

EVALUATION OF THE IMPACTS OF EMISSIONS AVERAGING AND FLEXIBILITY PROGRAMS FOR ALL TIER 4 FINAL OFF-ROAD DIESEL ENGINES

I. OBJECTIVES

The objective of this study is to examine the impact of the Federal Averaging, Banking, and Trading (ABT) program and the Federal Transition Program for Equipment Manufacturers (TPEM) on the criteria pollutant emissions from 2011 and later model-year off-road diesel engines in California. If warranted, the study will also identify possible measures for ensuring that California does not receive more than its proportionate share of higher-emitting diesel engines under these programs.

II. BACKGROUND

California is a participant in both the ABT and TPEM programs, which are administered at the federal level by the U.S. EPA. These programs are codified in Title 40 of the Code of Federal Regulations, Subpart H (40 CFR Subpart H), and in Section 1039.625 (40 CFR 1068.625), respectively. California does not have independent ABT or TPEM requirements apart from the federal programs.

The ABT program is a permanent component of the off-road regulations and permits engine manufacturers the flexibility of continuing to certify engine families to less stringent previous tier standards, as long as the manufacturer certifies a sufficient number of “counter-balancing” engines more stringent current-tier standard, so that the manufacturer’s entire fleet average is at or below numerical Tier 4 levels. The TPEM program permits equipment manufacturers the flexibility to continue selling a portion of their new equipment with previous-tier engines to ease the transition to the new standards for up to seven years following the introduction of Tier 4 standards. The TPEM program also has a permanent component for providing hardship relief to equipment manufacturers. However, because these programs are administered on a national level, it is likely that some states or some localities within a state could receive a disproportionate share of higher emitting engines, and have average emissions from new engines that are higher than the Tier 4 standards. Because California has areas in non-attainment with air quality standards, and has communities adversely affected by poor air quality, it is important for California to receive the benefits expected from the Tier 4 emission standards, and to verify that the ABT and TPEM programs are not adversely affecting either California as a whole, or specific communities in California.

Currently, there are no data to evaluate the distribution of ABT and TPEM higher emitting engines in California. As part of the initial new engine certification process, manufacturers are required to annually report to the U.S. EPA and ARB their expected and actual production numbers for TPEM-certified engines, but only on a national basis. Thus, California-specific TPEM production figures will need to be ascertained. Likewise, manufacturers are required to report annually the amount of ABT credits (i.e., in grams of pollutants) that have been used in certifying their engines nationally during the model year. Again, California-specific ABT-certified engine figures will need to be ascertained. Accordingly, additional sources of relevant information will need to be explored. For example, ARB’s In-Use Off-Road Diesel Vehicle regulations utilize a fleet owner registration process, the Diesel Off Road Online Reporting

System (DOORS), which includes statewide engine totals for certain classes of off road fleets and vehicles. The DOORS could be used to partially achieve this program objective at the statewide level; however, location-specific use figures (e.g., for construction, port, landfill, mining, and other sites) will still need to be ascertained. Once determined, the California TPEM and ABT-specific production numbers can be compared with Federal TPEM and ABT production numbers to come up with a percentage value, which can then be compared to the percentage value of all off-road diesel engine production or sales in California to determine whether California is receiving more than it's proportionate share of these higher emitting engines.

III. SCOPE OF WORK

The contractor should create a fully developed research plan to accomplish all tasks as described below. To accomplish these tasks, the contractor may need to develop and employ innovative strategies and approaches for acquiring the necessary information. Because it is likely that much of the required information can only be obtained through hands-on investigation, the scope of work is expected to be more than a simple paper analysis.

Task 1. Determine the numbers and percentages of ABT and TPEM engines that are sold in California and compare them to the numbers and percentages of ABT and TPEM engines sold nationwide.

The contractor will determine California-specific populations of ABT and TPEM engines versus national populations beginning with the 2011 model year. These tallies should include federally preempted engines and equipment as well as non-preempted engines and equipment. The TPEM tallies should also include equipment permitted under the hardship relief provisions of 40 CFR 1039.625(m), 40 CFR 1039.630, and 40 CFR 1068.255. The contractor should comprehensively research all sources of information in ascertaining engine and equipment populations, such as making contact with manufacturers directly to verify annual sales and/or production volume numbers, should that be warranted.

The contractor is expected to consult with ARB's Compression-Ignition and Heavy-Duty Certification section staff as a starting point for identifying engine and equipment types that have been ABT and TPEM-certified for sale in California. As mentioned previously, California-specific production numbers are not reported to ARB, but Executive Orders are required for all engines that are certified for California, including TPEM engines, and should provide an initial understanding of the various types of engines and equipment that should be tracked. ARB also maintains a number of databases, such as for new engine/vehicle certifications, in-use fleet registrations (e.g., the aforementioned DOORS), that may be useful in tabulating populations. However, this database information may not be complete, and in some cases, has been provided entirely by fleet owners themselves without any subsequent verification by ARB. The databases maintained and/or utilized by ARB are identified on ARB's homepage at <http://www.arb.ca.gov/html/databases.htm>.

The contractor will survey various sites to confirm the existence and quantities of ABT and TPEM engines and equipment. The contractor should also consult with U.S. EPA for utilizing any Federal databases as appropriate. The contractor may consider offering incentives to fleet

owners in order to gain voluntary access to their equipment. Such incentives might include the surrogate registration of engines and equipment for the fleet owners for one or more of the State's mandatory in-use programs, or perhaps a financial incentive for access privileges. For example, the contractor could enter into a contract with the fleet owner to enter the requisite engine specific data into the DOORS database for each piece of equipment on the fleet owner's lot.

After the necessary data are collected and accurate estimates of ABT and TPEM populations have been determined, California's share of these higher-emitting diesel engines must be calculated and compared to the sales/production rates of ABT and TPEM engines for determining whether California is getting more than its proportionate share of higher-emitting engines under these programs.

Task 2. Identify where the higher-emitting ABT and/or TPEM engines have ultimately been situated in California. In particular, identify and quantify locations, such as at landfills, construction sites, ports, and mining operations, where higher-emitting engines are prevalent (or at least make up a significant portion of the equipment fleet), and thereby possibly increase the local exposure risks.

In addition to determining whether California is receiving a disproportionate number of higher-emitting ABT and TPEM engines, the contractor shall need to identify the distribution of these engines on a county-by-county basis. This distribution will be used to ensure that no single community is at greater risk, unnecessarily, than any other communities in California. Furthermore, the contractor will identify specific job sites where a preponderance of ABT and TPEM engines are being employed to determine if there are pockets where local exposure risk is unreasonably high.

Task 3. Quantify the impact that California's participation in the Federal ABT and the Federal TPEM program have on California's emissions inventory and ARB's progress toward meeting its air quality and health impact goals.

In this final task, the contractor will assess the emissions impact of California's participation in the Federal ABT and TPEM programs. The contractor can consult with ARB on emissions inventory and modeling matters to develop statewide- and air basin-based emissions estimates related to its findings in tasks 1 and 2 above. The results of these estimates will be used to determine if the Federal ABT and TPEM programs need to be revised to ensure that the expected benefits from California's air quality goals are achieved, or alternatively, whether California needs additional unilateral regulatory emission control measures to secure its interests.

IV. DELIVERABLES

- Quarterly Progress Reports
- Draft and Final Reports
- All data and analyses generated through the course of this project

V. TIMELINE

It is anticipated that this project will be completed 24 months from the start date. This allows 18 months for completion of all work through delivery of a draft final report. The last 6 months are for review of the draft final report by ARB staff and the Research Screening Committee (RSC), modification of the report by the contractor in response to ARB staff and RSC comments, and delivery of a revised final report and data files to the ARB.

VI. BUDGET: \$300,000