issue letters of conformity. At the same time, ARB started developing a separate electronic certification database, called "E-Cert." As a result, both agencies devoted resources to developing separate systems with identical goals. Manufacturers must now develop separate software to format and submit data to the two similar but different systems. There is little value in having each agency spend limited resources developing separate systems, or having

manufacturers spend resources reporting similar but slightly different data to each agency using different systems, particularly since such efforts result in no environmental benefits.

(2) The agencies have different test procedures for plug-in hybrid electric vehicles (PHEVs). ARB adopted its PHEV test procedures in December 2009. This was a challenging rulemaking because there were not any PHEVs in production, making it difficult to develop regulations for the PHEVs of the future, and additional changes were (and are) still needed to these regulations to properly test PHEVs. Rather than conducting joint development of harmonized test procedures - including resolution of manufacturers' concerns with PHEV test procedure complexities in the ARB regulations - EPA developed separate PHEV regulations. The regulations are similar but different. Manufacturers will need to wrestle with differences, and both agencies will have spent scarce resources developing separate test procedures for the same vehicle. A new rulemaking to revise PHEV test procedures makes sense, both to align ARB and EPA procedures, and to use the experience that manufacturers and the agencies have gained since ARB's 2009 rulemaking.

Ideally, a vehicle would certify to one set of test procedures and the manufacturer would submit the certification data to one central location. Not only would this save agency and manufacturer resources, but -- perhaps more importantly -- it would better ensure one consistent format for data.

In the future, as new regulations are needed, ARB and U.S. EPA should work jointly, or one agency should take the lead, with the understanding that the regulations will apply throughout the U.S. Moreover, ARB and EPA should divide up certification between the agencies such that only one agency certifies a system or standard (*e.g.*, on-board diagnostic system, exhaust emission control system, evaporative emission control system, etc.). This would free agency and automaker resources, allow for a more thorough and focused certification process, and generally eliminate duplicative requirements, all without sacrificing the environmental benefits provided by clean new vehicles.

While there are clearly benefits in vehicle test procedure, certification process, fuel, and criteria emission standard harmonization, we realize that harmonization will be a challenging task that will require hard work and compromise by all parties – ARB, EPA, and automakers. We are also at a unique point in time, where our collective expertise and understanding of requirements can deliver a more efficient and effective process in combination with future rulemaking efforts.

We are aware that 50F testing (ARB requires testing at 50F, while EPA does not), high-altitude testing (U.S. EPA requires high-altitude testing, while ARB does not), and warranties cannot be harmonized at this time. However, all other elements of the two programs should be harmonized. These include the certification fuel, vehicle standards, fleet averages, phase-in requirements, test procedures, and certification requirements.

Moreover, ARB should allow compliance with fleet averages and phase-ins based on national volumes, using the same approach proposed in LEV III for Section 177 State Pooling. That is, allow manufacturers to comply with the California (and Section 177 State) fleet average and phase-in requirements by complying with these requirements nationally. Vehicle volumes would still be reported to California and the Section 177 States as proposed in the LEV III Initial Statement of Reasons (ISOR), but compliance would be based on total U.S. volumes.

ARB and EPA have both committed to this goal, and we fully expect U.S. EPA's Tier 3 Notice of Proposed Rulemaking (NPRM) to reflect this commitment. Over the past year, ARB staff has worked with U.S. EPA to harmonize the regulations in anticipation of U.S. EPA's rulemaking. However, U.S. EPA has not yet issued its Tier 3 NPRM and it is possible, if not likely, that U.S. EPA will not issue a Tier 3 final rule in time to allow ARB staff to incorporate changes in a 15-Day Notice.

***We recommend the Board direct the Executive Officer to work with automakers and U.S. EPA to harmonize the vehicle criteria emission regulations, including fuels, standards, test procedures, and certification requirements, and to develop a regulatory package for the Board's consideration within 18 months of this hearing or within 9 months of when U.S. EPA issues a final Tier 3 rule, whichever occurs last.***

- b. Particulate Matter (PM) Standards: Light-duty vehicles (LDVs) subject to this regulation are a very small fraction of the PM emissions. They account for only 1.7 percent of total PM<sub>10</sub> emissions and 3.5 percent of PM<sub>2.5</sub> emissions. The other 98.3 and 96.5 percent of PM emissions, respectively, come from sources such as cooking, farming operations, construction and demolition, etc.

Nonetheless, the proposed LEV III regulations propose to phase in a 70 percent reduction in the Federal Test Procedure (FTP) PM emission standards (from 10 mg/mile to 3 mg/mile) beginning in 2017 MY, and a 90 percent reduction beginning in 2025 MY. Additionally, the draft regulations contain new PM requirements for the Supplemental Federal Test Procedure (SFTP) of 10 mg/mile for cars and 20 mg/mile for light-duty trucks.

The proposed phase in of the 3 mg/mile FTP PM standard beginning in 2017 MY will be very challenging, particularly for larger heavier vehicles such as full-size pickup trucks. Yet we are optimistic that, with time, automakers will be able to achieve this level. We, like ARB, share the goal of achieving the PM standards on gasoline vehicles without the use of particulate filters, which would add significant cost and adversely impact fuel economy and GHG emissions. Our goal is to achieve the PM standards through improvements to the base engine and fuel delivery system. These, however, are long lead-time changes, and it is very important that ARB maintain a phased-in approach that provides adequate lead-time.

Building vehicles that achieve the PM standards is only half of what is needed to achieve certification and compliance. Manufacturers must be able to consistently and repeatedly measure the PM levels. PM emission testing is by far the most resource-intensive vehicle

emission measurement, requiring equipment, personnel, and considerable time. Moreover, measured PM emission levels are notoriously variable, changing by as much as 1.5 mg/mile (fully one-half of the proposed standard) when tested from one lab to another, one driver to the next, or on different days.

The proposed PM standards will require significant resources, including changes to existing labs and building additional labs, additional personnel for testing, and significant increase in workload for additional tests. Moreover, because of the variability associated with PM testing, manufacturers could face additional compliance risk. For example, if a vehicle's PM emissions were 2.0 mg/mile at a manufacturer's lab, but 3.2 mg/mile at the ARB lab, the vehicle could be considered out of compliance.

We appreciate that ARB staff recognized the increased workload and limited the number of vehicles required to be tested each year. Nonetheless, the proposed regulations still represent a significant increase in workload for manufacturers. ARB, U.S. EPA and industry are also working to revise the PM test procedures to reduce variability. However, these new test procedures could require extensive modifications to existing facilities and might not improve variability and repeatability sufficiently, particularly in the high volume test environments at automobile manufacturer facilities.

#### **FTP PM Standard 3 mg/mile in 2017:**

While we continue to have significant concerns about the resources needed to meet the new requirements with the new test procedures and new facilities, we believe that with the lead-time and phase-in provided, we will be able to meet these standards.

#### **FTP PM Standard 1 mg/mile in 2025:**

Based on our best knowledge of PM measurement and control technology, we see no way to meet or measure the 1 mg/mile standard proposed to start in 2025. While we recognize that the proposed standard will not begin for another 11 years after these regulations become final, we do not believe that setting a standard that is completely unachievable today is warranted. We support and recommend a thorough formal review of PM – the standards and vehicle emission control technologies, the test methods, and alternative test methods. After this review is complete, we would recommend ARB develop and promulgate standards for 2025 and beyond.

#### **SFTP US06 PM Standard 10 mg/mile (cars) and 20 mg/mile (trucks)**

This is an entirely new test for which industry and the agencies (U.S. EPA and ARB) are still gathering and analyzing the emissions data. Further complicating the standards is the likely introduction of new technologies to meet the GHG standards. Given this, we are very concerned with the technical feasibility of achieving the stringent SFTP US06 PM standard of 10 mg/mile for passenger cars (PCs) and 20 mg/mile for light-duty trucks (LDTs). In particular, technologies needed to meet the GHG requirements may conflict with the SFTP



US06 PM standards. Future low-powered/downsized technologies and range extenders needed to meet the GHG requirements, for example, may not be able to comply with these PM standards. In fact, vehicle testing has shown that these PM standards do not appear to be achievable for vehicles with these new technologies. Accordingly, we recommend a PM standard for PCs and LDTs of 25 mg/mi or, as an alternative a 10 mg/mi composite standard.

It is worth noting that the PM standards begin at a time when manufacturers enter the eighth year of the most stringent GHG standards in history, when the number of ZEVs and plug-in hybrid electric vehicles (PHEVs) jumps considerably, and while reducing exhaust emissions by 75 percent on both the FTP and SFTP and phasing in zero evaporative emission standards on all vehicles.

***We recommend eliminating the 2025 FTP PM Standard of 1 mg/mile from the regulations. Instead, ARB and U.S. EPA should work with automakers to develop standards for 2025 and beyond, when the results of a thorough formal review of the PM standards, test methods, and alternative test methods are available.***

***We recommend a SFTP PM standard for PCs and LDTs of 25 mg/mi or, as an alternative path, a 10 mg/mi composite standard.***

***We also recommend a formal review of the form and level of the standard with ARB, U.S. EPA, and automakers. This review should begin as soon as the new test procedures are public and facilities meeting the new requirements are available. The review should look at correlation and variability of the new test procedures and facility requirements, the ability to consistently and repeatedly measure PM at the 3 mg/mile and 1 mg/mile levels, and alternative PM test methods. Industry would work with ARB and U.S. EPA to develop a scope of work, timeline, commitments from each party, and a final report.***

c. Regulatory and Test Procedure Changes:

We identified a number of improvements and/or technical corrections to the proposed regulations soon after the ISOR was published on 7-Dec-2011 and met with ARB staff to review these changes. We have included these changes as Attachment 3 to this document.

The test procedures are critically important to the development, validation, and certification of vehicles. Manufacturers spend considerable resources on the test procedures and the results of the test procedures. Consequently, it is important that ARB, EPA, and industry work together to develop robust test procedures that are practicable to implement in a high-volume vehicle test lab setting. To this end, we have reviewed the test procedures to the extent feasible in the limited time and found a number of issues with the test procedures for "Zero Emissions Vehicles 2012" appendices A-2 & A-4 (specifically the PHEV Test Procedures) and the LEV III appendices C, D, E, and J. Some -- but not all -- of the issues are contained in Attachment 4.

Our experience in past rulemakings is that as manufacturers attempt to implement the regulations and test procedures, they discover previously unknown conflicts and inconsistencies within the requirements. In the past, ARB staff has been reluctant to correct these conflicts or inconsistencies because they had not received Board approval to do so. Consequently, we are requesting that the Board grant ARB Staff the authority to make changes to the regulations and test procedures that correct conflicts and inconsistencies.

***We recommend the Board authorize the ARB staff to make the changes identified in Attachments 3 and 4. Additionally, we recommend the Board grant ARB Staff the authority to correct conflicts and resolve inconsistencies within test procedures and regulations beyond those identified in Attachments 3 and 4, with the appropriate 15-day public notice.***

### 3. Fuels

- a. Certification Gasoline and Harmonization: The Alliance supports the changes ARB staff proposes to the gasoline used to certify LEV III vehicles. A blend of 10 percent ethanol is consistent with the fuel in the U.S. market currently and in the foreseeable future. Further, we have consistently supported a single certification fuel between U.S. EPA and ARB. When U.S. EPA and ARB require different fuels it effectively doubles the testing manufacturers are required to conduct, but provides no environmental benefit.

Despite the gasoline in the U.S. market and the clear benefits of harmonization, it appears likely that U.S. EPA will propose regulations requiring that manufacturers certify gasoline vehicles on fuel with 15% ethanol. As a result, ARB and U.S. EPA may have different certification gasoline requirements. To eliminate unnecessary duplicative testing, the Alliance will propose that U.S. EPA accept certification using ARB's certification gasoline. Likewise, we ask ARB accept certification using U.S. EPA's certification gasoline. In discussions with ARB staff, they indicated this would be appropriate, since the available data suggests that there is no significant difference in exhaust or evaporative emissions when using E10 or E15 in vehicles designed for such fuels.

***As part of the harmonization of vehicle emission programs, we recommend ARB allow manufacturers to use the federal Tier 3 gasoline for certification to the California standards for exhaust and evaporative emissions testing. (Note that evaporative tests using federal fuel would also use the federal temperature profiles.)***

- b. Market Fuel Octane: The GHG regulations will require dramatic changes in vehicle technologies while automakers are also required to reduce criteria emissions by 75 percent. To optimize engine fuel efficiency and minimize emissions, transitioning to higher octane regular and premium grade market gasoline may be necessary. One means to increase the total octane grade of the gasoline blend would be to maintain the minimum octane of the petroleum blendstock as ethanol is added. However, to

maximize the octane boost and benefit from the ethanol, the minimum octane rating for the petroleum Blendstock for Oxygenate Blending (BOB) also needs to be specified, and remain constant at the level of petroleum BOB needed to meet the octane rating for E0.

***We recommend the Board direct staff to assess the environmental benefits (criteria and GHG emission reductions) of higher octane gasoline.***

- c. Additional comments: We provide additional, more detailed comments in Attachment 5.

We appreciate your consideration and look forward to working with you and the ARB staff to implement these ambitious regulations.

Sincerely,



Steven Douglas  
Senior Director, Environmental Affairs

Copy: Margo T. Oge, U.S. EPA  
Chet France, U.S. EPA

Attachments



# Alliance OF AUTOMOBILE MANUFACTURERS

Mitch Bainwol  
President and CEO

November 21, 2011

Via Email and U.S. Mail

Mary D. Nichols, Chairman  
California Air Resources Board  
1001 "I" Street  
P.O. Box 2815  
Sacramento, CA 95812

RE: Use of Federal GHG Credits to Meet CA ZEV Obligations

Dear Chairman Nichols:

Thank you for making the time to visit with Steve Douglas and me last week. Following up on our meeting, this letter addresses an issue that is important to our members. In its Letter of Commitment dated July 28, 2011, ARB committed “to propose that its revised ZEV program for the 2018-2021 MYs include a provision providing that over-compliance with the federal GHG standards in the prior model year may be used to reduce in part a manufacturer’s ZEV obligation in the next model year.” As we discussed during our meeting, the Alliance of Automobile Manufacturers opposes this proposal.

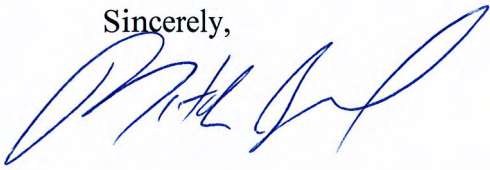
Like ARB, the Alliance and our members are committed to bringing advanced technology vehicles to the market. ARB has long maintained that successful commercialization of ZEVs requires it to mandate specific ZEV volumes during the ramp-up to commercialization. At the November 2010 ZEV Regulation workshop, for instance, ARB Staff presented “Guiding Principles” indicated that the upcoming ISOR would require “a critical mass of vehicles by 2025” at “high enough production to reach inflection point on the cost curve.” By offsetting the number of ZEVs based on GHG performance, the proposed change would reduce the number of ZEVs in California and those states that have adopted California’s ZEV regulations. To our way of thinking, this is inconsistent with ARB’s long-held position that a “critical mass” is needed for ZEVs to become cost-effective, viable technologies. If ARB truly believes that the number of mandated ZEVs should be lower—a view that our members would share—the appropriate response would be to reduce the mandated ZEV volumes accordingly, not to allow a subset of manufacturers to reduce their volumes based on their status under a completely different program.

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It is critical that the burden of the ZEV mandate be borne equally by all "large-volume" manufacturers as defined in California's regulations. As ARB and its staff are well aware, the cost of the ZEV mandate is very high – between \$800 million and \$1.3 billion annually in California alone, according to ARB's 2008 ZEV Initial Statement of Reasons. This adds significant per-vehicle cost to those manufacturers required to comply. In the past, ARB has required all large-volume automobile manufacturers to participate equally, thus creating a level playing field. Inasmuch as this proposal would allow certain manufacturers to eliminate a significant portion of their ZEV requirements, it would undermine this level playing field, giving such manufacturers a significant competitive advantage. As an aside, allowing credits to be transferred out of the Single National Program and into ARB's ZEV program is also likely to reduce the GHG credits available for purchase, thereby reducing the flexibility of the Federal GHG standards for MYs 2018-2021.

If you have questions regarding this letter please do not hesitate to contact Julie Becker, my Vice President for Environmental Affairs (202-326-5511).

Sincerely,



Mitch Bainwol

MB/sf

- cc: Members of the Air Resources Board
- Dan Sperling
- Ken Yeager
- Dorene D'Adamo
- Mrs. Barbara Riordin
- John R. Blames, M.D.
- Hector De La Tor
- Sandra Berg
- Ron Roberts
- Ronald O. Loveridge
- Margo T. Oge
- David Strickland
- James Goldstene
- Tom Cackette

*If was a pleasure to meet you. Really appreciate your making the time to visit on a very busy day. Best - M*

This attachment provides the Alliance of Automobile Manufacturers' technical comments on the 2017-2025 MY GHG regulations (13 CCR 1961.3). By and large, these comments are intended to highlight the areas where ARB regulations do not currently align with existing and proposed U.S. EPA regulations.

### **2017-2025 MY Greenhouse Gas Program**

ARB has recognized the importance and benefit of a single national program to address light-duty vehicle greenhouse gas emissions. ARB's 2012-2016 model year GHG regulations allow manufacturers to demonstrate compliance with the California standards by showing compliance with the U.S. Environmental Protection Agency's GHG program.<sup>1</sup>

In its July 2011 letter supporting the Federal greenhouse gas program ("July 2011 Commitment Letter"), ARB committed "to propose to revise its standards on GHG emissions from new motor vehicles for model-years MYs 2017 through 2025, such that compliance with the GHG emissions standards adopted by EPA for those model years that are substantially as described in the July 2011 Notice of Intent, even if amended after 2012, shall be deemed compliance with the California GHG emissions standards, in a manner that is applicable to states that adopt and enforce California's GHG standards under Clean Air Act (CAA) Section 177."<sup>2</sup> ARB's commitment to this action contemplated that, among other actions, California would participate in a mid-term evaluation of the standards for model years 2022-2025, while reserving rights to contest the findings of such an evaluation.

The Alliance notes that neither of the aforementioned provisions are discussed in the ISOR. However, the Alliance expects that staff will discuss this and related provisions at the January 26-27 board meeting for later finalization under a 15-day notice. Based on testimony that Tom Cackette, Chief Deputy Executive Officer of ARB, provided at the January 24, 2012, hearing on the EPA/NHTSA NPRM, we also anticipate that the Board resolution will indicate that, upon completion of the EPA/NHTSA rulemaking, the Board will adopt provisions allowing compliance with the EPA GHG standards for 2017-25 as an alternative pathway to compliance with the ARB standards. This approach would be consistent with the timeline contemplated in ARB's July 2011 Commitment Letter:

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<sup>1</sup> 13 CCR 1961.1 (a)(1)(A)(ii)

<sup>2</sup> Letter from Mary Nichols, California Air Resources Board Chairman, sent to Ray LaHood, Secretary of the U.S. Department of Transportation and Lisa Jackson, Administrator of the U.S. Environmental Protection Agency (July 28, 2011). Available at <http://www.epa.gov/otag/climate/letters/carb-commitment-ltr.pdf> (last accessed January 20, 2012).

1. EPA and NHTSA issue the [July 2011] Notice of Intent. (Completed)<sup>3</sup>
2. EPA and NHTSA issue a Notice of Proposed Rulemaking. (Completed)<sup>4</sup>
3. California holds a hearing on a proposed rule consistent with the actions described above. (Scheduled for January 26-27, 2012)
4. EPA and NHTSA issue a Final Rule.
5. California issues a Final Rule that revises its regulations.
6. EPA, NHTSA, and California conduct a mid-term evaluation for the standards for MYs 2022-2025.

In the interest of harmonized state and Federal regulations, the Alliance recommends that ARB harmonize its proposed regulation with existing and proposed Federal greenhouse gas regulations in the following areas:

1. **Units of Greenhouse Gas Credits and Debits** (See 40 CFR 86.1865-12(k)(4))

ARB quantifies greenhouse gas credits and debits in units of grams CO<sub>2e</sub> per mile. EPA quantifies these credits and debits as total tons of CO<sub>2</sub> or CREE emissions, accounting for differences in estimated passenger car and light-duty truck vehicle lifetime mileage.

ARB also appears to mix the use of these units at 13 CCR 1961.3(a)(8)(A)2.a. and 13 CCR 1961.3(a)(8)(A)2.b. (ISOR at A-93)

2. **Treatment of Electric, Plug-In Hybrid Electric, and Fuel Cell Upstream Emissions** (See NPRM at 75012)

ARB proposes to include upstream emissions for these vehicle types. EPA treats these types of vehicles as having 0 g/mi upstream emissions up to certain caps.

3. **Treatment of Dual Fueled Vehicles** (See 40 CFR § 600.510-12(j)(2)(vi) and NPRM at 75018)

ARB does not provide for weighting of dual fuel vehicle emissions on both gasoline and alternative fuel. EPA provides an actual usage-based factor and proposes to create a “utility factor” for CNG dual fueled vehicles.

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<sup>3</sup> 76 Fed. Reg. 48758 (August 9, 2011)

<sup>4</sup> 76 Fed. Reg. 74854 (December 1, 2011) (“NPRM”)

4. **Credits for Reduction of Air Conditioning Direct Emissions** (See 40 CFR 86.1866-12(b))
- a. ARB proposes to add a subjective judgment to determine whether an air conditioning (A/C) system has been optimized to minimize leakage and to justify the number of fittings and joints in an A/C system design. In contrast, EPA only requires the objective measurement of system leakage per an established SAE procedure.
  - b. Both ARB and EPA propose a “high-leak penalty” applicable to vehicles utilizing refrigerants with a global warming potential of 150 or less. In the equation for this penalty, the average leakage rate terms differ between ARB and EPA.



**Subject: LEV III ISOR – Proposed Changes to Criteria Regulations**

The following recommendations were identified in December or subsequently provided to ARB Staff after the ISOR was released.

**EXHAUST EMISSION REQUIREMENTS:**

1. **LEV III Phase-In Requirement (multiple)**: The phase in for LEV III (FTP and SFTP 150K durability and E10 certification fuel) was not clear in the ISOR and regulations. However, we now understand that ARB intends to require all vehicles that certify to ULEV 70 and below to meet the LEV III requirements (FTP and SFTP 150K durability and E10 certification fuel) beginning in 2015MY, with the exception of PZEVs, which can be carried over until 2018MY. There is also a backstop percentage phase-in requirement noted in the table below.

MY	%
2017	10%
2018	20%
2019	40%
2020	100%

Unfortunately, this penalizes manufacturers who have produced the cleanest vehicles (SULEV exhaust) by requiring the manufacturer to certify all of these vehicles in a single year (2015MY) to new requirements. Such a penalty seems unnecessary and would be a significant burden on manufacturers with significant number of SULEV engine families that are not certified to the PZEV standard.

There are several other clarifications to the LEV II and LEV III programs and how they interact that we propose below.

**Recommendations:**

- a. **LEV III Phase In**: We recommend revising the phase-in requirement for carry-over SULEVs to require 100% compliance with LEV III beginning no earlier than 2017MY (i.e., 2017MY or 2018MY; the latter would be consistent with the requirement for PZEVs to recertify). New SULEV certifications beginning in 2015MY would be certified to the new LEV III standards. We recommend the following regulatory change to implement this in Appendix A, (§1961.2(b)(2), page A-59; and the same changes in the test procedures, Appendix D):

“(2) *LEV III Phase-In Requirement for Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles.* Beginning in the 2015-2017 [or 2018] model year for carry-over certifications and 2015 model year for new certifications, the LEV II SULEV emission standards set forth in section 1961(a)(1) that are applicable to PCs, LDTs, and MDPVs shall only apply to those PCs, LDT1s, LDT2s, and MDPVs that receive partial ZEV allowances...”

- b. **LEV II NMOG+NOx**: Allow all vehicles (including LEV II) to meet a combined NMOG+NOx emission standards since the fleet average requirement for 2015MY and beyond is an NMOG+NOx standard.
  - c. **50F Allowance**: For 50F testing, LEV II vehicles should meet a combined NMOG+NOx standard and FFVs should be afforded the relief provided for 50F in LEV III.
2. **Alternative Phase-in for 3 mg/mile PM requirement (§1961.2(a)(2), page A-36)**: The regulations do not contain the alternative phase-in for the 3 mg/mile PM requirements that we have discussed.

**Recommendation:** *Provide an alternative phase in, as described in the On-Board Diagnostic (OBD) regulations §1968.2(c), definitions, “Alternate Phase-In.”*

3. **Interim In-Use Standards (§1961.2(a)(8), page A-48)**: Interim in-use standards only apply through the 2019MY for FTP, SFTP NMOG+NOx, and SFTP PM. Whereas FTP PM allows interim in-use through 2020MY.

**Recommendation:** All of the interim in-use standards should apply through 2020MY (the last year of the phase in). This is the period when manufacturers will certify larger vehicles to the new standards, when very difficult GHG standards apply with resultant new technology introductions, and the beginning of very high ZEV volumes. All of these combine to warrant interim in-use standards through the 2020MY.

4. **Early 2014MY Compliance (§1961.2, Page A-35)**: While §1961.2 allows compliance with the LEV III standards prior to 2015MY in the Introduction paragraph, the regulations do not provide a LEV III fleet averages in 2013 or 2014MY for either FTP or SFTP composite fleet average with which to comply. Moreover, the LEV III regulations appear to require LEV II vehicles to continue to meet separate NMOG and NOx standards.

**MDV Early Compliance:** There is no discussion of MDV early compliance, an equation for VEC credit for early compliance, a transfer of VECs from pre-LEV III to LEV III, or their depreciation after transfer.

**Recommendations:** The Alliance recommends the following changes to accommodate early compliance:

- **2013 and 2014 Fleet Average (§1961.2(b)(1)(A))**: The regulations should provide a 2013 and 2014MY LEV III fleet average of 107 mg/mile (PC/LDT1) and 128 mg/mile (LDT2) for manufacturers choosing early compliance. Otherwise, there will be no way to implement early compliance (e.g., if a vehicle certified to a combined standard what value would the OEM use for the NMOG curve?).
- **SFTP 2013 and 2014 Composite Fleet Average Option ((§1961.2(a)(7)(A)(2))**: Like the FTP fleet average, the SFTP composite fleet average emission standards should begin with the current .140 g/mile requirement to 2013 and 2014MYs.

- LEV II NMOG+NOx: Allow LEV II vehicles to meet a combined NMOG+NOx emission standards since the fleet average requirement for 2015MY (or earlier if the manufacturer opts in early) and beyond is an NMOG+NOx standard.
  - MDV: The regulations will also need to be changed to allow MDVs the option of early compliance with LEV III requirements.
5. **PM Standards for MDVs (§1961.2(a)(2)(B), page A-38)**: The test groups for MDVs (8,500-14,000 GVWR) are very small making compliance with phase-ins difficult when these vehicles are divided into two categories (8,500-10,000 and 10,001-14,000 GVWR).

**Recommendation**: Allow compliance with the phase-in percentages based on the 8,500-14,000 GVWR. For example, provided 10% of the 8,500-14,000 vehicles meet their appropriate standard the manufacturer is in compliance. This is also consistent with EPA.

6. **1 mg/mile PM Standard - Mid-Term Review**: Manufacturers remain concerned about meeting a PM standard below 3 mg/mile even in 2025. The ISOR acknowledges this concern, but stops short of a formal review of the standard.

**Recommendation**: We recommend a thorough formal review of the standard and form of the standard with ARB, U.S. EPA, and industry. The formal review should include a scope of work, timeline, commitments from each party, and a final report.

7. **Calculation of Fleet Average NMOG+NOx (§1961.2(b)(1)(B)1.a & b., page A-55)**: These equations appear to contain an error. The first bracketed term in the equation below should subtract the number of off-vehicle charge capable HEVs from the number of vehicles in the test group in both (b)(1)(B)1.a. and (b)(1)(B)1.b. Additionally, the equation in 1.b. uses Hybrid Electric Vehicle rather than PHEV. Appendix B differs.

$$\frac{\sum [\text{Number of vehicles in a test group} \times \text{applicable emission standard}] + \sum [\text{Number of off-vehicle charge capable hybrid electric vehicles in a test group} \times \text{HEV NMOG+NOx contribution factor}] + \text{Total Number of PCs plus LDT1s Produced and Delivered for sale in California, Including ZEVs and HEVs}}{\text{Total Number of PCs plus LDT1s Produced and Delivered for sale in California, Including ZEVs and HEVs}}$$

8. **Calculation of Fleet Average - Table of Emission Standards (§1961.2(b)(1)(B)1.c, page A-56)**: The Emission Category for MDVs (LEV395, ULEV340, etc.) should include the applicable LEV II emission categories, since MDPVs can and will continue to certify to LEV II standards through 2019MY. A separate chart for MDVs would be clearer.
9. **Calculation of Fleet Average – Federally Certified Vehicles (§1961.2(b)(1)(B)3., page A-57)**: This section provides that a federally certified vehicle receives credit for the next higher CA emission category in the fleet average calculation. For example, a federal vehicle certified to NMOG+NOx of 110 mg/mile would be treated as a ULEV125 for calculation of the fleet average, even though the vehicle must meet the 110 mg/mile standard. This seems an unnecessary penalty for manufacturers bringing cleaner vehicles into California. Moreover, if EPA and ARB harmonize their emission regulations, this would be moot.

**Recommendation:** The Alliance recommends ARB allow manufacturers to calculate the fleet average of federally certified vehicles at the level for which they are certified – in the previous example that would be 110 mg/mile.

10. **NMOG+NOx Contribution Factors (§1961.2(b)(1)(B)2., page A-57)**: It is not clear how these values were derived.
11. **PZEV Anti-Backsliding Provision (EXH §1961.2(b)(1)(A)2., page A-55, and EVAP §1976(b)(1)(G)2. Footnote 3, page A-136)**: This provision requires manufacturers maintain a specific percentage of SULEVs in the 2018-2021 (Exh) and zero evap vehicles in the 2015-2017 (Evap) based on their percentage of PZEV sales in the three years preceding. This provision will require manufacturers to appropriately manage their new vehicle fleet to ensure compliance. However, managing the new vehicle fleet requires significant lead time – more than one year currently provided. While ARB allows manufacturers to use projected vehicle sales for the final year before the backsliding provision begins (2017MY for Exh, and 2014MY for Evap), this does not provide sufficient lead time for manufacturers.

**Recommendations:**

- ARB should base the minimum requirement on “projected vehicle sales” for all three prior years. For example, 2018MY minimum SULEVs would be based on projected vehicle sales for the 2015-2017MYs.
  - ARB should allow manufacturers to comply with the EVAP PZEV anti-backsliding provision based on the average of the three model years 2015, 2016, 2017MYs. Thus, the percentage of LEV III Evap vehicles in the 2015-2017MYs (collectively) must be greater than or equal to the percentage of PZEVs in the 2012-2014MYs.
12. **Calculation of VEC for MDVs (§1961.2(c)(2)(A), page A-62; App D Section E, page E-1)**: This section provides the method for calculating the Vehicle Emission Credits (VECs) for MDVs other than MDPVs. However, there seem to be a couple of errors:
- The requirement should not begin until 2016MY when the LEV III MDV requirements begin.
  - The equation also contains a couple of errors.
    - i. LEVs are not included in the equation.
    - ii. The multiplier (“1.2” as shown below, but this should be for all of the multipliers) should be on the outside of the bracket “{” in the equation below:
 
$$\{[(1.2) \times (\text{No. of ULEV340s and ULEV570s Produced excluding HEVs}) + (\text{No. of ULEV340 HEVs} \times \text{HEV VEC factor for ULEV340s}) + (\text{No. of ULEV570 HEVs} \times \text{HEV VEC factor for ULEV570s})] - (\text{Equivalent No. of ULEV340s and ULEV570s Required to be Produced})\} +$$
  - Chassis certification is required for MDVs <10,000 GVWR in 2019 and 2022 depending on the section of the regulation. This should be consistent (2022MY) throughout.
13. **Section 177 State Pooling Provisions (EXH and EVAP)**: For the purposes of complying with fleet average and phase in requirements, this provision allows a manufacturer to pool their fleet

based on sales in all of the Section 177 states. However, it appears to require the manufacturer to notify the Executive Officer each year whether it will pool its volume or comply based on individual state volumes. Since it is unlikely that a manufacturer would ever choose to comply based on individual state sales:

**Recommendations:**

- ARB should require manufacturer's notification only prior to the first model year when the Section 177 State Pooling provision will be implemented.
- As currently written, the pooling provision clearly applies to all of §1961.2. However, the location of the pooling provision is not ideal for clarity. To provide better clarity that this provision covers all of §1961.2, ARB should consider moving the Pooling Provision from §1961.2(b)(1)(A)1.c to new Section §1961.2(b)(5).

**EVAPORATIVE & SFTP**

14. **LEV II SFTP Projection to 120k or 150k (§1961.2(a)(7)(A)2. Footnote 2, page A-45):**

- **Projection:** This footnote requires manufacturers to convert LEV II SFTP values to NMOG+NOx and project those values to 120k or 150k using either SFTP or FTP deterioration factors. However, it is possible that some vehicles were certified to 4K LEV II SFTP using 120k or 150k aged components. In this case, the projected emissions would be the certification value for the vehicle. Additionally, it is not clear which vehicles are required to project to 120k and which to 150k.

**Recommendation:** We recommend clarifying this footnote to indicate that manufacturers are not required to project vehicle data if the data was generated using 120k or 150k aged components. Additionally, we recommend clarifying that vehicles would project to 120k or 150k based on their FTP certification durability.

- **Carry-Over:** Footnote 2 begins with "For carry-over test groups certified to LEV II FTP emission standards..." However, it's possible that vehicles could be certified to LEV II in the 2015-2019MY timeframe that are not carry-over vehicles.

**Recommendation:** Delete "carry-over" from Footnote 2.

15. **FFV – SFTP Compliance on same gaseous or liquid fuel ((§1961.2(a)(7)(A)2., page A-44):** This section states that "SFTP Compliance shall be based on the same gaseous or liquid fuel used for FTP certification." However, for FFVs, the vehicle is certified on both gasoline certification fuel and E85. Conducting SFTP testing on two fuels would double the testing burden.

**Recommendation:** For consistency with EPA, we recommend certifying on the gasoline certification fuel only (e.g., either CA cert gasoline (E0 or E10) or EPA certification gasoline (E0 or E15)). If this is not possible, we recommend testing using the fuel with the worse-case FTP emissions.

16. **MDPV Evap Certification Standards (§1976(b)(1)(G)1.b, page A-133):** The evaporative emission standards include MDPVs with LDT3 and LDT4s. The evaporative emission standard size based

requirements were set recognizing that larger vehicles have inherently higher non-fuel emissions due to their size.

**Recommendation:** We recommend treating MDPVs as MDVs for evaporative emission standards.

17. **ORVR Certification of Incomplete Vehicles (§1978(a)(4), page A-140)**: This paragraph exempts <14,000 GVWR incomplete vehicles from the ORVR requirements if they are certified to complete heavy duty vehicle standards under federal regulations. However, some incomplete < 14,000 GVWR vehicles are not so certified, and are currently not tested to the ORVR requirements since they are incomplete.

**Recommendation:** To clarify, we recommend eliminating the ORVR requirements from all < 14,000 GVWR incomplete vehicles, by making the following changes to Appendix G, “California Refueling Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles”,

Subpart S, I.A.1.:

*“1. These refueling standards and test procedures are applicable to all new 2001 and subsequent model gasoline-fueled, alcohol-fueled, diesel-fueled, liquefied petroleum gas-fueled, natural gas-fueled, and hybrid electric passenger cars (including 2012 and subsequent model-year off-vehicle charge capable hybrid electric vehicles), light-duty trucks and medium-duty vehicles with a gross vehicle weight rating of less than 8,501 lbs., and to all new 2015 and subsequent model gasoline-fueled, alcohol-fueled, diesel-fueled, liquefied petroleum gas-fueled, natural gas-fueled, and hybrid electric (including 2012 and subsequent model-year off-vehicle charge capable hybrid electric vehicles) **complete** medium-duty vehicles with a gross vehicle weight rating of 8,501 through 14,000 lbs.”*

Subpart S, I.F.2.:

*“2. The maximum refueling emissions for 2001 and subsequent model passenger cars, light-duty trucks and medium-duty vehicles with a gross vehicle weight rating less than 8,501 lbs., and 2015 and subsequent model **complete** medium-duty vehicles with a gross vehicle weight rating 8,501 through 14,000 lbs. for the full useful life are:”*

18. **Early Phase-in for Zero Evap (§1976(b)(1)(G), page A-131)**: The proposed regulations for LEV III evaporative emissions allow manufacturers the option of certifying to the zero evaporative vehicles using the Bleed Emissions Test Procedure rather than a “rig” test. Like the LEV III exhaust regulations, the LEV III Evap regulations begin in the 2015MY. However, unlike the LEV III Exhaust regulations, there is no provision early compliance with the LEV III Evap standards.

**Recommendation:** Allow early (2014MY) compliance with the new evaporative emission standards consistent with early compliance allowance for LEV III exhaust,

recognizing the manufacturers will not receive credits toward the 2018-2022 phase-in for vehicles certified early.

19. **Allow Optional Use of Lower Octane (App D, Part II, 100.3.1.2 footnote (i), page II-4)**: The new certification fuel specifications require the use of two octane values. This leads to additional complications and costs at the testing facilities. Since using a lower octane will either have no effect or will result in worse case emissions, manufacturers would like the option to use the lower octane.

**Recommendation**: Revise this footnote to allow use of 91 octane for vehicles/engines that require premium gasoline as part of their warranty, as follows:

*(i) For vehicles/engines that require the use of premium gasoline as part of their warranty, the Octane ((R+M)/2) shall ~~may~~ be a 91 minimum. All other certification gasoline specifications, as shown in this table, must be met. For all other vehicles/engines, the Octane ((R+M)/2) shall be 87-88.4.*

20. **2015+ FFV fuel (App F III.F.3, Page III-54)**: As written, it is not clear which fuel would be used to test certain vehicles (e.g., FFVs).

**Recommendation**: Modifying this section as follows:

*“3. For 2015 and subsequent model motor vehicles ~~other than gasoline-fueled vehicles~~, the evaporative emission test fuel shall be the applicable fuel specified for exhaust emission testing in part II. section A.100.3. of the “California 2015 and Subsequent Model Criteria Pollutant Exhaust Emission Standards and Test Procedures and 2017 and Subsequent Model Greenhouse Gas Exhaust Emission Standards and Test Procedures for Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles.”*

21. **BETP – allow fuel vapor and N2 OR air (App F, Part III.D.12.1.2)**: For the carbon canister loading in the BETP, the test procedure requires the canister to be loaded with a mixture of fuel vapor and N2. Manufacturers would like the option to use air instead of N2.

**Recommendation**: Allow the use of air in addition to N2.

22. **Evap Testing during Exhaust DF tests (App F, Part II.A.(2.4), page II-2)**: The current and future evap test procedures require manufacturers to conduct an evap test during the exhaust DF determination at 5,000, 40,000, 70,000, and 100,000 miles. These tests are resource intensive without a commensurate gain.

**Recommendation**: We recommend deleting these additional evaporative tests.

23. **SFTP Air-to-Fuel Ratio Requirement, Lean Best Torque 6% for SFTP I (App C, Part I.D.2.1.4, page 7 and App D, Part I.D.2.1.4, page D-2)**: The subject Appendices contain requirements for the 2001-2014 (SFTP I) and 2015+ (SFTP II). Section 2.1.4 was revised to reduce the leanest air-to-fuel mixture required to obtain maximum torque (lean best torque, LBT) with a tolerance of  $\pm 3\%$  from a tolerance of  $\pm 6\%$ . We understand that the changes were intended to align with expected changes by U.S. EPA for SFTP II. However, in recent discussions with U.S. EPA, they have not made a decision on the actual percentage tolerance (e.g.,  $\pm 3\%$ ,  $\pm 6\%$ , or somewhere in between).

Industry and ARB will need to develop regulatory changes to accommodate expected changes and new procedures from U.S. EPA. Industry proposes bringing these changes to the board within 18 months of this hearing or within 9 months of EPA's final rule, whichever occurs last. Consequently, we recommend the following:

**Recommendation:**

**SFTP I:** Deleting this change for LEV II SFTP (i.e., SFTP I).

**SFTP II:** Remove the new requirement from the current regulatory proposal and adopt a harmonized requirement in the next rulemaking to allow U.S. EPA, ARB staff, and industry to determine the appropriate tolerance.

24. **Carry-Over PZEVs & Early Compliance (ZEV ISOR App A-1, §1962.1(c)(2)(A), page A-1-9):** The PZEV provisions do not appear to allow carry-over PZEVs from the 2014MY. Specifically, §1962.1(c)(2)(A) specifies the LEV III exhaust regulations (§1961.2(a)(1)) for 2015-2017MY PZEV exhaust. However, this would require recertification on the new certification fuel and certification to SFTP II. Moreover, the regulation also does not recognize early compliance with the LEV III SULEV standards. (The LEV III Evap Standards in §1976(b)(1)(G) recognize carryover PZEV evap as a LEV III Evap, so no changes are needed for evap.)

**Recommendations:**

- Allow carry-over LEV II SULEV (i.e., §1961(a)(1)) for 2014-2017MYs.
  - Allow compliance with PZEV using LEV III SULEV20 or SULEV30 in 2014MY.
25. **MDV Phase-In for OEMs with limited test groups:** For manufacturers with a small number (four or less) of MDV test groups the percentage phase-in requirements are not useful – much like a small volume manufacturer. In similar cases in the past, ARB has allowed alternative phase in for OEMs with 4 test groups or less. This could be implemented by the changes in §1961.2(a)(2)(B), PM for MDVs, and §1961.2(b)(3), LEV III Phase-In Requirements for MDVs by adding a statement in these regulatory sections to the effect that “Manufacturers with four or fewer test groups may request Executive Officer approval of an Alternative Compliance Plan.”

We recommend the elements below for an Alternative Compliance Program, which could be implemented with a Manufacturers Advisory Correspondence (MAC):

- **Applicability:**
  - i. Manufacturers with less than or equal to 4 test groups in a MY to use ACP.
  - ii. Cannot use ACP if cumulative VEC credits are negative.
- **Annual Choice:** Manufacturers that meet criteria in a. above have the choice, on a yearly basis, to use ACP or normal VEC credit compliance. Must obtain EO approval of ACP.
- **VEC Credits:**
  - i. For MY's using ACP, no VEC credits / debits are generated.



ii. For MY's using normal VEC credit compliance, earned credits carry forward/back under normal requirements. (MY earned + 5MY at full value).

- Standards: ACP requires test groups to phase-in using only standards marked below.
- 2022MY+: Starting in 2022MY, a volume limit (based on best volume estimate) at the ULEV250/400 level as follows:
  - i. 4 test groups - no more than 25% of volume at ULEV250/400
  - ii. 3 test groups - no more than 33% of volume at ULEV250/400
  - iii. 2 test groups - no more than 50% of volume at ULEV250/400

26. **PM certification testing**: ARB has recognized the significant burden associated with PM development and certification testing. The new PM standards, both FTP and SFTP, will require additional facilities and modifications to current facilities.

**Recommendation**: To limit the additional test burden but still provide ARB the assurance of compliance, we recommend limiting PM certification to a 20 percent of each manufacturer's test groups each year and allowing the manufacturer to attest that the other 80% of test groups meet the PM standards. The test groups to be tested would be identified during the manufacturer's Pre-Certification meeting. Since the manufacturer would attest to the standards, be held liable to meet the standards in use, and would not know which test groups would be tested beforehand, this would ensure all vehicles are meeting the standards. Moreover, if ARB so chose, they could ensure that all vehicles were tested every 5 years.

27. **LEV II SFTP Testing at Adjusted Loaded Vehicle Weight (ALVW)**: In LEV II, ARB and EPA staff agreed to harmonize SFTP standards and test procedures to help address manufacturers concerns with undue cost and facility burden associated with SFTP. Having all manufacturers test the same procedure twice (once at Adjusted Loaded Vehicle Weight (ALVW) for CARB and again at Loaded Vehicle Weight (LVW) for EPA) was clearly not the intent and actually conflicts with proactive work accomplished in LEV II and LEV III rulemakings and also required under the Federal Clean Air Act. The LEV II documentation supports our claim:

- CARB Mail Out MSC# 97-13, Page 2: ***"In this rulemaking, the ARB staff is proposing the adoption of the high-speed, high-acceleration and air-conditioner supplemental test procedures that are in all respects identical to the procedures adopted by U.S. EPA. The establishment of identical test procedures will continue to permit manufacturers to put a vehicle through one set of tests to demonstrate compliance with both the California and Federal standards.***
- July 24, 1997 Board Hearing Summary: ***"Staff proposed the new SFTP and emission standards to control emissions during driving conditions outside the FTP from low emission vehicles, ultra-low emission vehicles and super ultra-low emission vehicles. The proposed test procedures were, in all respects, identical to the procedures adopted by the U.S. EPA."***
- Aligned with the above statements, the LEV II test procedures (Section 100.5) point directly to EPA procedures (40CFR 86.129-00b) when determining test weight to be used for SFTP (LVW).

Further regarding undue facility and cost burden, the SFTP air conditioning test (SC03), has been and continues to be a very limited resource. Neither ARB nor EPA have tests facilities capable of conducting an SC03 test. The SC03 facility is a high cost/special environmental test site, operated at 95°F, with a road speed fan, and controlled humidity to 100 grams per pound, and with higher complexity to operate and maintain than standard test sites. During the LEV II rulemaking, ARB and EPA staff recognized this issue and intended to allow manufacturers to run SC03 as well as US06 at LVW to address manufacturers concern.

- From CARB Mail-Out #MSC 97-06, April 3, 1997, Page 9: "Adjustments to the US06 test cycle are allowed for those vehicles for which some of the US06 accelerations may be too severe...**A second adjustment is for medium-duty vehicles.** From the driving surveys, it was determined that, on average, these vehicles tend to be driven at lower speeds, and less aggressively at higher speeds than passenger cars. **Thus, a lower US06 dynamometer inertia test weight than the FTP is allowed; the US06 inertia weight will be based on the curb weight plus 300 pounds** [i.e. LVW]."

Recognizing Staff's current proposal and given the above history, we offer the following alternative.

**Recommendation:** Several manufacturers are currently testing SFTP at LVW, and lead time needed to make a certification program change is a major issue. Some of these programs were last certified several years ago, also creating very real issues associated with any retesting due to: engineering/calibration resources dedicated to current/future products, lack of vehicle availability, and testing capacity constraints for incremental facility workload. We therefore request manufacturers be allowed to carryover our current LVW-based LEV II SFTP testing, while ALVW would be required for new LEV II testing, based on approval date of the LEV III Rule.

## Test Procedure Issues

There are a number of test procedure issues with the “Zero Emissions Vehicles 2012” appendices A-2 & A-4 and the LEV III appendices C, D, E, and J. The Alliance encourages the ARB staff to work with industry on updating these procedures. Some (but not all) of the issues are listed below:

- **Hybrid Test Procedures**

“Zero Emissions Vehicles 2012”, appendix A-2 (“... TEST PROCEDURES FOR 2009 THROUGH 2017 MODEL ZERO-EMISSION VEHICLES AND HYBRID ELECTRIC VEHICLES...”) and A-4 (“... TEST PROCEDURES FOR 2018 AND SUBSEQUENT MODEL ZERO-EMISSION VEHICLES AND HYBRID ELECTRIC VEHICLES...”), basically carry over the circa 2009+ emissions testing procedures. These test procedures need to be updated to reflect advances in hybrid vehicle electrical propulsion technology plus be harmonized with EPA’s recent update of hybrid vehicle test procedures in the 2011 Fuel Economy Label and Green House Gas rulemaking. EPA now extensively points to SAE J1711. The J1711 test procedures are the result of many years of cooperative work between industry and government, which included EPA and the ARB staff. A-2 & A-4 not being harmonized with EPA (and J1711) creates additional test burden for OEM’s by requiring duplication of testing and uncertainty as to the certification requirements.

Additionally in A-4 there is one new section G.12 “The Calculations of the Combined Green House Gas Regulatory Rating of Off-vehicle Charge Capable Hybrid Electric Vehicles” which has differences with respect to similar equations and algorithms in EPA’s Part 600. These differences need to be analyzed further and harmonized where possible.

- **CFR Part 86 References**

LEV III appendices C and D, and ZEV 2012 appendices A-2 and A-4 test procedures (and others) have many references to CFR Part 86, subparts B and C test procedures. EPA is in the process of migrating these subparts B and C to Part 1066. Not being harmonized with EPA creates additional test burden for OEM’s by requiring duplication of testing and uncertainty as to the certification requirements.

- **Nitrous Oxide “N<sub>2</sub>O”**

LEV III appendices C and D now require N<sub>2</sub>O measurements. Recent studies have shown that N<sub>2</sub>O measurement technology at such ultra low levels (parts per billion range) is very much in its infancy and not well understood nor developed. OEM’s have a high level of concern over measurement technology readiness, instrument availability (most are prototypes), measurement accuracy, implementation lead time (commencing many years after technology is proven accurate and robust), additional testing burden, costs to implement, etc. The LEV III regulations require this N<sub>2</sub>O measurement for the 2015 MY, which is not feasible for OEM’s to meet given N<sub>2</sub>O measurement technology readiness and required lead time.

- **Particulate Matter “PM”**

The new ultra low PM standard of 3 mg/mi creates new and unprecedented measurement

challenges for both industry and government. Recent studies have shown that non-vehicle emissions “artifact” coupled with CFR required high exhaust gas dilution ratios “multiplier” can produce measurement errors which are a significant portion of this 3 mg/mile standard. This provides industry with little room for error and drives uncertainty in emissions results.

The LEV III and ZEV 2012 PM test procedures still reference older measurement techniques without properly accounting for this artifact or dilution ratio multiplier. The “LEV III PM TECHNICAL SUPPORT DOCUMENT” (appendix P) paper states test procedures will be updated in the future, but specifics are unclear.

This PM Technical Support Document shows data in support of measurements accuracy at 3 mg/mi, but it is not clear whether this data was using all of the proposed Part 1065 test procedures, and more specifically the higher exhaust dilution ratios or secondary dilution air. (Again) higher exhaust dilution ratios leads to higher measurement error and variability.

The paper goes on to state “We expect that manufacturers will be able to easily implement the LDV PM test procedure that U.S. EPA will release as part of their upcoming Notice of Proposed Rulemaking (NPRM) because it will be modeled on 40 CFR Part 1065, which the car manufacturers have already used extensively.” Although it is true that some car manufacturers have implemented some of these Part 1065 test procedures and equipment (primarily) for diesel testing, it is not in widespread use as will be needed for the proposed LEV III rulemaking where routine PM testing will be required for all fuels and for the additional test type of US06. Routine PM measurements for all emissions testing will be very costly and represent a significant testing burden for OEM’s.

- **LEV III Appendices D, E and J**

These test procedures contain a number of issues. Example, the appendix D test procedures uses an NMHC to NMOG conversion (1.1) which appears to be defined only for E10 fuel. This fixed factor is not harmonized with EPA’s proposed Part 1066 where an equation is used as a function of the ethanol blends (<25% ethanol). Another concern with the fixed factor (1.1) is that other fuels (E15) might trigger a full speciation requirement for ARB testing (burden).

Also in appendix D the new AC 17 test cycle for determining air conditioner efficiency improvements, there is a concern that these tests be limited due to facility constraints plus the significant testing burden (time required to complete the test sequence). Additionally with this new test cycle (AC 17) there is a concern with existing test facilities meeting the tight ambient tolerances. With some minor modifications to the requirements these issues can be reduced or eliminated.

In appendix E there is a new NMHC mass derivation (density equation vs. today’s factor) which is a major departure from current practices (& EPA)

Appendix J (HD Otto), there are conflicting requirements between the specified NMOG procedures and Part 1065. Examples are NMHC density and CH<sub>4</sub> instrumentation.

## CALIFORNIA LEV III Proposed Rules re CERTIFICATION TEST FUEL “Cert Fuel”

### **A. One of the Primary Goals of One National Program is harmonization of Federal and California Certification Test Fuel Specifications. If this goal is not realized, then at a minimum, “two-way” reciprocity is needed between EPA and ARB to accept results from one program in the other.**

1. The Alliance appreciates the opportunities to provide input to ARB about the development of new gasoline cert test fuel through public meetings and staff meetings with the Alliance and with individual members.
2. The Alliance has consistently supported a unified 50 State Federal EPA Tier 3 and ARB LEV III approach that would allow use of one cert fuel for vehicle certification testing.
3. The Alliance has also consistently supported use of an E10 (10 vol. % ethanol) blend gasoline cert fuel, as ARB has proposed, because it is still the predominant market fuel in use in California, and the entire United States.

Considerable uncertainty still remains about the use of E15 market fuel in light of ongoing litigation challenging the EPA E15 Waiver and corollary Mis-fueling Avoidance Rule, and because of the uncertainties about the pace of national investment in the retail infrastructure to enable E15 use (*e.g.*, new dispensers, *etc.*). At the point that E15 use is predominant in the national market and California market, then consideration of transitioning to a new cert fuel would be appropriate.

4. At present it appears that there may be two different cert fuels (E15 for Federal Tier 3 and E10 for California). If so, then the Alliance strongly urges that each Agency agree to “two way” reciprocity, in which each Agency accepts the other’s test fuel and certification (*i.e.*, accepts either ARB E10 OR EPA E15 certification -- assuming E15 cert fuel remains in an EPA final Tier 3 rule.)
5. Alliance members understand that California will accept Tier 3/ E15 in lieu of E10 certification based on the language in the ISOR at p. 17: “Staff also proposes to retain the option to certify on federal Tier 3 certification fuel which staff understands will be based on E15.”

The Alliance, however, found no references in Appendices C or D that address the relationship of the ARB and the EPA cert fuels, probably because EPA has not yet published its proposed rule for Tier 3. It is our understanding that ARB has agreed to honor EPA cert fuel/ testing in lieu of ARB/E10, consistent with the ISOR language quoted above. Therefore, we request that ARB be explicit in documenting in the final California regulatory language (and EPA should have reciprocal language in its Tier 3 final regulation) that OEMs may use Tier 3 EPA cert fuel and certification in lieu of ARB E10 cert fuel and testing.

Furthermore, it should be made clear in the regulatory language that this option extends not only to criteria pollutant and GHG exhaust emissions, but also to evaporative (recognizing that evap. testing on federal certification fuel requires use of the federal temperature profiles for equivalence). The regulations and the relevant cross-referenced documents (appendices) should clarify that ARB would accept EPA Tier 3/E15 certification in lieu of E10 ARB certification where otherwise E10 certification would be called for.

**B. Institute a future public review to assess cert fuel changes.**

1. ARB and EPA should institute a coordinated formal review effort, with stakeholder involvement, to assess experience with the new cert fuel(s) and also developments in market fuels, perhaps in the 2017 timeframe. There is much new regulatory content in the ARB proposal, and a formal commitment to assess the full range of requirements for various fuel types is appropriate, especially in this period of rapid change in vehicle and fuel technologies.

**C. Provide Additional Flexibility regarding Cert Fuel Octane Grade.**

1. The Alliance has pointed out that if EPA and ARB each were to require testing at one of two octane grades (regular or premium, depending on what the OEM requires), then a company may have to obtain and track up to four different cert fuels (E10 regular and premium and E15 regular and premium) rather than the single fuel, single octane grade currently in use. This means there will be a reduction in the ability to make “apples to apples” comparisons across vehicles, as well as added cost and complexity for OEMs. ARB has not yet provided an economic analysis of the benefits vs. burdens/cost of this extra complexity, and should do so.

2. To remedy this and allow flexibility to choose one octane grade, the word “shall” needs to be replaced with “may” in the first sentence of footnote (i) in the Table in Sec. 100.3.1.2 (Appendix D at II-4).

3. The Alliance encourages both ARB and EPA to consider moving market and cert fuel specifications to RON and MON in lieu of an AKI (R+M/2) metric, to provide greater flexibility in future years, and compatibility with other countries.

4. A specified MON value is important along with RON. With the wide variety of engine designs available across the U. S. marketplace, there is strong evidence to support the need for both a RON and MON specification. The AKI simple average will not meet the needs for future technologies for some OEM products. See Coordinating Research Council (CRC) Report #660 “Fuel Antiknock Quality – Engine Response to RON vs. MON” May, 2011.

**D. Market and Certification Fuel RON (Research Octane Number) and MON (Motor Octane Number) octane requirements should be raised commensurate with the ethanol (or other bio-based fuel) octane contribution.**

1. Over the past year, the Alliance has made a strong effort with both ARB and EPA to communicate the need to keep the petroleum refinery Blend-stock for Oxygenate Blending (BOB) octane grade at a requisite minimum level, and not allow it to “backslide” or diminish in light of any octane increase afforded by added ethanol (or other bio-based fuel).

2. Automakers have explained that to optimize engine fuel efficiency and minimize emissions, raising the U.S. regular unleaded octane floor from its current 87 AKI /91 RON value to a value consistent with the “regular grade” of many other Global Markets, *i.e.*, 95 RON, minimum will be necessary. Furthermore, there are also significant engine efficiency and vehicle GHG emissions benefits of raising the octane level of the U.S. premium octane grade. The Alliance recognizes that raising octane levels is a significant task, but one that needs to be studied and

addressed as our nation moves to more efficient vehicles and lower mobile source GHG emissions levels.

One means to increase the total octane grade of the gasoline blend would be through higher levels of ethanol (or other high octane bio-based fuels). However, while maximizing the octane boost and benefit by using renewable ethanol, the minimum octane rating for the petroleum BOB should also be specified to prevent further reduction in the BOB octane content. In this way, the vehicle can be optimized to utilize the beneficial fuel properties of renewable ethanol such as high octane quality and latent heat of evaporation that improves volumetric engine efficiency.

3. For purposes of E10 cert fuel, Alliance members requested that ARB use a higher RON and MON octane specification that would be commensurate with the octane enhancement provided by the 10% ethanol *over and above* the previous E0 octane cert fuel level. (The same principle would apply for any ethanol blend above the previous E0 cert fuel.) This would have made the cert fuels “forward looking” to marketplace need. The Alliance is disappointed ARB has not done so in the proposed 87 [and 91 minimum] AKI for LEVIII E10 cert fuel in the proposed Table in ARB Appendix D p.II-4.

#### **E. Criteria for Adding Future Clean Fuel/Certification Fuel Need to be Made Consistent.**

**[Appendix C Part II (MY 2001-2014) p. 37; Appendix D Part II (MY 2015+), p. II-9); Appendix A, Sec. 2317 p. 152-3].**

1. The language in Appendix C Sec. 100.3.9 (p. 37) appears to omit some important language in this section compared with corollary language for Sec. 100.3.9 in Appendix D Part II, p.II-9. It doesn't include the initial paragraph or section 100.3.9(a)(2) of the language in Appendix D, which should be identical for both sections as well as in Title 13 Sec. 2317 (Appendix A p. 152-3).

2. First, the Alliance requests that ARB clarify that the phrase used in the first sentence of Sec. 100.3.9 of the Appendices C and D and in Appendix A for Sec. 2317, “to establish *by regulation*” means that any petition and Agency response to accept a new cert or market fuel will be subject to notice and comment rulemaking, and not a direct final regulation. **Please add language to read “...establish by regulation (with notice and comment rulemaking)...”**

3. Second, the Alliance particularly supports inclusion of the language in Appendix D, Section 100.3.9(a)(2) in both Appendix C and Appendix D, and also in Sec. 2317(a)(3)(C) in Appendix A, but include the following (underlined) addition:

**Use of the new clean fuel in such existing motor vehicles would not result in increased deterioration of the vehicle, including “emission-related parts” as defined in Title 13 CCR Section 1900, and would not void the warranties of any such vehicles.**

4. Proposed Appendices M and N currently require a 50,000 mile minimum mileage durability test. **Given the 150,000 FUL (full useful life) requirement proposed for LEV III, the same durability minimum mileage should be required for future clean fuels evaluation.**



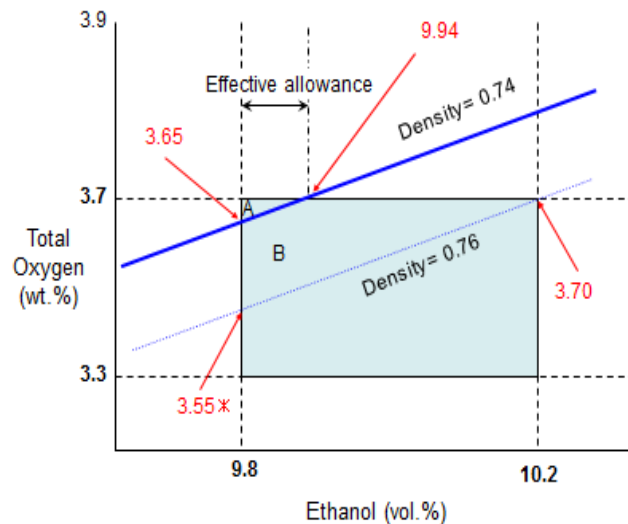
#### F. ARB's E10 Cert Fuel Specification for Benzene should be 0.8 ppm max.

1. ARB should change the Table in Appendix D, Sec. 100.3.1.2 (p. II-3, 4) benzene specification to 0.8 ppm maximum, and drop the range of 0.6-0.8 ppm maximum. Using a range just adds complexity and cost to the cert fuel preparation with no certification functional benefit.

#### G. ARB's E10 specification requires a change to the proposed Total Oxygen wt. % (Appendix D Part II, Sec. 100.3.1.2., at II-3-4).

1. As illustrated below: (1) assuming a density of 0.74, and (2) given the allowable total oxygen content criterion in the LEVIII E10 Cert Fuel Table [range from 3.3 to 3.7 wt. %], then (3) taken in conjunction with the 9.8 to 10.2 vol. % ethanol specification, this effectively yields an allowable total oxygen range of only 3.65-3.7 % by weight (see Area A below).

If the density is 0.76, the effective oxygen content is truncated to 3.55 to 3.7% by weight (see Area A plus B below). This effectively caps the lower oxygen content at a number much higher than the proposed specification. **ARB should change the lower limit from 3.3 to 3.5, and the upper limit from 3.7 to 4.0 wt. %.**



V.2

#### H. The Alliance supports ARB's use of the Multi-substituted Alkyl Aromatics cert fuel specification.

1. By controlling the number of alkyl and/or aryl substitutions on the aromatic ring structures, in addition to the proposed fuel volatility distillation controls, the Alliance anticipates that there will be good batch to batch control for the cert fuel blending over time. In this way, the automakers can focus on emissions hardware effects with a steady fuels baseline.

**I. Sec. 100.3.3 Alcohol Fuels M100 and E100 Fuels Appendix D at II-6)**

Appendix D, Section 100.3.3 “Alcohol Fuels” amends Title 13 California Code of Regulations (CCR) Title 13, Section 2292.3 with the following changes for E100:

<b>E-100 Fuel Ethanol</b>	
Ethanol	98.0 ± 0.5 vol. percent
Methanol	1.0 vol. percent max.
Petroleum fuel meeting the specifications of section 100.3.1.1	1.0 ± 0.1 vol. percent

The Alliance does not believe it was the ARB’s intent to mandate the use of methanol in preparing the denatured ethanol for E85 blending later regulated in Section 100.3.4 of this same Appendix D. For example, adding the maximum allowable ethanol content (98.5 v%) with the maximum allowable denaturant (1.1 v%) equates to 99.6 v% of denatured ethanol and therefore requires at least 0.4 v% methanol or water addition. The Alliance suggests that the ethanol industry has controlled the methanol level very well in field fuels, based on E85 fuel survey data, and that no intentional methanol or water addition is necessary to match the cert fuel to the market. Additionally, it appears that the Section 100.3.3 E100 changes require the use of the proposed LEVIII California Cert Fuel gasoline as the denaturant to be added to spirit grade, un-denatured ethanol; a very expensive and onerous fuel blend proposal. This section should simply state that the denatured E100 for use in LEVIII E85 Cert Fuel blending should meet the ASTM D4806 denatured fuel ethanol specification entitled, “Denatured Fuel Ethanol for Blending with Gasolines for Use as Automotive Spark-Ignition Engine Fuel.”

**J. Sec. 100.3.4 Mixtures FFV Fuels: M85 and E85 Cert Fuel (Appendix D Part II, at II-6)**

The Alliance recommends that the entire CCR Title 13 section 2292.4 “Specifications for E-85 Fuel Ethanol” be revised to be consistent with the latest version of ASTM Specification D5798 “Ethanol Fuel Blends for Flexible-Fuel Automotive Spark Ignition Engines.” The benefits of making these two documents consistent can be seen when attempting to blend E85 to meet the required 8.0 – 8.5 psi RVP in Section 100.3.4 of the LEVIII Appendix D proposal. For example, un-denatured ethanol has an RVP of approximately 2.2 psi and the proposed LEVIII Cert Gasoline specification is a nominal 7.0 psi RVP. These two fuels cannot be blended together to meet an 8.0 psi ethanol blend without the use of a third high vapor pressure component, such as butane, which is uncommon in the marketplace. See ASTM D5798, Appendix Figure X1.3 as a reference. As with the ARB direction with the gasoline cert fuel to match the typical blend of market fuel, the ARB E-85 cert fuel should utilize a specified higher vapor pressure California winter gasoline to be blended with denatured ethanol meeting ASTM D4806 to an ethanol content in the center of the allowable E85 marketplace gasoline, i.e. 67 vol.

**K. Sec. 100.3.5 Natural Gas Fuels (Appendix D at II-7)**

Alliance agrees with the majority of the ARB’s CNG fuel specifications with the exception of a few important parameters identified in red text in the table below.

Constituent	CARB Emissions Cert test fuel for exhaust and evaporative emission testing	CARB CNG Fuel - Alliance (Cert - Exhaust & EVAP)	CARB Commercial Fuel for mileage accumulation	CARB CNG Fuel - Alliance (Mileage Accumulation)
Methane (mol%)	90.0% +1.0%	No Change	Minimum of 88%	No Change
Ethane (mol%)	4.0% +0.5%	No Change	Maximum of 6.0%	No Change
C3 & higher (mol%)	2.0% +0.3%	No Change	Maximum of 3.0%	No Change
C6 and higher (mol%)	Maximum of 0.2%	No Change	Maximum of 0.2%	No Change
Hydrogen (mol%)	Maximum of 0.1%	No Change	Maximum of 0.1%	No Change
Carbon Monoxide (mol%)	Maximum of 0.1%	No Change	Maximum of 0.1%	No Change
Oxygen (mol%)	maximum of 0.5%	No Change	Maximum of 1.0%	No Change
Inert Gases (mol%) Sum of CO2 and N2	3.5% +0.5%	3.0% + - 0.5% (A)	1.5% to 4.5%	3.0%, max.
Odorant (mol%)	The natural gas at ambient conditions must have a distinctive odor potent enough for its presence to be detected down to a concentration in air of not over one-fifth of the lower limit of flammability.	No Change	The natural gas at ambient conditions must have a distinctive odor potent enough for its presence to be detected down to a concentration in air of not over one-fifth of the lower limit of flammability.	No Change
Water	The dewpoint at vehicle fuel storage container pressure shall be at least 10°F below the 99.0% winter design temperature listed in Chapter 24, Table 1, Climatic Conditions for the United States, in the American Society of Heating, Refrigerating and Air Conditioning Engineer’s (ASHRAE) Handbook, 1989 fundamentals volume. Testing for water vapor shall be in accordance with ASTM D 1142-90, utilizing the Bureau of Mines apparatus.	No Change	The dewpoint at vehicle fuel storage container pressure shall be at least 10°F below the 99.0% winter design temperature listed in Chapter 24, Table 1, Climatic Conditions for the United States, in the American Society of Heating, Refrigerating and Air Conditioning Engineer’s (ASHRAE) Handbook, 1989 fundamentals volume. Testing for water vapor shall be in accordance with ASTM D 1142-90, utilizing the Bureau of Mines apparatus.	No Change
Particulate Matter	The compressed natural gas shall not contain dust, sand, dirt, gums, oils, or other substances in an amount sufficient to be injurious to the fueling station equipment or the vehicle being fueled.	5µm filter should be used in dispensing fuel to the vehicle. (D)	The compressed natural gas shall not contain dust, sand, dirt, gums, oils, or other substances in an amount sufficient to be injurious to the fueling station equipment or the vehicle being fueled.	5µm filter should be used in dispensing fuel to the vehicle. (D)
Sulfur	16 ppm by volume (max)	10 ppm, max. ( B)	16 ppm by volume (max)	10 ppm, max. ( B)
Hydrogen Sulfide		1 ppm, max. (ASTM D4468) (C)		1 ppm, max. (ASTM D4468) (C)
Oils/Compressor Oil		5µm filter should be used in dispensing fuel to the vehicle. (D)		5µm filter should be used in dispensing fuel to the vehicle. (D)
Notes:				
A. Provides tighter Air/Fuel ratio and Energy Content controls for both Emissions and Driveability performance, while the Mileage Accumulation value provides some flexibility.				
B. 10 ppm Sulfur consistent with Liquid Fuels and comparable Spark Ignition 3-Way Exhaust Emissions Catalyst technology .				
C. Aligned with total Sulfur reduction and recognition of need to limit corrosive species in Certification Fuels.				
D. Consistent with SAE J1616 on need to reduce both Particulates and Compressor Oils at the point of Fuel Delivery, prior to entering the vehicle.				