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Re: GM Comments on New BEVx Category in ARB's Proposed ZEV Regulations

Dear Chairman Nichols and Members of the Board:

On behalf of General Motors, I am writing to share our views on a proposal contained in the ARB's proposed modifications to the ZEV regulations that you are scheduled to consider at the January 26 Board meeting.

We believe a key goal of the ZEV regulations is to encourage vehicles that achieve high levels of electric vehicle miles traveled. While pure ZEVs may provide electric miles 100% of the time they are driven, this does not mean that they will provide the most total electric miles in the real world. This is because they will not be taken on trips that exceed their range, or even somewhat less than their range because of range anxiety. Instead, a second, likely conventional gasoline vehicle, will be needed in the household for such trips.

As most of you know, GM introduced the Chevrolet Volt extended range EV just over a year ago. We have met with many of you and explained that due to the Volt's ability to be your only car we are seeing high levels of electric vehicle miles traveled. In some instances more EV miles than may be completed by a pure ZEV in a household due to the need to occasionally take a second vehicle for longer trips, a point that many of you have acknowledged or actually experienced. We are writing this letter to ask that you carefully consider how vehicles that achieve high levels of electric miles fit within the ZEV regulation categories, so that vehicles such as the Volt are appropriately credited and incentivized.

In addition to the ZEV category for battery electric vehicles and fuel cell vehicles, and the transitional ZEV (TZEV) category for plug-in hybrid electric vehicles, ARB has proposed a new third category starting in 2012 model year, "BEVx", for extended range electric vehicles. The ARB has proposed that this new BEVx category can be used to meet up to half of the ZEV category that cannot be met with TZEVs, and as such this new category can be viewed as in between ZEV and TZEV in the pecking order. As you might imagine, BEVx is of great interest to GM because of the Volt.

While we support the idea of a third category for extended range electric vehicles, we have the following comments on the specific criteria that have been proposed in the ARB regulations.

- First, the proposed regulations call for a minimum of 80 miles all-electric range on the battery. We believe this should be modified to be consistent with the same range requirements for ZEV (50 miles), the highest of the three categories. We propose that the minimum range requirement for BEVx should be no more than the minimum range requirement for the ZEV category of 50 miles.

- Second, the proposed regulations call for limiting the range extending (e.g., gasoline) engine, also referred to as the auxiliary power unit or APU in the regulations, to no more than the all-electric range on the battery. For example, an 80 mile BEVx would be limited to an 80-mile APU, for a total of 160 miles. We believe this will limit both the market acceptance of these vehicles and the total all-electric miles traveled. We propose that there be no limit on the range of the APU.

- Third, the proposed regulations state that "The APU cannot start under any user-selectable driving mode unless the energy storage system used for traction power is fully depleted." While we can appreciate the goal of making sure BEVx vehicles use all of their battery energy prior to using the APU, we believe there should be some flexibility in this regulatory language. For example, the Volt has a "Mountain Mode" switch that allows the driver to preserve battery energy needed for climbing a mountain so that the driver is not limited by the less powerful APU. We believe switches such as Mountain Mode make the Volt more desirable to a broader cross-section of customers, a goal that we all need to strive for with our ZEV program vehicles.

With these changes we believe the BEVx category will be more properly aligned in between the ZEV and TZEV categories as shown in the following table.

Category	Minimum EV Range	Gasoline Engine	Comments
ZEV	50 miles	Not allowed	
BEVx	~~80 miles~~ 50 miles	~~Range ≤ EV range~~ No range limit	Same EV technology (e.g., battery size and power) as 50-mile BEV. More EV miles and broader market acceptance than 50-mile BEV.
TZEV	10 miles	Helps to power vehicle	Not required to have full EV power or technology. Fewer EV miles.

Finally, we have heard arguments that the BEVx's APU is really intended to address range anxiety by being just powerful enough to provide a "limp-home" mode, but not powerful enough to intentionally use on longer trips that will involve APU operation. This is intended to result in a high fraction of a BEVx's miles being EV miles, making it similar to a BEV where 100% of its miles are EV miles.

While this may result in a high percentage of the BEVx's miles being electric for that one vehicle, it does not mean a high percentage of a given household's miles will be electric. For household's that own such a BEVx, or a BEV, we believe most will need a second vehicle which will most likely be a conventional gasoline vehicle for the forseeable future. This conventional vehicle, which may even be an older high emitter, will be used for the many trips that the limp-home BEVx or pure BEV cannot be used for.

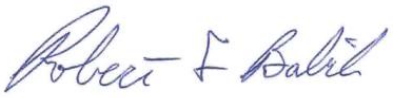
In contrast, under our proposed BEVx criteria, the BEVx can be the single vehicle for the household, and can be used for all trips. We believe that even though the percentage of EV miles may be lower on our BEVx, the total EV miles for the household will be greater. And it is the total EV miles that are a direct indication of the fleet-wide GHG emissions reduced and petroleum displaced.

For example, we have analyzed trip data from the National Household Travel Survey which indicates that a 50-mile BEV replacing a vehicle in a typical household would displace about 40% of its total miles driven with electric miles, assuming it is charged once a day. In contrast, this same data indicates a 50-mile BEVx as we are proposing would achieve about 70% EV miles since it can be taken on all trips. This analysis is supported by our own Chevrolet Volt, which, on average, has achieved nearly 2/3 electric miles in the real world.

We have also heard arguments that later in the life of an extended range EV like the Volt, when it may have been sold to a second or subsequent owner, the vehicle may primarily be driven in gasoline mode. We do not anticipate a large change in electric miles driven over the life of the Volt. All owners have an economic incentive to plug-in and charge the Volt and drive in electric mode every chance they get because it saves them money on gas. And we have designed the Volt to have a long battery life, which will be backed up by the ARB's 10 year/150,000 mile battery warranty required of any Volt to count toward ARB's ZEV Program regulations.

We appreciate your consideration of this important matter, and we look forward to continuing to work with the Air Resources Board on its ZEV Program going forward.

Sincerely,



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