STATE OF CALIFORNIA
AIR RESOURCES BOARD

Proposed Amendments to the Small Off-Road Engine Regulations: Transition to Zero Emissions	))))	**15 Day Notice Changes March 30, 2022**

COMMENTS OF THE TRUCK AND ENGINE MANUFACTURERS ASSOCIATION

On the Notice of Public Availability of Modified Text and Availability of Additional Documents to the Proposed Amendments to the Small Off-Road Engine Regulations: Transition to Zero Emissions

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At its December 9, 2021 Public Hearing the California Air Resources Board (Board) approved for adoption certain amendments to the California Code of Regulations as recommended by the CARB staff and further directed the staff to make additional regulatory changes with additional supporting documentation. Those additional changes and documentation, which were published on March 30, 2022, are the subject of these comments. These comments are in addition to the comments the Truck and Engine Manufacturers Association (EMA) previously submitted regarding the Amendments that the Board initially considered and approved at the December 9, 2021 Public Hearing.

I. Comments on the Modifications to SORE Exhaust Emission Regulations, Evaporative Emission Regulations, Emissions Test Procedure TP – 901, Emissions Test Procedure TP-902, Engine Testing Procedures Part 1054 and Part 1065

While EMA appreciates the changes proposed by CARB Staff in the 15 Day Notice, which address a number of the technical issues raised in our comments, the provisions of the 15 Day Notice continue to ignore the two elephants in the room – (i) the absence of zero emission options for many of the products and applications powered by small off road engines, not just for portable generators and high power pressure washers and (ii) the complete lack of adequate lead time for transitioning to ZE technology. The proposed lead time for reducing the emissions and transition to zero emissions is not realistic, nor is it legally sufficient, for the reasons set forth in EMA's previous comments. Simply put, the emissions reduction forecasted by CARB will not occur because the proposed requirements and timetable for the sale of ZE products cannot be met.

EMA presented an alternative emission-reduction proposal which can achieve equivalent, if not greater, emission reductions than the CARB staff Proposed Amendments at a fraction of the cost, while avoiding the enormous negative effect the Proposed Amendments will have on the thousands of small businesses that utilize outdoor power equipment. EMA's alternate proposal, which includes the creation of a new category for "Fixed Mount Generators", provides a cost effective and technologically achievable program for manufacturers and their customers that can be implemented in a manner which maintains manufacturers ability to provide products which meets customers' needs, including life cycle performance and total cost of ownership while zero emission technology continues to develop and be introduced to the category.

EMA is requesting additional revisions to certain technical amendments in the 15 Day Notice. Specifically, the "Tilt Test" addition to TP-902 will require engines and equipment to be tested in orientations that are inconsistent with the manufacturer's design and operating instructions on angle of operation. EMA requests CARB staff modify this language to limit tilt test angles to the manufacturer's recommendations rather than an arbitrary value of 90 degrees in a "one-size fits all approach", attempting to capture emissions from mis-use of equipment. The proposed amendment does not adequately account for the different types of small off-road non-handheld equipment engines are installed in and, in many cases, the Tilt Test as proposed is simply not practical nor realistic. Engine and equipment manufacturers can supply CARB staff with installation instructions, application models, and operator manual instructions that provide the maximum operating angles of the engine / equipment as part of the application process to support the test data collected under this requirement.

In addition to changes to the TP-902 Tilt Test, EMA supports the revisions proposed in the comments submitted by the American Honda Motor Co. Inc. to section 2400 addressing ripple effect changes as the result of the inclusion of a CO standard, calculating emission non-compliance, aligning operator instruction manual and labeling language with EPA regulations to avoid adding unnecessary complexity to the marketplace with multiple labels and manuals or dual products. EMA also supports Honda's comments addressing CARB's proposed amendments to the evaporative certification program under 2750 (intended to clarify requirements and align with changes made to TP-902 and CP-902) and its comments on amendments made to TP-902 and CP-902 requesting additional clarification.

EMA is also requesting that the replacement engine amendments be aligned with the federal regulations for clarity and consistency in the regulation and management of those products. EMA supports the comments submitted by the Outdoor Product Equipment Institute (OPEI) on Replacement Engines and addressing the gaps created by the SORE Amendments in the regulatory scheme for Large Spark Ignition engines.

II. Comments of Proposed Modifications to Emissions and Economic Analysis and Additional Documents Added to the Record

To reflect the changes directed by the Board at the December 9, 2021 Hearing CARB staff have modified the Emissions and Economic Analysis and added 44 Additional Documents to the Record. However, no context is provided for the Additional Documents making it difficult to anticipate how they are intended to be used by CARB Staff to support the Record.

Documents 1 -3 appear to simply summarize California's current battery recycling program. However, the information provided does not appear to be applicable to the size and type of batteries powering non-handheld equipment that will need to be recycled under the proposed amended regulations.

Numerous documents also were added to the Record relating to the availability of battery powered SORE products, battery technology and costs. While it is encouraging that CARB staff are continuing to review market information, CARB staff have done NO testing of this equipment to compare it with current SSI powered equipment, instead solely relying on marketing material for their comparisons (see Documents 5 – 11). This again is a deficient attempt to buttress the record, especially when assessed against the actual test data and documentation that manufacturers must provide to CARB staff to generate credits for ZE products. The additional documents do not establish that there are comparable ZE products actually available for the wide breadth of SSI products currently on the market, especially in the non-handheld commercial equipment category. They also do not demonstrate that significant progress has been made in the development of battery power and storage capacity necessary to support the rapid transition to ZE for a number of equipment categories, including portable generators and high power pressure washers. Given the inadequate lead time provided for the transition of these products and the "market assessment" for portable generators and high power pressure washers directed by the California Air Resources Board it is likely to be too little too late to avoid significant disruption and negative impacts on California consumers and small businesses.

The proposed SORE Amendments also relied on technical data that has been used in previous rulemakings. No new technical data was developed by CARB staff to support the regulatory changes at issue nor has any new technical data been added to the record (see Documents 12, 13, 22 – 25, 28 -31 and 44). Continuing to add documents based on old data which is not reflective of product currently in the market – or in some cases not even waiting for the most recently passed regulatory amendments to go into effect to evaluate their impact – is inherently unreasonable and has resulted in a rulemaking record that cannot support the Amendments.

Several of the Additional Documents relate to the Survey conducted by the California State University – Fullerton (CSUF), the basis for the 2020 SORE Air Emissions Inventory and Model. However, the additional documents are not sufficient to resolve the underlying issues with the data described in the comments previously submitted by OPEI and EMA (Documents 12 – 21, 23 -43). The data collected by CSUF, despite the requirements of the contract between CSUF and CARB, was not subjected to standard Quality Assurance and Quality Control (QA/QC) review prior to the publication of the Report that is the basis of the 2020 SORE Emissions Inventory and Model. The survey failed to utilize standard research tools including (1) providing interviewers with "normal ranges" for Respondent responses which were readily available from previous studies in 2001, 2011 and 2012 and which would have permitted appropriate follow up questions and standardized responses (rather than the imputation of data by CARB after-the fact), (2) performance of QA/QC on the raw data or (3) normalization of the data for usage and age of equipment in addition to the number of units. Despite rejecting the IQR methodology employed by Air Improvement Resources (AIR) (described in the EMA November 29, 2021 comments) based on the information in Document 35 it appears that CARB staff also performed an IQR analysis of the CSUF survey data. While AIR performed its analysis using the raw data to flag outliers which were then evaluated for accuracy by triangulating with other available data, CARB staff used a logarithmic analysis to flag outliers. However, CARB staff used the arithmetic average rather than the geometric mean which resulted in the failure to properly screen outliers. A more detailed description of CARB staff's IQR analysis and its' impacts on the data is described in Attachment A, prepared by AIR. In addition, the revised IQR analysis using the geometric mean results in data which aligns much more closely with the 2012 Survey conducted by CARB (Document 14) which was a more robust survey than the CSUF Survey, including three times as many data points than the CSUF survey. Further, when one reads through the additional information provided to evaluate the flagged data it was discovered that even data that failed CARB's faulty IQR analysis was retained, that CARB staff applied rationale inconsistently from response to response and in one case the response was even changed. The result of this series of mis-steps was the inclusion of outlier data and non-normalized data which skewed the emissions inventory to levels higher than "real world", the stated objective of the 2020 update.

In short, the exercise glosses over mismanagement of the CSUF contract and misapplies accepted research and analysis principles to save a study that doesn't have enough data to statistically support the Report's findings. Document 35 was not included in the ISOR documents depriving the public of an adequate opportunity for comment on the CARB staff analysis. Two additional documents were added to the Record (documents 17 and 20) and while these documents provide additional information, they fail to address that the underlying study cannot be "fixed" after the fact. All statistical analyses have assumptions that must be met to be valid. A key component is that the underlying data has been validated using accepted QA/QC measures.

Applying different tools to bad data doesn't make it good data, nor do the documents support mis-applying analysis tools . In addition, the inclusion of an unpublished graduate thesis from 2006 to support the CSUF survey and analysis is simply grasping at straws (Document 20). The 2020 SORE Emissions Inventory and Model, rather than reflect "real world" conditions is based on bad data and as a result overestimates both the emissions inventory and expected reductions forecasted by the Proposed SORE Amendments adopted by the Board. These overestimations result in material underestimation of the costs of the Proposed Amendments adopted by the Board and their impact on California consumers and businesses.

III. Conclusion

While the additional amendments proposed in the CARB Staff 15 Day Notice address certain of the technical issues identified in the previous comments submitted by EMA, OPEI and PGMA they do not address the substantive flaws described in those comments.

Accordingly, EMA again requests that serious consideration be given to the alternate proposal described in our previous comments. EMA believes that the alternative proposal will provide real-world emission reductions in a cost effective and technologically achievable manner.

Respectfully Submitted,

TRUCK AND ENGINE
MANUFACTURERS ASSOCIATION

Attachment A

Comments on ARB's Estimates of Annual Activity for Gasoline Equipment

In their analysis of annual use from the equipment survey, Staff used an IQR analysis conducted in log space to identify pieces of equipment with very high annual use that were further evaluated for potential removal from the sample. In some cases, certain pieces of equipment considered outliers with this analysis were removed.[1] After the removal of some of the outliers, Staff computed annual use of the remaining sample using arithmetic averages. However, very few pieces of equipment were removed from the sample, resulting in very high annual use for many equipment types.

AIR believes that Staff's use of the log of annual use to identify outliers should have been accompanied by using the geometric mean to compute annual use, instead of arithmetic means.

A comparison of the two methods for different equipment types for household, business, and landscape use is shown in the tables below. There are significant differences in annual use between arithmetic averages and geometric averages. For example, for household welders, where the sample size is only 16 pieces, the arithmetic average is 178.2 hours per year, and the geometric average is 4.8 hours per year. The median use is only 2 hours per year. Welder use is hugely influenced by a welder that the respondent says is being used 2184 hours per year, which would be 8.4 hours per year, 5 days a week for the entire year. This type of use for a household is highly unlikely. Another example is landscape lawnmowers.

Other examples are shown in the tables. Any gasoline equipment with use in excess of 2000 hours per year is highly suspect, because it indicates use for about 8 hours per day, 5 days per week. While electric equipment such as pumps can experience high use, gasoline equipment where the motor is reported to be on 8+ hours per day requires so much refueling that it is simply not logical that anyone would be using the equipment his much.

Household Gasoline Equipment Annual Hours						
Equipment	**Count**	**Minimum**	**Maximum**	**Average**	**Median**	**Geometric Mean**
Chainsaw	169	0	208	17.9	2.0	3.7
Compressor	15	0	2912	349.3	26.0	18.9
Generator	127	0	2184	46.2	3.0	4.8
Lawn Mower	308	0	780	23.4	10.0	8.5
Leaf Blower/Vacuum	100	0	156	14.9	8.0	7.4
Pressure Washer	68	0	624	29.3	6.0	6.4

[1] Staff computed the log of annual equipment use (in hours per year), then used an IQR analysis to identify outliers.

Pump	7	0.17	50	9.8	2.0	3.5
Snow Blower	4	0.5	10	5.4	5.5	4.1
String Trimmer	169	0	208	15.8	5.0	6.0
Welder	16	0	2184	178.2	2.0	4.8

Business Gasoline Equipment Annual Hours						
Equipment	**Count**	**Minimum**	**Maximum**	**Average**	**Median**	**Geometric Mean**
Chainsaw	91	0	192	21.2	6.0	7.0
Compressor	23	0	2080	203.2	8.7	17.4
Generator	87	0	2920	167.2	8.0	16.1
Lawn Mower	81	0	1092	106.1	24.0	26.0
Leaf Blower/Vacuum	116	0	728	86.1	26.0	29.9
Hedge Trimmer	12	3	192	55.5	24.0	26.3
Riding Mower	4	24	468	147.3	48.5	72.1
Pressure Washer	100	0	1040	78.2	12.0	16.2
Pump	30	0	3120	167.8	13.0	16.7
Snow Blower	3	6	150	58.0	18.0	26.2
String Trimmer	90	0	728	70.1	18.0	21.3
Welder	33	0	2184	118.2	26.0	17.6

Landscape Gasoline Equipment Annual Hours						
Equipment	**Count**	**Minimum**	**Maximum**	**Average**	**Median**	**Geometric Mean**
Chainsaw	1825	0	1248	137.4	62.4	52.0
Compressor	30	4	468	176.3	92.5	70.2
Generator	100	0	1456	61.9	15.0	15.2
Hedge Trimmer	1096	0	2080	137.8	62.8	57.1
Lawn Mower	1174	0	4368	253.8	216.7	131.0
Leaf Blower/Vacuum	1616	0	4160	224.3	119.6	110.4
Pressure Washer	151	0	312	29.6	12.0	12.6
Pump	25	0	832	160.6	18.0	25.0
Riding Mower	135	0	2912	290.3	182.8	120.5
Snow Blower	31	52	390	379.1	390.0	365.6
String Trimmer	1596	0	2920	196.3	103.9	92.0
Welder	10	0.33	48	25.9	39.4	13.8