



February 9<sup>th</sup>, 2018

**To: Texas Commission on Environmental Quality (TCEQ)**

**RE: Volkswagen Mitigation Trust D - Beneficiary Mitigation Plan**

I am writing on behalf of Tesla to share our comments regarding the Texas Commission on Environmental Quality's ("TCEQ's") upcoming Beneficiary Mitigation Plan for Texas' allocation of the Volkswagen (VW) Mitigation Trust. It will be critical to utilize the \$209+ million allocated to Texas under the VW settlement funds from Appendix D to maximize air quality benefits. Replacing heavy-duty (HD) diesel trucks and investing in light-duty (LD), medium duty (MD) and HD Zero-Emission Vehicle (ZEV) charging infrastructure can help achieve this objective.

Tesla recognizes that all classes of ZEVs are important to meeting the Mitigation Plan's goals, yet given our expertise and products in the LD and HD electric vehicle (EV) market, our comments below focus primarily on LD and HD ZEVs. In addition to selling best-in-class light-duty vehicles including the Model S, Model X, and Model 3, Tesla recently unveiled its Semi Truck, an all-electric Class 8 vehicle that consumes less than two kilowatt-hours of energy per mile in typical applications and is capable of 500 miles of range.<sup>1</sup> Production is expected to begin in 2019 for the 500 mile range model.<sup>2</sup> Beyond reducing NOx emissions, the Tesla Semi also includes enhanced safety features, low cost of ownership, no loss of energy during idling, which is especially relevant to port drayage applications, and superior performance relative to standard, class 8 vehicles.<sup>3</sup>

Regarding charging infrastructure, it is important to note that over 80% of EV charging occurs at home or at work<sup>4</sup>, and although Level-3 (DC-Fast) charging is important for long distance travel, it is generally used as a backup solution for local drivers. Level-2 charging at residences and workplaces supports the majority of daily local travel and is vital for mainstream EV adoption<sup>5</sup>.

Our comments below focus on providing several key principals and strategies for how the Beneficiary Mitigation Plan (BMP) can optimally allocate funds to maximize NOx reductions, in a cost-effective and equitable manner. These include:

1. Focus funds on replacement of diesel vehicles with ZEVs and investment in HD ZEV infrastructure first and foremost wherever feasible.
2. Provide funds as close as possible to point of sale under a first come, first served model.
3. Allocate the full 15% (~\$31 million) of eligible ZEV supply equipment funds for investment in LD charging infrastructure and include make-ready infrastructure rebates.
4. Focus LD ZEV infrastructure funds should on workplace and multi-unit dwellings (MUDs)
5. Coordinate with other state agencies

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<sup>1</sup> Tesla. Available at: <https://www.tesla.com/semi/>.

<sup>2</sup> *Ibid*

<sup>3</sup> *Ibid*

<sup>4</sup> <https://www.nrel.gov/docs/fy17osti/69031.pdf>

<sup>5</sup> <https://www.inl.gov/article/charging-behavior-revealed-large-national-studies-analyze-ev-infrastructure-needs/>

## **Focus funds on replacement of diesel vehicles with Heavy-Duty ZEVs and investment in Heavy-Duty ZEV infrastructure**

Appendix D outlines a number of different mitigation actions and expenditures that are eligible to receive funds under the BMP, HD EVs are also up to four times more efficient than diesel and natural gas engines and provide additional benefits relative to diesel and other near-zero vehicles that should be taken into consideration when developing the BMP.<sup>6</sup> Beyond fuel efficiency, these benefits include reduced noise, lower overall maintenance cost, and no loss of energy during idling, which is especially relevant to port drayage applications, among other items.<sup>7</sup>

### *Replacement of Diesel Vehicles with Heavy-Duty ZEVs*

Given the long term impact the BMP funds can have on reducing NOx and other emissions, we recommend focusing funds first and foremost on ZEVs whenever feasible to achieve maximum NOx reduction relative to replacement of other alternate fuel trucks and buses.<sup>8</sup> Reducing NOx emissions is also critical for Texas to meet federal air quality standards for ozone in 2023 and 2031.

It is, therefore, important that BMP funding target the remaining high NOx emitting fleet and further narrow the NOx reduction gap by replacing these vehicles with HD ZEVs wherever feasible. Using the EPA Diesel Emissions Quantifier, replacement of Class 8 Long Haul Trucks (with trailer) provides a 75% reduction in NOx over lifetime of the vehicle relative to replacement of Class 7 buses. The comparison was conducted using default values and a 2009 replacement date.<sup>9</sup> The VW Beneficiary Mitigation Plan toolkit developed by NASEO also indicates that Class 8 vehicle replacement provides greater NOx reduction relative to Class 7 transit vehicles.<sup>15</sup>

While the TCEQ's Texas Emissions Reduction Program already provides some funds for adopting cleaner vehicles, the VW funds can complement the existing programs and be used to focus only on the very cleanest vehicle technologies that are entirely zero-emissions.

### *Eligibility of Heavy-Duty ZEV charging infrastructure*

Adoption of EVs are tied closely to the accessibility of charging infrastructure. The business case for a fleet owner to transition to HD ZEVs is greatly enhanced if the barrier to install make-ready charging infrastructure is reduced, thereby increasing adoption and further reducing overall NOx and GHG emissions. HD Charging Infrastructure is an eligible expenditure under each section of the eligible truck replacement mitigation actions and expenditures<sup>10</sup>. Therefore, Tesla recommends that HD charging infrastructure be explicitly highlighted in TCEQ's BMP and that funds be allocated to support all of the components of charging infrastructure including the "make-ready"<sup>11</sup> components of the HD charging infrastructure in addition to the electric vehicle supply equipment ("EVSE") or "charging connectors" themselves.

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<sup>6</sup> *Ibid*, p.2.

<sup>7</sup> CARB, Advanced Clean Local Trucks Workshop (April 2017), slide 7. Available at: <https://www.arb.ca.gov/msprog/actruck/mtg/170425workshoppresentation.pdf>.

<sup>8</sup> NASEO, VW Mitigation Plan Toolkit, Table 1. Available at: [https://www.naseo.org/Data/Sites/1/03-27-17\\_naseo-vw-beneficiary-mitigation-plan-toolkit-final.pdf](https://www.naseo.org/Data/Sites/1/03-27-17_naseo-vw-beneficiary-mitigation-plan-toolkit-final.pdf).

<sup>9</sup> <https://www.epa.gov/cleandiesel/diesel-emissions-quantifier-deq>

<sup>10</sup> <https://www.epa.gov/sites/production/files/2016-10/documents/amended20partial-cd.pdf>

<sup>11</sup> "Make-ready" includes the electrical infrastructure to support electric vehicle charging. Make-ready refers to the 'full circuit' infrastructure (i.e. panels, conduit, wiring) required for the electric vehicle supply equipment to be connected up to but excluding the charging station itself.

### **Provide funds as close as possible to point of sale under a first come, first served model**

Depending on the funding structure that is ultimately adopted by the BMP, we recommend that any incentive is offered as close as possible to the point of sale, which is broadly considered the most effective method of driving EV sales.<sup>12</sup> An incentive closer to the point of sale can also help provide some certainty to the customer for availability of funding.<sup>13</sup> Furthermore, to facilitate a seamless customer experience and ease of program administration, we support a first-come, first-serve project administration structure rather than a competitive bidding process.

### **Allocate the full 15% (~\$31 million) of eligible ZEV Supply Equipment funds for investment in LD charging infrastructure and include make-ready infrastructure rebates**

As of December 2017, the charging infrastructure in Texas amounted to a total of 910 public Level-2 and 96 Level-3 chargers.<sup>14</sup> A recent EV infrastructure study from the National Renewable Energy Laboratory (NREL) estimates that Texas will require 30,700 Level-2 and 1,720 Level-3 chargers to support the number of EVs predicted by 2030.<sup>15</sup> Tesla believes that these are conservative estimates and the actual need for charging infrastructure is greater. Therefore, Tesla recommends that the BMP allocate the full possible 15% of the funding to LD charging infrastructure.

Appendix D provides several definitions that impact the development of the LD funding allocation under the BMP. Appendix D defines “‘infrastructure’ as the equipment used to enable the use of electric powered vehicles (e.g., electric vehicle charging station).”<sup>16</sup> It also states that “each Beneficiary may use up to fifteen percent (15%) of its allocation of Trust Funds on the costs necessary for, and directly connected to, the acquisition, installation, operation and maintenance of new light duty zero emission vehicle supply equipment for projects as specified below.”<sup>17</sup> While not explicitly defined in Appendix D, we strongly encourage the BMP to include funding of Level-2 make-ready infrastructure, which includes wiring, conduit and subpanel installation, etc. given that these are often the greatest costs of installing EV charging stations.<sup>18</sup>

Limiting funding to the final charging connector (only), unless leveraging alternative funds for EV make-ready infrastructure, indirectly hinders an essential component of an EV-ready parking structure – the electrical capacity upgrade and wiring. Including EV make-ready infrastructure (not just the EVSE as approved criteria for funding could substantively reduce barriers to EVSE deployment, particularly in multi-unit dwellings (MUDs). Thus, Tesla recommends funding focus on both make-ready infrastructure as well as EVSE.

Making funds available to support EV make-ready infrastructure in new and existing common parking areas could result in greater adoption of EVs by those residents who may be considering switching from a gasoline vehicle. Once a parking area or structure is EV make-ready, a relatively nominal

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<sup>12</sup> “Cash at the time of purchase is by far the best financial incentive – over twice the value of a tax credit.” Plug in America, *Evaluating Methods to Encourage Plug-in Electric Vehicle Adoption: A review of reports on PEV incentive effectiveness for California Utilities* (October 2016), p.13.

<sup>13</sup> ICCT, *Principles for Effective Electric Vehicle Design* (June 2016), p. 6. Available at: [http://www.theicct.org/sites/default/files/publications/ICCT\\_IZEV-incentives-comp\\_201606.pdf](http://www.theicct.org/sites/default/files/publications/ICCT_IZEV-incentives-comp_201606.pdf).

<sup>14</sup> U.S. Department of Energy (DOE) (2017b). “Alternative Fueling Station Locator.”

<sup>15</sup> <https://www.nrel.gov/docs/fy17osti/69031.pdf>

<sup>16</sup> Consent Decree Appendix D, p.12. Available at: [https://www.arb.ca.gov/msprog/vw\\_info/vsi/vw-mititrust/documents/appendixd2.pdf](https://www.arb.ca.gov/msprog/vw_info/vsi/vw-mititrust/documents/appendixd2.pdf).

<sup>17</sup> Consent Decree Appendix D, p.8. Available at: [https://www.arb.ca.gov/msprog/vw\\_info/vsi/vw-mititrust/documents/appendixd2.pdf](https://www.arb.ca.gov/msprog/vw_info/vsi/vw-mititrust/documents/appendixd2.pdf)

<sup>18</sup> Southern California Edison, Charge Ready Advisory Board Meeting Number 5(August 2017), Slide 11.

amount of funds (typically less than \$1,000) are then required to purchase and connect an EVSE at each occupant parking space.

Different rebate amounts can be provided for make-ready and EVSE components as the make-ready infrastructure can often represent a significantly higher portion of the installation costs. A separate rebate for the EVSE-only would also allow customer preference of EVSE depending on their required application. To ensure funds are better applied, TCEQ should also consider economies of scale to improve overall cost-effectiveness of funding disbursement and thus set a minimum EVSE port number requirement per project. Additionally, the choice of EVSE should be left up to the site owner so that they can choose what best suits their needs.

### **LD ZEV infrastructure funds should be focused on Workplace and Multi-Unit Dwellings**

Appendix C of the VW settlement allocates \$800 million in California and more than \$1.2 billion nationally for ZEV charging infrastructure through Electrify America.<sup>19</sup> Phase one of the investment plan is to spend 82% of the funds on a national Level-3 (aka. Direct Current (“DC”) fast) charging network that covers almost every state, representing more than 2,500 DC fast chargers.<sup>20</sup> Future phases of the investment plans may target additional DC fast charging infrastructure. This initiative will satisfy some of the long distance charging needs along major highway corridors; however, Tesla acknowledges the need for more Level-2 home and workplace charging, where more than 80% of EV charging occurs.<sup>21</sup>

We, therefore, recommend that TCEQ focus the 15% of LD ZEV charging infrastructure funds primarily on multi-unit dwellings and workplaces (Level-2 charging). In the context of MUDs, residents may not have access to any charging infrastructure nor have the ability to deploy such infrastructure to the extent that they do not own the physical property where the charging infrastructure would need to be deployed. Even in instances where residents can deploy this infrastructure, the costs of retrofitting a single parking spot can be prohibitive. Notably, in many cases, standard parking lots in multi-unit residences and workplaces do not have either the electrical capacity needed to charge EVs, nor do they have the correct wiring and conduit to connect an EV charging post and connector (EVSE).

**Therefore it is critical that LD ZEV infrastructure funds target MUDs and workplaces to reduce cost barriers associated with electrical upgrades and EVSE installation.** Retrofit costs for electrical capacity and wiring upgrades for workplace and public charging locations averaged \$3,000 per space nationally<sup>22</sup>. The costs for a make-ready infrastructure projects can be minimized through economies of scale by enabling multiple make-ready parking spaces per garage, thereby reducing the per-space cost. The Charge Ready Program initiated by Southern California Edison (SCE) found that in the case of retrofitting a building with EV make-ready infrastructure, a 5-space project was 50% more expensive per space, than a 25-space project.<sup>23</sup>

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<sup>19</sup> EPA, VW Clean Air Act Civil Settlement. Available at: <https://www.epa.gov/enforcement/volkswagen-clean-air-act-civil-settlement>.

<sup>20</sup> Electrify America, Investment Plan. Available at: <https://www.electrifyamerica.com/our-plan>.

<sup>21</sup> Idaho National Laboratory, Charging Behavior Revealed. Available at: <https://www.inl.gov/article/charging-behavior-revealed-large-national-studies-analyze-ev-infrastructure-needs/>.

<sup>22</sup> <https://avt.inl.gov/sites/default/files/pdf/EVProj/HowDoPubliclyAccessibleInfrastructureInstallationCostsVaryByGeographicLocation.pdf>

<sup>23</sup> Southern California Edison, Charge Ready Advisory Board Meeting Number 5(August 2017), Slide 11.

Specifically, Tesla recommends that LD ZEV infrastructure funds focus on upgrading the electrical capacity (i.e. adding panel breaker space) to support a minimum of 20% of total parking spaces, and install the necessary wiring to support as many additional spaces as possible, preferably up to 100% of spaces.

**Coordination with other State Agencies should be undertaken**

Coordination of investments within the TCEQ and other Texas agencies with similar programs to those being proposed in the BMP is critical to ensure funding is maximized and duplication does not occur. The impact from the expenditures under Appendix D should be incremental to what is already being done in the state, particularly when it comes to the deployment of EV charging infrastructure. One mechanism that could be helpful in tracking funding is maintaining a central database accessible to all state agencies that details project and funding categories for charging infrastructure and ZEVs. In addition, an Advisory Committee could be established comprised of the state agencies including local air districts and stakeholders to provide on-going input on mitigation actions.

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Tesla appreciates the opportunity to provide feedback on the development of the BMP at this early stage of process and the level of transparency being provided by TCEQ in designing this plan. As outlined above, Tesla provides several recommendations to help guide the development of the BMP. These include maximizing LD EV infrastructure investments, a ZEV centric strategy, replacement of heaviest NOx emitters, and coordination among state agencies.

We look forward to continuing engage in the development process and to reviewing the draft BMP once available.

Sincerely,

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Tesla