October 8, 2018

VIA ELECTRONIC MAIL

Texas Commission on Environmental Quality
Air Quality Division
Implementation Grants Section, MC-204
P.O. Box 13087
Austin, TX 78711-3087
ATTN: VW Settlement
VWsettle@tceq.texas.gov

RE: Comments on the State of Texas Proposed Beneficiary Mitigation Plan for Funds from the Volkswagen Partial Consent Decree Environmental Mitigation Trust

To Whom It May Concern:

In line with the requirement to use settlement funds to offset NOx emissions, and in order to maximize the air quality benefits in a way that it will bring benefits for vulnerable populations and disadvantaged communities, we offer the following comments on the final draft mitigation plan.

TCEQ proposes that the State use:

- up to $31,500,000 (15%) for acquisition and installation of new light duty electric vehicle charging infrastructure
- up to $169,290,000 (81%) for the replacement or repower of Electric Forklifts and Port Cargo Handling Equipment and Airport Ground Support Equipment, Class 8a Refuse Vehicles, School Buses, Transit and Shuttle Buses, Class 6 Local Freight Truck, Class 8b Local Freight Trucks, and Ocean-Going Vessels Shore Power.

Contrary to TCEQ's proposal, we advise that no funds should be used for electric vehicle charging station or repowering or replacement of Diesel cargo handling equipment, or buses, trucks or vessels to electric for several reasons. Conversely, funding should be prioritized toward the most cost-effective option for reducing emissions and improving air

quality by repowering or replacement of pre-2008 diesel engines to new or retrofitted diesel engine powered vehicles, equipment and/or vessels.

As of December 2016, there are only 21,949 electric or plug-in hybrid vehicles registered in Texas.[1] That is just 1% of all registered vehicles in the state. Therefore, it is an indisputable fact that the use of funds ($31,350,000) for electric vehicle (EV) charging infrastructure would benefit a very narrow constituency while failing to comply with the spirit of the mitigation trust to implement projects that reduce NOx emissions in the most cost-effective way possible.

We have confidence that TCEQ shares our goals in maximizing the settlement funds to provide tangible and measurable improvements to air quality. Therefore we restate our position that the use of any funds for EVs or EV charging infrastructure is inconsistent with this goal, for the reasons outlined below.

First, as the numbers reveal, it is approximately 300 times more cost-effective to spend these funds on diesel retrofits than on heavily subsidizing one-tenth of one percent of vehicles owners in the state.

Any potential environmental benefits of EVs depend critically on the source from which they derive their power. EPA's E-grid database shows that the NOx emissions for the Texas region average 0.6989 lb/MWh.[2] Assuming one year of charging with an average of 12,000 miles driven (3.5 mi/kWh) in addition to the energy losses from the charging equipment and battery, each light duty requires between 3.6 and 4.1 MWh of electricity use per year, with an estimate generation of 2.52-2.87 lb. of NOx emissions each year.[3] Furthermore, the emissions associated with charging EVs will be higher if that charging occurs during day-time peak electric demand.

By comparison, a new light duty gasoline vehicle emits approximately 0.3 g NOx per mile driven, producing about 7.9 lb. of NOx emissions each year (if driven 12,000 miles).[4] **So, each EV deployed in Texas might avoid 5.03 lbs. of NOx emissions per year.**

If we compare the cost of a light duty model offered both as a gasoline version and as an electric version, we find a significant price premium. For example, Edmunds.com shows that the premium for an electric vs. gasoline Ford Focus is about $12,000 and will yield about $637 in avoided fuel costs ($425 in electricity costs vs. $1,074 for gasoline) per year in Texas, if driven 12,000 mi/yr).[5] It is worth noting that EV price premium does not include a potential future

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[1] See https://autoalliance.org/in-your-state/TX/

[2] U.S. Environmental Protection Agency. See, https://www.epa.gov/sites/production/files/2017-02/all_egrid2014v2_files.zip

[3] See table 8 in Apostolaki-Iosifidou, E., Codani, P., & Kempton, W. (2017). Measurement of power loss during electric vehicle charging and discharging. *Energy*, *127*, 730-742. http://www.sciencedirect.com/science/article/pii/S0360544217303730#tbl6

[4] See, Table 1 of § 86.1811-17 - Fully Phased-in Tier 3 Exhaust Emission Standards. https://www.law.cornell.edu/cfr/text/40/86.1811-17

[5] See https://www.edmunds.com/ford/focus/2017/mpg/?mpy=12000&zip=78711&pos=9 and https://www.edmunds.com/ford/focus/2017/electric/mpg/?mpy=12000&zip=78711&pos=9

expensive replacement (approximately $15,000) of the EV's battery that could offset all of the fuel savings, although that cost is covered under warranty if needed in the first 5 years. When total cost of ownership of an EV has been compared to a gasoline vehicle, including a battery replacement between years 7-10 of EV ownership, there is a $20,000-30,000 increase for the EV.[6]

Moreover, the price premium does not include the high cost of building out EV charging infrastructure, nor the cost of the additional power plant capacity that is needed to power additional electric load while maintaining reliability. That capacity typically is dispatchable coal or gas generation. Wind and solar energy are not dependable and therefore would not be built to maintain reliability and supply the additional electric capacity. Each Ford Focus being charged would draw about 6.6 kW and new gas-fired power plant capacity costs more than $1,000 per kW, so the equivalent of each new Ford Focus being charged requires electric ratepayers to incur more than $6,600 in new capacity charges. In addition, a typical workplace EV charging port costs $2,704 and typically is occupied by one vehicle the entire workday.[7]

Considering all the factors outlined above, over just the first 5 years (not considering the even greater lifetime cost for a battery replacement), each EV in Texas will generate approximately $3,245 ($649/yr. over 5 years) in fuel savings that will be offset by $21,304 in costs, while avoiding 25.15 lbs. (0.02012 tons) of NOx emissions at an approximate cost-benefit of almost $1,700,000 per ton of NOx emissions avoided. This compares to EPA's estimated cost of $5,950 per ton of NOx reduction by retrofitting diesel engines with NOx emission controls.[8]

It is clear that if TCEQ seeks cost-effective and real improvements to air quality, it is more than 285 times more cost-effective to spend these funds on diesel retrofits than on EVs. Additionally, the costs above do not include the income redistribution that is occurring due to tax credits that transfer wealth from middle-class Americans to the wealthiest Americans that can afford to pay the steep premium for EVs. A study by Severin Borenstein and Lucas Davis from the University of California, Berkeley, shows that 90% of plug-in car tax credits were received by those with highest income.[9]

Moreover, as noted in a Strata policy paper

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[6] Arthur D. Little. *Battery Electric Vehicles vs. Internal Combustion Engine Vehicles*, January 2017,p.8 http://www.adlittle.com/fileadmin/editorial_us/downloads/ADL_BEVs_vs_ICEVs_January_24_2017_USA.pdf

[7] U.S. Department of Energy. See figure 11 in Costs Associated with Non-Residential Electric Vehicle Supply Equipment Factors to consider in the implementation of electric vehicle charging station https://www.afdc.energy.gov/uploads/publication/evse_cost_report_2015.pdf

[8] See table 3 in The Cost-Effectiveness of Heavy-Duty Diesel Retrofits and Other Mobile Source Emission Reduction Projects and Programs https://www.dvrpc.org/CMAQ/pdf/2015_EPA_cost_effectiveness.pdf

[9] The Distributional Effects of U.S. Clean Energy Tax Credits Severin Borenstein and Lucas Davis. University of California-Berkeley. http://ei.haas.berkeley.edu/research/papers/WP262.pdf

> *"The harmful effects of emissions from gasoline vehicles are generally concentrated near the areas where they are driven, while the harmful effects of emissions generated by power plants are more likely to affect those who live near them. In this sense, if people who live in wealthy neighborhoods are more likely to purchase electric vehicles, there is reason to believe they will disproportionally benefit from cleaner air compared to their lower income counterparts. And if low-income individuals are more likely to live near power plants where property values are lower, the benefits of electric vehicles will be a privilege enjoyed mostly by the wealthy. Therefore, the harmful effects of the extra power necessary to allow electric vehicles to operate will be disproportionately absorbed by low-income families living in the proximity of power stations."*[10]

Consequently, much or all the potential benefits from the emission mitigation of EVs will be offset by the extra power that point sources would have to produce to supply the charging infrastructure.

In addition to its regressive nature, this investment would be contrary to the agency's stated goal of assisting the most vulnerable, impacted population and disadvantaged comminutes in the state.

As noted in a paper published by The National Bureau of Economic Research:

> *"Census block groups with median income greater than about $65,000 receive positive environmental benefits from electric vehicle adoption whereas block groups with income less than this threshold receive negative environmental benefits."*[11]

In short, this policy alternative contradicts your department's stated goal of "maximizing emission reduction in a cost-effective way."

Expanding Texas's Diesel Emission Reduction Act (DERA) state-level program.

Ample evidence supports the DERA option as the **most cost-effective and beneficial action for the administration of all the settlement funds.**

The EPA estimates that clean diesel funding generates up to $13 of public health benefit for every $1 spent on diesel projects.[12] Additionally, federal funding will provide a 50 percent bonus to the state-based grant, further underscoring that this program is the most cost-effective

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[10] THE CURRENT STATE OF ELECTRIC VEHICLE SUBSIDIES: ECONOMIC, ENVIRONMENTAL, AND DISTRIBUTIONAL IMPACTS - Ryan C Bosworth, PhD & Grant Patty Patty https://strata.org/pdf/2017/ev-full.pdf

[11] Holland, S.P., Mansur, E.T., Muller, N.Z., Yates, A.J. (November 2016). Distributional Effects of Air Pollution from Electric Vehicle Adoption. The National Bureau of Economic Research. Working Paper. pp. 2. Retrieved from http://www.nber.org/papers/w22862

[12] U.S. Environmental Protection Agency. EPA Report: Diesel Engine Grants Program Nets Major Air, Public Health Benefits (04/29/2016) https://www.epa.gov/newsreleases/epa-report-diesel-engine-grants-program-nets-major-air-public-health-benefits-0

use of settlement funds. No other policy choice available provides greater maximization of reductions of NOx in a more cost-effective way.

Once the Congressionally-appropriated EPA funds for the DERA program are factored in, using the VW funds for diesel retrofits likely are more than 400 times more cost-effective than an investment in EVs.

More importantly, the fact that this action can be targeted at areas with air quality challenges also fits your agency goal to "assist the most vulnerable, impacted population and disadvantaged comminutes in the state."

Moreover, the EPA acknowledges that "the technologies used in DERA grants can reduce PM emissions by up to 95% and NOx by up to 90%. Each of these reductions makes an immediate and positive impact on public health."[13] Hardly the same can be said about the vastly inefficient investments in charging infrastructure.

It is a well-established fact that diesel engines that pre-date the EPA's stricter emissions standards emit higher levels of diesel exhaust and, therefore, simply meeting current standards can significantly improve air quality, especially in vulnerable communities. Therefore, we argue that expanding the DERA program is in the state's best interest as it provides a unique opportunity to provide tangible benefits to the communities who need it the most.

Conclusion

The air quality benefits provided to vulnerable communities by the cost-effective expansion of the DERA program stands in sharp contrast with the negligible, even possibly negative effects that these communities would experience under the EV charging infrastructure expansion.

Furthermore, the incontrovertible fact that this infrastructure would account for a direct transfer of wealth from middle class Americans to well-off individuals, while further exposing vulnerable communities to air quality and health risks challenges goes against the spirit of the settlement.

The efficiency, the expanded benefits for vulnerable communities and the EPA 50 percent bonus to the state, especially in our current budget situation, makes this the superior option and we respectfully encourage your agency to consider re-allocating all available funds to the expansion of DERA.

While we acknowledge that we will likely be the only party on record specifically advising against the use of funds for EVs or EV charging infrastructure, it would be disappointing to see the TCEQ is go against all technical evidence in order to pursue a strategy that will benefit a very narrow constituency at the expense of vulnerable communities.

[13] Third Report to Congress: Highlights from the Diesel Emission Reduction Program. EPA-420-R-16-004 February 2016. https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100OHMK.pdf

We respectfully ask you to reconsider assigning any funds for the expansion of electric vehicles or changing infrastructure.

If we can be of any assistance, please do not hesitate to reach out directly to.
Thank you for your time and consideration.

Sincerely,

Jerome Greener
State Director
Americans for Prosperity - Texas