



Submitted via email to vwsettlement@ecy.wa.gov

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Re: BYD Comments on Washington's Use of Volkswagen Mitigation Trust Funds

Dear Mr. Rude and Ms. St. Onge:

BYD America ("BYD") appreciates the opportunity to submit the following comments that align with and build upon the state's *Results Washington* priorities of achieving sustainable and clean transportation via the deployment of zero-emission vehicles and equipment. Such deployments will take advantage of this unprecedented opportunity to reduce mobile source emissions and, in particular, provide both near- and long-term nitrogen oxide (NOx) emissions reductions in those areas that bear a disproportionate share of the state's air pollution burden. Further, because Washington's electric grid is among the cleanest in the U.S., all-electric vehicles in the state will outperform, on a well-to-wheels emissions basis, any conventional or other alternative fuel vehicles.

BYD has deployed a series of innovative all-electric vehicle projects in Washington in recent years, including demonstration of all-electric buses with transit agencies throughout the state¹ as well as with Sea-Tac for their airport shuttle service. Wenatchee's Link Transit is currently taking delivery of five of BYD's all-electric transit buses and has plans to purchase five additional buses this year. BYD has also worked with Washington's Department of Transportation to submit a proposal to the Federal Transit Administration in order to deploy all-electric transit buses in four smaller transit agencies – Mason Transit, Valley Transit, Clallam Transit, and Jefferson Transit. BYD also submitted a separate proposal to the FTA in partnership with C-Tran in Vancouver, WA.

Beyond our Washington experience and successes, BYD is a global company that has changed what is possible in zero-emission transportation. Our commitment to "solve the whole problem" has made BYD an industry pioneer and leader in not only the transportation sector, but also high-efficiency energy storage, solar power, LED lighting, and information technology. BYD and its shareholders, including Warren Buffett, see these environmentally and economically forward products as the way of the future.

¹ Transit agency partners include King County Metro, Sound Transit, Spokane Transit, Kitsap Transit, Pierce Transit, Ben Franklin Transit, C-Tran, Link Transit, Whatcom Transportation Authority, Twin Transit, Yakima Transit, Valley Transit, and Mason Transit.

Resiliency and sustainability are increasingly important environmental issues. BYD's technology and charging system are capable of supporting multiple power transfer pathways – vehicle-to-grid (V2G), vehicle-to-vehicle, and vehicle-to-load. This flexibility effectively turns each BYD vehicle into a mobile power plant, which can be used to support first responders in emergency scenarios or utilities in power outages. This yields substantial benefits in safety, durability, cost-effectiveness, and facility factors, while still meeting the demands of heavy-duty fast charging.

Our North American headquarters and manufacturing facilities are located in Southern California. We are vertically integrated in order to better control the quality and costs throughout the manufacturing chain – we produce every major vehicle component, including our 100% recyclable batteries, inverters, and traction motors. This business structure ensures seamless communication and efficiency across components, which creates a better operational experience and competitive pricing.

Our recommendations to Washington's Department of Ecology and the Department of Transportation fall into three categories:

- Concentrate funding for projects based on the largest sources of statewide NOx emissions
- Provide support for transformative technologies in areas disproportionately burdened with air pollution
- Leverage Volkswagen funds by aligning projects with other state initiatives to yield economic, emissions, and energy benefits

BYD urges Washington to take these recommendations into consideration, which will enable the state to most efficiently and effectively use its allocation of Volkswagen funds.

Washington Should Concentrate Funding for Projects Based on the Largest Sources of Statewide NOx Emissions

BYD appreciates that Washington has the opportunity to use its maximum 15% allocation for electric vehicle charging infrastructure. We thus recommend that Washington distribute the remaining funds to projects that directly address the largest sources of NOx emissions in the state.

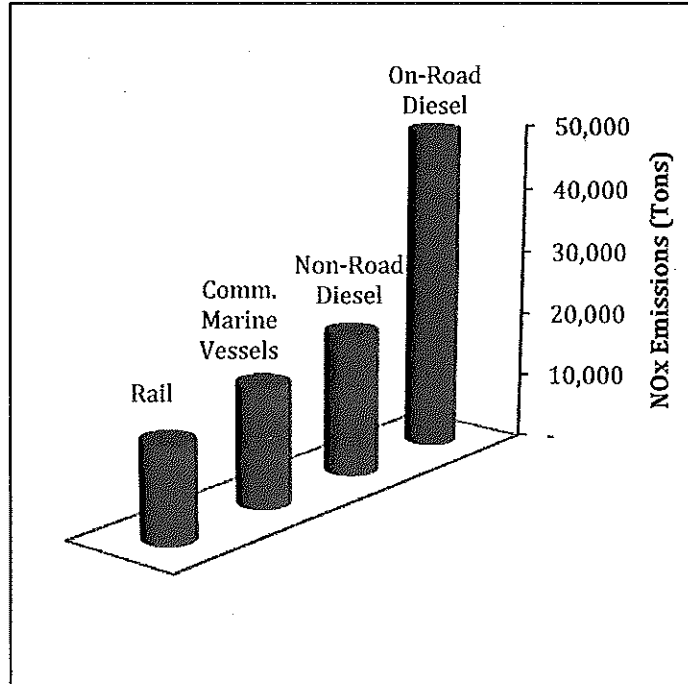
As Figure 1 shows below at right, on-road heavy-duty diesel vehicles and non-road diesel equipment (excluding locomotives and marine) should be the state's primary focus for these funds as they account for 50,923 and 21,867 tons of NOx each year, respectively.² Cumulatively, these sources account for 69% of the state's NOx emissions. The on-road sector is particularly important as 48% of the state's NOx emissions come from this source.

² "2014 National Emission Inventory (NEI) Data". United States Environmental Protection Agency, 2014. <https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data>.

Washington can target transit and shuttle buses as well as drayage, delivery, cab forward, bucket, and tractor trucks. These vehicle types are often used in “captive” fleets that operate almost entirely within dense communities or areas overburdened with air pollution (e.g., ports and terminals) and are thus capable of delivering immediate environmental benefits.

Allocating funds to cargo handling equipment will address non-road diesel equipment emissions. These pieces of equipment operate entirely within ports, rail yards, depots, and terminals – areas that Washington has consistently addressed due to environmental justice concerns stemming from disproportionate air pollution impacts.

Figure 1: Washington NOx Emissions from Settlement-Eligible Sources (2014)



In particular, focusing funds on terminal tractors (also referred to as yard tractors, yard hostlers, or yard trucks) presents Washington with a viable solution to addressing non-road diesel emissions. Terminal tractors move freight quickly and efficiently through Washington’s largest ports of Seattle, Tacoma, and Bremerton; however, this efficiency is at the cost of clean air because these vehicles typically use older, high-emitting diesel engines. Washington can therefore make an immediate and lasting impact on local air quality in these disproportionately burdened areas by electrifying terminal tractors.

Washington Should Provide Support for Transformative Technologies in Areas Disproportionately Burdened with Air Pollution

Washington can immediately reduce harmful NOx emissions, thereby generating environmental, health, and economic benefits, by electrifying trucks and transit buses operating in the state’s population centers or along key corridors. Electrified vehicle technologies produce zero emissions, eliminate the need for expensive-to-maintain particulate traps, and mitigate the need for oil changes. To combat non-road diesel emissions, Washington can allocate funds to electrify the state’s cargo handling equipment projects.

BYD Solutions

Electrified on-road trucks, such as BYD’s various Class 5, 6, and 8 models, create additional benefits for the environment and operators alike, as shown in Table 1 below. Each of these models presents customers with a basic chassis readily available for customization. BYD works with top outfitters and upfitters to meet customer specifications; thus, each of our chassis can be outfitted into a dry box, flatbed, stake bed, refrigerated unit, refuse body, and bucket truck version. Both the Class 5 & 6 BYD trucks are currently listed on the Washington State Department of Enterprise Services Motor Vehicles contract.

As the world’s largest producer of battery electric buses, BYD has demonstrated experience and established customer delivery and deployment processes. Indeed, BYD has deployed more than 12,000 zero-emission buses internationally and has received orders for over 20,000 additional buses. These buses have accumulated more than 130 million miles of service, saved over 27 million gallons of diesel, and reduced 625 million pounds of greenhouse gases (GHGs).

Table 1: What Sets BYD On-Road Trucks Apart

Vehicle Type	Models ³	Battery Performance	CO2 Reduced per Truck (tonnes)	Annual Fuel Savings	Annual Maintenance Savings
<u>Class 5 Medium-Duty Truck</u>	5D, 5F	155 mile range	340	\$ 6,000	\$ 4,000
<u>Class 6 Medium-Duty Truck</u>	6B, 6D, 6F, 6R	124 mile range	450	\$ 8,200	\$ 4,600
<u>Class 8 Heavy-Duty Truck</u>	8TT, 8R, 8TS, and 8TT	92 mile range	636	\$ 9,600	\$ 4,500

BYD’s product line of seven bus and coach models, ranging from 23’ coach buses to 60’ articulated transit buses and everything in between, are American Disabilities Act and Buy America-compliant. They can therefore help transit agencies in Washington reduce fuel costs and minimize maintenance expenses, thereby increasing reliability and performance. Due to the increased miles put on transit buses, these vehicles see even more substantial maintenance and fuel savings than our trucks. BYD’s standard 40’ bus experiences yearly savings on the order of \$45,000 per bus. Further, BYD’s recyclable battery technology

³ “B” stands for “Bucket.” “D” stands for “Delivery.” “F” stands for “Forward / Cab Forward.” “R” stands for “Refuse.” “TS” stands for “Tractor Single.” “TT” stands for “Tractor Tandem.”

enables these vehicles to operate as much as 200 miles on a single charge, all while producing zero emissions.

BYD's buses each come with a standard 12-year battery warranty that further reduces any risk for operators. Five of BYD's bus models are already listed on the Washington Department of Enterprise Services Heavy Duty Transit Bus Contract, thereby allowing transit agencies to seamlessly and expeditiously add these vehicles to their fleets.

BYD's model 8Y terminal tractor is a 100% battery-electric class 8 truck that is capable of 15 hours of continuous operation between charges with minimal battery degradation. Each terminal tractor eliminates 1,590 metric tons of CO₂ over its deployment lifetime. Related to the vehicle's hugely beneficial total cost of ownership, the T8Y saves operators \$19,100 in fuel costs and \$8,800 in maintenance costs per truck each year – lower downtime, fewer moving parts, less wear and tear, and improved environmental efficiency are the hallmarks of BYD's T8Y terminal tractor. Further, they are able to be deployed immediately as they are compliant with Federal Motor Vehicle Safety Standards (FMVSS).⁴

Finally, as electric vehicles require dedicated charging infrastructure, Washington has already created initiatives, such as *Results Washington*, to tackle this issue, and BYD stands ready to align with and further support this initiative. Where BYD's technology exceeds the capabilities of our competitors is the design and capability of our AC chargers; specifically, our AC charging is all done on-board the vehicle. This on-board charging approach:

- Eliminates installation of large, expensive, hot DC charging stations with external converters, since that conversion is done internally;
- Virtually eliminates heat loss, so the charging system converts more of the current to motive energy;
- Virtually eliminates overheating, so charging can occur in all temperatures – in other words, there are no cold weather limitations on the technology;
- Eliminates the need for costly charger cooling systems;
- Virtually eliminates charger maintenance and increases charger durability, so there's no need for replacement during the life of the vehicle or for many years after;
- Significantly diminishes electrical and heat hazards to staff; and
- Allows the chargers to be compact, easy to operate, easily installed with minimal space, engineering or permitting and even easily moved as needs change.

Washington Should Leverage Volkswagen Funds by Aligning Projects with Other State Initiatives to Yield Economic and Energy Benefits

The \$112.7 million expected to be allocated to Washington is an opportunity for the state to transform its transportation sector. Simply replacing existing diesel vehicles with new (but still conventional fuel) technology may yield limited benefits, but it will do very little in leading the state towards a cleaner, more cost-effective, and more reliable energy future

⁴ The T8Y is also compliant with Canadian Motor Vehicle Safety Standards (CMVSS).

with greater energy independence. Electric vehicles, however, offer the means to achieve energy security and environmental sustainability while simultaneously creating a driver for economic growth.

To that end, Washington should allocate funding to align with its key state and environmental agency initiative -- *Results Washington*. More specifically, Washington has the ability to fund the deployment of electric vehicles, thereby directly addressing the three goals of the Clean Transportation component of *Results Washington*:

- Reduce the average emissions of GHGs for each vehicle mile traveled by 25%
- Increase the average miles traveled per gallon of fuel for Washington's overall passenger and light duty truck fleet
- Increase the number of plug-in electric vehicles registered in Washington⁵

As described above, electric vehicles and BYD's technologies, in particular, provide unparalleled GHG reduction and fuel economy benefits. Further, to accelerate the adoption of zero-emission vehicles in Washington, BYD's electric vehicle deployment experience will provide the state with the means to cost-effectively and efficiently meet its goals. As an example, BYD has deployed over 12,000 transit bus and motor coaches internationally.

Electric vehicle deployments will also increase domestic energy security by offering drivers and operators a choice of fueling options. According to the Electric Drive Transportation Association, domestically produced grid electricity, on average, can power plug-in vehicles at the equivalent of \$1 a gallon of gasoline. Importantly, this pricing structure is stable as it is insulated from the global volatility that impacts diesel.⁶

Closing Remarks

The commercial-scale heavy-duty electric transportation market is rapidly maturing, as demonstrated by the price reduction of more than 20% in our bus products over the last five years. This Volkswagen opportunity represents a unique chance to create immediate air quality and economic benefits for Washington's residents, as well as build the groundwork for a sustainable electric transportation marketplace.

The economic, air quality, and energy-specific benefits of electrified equipment are clear – all-electric trucks, buses, and equipment generate no tailpipe emissions while, over the lifetime of the vehicles, deliver a lower total cost of ownership than conventional petroleum fuels and natural gas. In a state with an electric grid as clean as Washington's, these benefits are even further magnified.

BYD believes early-market incentive funding is critical to achieving more favorable upfront economics and that increasing sales will lead to cost-competitive purchase prices.

⁵ "Goal 3: Sustainable energy & a clean environment – Goal map". Results Washington. <http://www.results.wa.gov/what-we-do/measure-results/sustainable-energy-clean-environment/goal-map>.

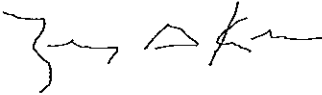
⁶ "Why Electric Drive?" Electric Drive Transportation Association. <http://electricdrive.org/hu/d/sp/i/27103/IP1/LandingPageTechIss/pid/27103>.

We have committed to and successfully delivered substantial price reductions from our first generation of products. We hope to continue this progress in Washington and support the state in addressing a broad spectrum of environmental issues, resiliency and sustainability chief among them.

BYD thanks the Department of Ecology and Department of Transportation for the opportunity to submit these recommendations. We would like to work with you and your team to ensure an efficient and effective rollout of the state's mitigation plan.

Towards that end, we request an in-person meeting to discuss our recommendations further. We look forward to future collaboration that will help Washington meet its environmental, fiscal, and social justice goals.

Sincerely,

A handwritten signature in black ink, appearing to read 'Zachary S. Kahn', written in a cursive style.

Zachary S. Kahn
Director of Government Relations
BYD America

