Attachment B

California Environmental Protection Agency
AIR RESOURCES BOARD

PROPOSED 15-DAY MODIFICATIONS

CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 2009 THROUGH 2017 MODEL ZERO-EMISSION VEHICLES AND HYBRID ELECTRIC VEHICLES, IN THE PASSENGER CAR, LIGHT-DUTY TRUCK AND MEDIUM-DUTY VEHICLE CLASSES

Adopted: December 17, 2008
Amended: December 2, 2009
Amended: [insert date]

[Note: This document shows the originally proposed changes to the preexisting language text in underline to indicate additions and strikeout to indicate deletions. Modifications to the original proposal are shown in double underline to indicate additions and ~~double strikeout~~ to indicate deletions. Existing intervening text that is not proposed to be amended is indicated by "* * * *".]

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California Exhaust Emission Standards and Test Procedures For 2009 Through 2017~~and Subsequent~~ Model Zero-Emission Vehicles and Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck And Medium-Duty Vehicle Classes
(incorporated by reference in section 1962.1)

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B. Definitions and Terminology.

1. Definitions.

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"**Conventional rounding method**" means to increase the last digit to be retained when the following digit is five or greater. Retain the last digit as is when the following digit is four or less.

"**East Region pool**" means the combination Section 177 states east of the Mississippi River.

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"**West Region pool**" means the combination of Section 177 states west of the Mississippi River.

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C. Zero-Emission Vehicle Standards.

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2. Percentage ZEV Requirements

2.1 General Percentage ZEV Requirement.

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(2) For 2012 ~~and subsequent~~through 2017 model years, a manufacturer's production volume for the given model year will be based on the three-year average of the manufacturer's volume of PCs and LDT~~1s, and LDT2s, as applicable,~~ produced and delivered for sale in California in the prior fourth, fifth and sixth model year (for example, 2013 model year ZEV requirements will be based on California production volume of PCs and LDT~~1~~s, ~~and LDT2s as applicable,~~ for the 2007 to 2009 model years, and 2014

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model year ZEV requirements will be based on California production volume of PCs and LDTs, for the 2008 to 2010 model years). ~~This production averaging is used to determine ZEV requirements only, and has no effect on a manufacturer's size determination.~~ As an alternative to the three-year averaging of prior year production described above, a manufacturer may elect to base its ZEV obligation on the number of PCs and LDT~~1~~s~~, and LDT2s, as applicable,~~ produced by the manufacturer and delivered for sale in California that same model year. ~~For 2012 and subsequent model years, a~~ A ~~manufacturer may, on an annual basis, select either the three-year average or the same model year calculation method. In applying the ZEV requirement, a PC, LDT1, or LDT2 as applicable, that is produced by one manufacturer (e.g., Manufacturer A), but is marketed in California by another manufacturer (e.g., Manufacturer B) under the other manufacturer's (Manufacturer B) nameplate, shall be treated as having been produced by the marketing manufacturer (Manufacturer B).~~

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2.7 Changes in Small Volume, Independent Low Volume, and Intermediate Volume Manufacturer Status.

(a) *Increases in California Production Volume.* In 2009 ~~and subsequent~~ through 2017 model years, if a small volume manufacturer's average California production volume exceeds 4,500 units of new PCs, LDTs, and MDVs based on the average number of vehicles produced and delivered for sale for the three previous consecutive model years, or if an independent low volume manufacturer's average California production volume exceeds 10,000 units of new PCs, LDTs, and MDVs based on the average number of vehicles produced and delivered for sale for the three previous consecutive model years, the manufacturer shall no longer be treated as a small volume, or independent low volume manufacturer, as applicable, and shall comply with the ZEV requirements for intermediate volume manufacturers, as applicable, beginning with the sixth model year after the last of the three consecutive model years.

If an intermediate volume manufacturer's average California production volume exceeds 60,000 units of new PCs, LDTs, and MDVs based on the average number of vehicles produced and delivered for sale for the three previous consecutive model years (i.e., total production volume exceeds 180,000 vehicles in a three year period), the manufacturer shall no longer be treated as an intermediate volume manufacturer and shall, beginning with the sixth model year after the last of the three consecutive model years, or in model year 2018 (whichever occurs first), comply with all ZEV requirements for large volume manufacturers

~~Requirements will begin in the fourth model year, or in model year 2018 (whichever occurs first) rather than the sixth model year when a manufacturer ceases to be a small or intermediate independent low volume manufacturer in 2003 or subsequent years due to the aggregation requirements in majority ownership situations, except that if the majority ownership in the manufacturer was acquired prior to the 2001 model year,~~

~~the manufacturer must comply with the stepped-up ZEV requirements starting in the 2010 model year.~~ Requirements will begin in the ~~fourth~~ sixth model year, or in model year 2018 (whichever occurs first) ~~rather than the sixth model year~~ when a manufacturer ceases to be an intermediate volume manufacturer in 2003 or subsequent years due to the aggregation requirements in majority ownership situation.

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3. Partial ZEV Allowance Vehicles (PZEVs).

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3.2 Baseline PZEV Allowance. In order for a vehicle to be eligible to receive a PZEV allowance, the manufacturer must demonstrate compliance with all of the following requirements. A qualifying vehicle will receive a baseline PZEV allowance of 0.2.

(a) *SULEV Standards.* For 2009 through 2014 model years, ~~C~~certify the vehicle to the 150,000-mile SULEV exhaust emission standards for PCs and LDTs in ~~section~~subdivision 1961(a)(1), title 13, CCR. Bi-fuel, fuel-flexible and dual-fuel vehicles must certify to the applicable 150,000-mile SULEV exhaust emission standards when operating on both fuels. For 2015 through 2017 model years, certify the vehicle to the 150,000-mile SULEV 20 or 30 exhaust emission standards for PCs and LDTs in subdivision 1961.2(a)(1). Bi-fuel, fuel flexible and dual-fuel vehicles must certify to the applicable 150,000-mile SULEV 20 or 30 exhaust emission standards when operating on both fuels;

(b) *Evaporative Emissions.* For 2009 through 2014 model years, ~~C~~certify the vehicle to the evaporative emission standards in ~~section~~subdivision 1976(b)(1)(E), title 13, CCR(zero-fuel evaporative emissions standards). For 201~~5~~4 through 2017 model years, certify the vehicle to the evaporative emission standards in subdivision 1976(b)(1)(G) or subdivision 1976(b)(1)(E);

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3.3 Zero-Emission VMT PZEV Allowance.

(a) *Calculation of Zero Emission VMT Allowance.* A vehicle that meets the requirements of ~~section~~subdivision C.3.2 and has zero-emission vehicle miles traveled ("VMT") capability will generate an additional zero emission VMT PZEV allowance, calculated as follows:

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Range	*Zero-emission VMT Allowance*
$EAER_u$ < 10 miles	0.0
$EAER_u$ ≥10 ~~miles~~ to 40 miles ~~and~~ ~~R_{cda} = 10 miles to 40 miles~~	$EAER_u$ x (1 – UF_{Rcda})/11.028
~~R_{cda}~~ $EAER_u$ > 40 miles	~~$EAER_{u40}$/ 29.63~~ $(EAER_{u40})$ x [1 – $(UF_{40}$*$R_{cda}/EAER_u)]$/ 11.028 Where, UF_{40}= utility factor at 40 miles $EAER_{u40}$= 40 miles

A vehicle cannot generate more than 1.39 zero-emission VMT PZEV allowance.

The urban equivalent all-electric range ($EAER_u$) and charge depleting actual range (urban cycle) (R_{cda}) shall be determined in accordance with sections ~~F.11~~ G.5.4 and ~~F.5.4~~G.11.9, respectively, of these test procedures. The utility Factor (UF) based on the charge depleting actual range (urban cycle) (R_{cda}) shall be determined according to Section 4.5.2 Equation ~~5~~6 and the "Fleet UF" Utility Factor Equation Coefficients in Section 4.5.2, Table 3 of SAE J2841 March 2009.

~~(b) *Alternative Procedures.* As an alternative to determining the zero-emission VMT allowance in accordance with the preceding section C.3.3(a), a manufacturer may submit for Executive Officer approval an alternative procedure for determining the zero-emission VMT potential of the vehicle as a percent of total VMT, along with an engineering evaluation that adequately substantiates the zero-emission VMT determination. For example, an alternative procedure may provide that a vehicle with zero-emissions of one regulated pollutant (e.g., NOx) and not another (e.g., NMOG) will qualify for a zero-emission VMT allowance of 1.5.~~

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4. Qualification for ZEV Multipliers and Credits.

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(c) *ZEV Credits for 2009 ~~and Subsequent~~ through 2017 Model-Year ZEVs.* A 2009 ~~and subsequent~~through 2017 model-year ZEV, other than a NEV or Type 0, earns 1 ZEV credit when it is produced and delivered for sale in California. A 2009 ~~and subsequent~~through 2017 model-year ZEV earns additional credits based on the earliest year in which the ZEV is placed in service (not earlier than the ZEV's model year). The vehicle must be delivered for sale and placed in service in ~~the same state (i.e California)~~a Section 177 state or in California in order to earn the total credit amount. The total credit amount will be earned in the state (i.e. California or a Section 177 state) in which the vehicle was delivered for sale. The following table identifies the total credits that a ZEV in each of the eight ZEV tiers will earn, including the credit not contingent on placement in service, if it is placed in service in the specified calendar year or by June 30 after the end of the specified calendar year. A vehicle is not eligible to receive credits if it is placed in service after December 31, five calendar years after the model year. For example, if a vehicle is produced in 2012, but does not get placed until January 1, 2018, the vehicle would no longer be eligible for ZEV credits.

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(e) *Counting Specified ZEVs Placed in a Section 177 State and in California.*

(1) *Provisions for 2009 Model Year.*

(A) ~~Manufacturers with a ZEV requirement producing~~ Large volume manufacturers and intermediate volume manufacturers with credits earned from ZEVs, excluding NEVs and Type 0 ZEVs, that are either certified to the California ZEV standards or approved as part of an advanced technology demonstration program and are placed in service in a section 177 state, may be counted towards compliance with the California percentage ZEV requirements in ~~section~~subdivision C.2, including the requirements in ~~section~~subdivision C.2.2(b), as if they were delivered for sale and placed in service in California.

(B) ~~Manufacturers with a ZEV requirement producing~~ Large volume manufacturers and intermediate volume manufacturers with credits earned from ZEVs, excluding NEVs and Type 0 ZEVs, that are either certified to the California ZEV standards or approved as part of an advanced technology demonstration program and are placed in service in California may be counted towards compliance with the percentage ZEV requirements of ~~any~~all section 177 state, including requirements based on ~~section~~subdivision C.2.2(B).

(2) *Provisions for 2010 and Subsequent Model Years.* ~~Manufacturers with a ZEV requirement producing~~ ~~Specified model year~~ Large volume manufacturers and intermediate volume manufacturers with credits earned from ZEVs, including Type I.5x and Type IIx vehicles, and excluding NEVs and Type 0 ZEVs,, that are either certified to the California ZEV standards applicable for the ZEV's model year or approved as part of an advanced technology demonstration program and are placed in service in California

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or in a section 177 state may be counted towards compliance in California and in all section 177 states, with the percentage ZEV requirements in ~~section~~subdivision C.2, provided that the credits are multiplied by the ratio of a~~n LVM's~~manufacturer's applicable production volume for a model year, as specified in ~~section~~subdivision C.2.1(b) in the state receiving credit to the ~~LVM's~~manufacturer's applicable production volume (hereafter, "proportional value"), as specified in ~~section~~subdivision C.2.1(b) for the same model year in California. Credits generated in a section 177 state will be earned at the proportional value in the section 177 state, and earned in California at the full value specified in ~~section~~subdivision C.4.5(d) However, credits generated by 2010 and 2011 model-year vehicles produced, delivered for sale, and placed in service, or as part of an advanced technology demonstration program in California to meet the any section 177 state's requirements that implement ~~section~~subdivision C.2.2(b) requirements are exempt from proportional value, with the maximum number of credits allowed to be counted towards compliance in a section 177 state being limited to the number of credits needed to satisfy a manufacturer's section 177 state's requirements to implement ~~section~~subdivision C.2.2(b)(1)(B). The table below specifies the qualifying model years for each ZEV type that may be counted towards compliance in all section 177 states.

Vehicle Type	Model Years:
Type I, I.5, or II ZEV	2009 – ~~2014~~2017
Type III, IV, or V ZEV	2009 – 2017
Type I.5x or Type IIx	2012 – 2017

(3) *Optional Section 177 State Compliance Path.* Large volume manufacturers and intermediate volume manufacturers that choose to elect the optional section 177 state compliance path must notify the Executive Officer and each section 177 state in writing no later than September 1, 2014.

(A) *Additional 2016 and 2017 Model Year ZEV Requirements.* Large volume manufacturers and intermediate volume manufacturers that elect the optional section 177 state compliance path must generate additional 2012 through 2017 model year ZEV credits, including no more than 50% Type 1.5x and Type IIx vehicle credits and excluding all NEV and Type 0 ZEV credits, in each section 177 state equal to the following percentages of their sales volume determined under subdivision C.4.5(e)(3)(A)1.:

Model Years	Additional Section 177 State ZEV Requirements
2016	0.75%
2017	1.50%

Subdivision C.4.5(e)(2) shall not apply to any ZEV credits used to meet a manufacturer's additional 2016 and 2017 model year ZEV requirements under this

subdivision C.4.5(e)(3)(A). ZEVs produced to meet a manufacturer's additional 2016 and 2017 model year ZEV requirements under this subdivision C.4.5(e)(3)(A) must be placed in service in the section 177 states no later than June 30, 2018.

1. *Trading and Transferring ZEV Credits within the West Region Pool and East Region Pool.* Manufacturers may trade or transfer specified model year ZEV credits used to meet the same model year requirements in subdivision C.4.5(e)(3)(C), within the West Region pool, and will incur no premium on their credit values. For example, for a manufacturer to make up a 2016 model year shortfall of 100 credits in State X, the manufacturer may transfer 100 (2016 model year) ZEV credits, from State Y, within the West Region pool. Manufacturers may trade or transfer specified model year ZEV credits, used to meet the same model year requirements in subdivision C.4.5(e)(3)(C), within the East Region pool, and will incur no premium on their credit values. For example, for a manufacturer to make up a 2016 model year shortfall of 100 credits in State W, the manufacturer may transfer 100 (2016 model year) ZEV credits from State Z, within the East Region pool.

2. *Trading and Transferring ZEV Credits between the West Region Pool and East Region Pool.* Manufacturers may trade or transfer specific model year ZEV credits used to meet the same model year requirements in subdivision C.4.5(e)(3)(C) between the West Region pool and the East Region pool; however, any credits traded or transferred will incur a premium of 30% of their value. For example, in order for a manufacturer to make up a 2016 model year shortfall of 100 credits in the West Region Pool, the manufacturer may transfer 130 (2016 model year) ZEV credits from the East Region Pool. No credits may be traded or transferred to the East Region pool or West Region pool from a manufacturer's California ZEV bank, or from the East Region pool or West Region pool to a manufacturer's California ZEV bank.

(B) *Reduced TZEV Percentages.* Large volume manufacturers and intermediate volume manufacturers that elect the optional section 177 state compliance path and that fully comply with the additional 2016 and 2017 model year ZEV requirements in this subdivision C.4.5(e)(3)(A). are allowed to meet TZEV percentages reduced from the allowed TZEV percentages in subdivision C.2.2(d)(2) and (3) in 2015 through 2017 model year in each section 177 state as enumerated below:

Model Year	2015	2016	2017
Existing TZEV Percentage	3.00%	3.00%	3.00%

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Section 177 State Adjustment for Optional Compliance Path for TZEVs	75.00%	80.00%	85.00%
New Section 177 State Optional Compliance Path TZEV Percentage	2.25%	2.40%	2.55%

Manufacturers may meet the reduced TZEV percentages above with credits from ZEVs or credits from TZEVs. These reduced TZEV percentages also reduce the total ZEV percent requirement, as illustrated in subdivision C.4.5(e)(3)(C).

1. *Trading and Transferring TZEV Credits within the West Region Pool and East Region Pool.* Manufacturers may trade or transfer specified TZEV credits to meet the same model year subdivision C.4.5(e)(3)(C) percentages within the West Region pool, and will incur no premium on their credit values. For example, for a manufacturer to make up a 2016 shortfall of 100 credits in State X, the manufacturer may transfer 100 (2016 model year) TZEV credits from State Y, within the West Region pool. Manufacturers may trade or transfer TZEV credits to meet the same model year subdivision C.4.5(e)(3)(C) within the East Region pool, and will incur no premium on their credit values. For example, for a manufacturer to make up a 2016 model year shortfall of 100 credits in State W, the manufacturer may transfer 100 (2016 model year) TZEV credits from State Z, within the East Region pool.

2. *Trading and Transferring TZEV Credit between the West Region Pool and East Region Pool.* Manufacturers may trade or transfer specified TZEV credits used to meet the same model year percentages in subdivision C.4.5(e)(3)(C) between the West Region pool and the East Region pool; however, any credits transferred will incur a premium of 30% of their value. For example, in order for a manufacturer to make up a 2016 model year shortfall of 100 credits in the West Region Pool, the manufacturer may transfer 130 (2016 model year) TZEV credits from the East Region Pool. No credits may be traded or transferred to the East Region pool or West Region pool from a manufacturer's California ZEV bank, or from the East Region pool or West Region pool to a manufacturer's California ZEV bank.

(C) *Total Requirement Percentages.* Requirements for the minimum ZEV floor, and allowed percentages for AT PZEVs and PZEVs in subdivision C.2 remain in effect for large and intermediate volume manufacturers choosing the optional section 177 state compliance path in each section 177 state. However, the optional section 177 compliance path requires manufacturers to meet additional ZEV requirements and allows manufacturers to meet reduced TZEV percentages as described above in subdivision C.4.5(e)(3)(A) and (B). The table below enumerates the total annual

percentage obligation in each section 177 state for the 2015 through 2017 model years if the manufacturer elects the optional section 177 state compliance path and produces the minimum number of credits required to meet its minimum ZEV floor and the maximum percentage allowed to be met with credits from TZEVs, AT PZEVs and PZEVs.

Years	Total ZEV Percent Requirement for Optional Compliance Path	Minimum ZEV Floor for Optional Compliance Path	TZEVs for Optional Compliance Path	AT PZEVs (no change)	PZEVs (no change)
2015	13.25%	3.00%	2.25%	2.00%	6.00%
2016	14.15%	3.75%	2.40%	2.00%	6.00%
2017	15.05%	4.50%	2.55%	2.00%	6.00%

d. *Reporting Requirements.* On an annual basis, by May 1st of the calendar year following the close of a model year, each manufacturer that elects the optional section 177 state compliance path shall submit, in writing, to the Executive Officer and each section 177 state a report, including an itemized list, that demonstrates the manufacturer has met the requirements of this subdivision C.4.5(e)(3)(C) in each section 177 state as well as in the East Region pool and in the West Region pool. The itemized list shall include the following:

i. The manufacturer's total applicable volume of PCs and LDTs delivered for sale in each section 177 state within the pool, as determined under subdivision C.2.1(b).

ii. Make, model, vehicle identification number, credit earned, and section 177 state where delivery for sale and placement in service for ZEV occurred to meet the manufacturer's additional ZEV obligation under subdivision C.4.5(e)(3)(A)

iii. Make, model, vehicle identification number, credit earned, and section 177 state where delivery for sale of each TZEV occurred and section 177 state where delivery for sale and placement in service of each ZEV occurred to meet manufacturer's requirements under subdivision C.4.5(e)(3)(C)

e. *Failure to Meet Optional Section 177 State Compliance Path Requirements.* A manufacturer that elects the optional section 177 state compliance path and does not meet the requirements in subdivision C.4.5(e)(3)(A) by June 30, 2018 in all section 177 states within an applicable pool shall be treated as subject to the total

ZEV percentage requirements in section C.2 for the 2015 through 2017 model years in each section 177 state and the pooling provisions in subdivision C.4.5(e)(3)(A) shall not apply. Any transfers of ZEV credits between section 177 states will be null and void, and ZEV credits will return to the section 177 state in which the credits were earned. A manufacturer that elects the optional section 177 state compliance path and does not meet the percentages in subdivision C.4.5(e)(3)(B) in a model year or make up their deficit within the specified time and with the specified credits allowed by subdivision C.7.7(a) in all section 177 states within an applicable pool shall be treated as subject to the ZEV percentage requirements in section C.2 for the 2015 through 2017 model years and the pooling provisions in subdivision C.4.5(e)(3)(B) shall not apply. Any transfers of TZEV credits between section 177 states will be null and void if a manufacturer fails to comply, and TZEV credits will return to the section 177 state in which the credits were earned. Penalties shall be calculated separately by each section 177 state where a manufacturer fails to make up the ZEV deficits by the end of the 2018 model year.

f. The provisions in section C shall apply to a manufacturer electing the optional section 177 state compliance path, except as specifically modified by this subdivision C.4.5(e)(3).

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7. Generation and Use of ZEV Credits; Calculation of Penalties

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7.2 ZEV Credit Calculations.

(a) *Credits from ZEVs*. For model years 2009 through 2014, ~~T~~the amount of g/mi ~~ZEV~~ credits earned by a manufacturer in a given model year from ZEVs shall be expressed in units of g/mi NMOG, and shall be equal to the number of credits from ZEVs produced and delivered for sale in California that the manufacturer applies towards meeting the ZEV requirements for the model year subtracted from the number of ZEVs produced and delivered for sale in California by the manufacturer in the model year and then multiplied by the NMOG fleet average requirement for PCs and LDT1s~~, or LDT2s as applicable,~~ for 2009 through 2011 model years , and for PCs and LDT1s for 2012 through 2014 ~~that~~ model years.

For model years 2015 through 2017, the amount of credits earned by a manufacturer in a given model year from ZEVs shall be expressed in units of credits, and shall be equal to the number of credits from ZEVs produced and delivered for sale in California that the manufacturer applies towards meeting the ZEV requirements, or, if applicable, requirements specified under subdivision C.4.5(e)(3) for the model year subtracted from the number of ZEV credits produced and delivered for sale in California by the manufacturer in the model year or model years.

(b) *Credits from PZEVs.* For model years 2009 through 2014, ~~T~~the amount of g/mi ~~ZEV~~ credits from PZEVs earned by a manufacturer in a given model year shall be expressed in units of g/mi NMOG, and shall be equal to the total number of PZEVs produced and delivered for sale in California that the manufacturer applies towards meeting its ZEV requirement for the model year subtracted from the total number of PZEV allowances from PZEVs produced and delivered for sale in California by the manufacturer in the model year and then multiplied by the NMOG fleet average requirement for PCs and LDT1s~~, or LDT2s as applicable,~~ for 2009 through 2011 model years , and for PCs and LDT1s for 2012 through 2014 ~~that~~ model years.

For model years 2015 through 2017, the amount of credits earned by a manufacturer in a given model year from PZEVs shall be expressed in units of credits, and shall be equal to the number of credits from PZEVs produced and delivered for sale in California that the manufacturer applies towards meeting the ZEV requirements, or, if applicable, requirements specified under subdivision C.4.5(e)(3), for the model year subtracted from the number of PZEV credits produced and delivered for sale in California by the manufacturer in the model year or model years.

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7.5 ZEV Credits for Transportation Systems.

(a) *General.* In model years 2009 through 2011, a ZEV placed, for two or more years, as part of a transportation system may earn additional ZEV credits, which may be used in the same manner as other credits earned by vehicles of that category, except as provided in subdivision C.7.5(c) below. In model years 2012~~09 and subsequent~~ through 2017, a ZEV or TZEV placed, for two or more years, as part of a transportation system may earn additional ZEV credits, which may be used in the same manner as other credits earned by vehicles of that category, except as provided in subdivision C.4.5(e)(2) and as provided in ~~section~~subdivision C.7.5(c) below. In model years 2009 through 2011, an ~~Enhanced AT PZEV~~ ~~TZEV,~~ AT PZEV or PZEV placed as part of a transportation system may earn additional ZEV credits, which may be used in the same manner as other credits earned by vehicles of that category, except as provided in ~~section~~subdivision C.7.5(c) below. A NEV is not eligible to earn credit for transportation systems. To earn such credits, the manufacturer must demonstrate to the reasonable satisfaction of the Executive Officer that the vehicle will be used as a part of a project that uses an innovative transportation system as described in ~~section~~subdivision C.7.5(b) below.

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(c) *Cap on Use of Credits.*

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(2) ~~*Enhanced AT PZEVs*~~*TZEVs*. Credits earned or allocated by ~~Enhanced AT PZEVs~~TZEVs pursuant to this ~~section~~subdivision C.7.5, not including all credits

earned by the vehicle itself, may be used to satisfy up to one-tenth of a manufacturer's ZEV obligation in any given model year, or, if applicable, requirements specified under subdivision 4.5(e)(3), but may only be used in the same manner as other credits earned by vehicles of that category.

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7.6 Use of ZEV Credits. For model years 2009 through 2014, ~~A~~a manufacturer may meet the ZEV requirements in any given model year by submitting to the Executive Officer a commensurate amount of g/mi ZEV credits, consistent with ~~section~~subdivision C.2. For model years 2015 through 2017, a manufacturer may meet the ZEV requirements in any given model year by submitting to the Executive Officer a commensurate amount of ZEV credits, consistent with subdivision C.2. Credits in each of the categories may be used to meet the requirement for that category as well as the requirements for lesser credit earning ZEV categories, but shall not be used to meet the requirement for a greater credit earning ZEV category. For example, credits produced from ~~Enhanced AT PZEVs~~TZEVs may be used to comply with AT PZEV requirements, but not with the portion that must be satisfied by ZEVs. These credits may be earned previously by the manufacturer or acquired from another party.

(a) *NEVs.* Credits earned from NEVs offered for sale or placed in service in model years 2001 through 2005 cannot be used to satisfy more than the percentage limits described in the following table:

Model Years	ZEV Obligation that:	Percent limit for NEVs allowed to meet each Obligation[1]:
2009 – 2011	Must be met with ZEVs	50%
2009	May be met with AT PZEVs but not PZEVs	75%
2010 – 2011		50%
2009 – 2011	May be met with PZEVs	No Limit
2012 – ~~2014~~2017	Must be met with ZEVs	0%
	May be met with ~~Enhanced AT PZEVs~~TZEVs and AT PZEVs	50%
	May be met with PZEVs	No Limit

[1] If applicable, obligation in this table means requirements specified under subdivision 4.5(e)(3).

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Additionally, credits earned from NEVs ~~offered for sale or~~ placed in service in model years 2006 through 2017 ~~or later~~ can be used to meet the percentage limits described in the following table:

Model Years	ZEV Obligation that:	Percent Limit for NEVs allowed to meet each Obligation[1]:
2009 - 2011	May be met through compliance with Primary Requirements	No Limit
	May be met through compliance with Alternative Requirements, and must be met with ZEVs	0%
	May be met through compliance Alternative Requirements, and may be met with AT PZEVs or PZEVs	No Limit
2012 – ~~2014~~2017	Must be met with ZEVs	0%
	May be met with ~~Enhanced AT PZEVs~~TZEVs, AT PZEVs, or PZEVs	No Limit

[1] If applicable, obligation in this table means requirements specified under subdivision 4.5(e)(3).

This limitation applies to credits earned by the same manufacturer or earned by another manufacturer and acquired.

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D. Certification Requirements.

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3. ZEV Reporting Requirements. In order to verify the status of each manufacturer's compliance with the ZEV requirements for a given calendar year, each manufacturer shall submit a report to the Executive Officer at least annually, by May 1 of the calendar year following the close of the model year, that identifies the necessary delivery and placement data of all vehicles generating ZEV credits or allowances, and all transfers and acquisitions of ZEV credits. The manufacturer may update the report by September 1 to cover activities occurring between April 1 and June 30. If a manufacturer updates their annual California production numbers in their ZEV report, the annual NMOG production must also be updated.

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~~E~~F. Test Procedures for 2012 through 2017~~and Subsequent~~ Model Zero-Emission

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Vehicles (including Fuel Cell Vehicles and Hybrid Fuel Cell Vehicles) and All 2012 through 2017~~and Subsequent~~ Model Hybrid-Electric Vehicles, Except Off-Vehicle Charge Capable Hybrid Electric Vehicles.

The "as adopted or amended dates" of the 40 CFR Part 86 regulations referenced by this document are the dates identified in the "California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles." Unless otherwise noted, these requirements shall apply to all ZEVs (including fuel cell vehicles and hybrid fuel cell vehicles) and all HEVs, except off-vehicle charge capable HEVs. A manufacturer may elect to certify a 2009, 2010, or 2011 model-year zero-emission vehicle or hybrid electric vehicle, except an off-vehicle charge capable hybrid electric vehicle, using this section ~~E~~F.

~~F~~G. Test Procedures for 2012 through 2017 ~~and Subsequent~~ Model Off-Vehicle Charge Capable Hybrid Electric Vehicles.

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12. The Calculations of the Combined Green House Gas Regulatory Rating of Off-vehicle Charge Capable Hybrid Electric Vehicles

12.1 The combined Greenhouse Gas (GHG) emissions value is determined by the following equation.

$GHG_{PHEV,\ combined} = 0.55 * (GHG_{urban}) + 0.45 * (GHG_{highway})$ (Eq. 1)

12.2 The urban GHG emissions value for off-vehicle charge capable hybrid electric vehicles is calculated using the following equations.

12.2.1 The urban GHG emissions value is determined by the following equation.

$$GHG_{urban} = \sum_{i=1}^{N_{urban}} (UF_i) * (\frac{Y_{CD.i}}{D_i} + GHG_{cd.AC.i}) - \sum_{i=1}^{N_{urban}} (UF_i) * G_{upstream} + (1 - \sum_{i=1}^{N_{urban}} (UF_i)) * (Y_{cs.urban})$$

(Eq. 2)

Where,

GHG_{urban} = Rated urban GHG emissions for PHEV, in gCO_2e/mile
i = Number of charge-depleting urban test cycle
N_{urban} = Total number of urban test cycles in charge depleting to charge sustaining range (R_{cdtcs})
UF_i = Utility factor for urban test cycle i
$Y_{CD.i}$ = Mass emissions of CO_2 in grams per vehicle mile, for the "i"th test in the charge depleting test

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D_i = Distance of the "*i*"th urban test cycle, in miles.
$GHG_{cd.AC.i}$ = Rated GHG emissions for test cycle *i*, in gCO_2e/mile
$Y_{cs.urban}$ = Weighted mass emissions of CO_2 in grams/mi of the charge sustaining test.
$G_{upstream}$ = Gasoline upstream factor = $0.25 * GHG_{target}$.

12.2.2 The Charge Depleting to Charge Sustaining Range (R_{cdtcs}) is the total number of cycles driven at least partially in charge depleting mode times the cycle distance. Cycles meets charge sustaining criterion are not included in the R_{cdtcs}. The R_{cdtcs} includes the transitional cycle, where the vehicle may have operated in both depleting and sustaining modes.

12.2.3 The utility factors for urban and highway cycles are provided in the following table.

Utility factors for each PHEV drive cycle test with charge-depletion operation

Test cycle number	Test cycle utility factor	
	Urban, UF_i	Highway, UF_i
1	0.176	0.233
2	0.141	0.172
3	0.112	0.127
4	0.091	0.095
5	0.074	0.071
6	0.059	0.054
7	0.049	0.041
8	0.039	0.032
9	0.033	0.025
10	0.027	0.020
11	0.023	0.017
12	0.019	0.013

12.2.4 This charge-depleting GHG rate from electricity use in each test cycle is defined by the following equation:

$$GHG_{cd.AC.i} = GHG_{grid} * E_{cd.AC.i} \quad \text{(Eq. 3)}$$

Where,
$GHG_{cd.AC.i}$ = Rated GHG emissions for charge-depleting PHEV, in gCO_2e/mile
$E_{cd.AC.i}$ = Urban or highway charge depleting electricity use, in kWh/mile
GHG_{grid} = Lifecycle California electricity GHG intensity, 270 gCO_2e/kWh

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12.2.5 The urban or highway charge depleting electricity use is defined by the following formula:

$$E_{cd.AC.i} = \frac{E_{cd.DC.i}}{\sum_{i=1}^{N} E_{cd.DC.i}} * E_{cd.AC.total} \quad \text{(Eq. 4)}$$

Where,

N = Total number of test cycles in the charge depleting to charge sustaining range (R_{cdtcs}) of the urban or highway charge depleting test.

$E_{cd.AC.i}$ = AC kWh consumed in the "i"th cycle of the charge depleting test.

$E_{cd.DC.i}$ = Depleted DC energy for the "i"th cycle in the charge depleting test. It is defined in section F.3.4 of these test procedures.

$E_{cd.AC.total}$ = Charge-depleting net AC energy consumption is determined according to section F.3.4 of these test procedures.

12.2.6 The $Y_{cs.urban}$, which is the weighted CO_2 mass emissions of the charge-sustaining test, is determined by the following equation, which can be found in section F.5.5 of these test procedures.

$$Y_{CS.Urban} = 0.43 * \frac{Y_C}{D_C} + 0.57 * \frac{Y_H}{D_H} \quad \text{(Eq. 5)}$$

Where,

$Y_{CS.Urban}$ = Weighted mass emissions of CO_2 in grams/mi of the charge sustaining test.

Y_C = Mass emissions as calculated from the cold start UDDS, in grams per cycle.

Y_H = Mass emissions as calculated from the hot start UDDS, in grams per cycle.

D_C = The measured driving distance from the cold start UDDS, in miles.

D_H = The measured driving distance from the hot start UDDS, in miles.

12.3 The highway GHG emissions value for off-vehicle charge capable hybrid electric vehicles is calculated using the following equation.

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$$GHG_{highway} = \sum_{j=1}^{N_{highwayn}} (UF_j\}*(\frac{Y_{CD.j}}{D_j} + GHG_{cd.AC.j}) - \sum_{j=1}^{N_{highway}} (UF_i)*G_{upstream} + (1 - \sum_{j=1}^{N_{highway}} (UF_j))*(Y_{cs.highway})$$

(Eq. 7)

Where,

$GHG_{highway}$= Rated highway GHG emissions for PHEV, in gCO_2e/mile

j = Number of charge-depleting highway test cycle

$N_{highway}$ = Total number of highway test cycles in charge depleting to charge sustaining range (R_{cdtcs})

UF_j = Utility factor for highway test cycle j (see Table 1)

$Y_{CD.j}$ = Mass emissions of CO_2 in grams per vehicle mile, for the "j"th test in the charge depleting test

D_j = Distance of the HFEDS cycle, in miles.

$GHG_{cd.AC.j}$= Rated GHG emissions for test cycle j, in gCO_2e/mile (see Eq. 3)

$Y_{cs.highway}$ = Mass emissions of CO_2 in grams/mi of the highway charge sustaining emission test, which can be found in section F.6.3.3 of these test procedures.

$G_{upstream}$ = Gasoline upstream factor $0.25 * GHG_{tar}$

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