BMW Group

January 25th 2012

Mr. James Goldstene
Executive Officer
California Air Resources Board
1001 I Street,
Sacramento, California 95814

Re: BMW Comments on the Proposed Amendments to the California Zero Emission Vehicle Program Regulations

Dear Mr. Goldstene,

On behalf of BMW AG, BMW of North America, LLC (BMW) appreciates the opportunity to comment on the proposed amendments to the California Zero Emission Vehicle (ZEV) and Clean Fuel Outlet (CFO) program regulation. BMW comments and recommendations on criteria and greenhouse gas regulations (LEV III & GHG) are addressed in a separate letter.

On December 7, 2011 the staff of the California Air Resources Board published its Initial Statement of Reasons for the 2012 proposed amendments to the ZEV Program Regulation. BMW has worked closely with ARB staff and other involved parties on several issues over the last two years and would like to thank the staff for their diligence on working with all stakeholders in producing the proposed ZEV amendments. Our common future goal is to link ZEV and all other policy instruments in an overall approach concerning GHG reduction, local air quality, energy security and other related aspects in the transportation sector.

The proposed amendments to ZEV continue the progress toward a cleaner environment. In addition to the following BMW general remarks on the ZEV and the CFO regulation, please find attached specific technical comments and recommendations.

In recent years, enormous progress has been made on advanced clean cars; however, many technical and monetary challenges still remain. The future development of advanced clean cars is strongly dependent on various frame conditions. These conditions are for the most part not in the automobile manufacturers' responsibility and control. Given the technology forcing nature of the ZEV regulations, as well as the task for the automotive industry to develop, produce and sell vehicles that future customers will accept, BMW recommends the implementation of early additional phase-in flexibility to address the ambitious ramp-up rate of the requirements and the inclusion of well-timed reviews before 2018 to validate industry-wide technology development, customer demand for advanced clean cars, and the development of an adequate refueling infrastructure necessary for vehicles in the ZEV program.

BMW appreciates ARB staff's goal to support manufacturers to successfully meet future ZEV requirements by accelerating the BEV market with a new vehicle category, the BEVx category,

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starting in model year 2012. Especially in the emerging EV market, this new category can help attract additional customers who are willing to buy a BEV but are still reluctant due to range anxiety concerns.

This additional BEVx category will increase the total zero emission vehicle miles travelled and also will help customers to clearly differentiate a BEV with a short range auxiliary power unit used for driving to a charging station from a PHEV with a full function power-train used for long-distance travel.

BMW also appreciates ARB's staff proposal to extend compliance flexibility concerning the new BEVx category and the travel provision. The extension of this provision to all qualified BEV and BEVx types through model year 2017 will help all large volume manufacturers (LVMs) and "transitioning LVMs" (current intermediate volume manufacturers that will be LVMs by model year 2018) to prepare and expand their BEV offerings to other Section 177 ZEV states, where the markets for EVs haven't yet matured in the same way as the California market.

From model year 2018 and subsequent model years, the increasing ZEV requirement will lead to an immense market development for BEVs in all Section 177 ZEV states. With respect to compliance flexibility and softening the required ramp-up of BEV sales in the Section S177 ZEV states, BMW recommends the implementation of an additional pooling provision option. This option could be phased-in during model years 2015 to 2017 and continued from model year 2018 and subsequent model years, when travel for qualified BEVs and BEVx types expires.

Concerning the proposed amendments to the CFO regulation, BMW appreciates the inclusion of a placeholder for electricity. The proposed review to activate this placeholder should be aligned with our proposed validation of industry-wide technology development and customer demand for advanced clean cars mentioned earlier.

BMW recognizes the necessity of using OEM vehicle projections as the basis for the CFO trigger. Nevertheless, we are concerned about being bound to them because such projections depend on many parameters beyond the influence of an OEM. A penalty based on these projections could limit the flexibility of automobile manufacturers to react to changing market demands (e.g. financial crisis, customer acceptance). Furthermore, we request that ARB clarify the requirements for reporting, reviewing, and penalty payment.

BMW is committed to working constructively with ARB on this matter. If you should have any questions please contact me or Dr. Azita Khalili at (805) 271-7314.

Sincerely,

Thomas C. Baloga
Vice President, Engineering - US

cc: Mary Nichols
Tom Cackette
Bob Cross
Analisa Bevan
Elise Keddie

Enclosure

2012 Proposed AMENDMENTS TO THE CALIFORNIA ZERO EMISSION VEHICLE PROGRAM,
BMW COMMENTS ON PROPOSED REGULATION ORDER

ZEV Regulation, 2012 through 2017 Model Years, California Code of Regulations, section 1962.1

- **(d)(5)(E): MY09-MY11 travel provision**
  Please ensure in the regulation text the understanding of ARB* that in the 2009 to 2011 model years, the 1:1 travel provision is applicable for Intermediate Volume Manufacturers (IVMs). Proposed language should only affect model years 2012 through 2017.
  * with reference to ARB letter 2011-12-17, A. Bevan: "... in the 2009 to 2011 model years all IVMs are allowed to travel eligible vehicle credits at a one to one ratio. ... ARB plans to modify this language in the upcoming amendments to clarify that proportionality applies to both IVMs and LVMs starting as early as model year 2012."

- **(g)(5)(A), (d)(5)(E)2.: MY09-MY11 transportation system credits**
  Please ensure in the regulation text that in the 2009 to 2011 model years, all IVMs are allowed to travel eligible credits from transportation systems at a one to one ratio. Proposed language should only affect model years 2012 through 2017:
  "In model years 2009 and subsequent through 2017, 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 (d)(5)(E)2. and as provided in section subdivision (g)(5)(C) below.

- **(c)(3)(A): Clarification on Zero-Emission VMT allowance calculation**
  We appreciate that the calculation for Zero-Emission VMT allowance now refers to Urban Equivalent All-Electric Range ($EAER_U$) instead of Charge Depleting Actual Range (R_{cda}). In the proposed equation we still see some room for ambiguities which should be avoided by explicitly describing the calculation of EAERu as follows:
  10 miles ≤ Urban equivalent all-electric range ($EAER_u$) ≤ 40 miles:
  VMT allowance credit = $EAER_u$ * (1-UF_{Rcda}) / 11.028
  $EAER_u$ = ERF * R_{cda}
  $EAER_u$ ≥ 40 miles:
  VMT allowance credit = $EAER_{u40}$ * (1-UF_{Rcda}) / 11.028
  $EAER_{u40}$ = ERF * $R_{cda\ (EAERu40)}$
  $R_{cda\ (EAERu40)}$ depends on ERF and presetting of $EAER_{u40}$ = 40 miles
  Example:
  ERF =100%: **$EAER_{u40}$ = 40 miles** = 1.0 * $R_{cda\ (EAERu40)}$
  → $R_{cda\ (EAERu40)}$ = 40 miles → max. VMT allowance credit = 1.39
  ERF = 80%: **$EAER_{u40}$ = 40 miles** = 0.8 * $R_{cda\ (EAERu40)}$
  → $R_{cda\ (EAERu40)}$ = 50 miles → max. VMT allowance credit = 1.13
  ERF = 60%: **$EAER_{u40}$ = 40 miles** = 0.6 * $R_{cda\ (EAERu40)}$
  → $R_{cda\ (EAERu40)}$ = 66.7 miles → max. VMT allowance credit = 0.83
  ...

- **(d)(5)(E)2.: Provisions for 2010 through 2017 Model Years**
  An Optional Compliance Path should be implemented in order to soften the ramp up

volumes for BEVs and PHEVs in models years 2017 and 2018 in Section 177 states, and simplify compliance. LVMs and IVMs ("transitioning LVMs" by 2018) should therefore have the possibility to choose the Optional Compliance Path for pooling ZEVs and TZEV volume requirements in Section 177 states in 2015 through 2021 model years.

ZEV Regulation, 2018 and subsequent Model Years, California Code of Regulations, section 1962.2

- **(b)(2)(E): Requirements for LVMs in 2018 and through 2025 Model Years**
  Total ZEV percent requirement 2018-2025 is very ambitious and strongly dependent on various external frame conditions (e.g. customer acceptance of advanced clean cars, development of cost for new key components like batteries or fuel cell stacks, development of hydrogen infrastructure). We therefore recommend implementing an additional review before 2018 to examine industry-wide compliance status and the development of infrastructure necessary for vehicles in the ZEV program.
- **(b)(2)(E): Additional flexibility to meet ZEV requirement**
  In order to better reflect projected customer demand on EVs, we propose to increase the flexibility for manufacturers to meet total ZEV requirement with TZEVs.

Model Years	2018	2019	2020	2021	2022	2023	2024	2025
Total ZEV % requirement	4.5%	7.0%	9.5%	12.0%	14.5%	17%	19.5%	22%
Minimum ZEV floor	2.25%	3.50%	4.75%	6.00%	7.25%	8.25%	9.75%	11%
BEV, FCV	min 50%	min 50%	min 50%	min 50%	min 50%	min 50%	min 50%	min 50%
BEVx	max 50%	max 50%	max 50%	max 50%	max 50%	max 50%	max 50%	max 50%
	Additional ZEV credits (min 50% BEV, FCV / max. 50% BEVx) must satisfy remainder of the manufacturer's total ZEV % requirement, if TZEV share is lower than max. allowed TZEV %.							
Max TZEV %	2.25%	3.50%	4.75%	6.00%	7.25%	8.25%	9.75%	11%

- **(c)(3)(A): Flexibility on Zero-Emission VMT TZEV allowance**
  In the proposed language the UDDS Test Cycle Range is defined as "all electric R_{cda}". This is equal to "All Electric Range (AER)". AER makes sense for defining a minimum all electric range criteria but is not very suitable for defining overall electric range capability because it would exclude any blended hybrid operational mode for TZEVs. "Equivalent All Electric Range (EAER)" offers the same benefits to the environment and less restrictions to OEM's TZEV hybrid operational strategy than "AER" and respectively "all electric R_{cda}". In addition to the clarification on calculating $EAER_{UDDS}$, we propose to use higher constants (0.5 instead of 0.3 respectively

1.3 instead of 1.1) for the TZEV credit calculation resulting in a possible credit range of min. 0.6 to max. 1.5 for TZEVs. Therefore, we propose the following modification of the equation:

AER < 10 miles:

TZEV credit = 0

AER > 10 miles:

TZEV credit = 0.01 * $EAER_{UDDS}$ + 0.5

$EAER_{UDDS}$ = ERF * $R_{cda\ UDDS}$

(Electric Range Fraction * Actual Depleting Range)

$EAER_{UDDS}$ > 80 miles:

TZEV credit = 1.3 (credit cap)

Allowance for US06 capability:

TZEVs with US06 AER of at least 10 miles shall earn an **additional 0.2 allowance**.

- **(g)(6)(A): Use of Discounted PZEV and AT PZEV Credits**
  In order to avoid any ambiguities concerning discounted credits, we recommend to ensure in the regulation text that neither banked ZEV credits nor banked Enhanced AT PZEV credits from model years 2017 and earlier will be discounted and may be used without any carry forward credit limitations.

- **(g)(6)(B): Use of BEVx Credits**
  Please ensure in the regulation text that banked BEVx credits from model years 2017 and earlier may be used to satisfy up to 50% of the portion of a manufacturer's requirement that must be met with ZEV credits as well as BEVx credits from model year 2018 and subsequent model years.