State of California
AIR RESOURCES BOARD

Proposed Regulation to Provide Certification Flexibility for Innovative Heavy-Duty Engines and California Certification and Installation Procedures for Medium- and Heavy-Duty Vehicle Hybrid Conversion Systems (Innovative Technology Regulation)

Resolution 16-20

October 20, 2016

Agenda Item No.: 16-9-2

WHEREAS, sections 39600 and 39601 of the Health and Safety Code authorize the Air Resources Board (ARB or Board) to adopt standards, rules, and regulations and to do such acts as may be necessary for the proper execution of the powers and duties granted to and imposed upon the Board by law;

WHEREAS, sections 39002, 39003, 39500, 39001, and 43000 of the Health and Safety Code charge the Board with the responsibility for systematically addressing the serious air pollution problem caused by motor vehicles;

WHEREAS, section 43000(a) of the Health and Safety Code states that the Legislature finds and declares that the emission of air pollutants from motor vehicles is the primary cause of air pollution in many parts of the state;

WHEREAS, section 43018(a) of the Health and Safety Code states that the Board shall endeavor to achieve the maximum degree of emission reduction possible from vehicular and other mobile sources in order to accomplish the attainment of the state air quality standards at the earliest practicable date;

WHEREAS, section 38560 of the Health and Safety Code directs the Board to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective greenhouse gas (GHG) emissions reduction from sources or categories of sources;

WHEREAS, the California Global Warming Solutions Act of 2006 (AB 32, Stats. 2006, ch. 488; Health and Saf. Code § 38500 et seq.) declares that global warming poses a serious threat to the economic well-being, public health, natural resources, and environment of California and creates a comprehensive, multi-year program to reduce California's GHG emissions to 1990 levels by 2020;

WHEREAS, California Code of Regulations, title 13, section 1956.8 of the California Code of Regulations provides optional low oxides of nitrogen (NOx) emission standards

for on-road heavy-duty engines of 0.10, 0.05, and 0.02 grams per brake horsepower-hour (g/bhp-hr) in order to encourage engine manufacturers to introduce new technologies to reduce NOx emissions below the current mandatory heavy-duty engine emission standards;

WHEREAS, deployment of robust hybrid truck and bus technology – particularly hybrids with zero-emission range – is needed to facilitate California's transition to zero-emission passenger and freight transportation solutions by supporting innovation in zero-emission applications; helping build supply chains and a servicing industry for zero-emission components like controllers, motors, and electricity converters; and fostering fleet readiness for plug-in technology;

WHEREAS, medium- and heavy-duty vehicle hybrid conversion systems, also referred to as aftermarket or retrofit kits, can achieve near-term GHG reductions from California's in-use truck and bus fleet, while demonstrating the market for, and accelerating fleet acceptance of, hybrid and zero-emission trucks and buses;

WHEREAS, studies indicate that a heavy-duty engine that is not carefully integrated with a hybrid driveline has the potential to emit excess in-use NOx and, to a lesser extent, other criteria pollutants, relative to its non-hybrid counterpart;

WHEREAS, innovative, potential new engine designs – such as camless, free piston, or opposed piston engine architectures – could achieve significant GHG and criteria pollutant emission reductions and fuel economy benefits, including from long-haul tractor trailers, which are the greatest source of heavy-duty vehicle emissions and fuel consumption;

WHEREAS, over the next 15 years, California must accelerate deployment of zero- and near-zero-emission truck and bus technology to concurrently meet its upcoming air quality and climate goals, including:

- Attaining federal health-based air quality standards for ozone in 2023 and 2031 in the South Coast and San Joaquin Valley air basins, and fine particulate matter standards over the next decade;

- Achieving GHG emission reduction targets of 40 percent below 1990 levels by 2030, as directed by Governor's Executive Order B-30-15 and codified by SB 32 (Stats. 2016, ch. 249), with continued progress towards an 80 percent reduction in GHG emissions from the transportation sector by 2050, as directed by Governor's Executive Order B-16 2012;

- Reducing our petroleum use by up to 50 percent by 2030; and

- Minimizing health risk from exposure to toxic air contaminants;

WHEREAS, ARB's 2014 *First Update to the Climate Change Scoping Plan*, ARB's May 2016 *Mobile Source Strategy*, and the July 2016 *California Sustainable Freight Action*

Plan, conclude that many of the same actions are needed to meet GHG, criteria pollutant, and toxic pollutant emission reduction goals – specifically, to transition to zero- and near-zero-emission technologies and use of the cleanest, lowest carbon fuels and energy sources across all vehicle and equipment categories;

WHEREAS, section 44258.4 of the Health and Safety Code established the Charge Ahead California Initiative that sets the following goals: to place in service at least 1,000,000 zero-emission and near-zero-emission vehicles by January 1, 2023, and to increase access to these vehicles for disadvantaged, low- and moderate-income communities and consumers;

WHEREAS, the July 2016 *California Sustainable Freight Action Plan*, developed in response to Executive Order B-32-15, includes the goal to deploy 100,000 freight vehicles and equipment capable of zero-emission operation by 2030;

WHEREAS, section 39719.2 of the Health and Safety Code creates the California Clean Truck, Bus, and Off-Road Vehicle and Equipment Technology Program to fund development, demonstration, pre-commercial pilot, and early commercial deployment of zero-emission and near-zero-emission truck, bus, and off-road vehicle and equipment technologies, with priority given to projects benefitting disadvantaged communities;

WHEREAS, California has invested over $500 million in Air Quality Improvement Program (AQIP) and Greenhouse Gas Reduction Fund (GGRF) monies over the past seven years to accelerate California's transition to zero- and near-zero-emission vehicles and equipment, primarily to accelerate deployment of light-duty plug-in hybrid and zero-emission vehicles;

WHEREAS, the Fiscal Year 2016-17 Funding Plan for AQIP and GGRF monies, approved by the Board on June 23, 2016, directs that an additional $175 million be invested to demonstrate and deploy the next generation of truck and bus technologies (contingent upon funding appropriation since provided by the Legislature), including low-NOx heavy-duty engines and hybrid trucks and buses;

WHEREAS, ARB's 2016 Mobile Source Strategy identifies several potential technology advancing measures needed to achieve California's air quality and climate goals, including a mandatory low-NOx emission standard and measures to require accelerated deployment of zero- and near-zero-emission technology in the transit bus, shuttle bus, and last-mile delivery sectors;

WHEREAS, early deployment of a diversity of low-NOx, hybrid, and high-efficiency truck and bus technology enables development and implementation of more impactful technology-advancing regulations, more effective investment of GGRF and AQIP incentive funding, and progress towards fulfilling California's air quality goals;

WHEREAS, only two low-NOx heavy-duty engines, two hybrid heavy-duty engines, and three hybrid truck and bus conversion systems are currently certified by ARB for sale in California;

WHEREAS, section 43013(a) of the Health and Safety Code provides that the Board shall adopt and implement motor vehicle emission standards, in-use performance standards, and motor vehicle fuel specifications for the control of air contaminants and sources of pollution which the Board has found to be necessary, cost-effective, and technologically-feasible, to carry out the purposes of Division 26 of the Health and Safety Code, unless preempted by federal law;

WHEREAS, section 43104 of the Health and Safety Code states that for certification of new motor vehicles or new motor vehicle engines, the Board shall adopt, by regulation, test procedures and any other procedures necessary to determine whether the vehicles or engines are in compliance with the emissions standards established pursuant to section 43101;

WHEREAS, sections 27156 and 38391 of the California Vehicle Code prohibit the installation, sale, offer for sale or advertisement of any device, apparatus, or mechanism intended for use with, or as part of any required motor vehicle pollution control device or system that alters or modifies the original design or performance of any such motor vehicle pollution control device or system unless the Board finds that the device, apparatus, or mechanism either does not reduce the effectiveness of any required motor vehicle pollution control device or does not result in emissions from a modified vehicle that exceeds the applicable emission standards for the vehicle;

WHEREAS, the on-board diagnostic (OBD) system requirements of ARB's engine and vehicle certification program are a critical emission control strategy for identifying and addressing engine and aftertreatment system malfunctions that can lead to excess in-use emissions;

WHEREAS, the proposed Innovative Technology Regulation would provide targeted, short-term certification flexibility to encourage and enable early deployment of innovative truck and bus technologies, while maintaining ARB's ability to ensure the technology's emission benefits are achieved in-use;

WHEREAS, ARB staff conducted three statewide public workshops in developing the proposed regulation, on March 9, 2015; September 28, 2015; and July 13, 2016, and at these workshops staff released concepts for public review and discussed the proposed ITR;

WHEREAS, ARB staff held 12 public work group meetings between March 2015 and July 2016 during the regulatory process in order to evaluate, refine, and seek comments on the proposed Innovative Technology Regulation;

WHEREAS, taking into account the information and comments received at the aforementioned workshops, workgroups, and other stakeholder meetings, ARB staff prepared a report entitled "*Staff Report: Initial Statement of Reasons for Rulemaking: Proposed Regulation to Provide Certification Flexibility for Innovative Heavy-Duty Engines and California Certification and Installation Procedures for Medium- and Heavy-Duty Vehicle Hybrid Conversion Systems (Innovative Technology Regulation)*" (ISOR) released to the public on August 30, 2016;

WHEREAS, Attachment A to the ISOR, released to the public on August 30, 2016, contains the Innovative Technology Regulation and Attachment B to the ISOR, released to the public on August 30, 2016, contains amendments to Section 1956.8, Title 13, California Code of Regulations; "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles"; and "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines and Vehicles";

WHEREAS, ARB staff has proposed adoption of California Code of Regulations, title 13, sections 2208, 2208.1, and 2208.2 as set forth in Appendix C to the ISOR, released to the public on August 30, 2016, which would provide a manufacturer of an eligible innovative engine family certification and/or OBD compliance flexibility for a limited time; provide a certification pathway for a limited time for an eligible small engine originally certified for off-road, light-duty or medium-duty use as a range extender for a heavy-duty hybrid vehicle; and identify criteria for a dual Executive Order for a heavy-duty hybrid engine and driveline combination through the 2024 model year (MY);

WHEREAS, ARB staff has proposed adoption of amendments to California Code of Regulations, title 13, section 1956.8, "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," and "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines and Vehicles" as set forth in Appendix D, D-1, and D-2 to the ISOR, released to the public on August 30, 2016, which would include optional low-CO_2 emission standards through the 2027 MY;

WHEREAS, ARB staff has proposed adoption of "*California Certification and Installation Procedures for Medium- and Heavy-Duty Vehicle Conversion Systems*" as set forth in Appendix E to the ISOR, released to the public on August 30, 2016, which would provide a certification pathway for hybrid conversion systems installed on an ARB-certified vehicle between 6,001 and 14,000 pounds gross vehicle weight rating (GVWR) or an ARB-certified engine installed in a vehicle over 8,500 pounds GVWR; provide vehicle-based (as opposed to engine-based) hybrid technology test procedures; and provide three options for demonstrating hybrid heavy-duty engines and hybrid conversion systems meet the required emission criteria;

WHEREAS, ARB's regulatory program which involves the adoption, approval, amendment, or repeal of standards, rules, regulations, or plans has been certified by

the Secretary for Natural Resources under Public Resources Code section 21080.5 of the California Environmental Quality Act (CEQA; California Code of Regulations, title 14, Section 15251(d)); and ARB conducts its CEQA review according to this certified program (California Code of Regulations, title 17, sections 60000-60007);

WHEREAS, ARB prepared an environmental analysis (EA) under its certified regulatory program for the proposed Innovative Technology Regulation, and circulated it as part of the Staff Report for 45 days; the EA concluded that the potential slight emission increase associated with engines certified with reduced OBD capability would be more than offset by the cleaner-than-required eligible technology, and staff anticipates that the proposed Innovative Technology Regulation will have a modest direct air quality benefit (depending upon the extent of manufacturer participation) from accelerated technology deployment of low-emission truck and bus technology, and a more significant indirect air quality benefit from helping enable California's transition to zero- and near-zero-emission trucks and buses;

WHEREAS, the EA concluded there is no substantial evidence to support a fair argument that the proposed Innovative Technology Regulation will result in any significant adverse impacts on the environment;

WHEREAS, no comments were received during the 45-day comment period that raise significant environmental issues associated with the proposal and no approval of written responses to environmental comments is required under California Code of Regulations, title 17, section 60007;

WHEREAS, a public hearing and other administrative proceedings have been held in accordance with the provisions of chapter 3.5 (commencing with section 11340), part 1, division 3, title 2 of the Government Code to consider adoption of the proposed California Code of Regulations, title 13, sections 2208, 2208.1, and 2208.2, and amendments to California Code of Regulations, title 13, section 1956.8;

WHEREAS, the Board finds that:

> Despite advances in reducing emissions from mobile sources, stationary sources, and area sources, California still has the most severe air pollution problems in the United States;
>
> ARB's comprehensive certification requirements are an important strategy in reducing emissions;
>
> It is necessary and appropriate to provide near-term certification flexibility to encourage accelerated deployment of critical new innovative truck and bus technologies while taking into account the need for robust diagnostics capabilities to expeditiously identify and address excess in-use truck and bus emissions;

It is necessary and appropriate to create new optional low-CO_2 emission standards for 2017 through 2027 MY engines, which reflect a 15 percent CO_2 emission reduction relative to a 2017 MY baseline compression-ignition engine, in order to encourage the production of cleaner high efficiency engines;

It is necessary and appropriate to provide certification criteria, including emissions, diagnostics, warranty, reporting, and other requirements, for hybrid truck and bus conversion systems to be sold and installed on a California-certified base engine or vehicle;

The proposed Innovative Technology Regulation and amendments meet the statutory requirements, including the following:

That ARB adopt standards, rules, and regulations, and do such acts as may be necessary for the proper execution of the powers and duties granted to and imposed by Division 26 of the Health and Safety Code, and by any other provision of law, as identified in Health and Safety Code sections 39600 and 39601;

That the burden of achieving needed reductions in vehicle emissions be distributed equitably among the various classes of vehicles, including both on- and off-road vehicles, to accomplish improvements in both the emissions level and in-use performance and durability of all new motor vehicles, as identified in Health and Safety Code section 43000.5; and

That ARB establish criteria for the evaluation of the effectiveness of motor vehicle pollution control devices, as identified in Health and Safety Code section 43011.

WHEREAS, the Board further finds that:

The proposed Innovative Technology Regulation and amendments were developed in an open public process, in consultation with affected parties, through numerous public workshops, individual meetings, and other outreach efforts, and these efforts are expected to continue;

The economic and fiscal impacts of the proposed Innovative Technology Regulation and amendments have been analyzed as required by California Government Code sections 11346.2, 11346.3, 11346.5, and 11346.9, and the conclusions and supporting documentation for this analysis are as described in Chapter VI of the ISOR, as supplemented by staff's presentation at the hearing of this item;

Alternatives have been analyzed as required by California Government Code sections 11346.2 and 11346.8, and no reasonable alternatives to the Innovative Technology Regulation or amendments considered to date, or that have

otherwise been identified and brought to the attention of ARB, would be more effective at carrying out the purpose for which the regulatory actions are proposed or would be as effective and less burdensome to affected entities than the proposed regulatory actions;

The proposed Innovative Technology Regulation and amendments are consistent with ARB's environmental justice policies and do not disproportionately impact people of any race, culture, or income; and

On the basis of the whole record, including the environmental analysis included in the Staff Report, no substantial evidence exists to support a fair argument that the proposed Innovative Technology Regulation or amendments will result in any significant adverse impacts on the environment.

NOW, THEREFORE, BE IT RESOLVED that the Board hereby approves for adoption California Code of Regulations, title 13, sections 2208, 2208.1, and 2208.2 as set forth in Attachment A hereto; the amendments to California Code of Regulations, title 13, section 1956.8, amendments to "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles," and amendments to "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines and Vehicles" as set forth in Attachment B hereto; and the "California Certification and Installation Procedures for Medium- and Heavy-Duty Vehicle Hybrid Conversion Systems" as set forth in Attachment C hereto.

BE IT FURTHER RESOLVED that if there is a possibility that any modifications to the regulation made available for one or more 15 day public comment periods may affect the conclusion of the environmental analysis, the Executive Officer shall prepare and circulate any additional environmental analysis to the extent required by ARB's regulations at California Code of Regulations, title 17, sections 60000-60007, and prepare written responses to any comments received raising significant environmental issues as necessary, to present to the Board for approval along with the final regulation, and, if not presented to the Board, the Executive Officer shall take final action to adopt the regulation after conducting all appropriate environmental analysis and appropriately responding to comments.

BE IT FURTHER RESOLVED that the Board directs the Executive Officer to determine if additional conforming modifications to the regulation are appropriate. If no additional modifications are appropriate, the Executive Officer shall take final action to adopt the regulation, as set forth in Attachment A. If the Executive Officer determines that additional conforming modifications are appropriate, the modified regulatory language shall be made available for public comment, with any additional supporting documents and information. The Executive Officer shall consider written comments submitted during the public review period and make any further modifications that are appropriate available for public comment for at least 15 days. The Executive Officer may present

the regulation to the Board for further consideration if warranted, and if not, the Executive Officer shall take final action to adopt the regulation after addressing all appropriate conforming modifications.

BE IT FURTHER RESOLVED that the Board hereby determines, in accordance with the section 209(b) of the federal Clean Air Act, that the Innovative Technology Regulation and amendments approved for adoption are, in the aggregate, at least as protective of public health and welfare as applicable federal standards; that the Innovative Technology Regulation and amendments are necessary, as part of ARB's motor vehicle emissions program, to meet compelling and extraordinary conditions existing in the state; and that the Innovative Technology Regulation and amendments, and accompanying enforcement procedures are consistent with section 202(a) of the federal Clean Air Act.

BE IT FURTHER RESOLVED that the Executive Officer shall, upon adoption, forward the regulations to the United States Environmental Protection Agency with a request for a waiver or authorization, as appropriate, or confirmation that the regulations are within the scope of an existing waiver of federal preemption or authorization, pursuant to section 209(e)(2)(A) of the federal Clean Air Act, as appropriate.

I hereby certify that the above is a true and correct copy of Resolution 16-20 as adopted by the Air Resources Board.

Janice Harlan

Janice Harlan, Clerk of the Board

Resolution 16-20

October 20, 2016

Identification of Attachments to the Board Resolution

Attachment A: Proposed **Regulation to Provide Certification Flexibility for Innovative Heavy-Duty Engines, and Certification and Installation Procedures for Medium- and Heavy-Duty Vehicle Hybrid Conversion Systems (Innovative Technology Regulation)**, California Code of Regulations, title 13, **sections 2208, 2208.1,** and **2208.2**, as set forth in Appendix C to the Initial Statement of Reasons, released August 30, 2016.

Attachment B: Proposed amendments to **California Code of Regulations, Title 13, Section 1956.8; California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles;** and **California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Otto-Cycle Engines and Vehicles**, as set forth in Appendix D to the Initial Statement of Reasons, released August 30, 2016.

Attachment C: Proposed **California Certification and Installation Procedures for Medium- and Heavy-Duty Vehicle Hybrid Conversion Systems**, as set forth in Appendix E to the Initial Statement of Reasons, released August 30, 2016.