March 9, 2018

Honorable Jon Niermann, Commissioner
Texas Commission on Environmental Quality (TCEQ)
12100 Park 35 Circle, Building F
Austin, TX  78753

VIA HAND DELIVERY

Subject: GM Follow-up from February 5th Meeting on Texas’s VW Environmental Mitigation Trust Fund

Dear Commissioner Niermann:

Thank you for taking the time to meet with Ashley Morgan and myself last month to discuss opportunities related to the VW Environmental Mitigation Trust Fund (Fund). Texas is pivotal to the success of electric vehicles (EVs) given the state’s technology leadership and air quality attainment goals, in addition to its sheer population and geography.

As we discussed, GM strongly encourages Texas to use the maximum allowable 15% of the fund (equating to approximately $31M of $209M available) to increase the availability of critically-needed EV charging stations. We therefore respectfully submit the following comments aimed at addressing points brought up during our discussion:

The Case for 15%

Some have argued for Texas to leverage all VW funds solely to replace older heavy-duty trucks with newer heavy-duty trucks. Texas ranks highest among the states for mobile NOx emissions by a considerable margin (34% greater than the #2 state, California).¹ Moreover, the second-leading contributor to mobile NOx emissions in Texas comes from the light-duty vehicle sector (27%).² It is therefore critically important to begin addressing NOx emissions from the light-duty vehicle sector, and an investment in EV infrastructure is the single most important step toward advancing NOx reductions in this sector.

² ibid

Designing, Building and Selling the World’s Best Vehicles
Using Argonne National Laboratory’s *Greenhouse Gasses, Regulated Emissions, and Energy Use in Transportation* (GREET) model, Atlas Public Policy, a transportation electrification consulting firm, analyzed electricity sources in the Texas region and assessed lifecycle NOx emissions from battery EVs (BEVs) compared to conventional gasoline vehicles overall, as well as emissions in urban areas, which are typically non-attainment and where NOx emissions have the greatest health effects.

This analysis employed all GREET defaults which generally relies on conservative assumptions about technological progress. The findings may be seen in the table below.

<table>
<thead>
<tr>
<th>Vehicle (Fuel Source)</th>
<th>2015</th>
<th>2030</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lifecycle NOX Emissions (g/mi)</td>
<td>Lifecycle Urban NOX Emissions (g/mi)</td>
<td>Lifecycle NOX Emissions in 2030 (g/mi)</td>
<td>Lifecycle Urban NOX Emissions (g/mi)</td>
</tr>
<tr>
<td>Spark Ignition Internal Combustion Engine Vehicle (E10)</td>
<td>0.28</td>
<td>0.10</td>
<td>0.17</td>
<td>0.06547</td>
</tr>
<tr>
<td>Battery Electric Vehicle (Texas Region/TRE)</td>
<td>0.18</td>
<td>0.0353</td>
<td>0.11</td>
<td>0.01564</td>
</tr>
<tr>
<td>Emission Reduction from Battery Electric Vehicle</td>
<td>36%</td>
<td>65%</td>
<td>35%</td>
<td>76%</td>
</tr>
</tbody>
</table>

This analysis relied on the default assumptions from Argonne’s GREET model. The Texas electricity region (TRE) was used to provide a localized assessment of NOx emissions from electricity. The internal combustion engine fuel economy is assumed to be 26 mpg in 2015 and 36.5 mpg in 2030.

In summary, BEVs in Texas reduce overall NOx emissions today by 36% compared to comparable gasoline vehicles, and these emissions benefits accrue into the future. In addition, BEVs can reduce NOx emissions in urban areas by 65% today and over 75% in the

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3 The GREET model is generally recognized as the “gold standard” for evaluating and comparing the energy and environmental impacts of transportation fuels and advanced vehicles. For additional information on GREET, see: [https://greet.es.anl.gov/publications](https://greet.es.anl.gov/publications)
future. Thus, an investment in EV charging infrastructure, and corresponding growth in EV adoption, will drive needed NOx emissions reductions across this critical sector.\textsuperscript{4}

With regards to the market naturally solving the problem of EV charging infrastructure, EV charging infrastructure (EVSE) today has not attracted sufficient investment to establish a compelling foundation of charging stations across any of the EVSE market sectors (home, multi-dwelling units, workplace, public level 2 (240v) or public direct charge (440v)). This suggests that the EV charging infrastructure market remains a challenging start-up case in the short to midterm.

To be sure, the market will become more viable and competitive over time as hardware costs decrease, as installations become more streamlined through updated building codes, and as station utilization improves. But early utilization requires additional investment to close the infrastructure gap and establish a highly visible network of charging stations, thus enhancing motorist confidence in the ability to drive EVs anywhere in the state while lowering mobile source emissions.

EV infrastructure is also key to attracting additional innovative and advanced mobility solutions to Texas, such as car-sharing, ride-hailing, and autonomous vehicles, all of which will contribute to future emissions reductions. The ability to introduce and grow these advanced mobility services in Texas relies on a robust foundation of EV charging infrastructure, especially DC fast-charging, and the development of alternative transportation solutions urgently needs assistance from additional investment sources such as the Fund.

Investing in EV charging infrastructure and enabling EV growth is not "growth for the sake of growth." Each EV added to the grid is a benefit to all utility customers as well as a reduction in all emissions, including NOx. There are currently 22,500 EVs registered in Texas, demonstrating there is sound support for zero-emission technologies.

The National Renewable Energy Laboratory’s (NREL) estimates that Texas will need 1,720 DC fast-chargers (and 30,000 L2 charge stations) by 2030 to support even a nominal growth in EV adoption.\textsuperscript{5} Today in Texas, there are only 54 SAE industry standard DC fast chargers (DCFC) – and all but 2 DCFC stations are located exclusively within three major urban areas: Dallas, Houston, and Austin.\textsuperscript{6}

\textsuperscript{4} Atlas Public Policy Analysis using GREET v1.3.0.13239
Texas could vastly advance its EV transportation solutions and provide motorists with a carefully targeted strategy to effectively locate a modest number of DCFC stations across the state assuring consumers that EVs can be driven across Texas and between its major urban centers (intercity). This is a high-priority need for Texas, and a responsible and cost-effective use of the 15% permissible under terms of the Fund.

**Current SAE-compatible DCFC Installations in Texas**

![Map of SAE DC Fast-charging stations in Texas](image)

*Current state of SAE DC Fast-charging in Texas. No intra or interstate, or inter-city, mobility enabled.*

**Discussion of Mitigation Fund Use for EV Charging**

Automakers have made enormous investments in the electrification of transportation — GM alone has invested billions of dollars to develop electrification technologies, including the state-of-the-art Chevrolet Volt and Chevrolet Bolt EV. In fact, GM just this week announced plans to increase production of the Bolt EV later this year in response to increased global demand for electrified vehicles. Such advanced technology will require more widespread charging infrastructure to assure motorists that EVs can be driven anywhere they need to go and thus, the urgency to rapidly expand EV charging infrastructure in Texas.

While the majority of all EV charging today is done at the home, there remains critical infrastructure needs not met by single-family home charging. To maximize the impact of limited state funds, it is important to invest strategically. GM would prioritize today’s key infrastructure needs as follows:

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7 Mary T. Barra, Chairman and CEO, General Motors, Remarks at the CERAWeek energy conference in Houston, TX, March 7, 2018
Highway corridor DCFC most visibly inspires consumer confidence in the driving range, and practicality, of EVs. A 2016 survey of 2,500 respondents by Altman Viandrie & Company found the top reason drivers gave for not wanting to purchase a plug-in electric vehicle was a perceived lack of charging stations (85%). Highly visible corridor EV charging (SAE industry standard) can help address this perception issue.⁸

Workplace EV charging creates an EV “showroom” that very effectively grows EV awareness among Texas employees and employers. According to U.S. Department of Energy data, workplace charging results in employees 6X more likely to purchase an EV than employees at companies not offering workplace charging.

Multi-unit dwelling EV charging provides an important opportunity to expand EV adoption to drivers residing in townhomes, condominiums, and apartments, who may not have access to a “home” charger every evening. This is currently an untapped means to incent EV adoption. This need can be met by Level 1 or Level 2 charging directly at the multi-unit dwellings, or by neighborhood DC fast-charge hubs that can serve these residents.

Public EV charging at key destinations is also important to increase the practicality of EVs and the number of places an EV can go, with a special focus on destinations typically outside a consumer’s normal daily driving patterns (e.g. airports, beaches, hotels, resorts, etc.).

Urban core DCFC is critical to attracting and supporting high-mileage commercial mobility solutions such as car-sharing, ride-hailing, and autonomous movers of both people and goods.

EV charging infrastructure is vital to the growth of the EV market and will lead to long-lasting emissions reductions that increase over time as the market expands. And Texas’s low electricity prices mean that electric vehicles are an important economic driver for the state.

The Role of Utilities

We also encourage the state to directly engage all electric utilities in the strategic planning of EV infrastructure. As fuel and infrastructure providers for plug-in electric vehicles (PEVs), electric utilities can also play a significant role in charging infrastructure investment, motorist education and outreach, and other market acceleration programs, which will ultimately provide state-wide emissions reductions.

⁸ AV&Co., Connected Cars Survey, 2016. Note: Terms of Use for the report prevent us from providing a link to the specific source material.
To that end, we encourage the Commission to work with Texas’ electric utilities to ensure appropriate electric distribution infrastructure is in place to support the integration of charging stations across all areas discussed above. This coordination ensures that investments made through the Fund and utilities are complementary, efficiently allocated, and effective in spurring technological innovation through PEV growth that generates long-term NOx reductions.

Conclusion

The VW Environmental Mitigation Trust is an opportunity to invest in forward-looking infrastructure that lays a much-needed foundation for EV adoption and the development of advanced transportation technologies in Texas. GM greatly appreciates TCEQ’s interest in and efforts to support the strategic transition to transportation electrification that will result in short and long-term air quality benefits from the reduced mobile source emissions.

I look forward to our continued discussion on this important topic. In the meantime, should you or Commission staff have additional questions, please feel free to contact either Ashley or me.

Sincerely,

[Signature]

cc: Chairman Bryan Shaw, Ph.D.
Commissioner Toby Baker
Mr. Richard Hyde, P.E., Executive Director
Mr. David Brymer, Air Quality Division Director