Submitted via email to evstakeholder.group@bpu.nj.gov

November 29, 2017

Michael Hornsby
Chief Project Development Officer
NJ Board of Public Utilities
Office of Policy & Planning
609-292-2412 / Michael.Hornsby@bpu.nj.gov

Re: BYD Comments on Task 2 Questions

Dear Mr. Hornsby:

BYD America ("BYD") appreciates the opportunity to submit the following comments that align with and build upon New Jersey's 2015 Energy Master Plan update and the Electric Vehicle (EV) Infrastructure Stakeholder Process. Our comments will support the state in achieving broad, multi-sector deployments of zero-emission vehicles, which will reduce near- and long-term mobile source emissions in areas that bear a disproportionate share of the state's air pollution burden.

BYD is a global company that is changing 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.

While we appreciate that BPU's primary focus for EVs is in the light-duty vehicle market, BYD would like to take this opportunity to provide additional information on the availability of all-electric medium and heavy-duty trucks and buses, as it pertains to the four questions specifically posited by the BPU. As such, we have provided responses to the questions posed with the MD/HD vehicle market in mind.

What goals for EV Infrastructure should be established?

Supported by more than a decade of favorable public policies and associated incentives in key markets, the light-duty electric vehicle market has made tremendous progress in areas such as public awareness of and comfort with electric vehicle technologies, charging infrastructure permitting and installation best practices, and vehicle battery price reductions. The medium- and heavy duty vehicle market has undoubtedly benefited from this rising tide in global transportation electrification. BYD supports the continued efforts by the BPU and other public entities to advance the light-duty electric vehicle market. That said, the benefits of all-electric trucks and buses warrant a similar focus from public entities as has been received by the light-duty market during its early stage.

BYD thus believes the BPU should expand the current focus to include support for the all-electric medium- and heavy-duty vehicle market. While the medium- and heavy duty electric vehicle market has seen less vehicle deployments than the light-duty electric vehicle market, advances in battery technology over the last few years have primed the medium- and heavy duty electric market to grow exponentially in certain applications.[1]

Heavy duty electric vehicles have seen significant deployments to date in the transit bus space. In fact, in 2017, zero emission buses will make up more than 10% of the total sales of transit buses in the United States (over 556 buses). As a percentage of the current market, this is well above the percentage of new light duty vehicles that are electric. To date, several major transit agencies have committed to zero emission fleets by 2035, including LA Metro,[2] LA Department of Transportation,[3] King County Transit,[4] Foothill Transit,[5] and San Joaquin Transit. [6] Internationally, "mayors of London, Paris, Los Angeles, Copenhagen, Barcelona, Quito, Vancouver, Mexico City, Milan, Seattle, Auckland, and Cape Town all signed the C40 Fossil-Fuel-Free Streets Declaration, which pledges that they will add only fully electric buses to their cities' public transportation from 2025."[7] And perhaps most impressively, Shenzhen, will have its fleet of over 16,000 buses electrified by the end of 2017.[8] These cities and transit agencies have demonstrated that fleets of electric buses are technologically feasible and ready for deployment. New Jersey Transit should be a leader on the east coast in clean transportation, and to that end, BYD proffers that a goal ***should be for transit buses in New Jersey to be 100% electric by 2040.***

There are other applications where heavy duty vehicles are rapidly demonstrating their commercial readiness and value. These include (1) port vehicles – such as yard trucks and drayage trucks – (2) delivery trucks, and (3) refuse trucks. BYD has class 5, 6 & 8 truck models commercially available in 2017 that would allow for zero emission goods movement from the port, to the distribution center, to the end user. New Jersey should consider goals for increasing the numbers of electrified versions of these vehicles on the road by 2040.

The New Jersey Energy Master Plan Update (State Energy Plan) states that energy and transportation markets can develop quickly. BYD agrees and points to recent advances in the electric truck and bus industry as a perfect example. In the two years since the State Energy Plan was most recently updated significant developments in the electric medium- and heavy-duty bus and truck market have occurred. Major truck and bus OEMs, including Daimler, Volkswagen, Cummins, Peterbilt, Volvo, Nikola. Gillig, and Tesla, among others, have announced plans to develop or progressed on existing plans to develop electric

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[1] Global Truck Study 2016: The Truck Industry in Transition, p. 25, Deloitte, 2016, Accessed November 27, 2017. https://www2.deloitte.com/content/dam/Deloitte/us/Documents/manufacturing/us-manufacturing-global-truck-study-the-truck-industry-in-transition.pdf
[2] https://boardagendas.metro.net/board-report/2017-0524/
[3] https://la.streetsblog.org/2017/11/09/l-a-city-approves-full-ladot-transit-electrification-by-2030/
[4] http://kingcounty.gov/elected/executive/constantine/news/release/2017/March/01-metro-zero-emission.aspx
[5] http://foothilltransit.org/foothill-transit-announces-all-electric-bus-fleet-by-2030/
[6] http://www.greencarcongress.com/2017/08/20170819-rtd.html
[7] https://www.greencarreports.com/news/1113794_these-12-cities-will-buy-only-electric-buses-from-2025-on-more-expected-to-join
[8] https://cleantechnica.com/2017/11/12/100-electric-bus-fleet-shenzhen-pop-11-9-million-end-2017/

medium- and heavy-duty vehicles. BYD surmises that if the State Energy Plan were updated today, electric drive vehicles would be included as a focus for the medium- and heavy-duty sector in addition to natural gas.

Regardless, support for emerging technologies is one of five overarching goals identified in the current State Energy Plan.[9] The State Energy Plan indicates a dedication to "continue to evaluate emerging energy technologies for energy production and transportation, but will concentrate on implementing new technologies that are *cost effective*, that advance both *economic development* and *environmental quality*, but have yet to penetrate the market."[10]

Electric medium- and heavy duty vehicles satisfy all of the stated criteria and have yet to penetrate the market, clearly meeting the spirit of State Energy Plan's commitment to emerging technologies.

1. *Cost Effective:*
    a. While lower total cost of ownership (TCO) arguments in the general consumer market have long been a challenge, in the commercial sector, where medium- and heavy-duty vehicles are overwhelmingly used, TCO is often the sole factor on which fleet managers and procurement offices will base purchase decisions. Significant variance occurs among weight class and application, but in general, with and without incentives, medium- and heavy-duty electric vehicles are cost effective compared to fossil fuels when considering TCO.[11]
2. *Advance economic development:*
    a. Recent research focused on a variety of commercial applications of medium- and heavy-duty electric vehicles showed all markets analyzed created significant net economic and societal per vehicle benefit, slightly smaller but similar in scale the those estimated for the light-duty vehicle market.[12]
3. *Advance environmental quality:*
    a. Electrification of the transportation sector, particularly medium- and heavy-duty vehicles, can help to reduce smog-forming emissions and particulates. For example, medium- and heavy-duty EVs reduce smog-forming NOx emissions by up to 60 times more per kilowatt hour (kWh) than renewable generation or energy efficiency.[13] Additionally, recent Southern California

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[9] New Jersey Energy Master Plan Update, p. i, accessed November 22, 2017. http://nj.gov/emp/docs/pdf/New_Jersey_Energy_Master_Plan_Update.pdf
[10] Ibid, p. 11.
[11] "What's Sparking Electric-Vehicle Adoption in the Truck Industry," McKinsey, September 2017, accessed November 21, 2017. https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/whats-sparking-electric-vehicle-adoption-in-the-truck-industry
[12] California Transportation Electrification Assessment, Phase 3-Part A: Commercial and Non-Road Grid Impacts – Final Report, p. 7, ICF International, November 2015, accessed November 27, 2017. https://www.icf.com/resources/reports-and-research/2016/california-transportation-electrification-assessment
[13] California Transportation Electrification Assessment, Phase 1: Final Report, p. 80, ICF International, September 2014, Accessed November 22, 2017. http://www.caletc.com/wp-content/uploads/2016/08/CalETC_TEA_Phase_1-FINAL_Updated_092014.pdf

> Edison testimony to the California Public Utilities Commission (PUC) indicated that electric Class 8 trucks are 83% cleaner, in terms of GHG emissions, than the cleanest natural gas engines.[14]

Other utilities in the nation have used similar criteria on which to measure investments in emerging technologies, and alternative fuel vehicles specifically. Southern California Edison (SCE) underwent an extensive evaluation of potential pathways to reach California's aggressive 2030 climate goals. SCE's analysis concluded that the "clean power and electrification" pathway, which focused on the electrification of the transportation sector, would most allow California to reach its climate and air quality goals in the most cost effective manner. In this preferred approach, SCE estimated 21% of medium- and heavy-duty vehicles could be electrified by 2030, compared to only 12% of medium-and heavy-duty vehicles that could use compressed natural gas in the other natural-gas favorable scenario.[15]

What role should the Board, other government agencies; electric utilities, non-governmental organizations and the private market have in addressing EV/infrastructure adoption?

EV Grid Integration

BYD recommends the BPU facilitate the development of a stakeholder working group to discuss potential grid integration opportunities and identify future utility and public sector actions to realize identified opportunities. The working group should align, both in mission and potentially meeting schedule, with the established California Vehicle-Grid Integration Communications Protocol Working Group. Several members active in the California working group also participate in the EV Stakeholder Group, including Greenlots and Chargepoint.

EV Rates (ToU, Demand Charges, etc.)

BYD supports the development and implementation of innovative commercial rates specific to medium- and heavy duty electric vehicles. As an example, BYD supports the recent proposal from Southern California Edison which included a five-year introductory period for commercial rates where demand charges will not be assessed, after which they will be phased in over the following five-year period.[16]

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[14] Testimony of Southern California Edison Company in Support of its Application of Southern California Edison Company (U 338-E) for Approval of its 2017 Transportation Electrification Proposals, pg. 60, Southern California Edison Company, January 2017, accessed November 27, 2017. http://www3.sce.com/sscc/law/dis/dbattach5e.nsf/0/F5582C9D0A9A3659882580AE007F74A4/$FILE/A1701XXX-SCE%20TE%20Testimony%201-20-17.pdf

[15] "The Clean Power and Electrification Pathway," p. 4, Southern California Edison, accessed November 19, 2017. https://www.edison.com/content/dam/eix/documents/our-perspective/g17-pathway-to-2030-white-paper.pdf

[16] Testimony of Southern California Edison Company in Support of its Application of Southern California Edison Company (U 338-E) for Approval of its 2017 Transportation Electrification Proposals, pg. 61, Southern California

Role in EVSE and/or Infrastructure

BYD believes utilities can and should plan an active role in the supporting the EV charging infrastructure industry. The 'make-ready' model proposed by several California utilities should be considered by the BPU. This model allows utilities to rate-base the cost of the electric infrastructure (conduit, meter, panel, associated trenching, etc.) and maintains the EV charging structure industry's ability to participate in a competitive market by offering charging stations and associated services. Allowing utilities to rate-base the costs of these investments is beneficial to ratepayers, shareholders and the general public at large.

What is the present status of EVs and EV infrastructure in New Jersey?

The medium- and heavy duty electric vehicle market is in its nascent stage in New Jersey, although products are now commercially available and being used successfully in a variety of applications throughout the country. In New Jersey, BYD has engaged in discussions and demonstrations with a number of operators across our vehicle platforms. There is strong interest from several port operators in the state to purchase all-electric yard trucks for port operations. BYD also hopes to finalize an agreement with a large international company for the purchase of four yard trucks, and five class 6 delivery trucks, for use in New Jersey in 2018.

Accordingly, other states and public bodies, such as the California PUC, have included the medium- and heavy duty sector in its transportation electrification plans and goals. As such, San Diego Gas & Electric, Southern California Edison, and Pacific Gas & Electric have filed proposals with the CPUC that include investments of more than $775M to directly support the medium- and heavy duty electric vehicle market.[17] These include investments in charging infrastructure as well as pilot projects for all-electric transit busses, maritime port crane and yard tractor electrification, airport ground support equipment, and electric school bus renewables integration.

What EV/EV infrastructure developments can be expected in the short/medium term under a Business as Usual scenario?

Given the medium- and heavy duty electric vehicle market is in the very early stage, accurately predicting the market growth is challenging. Limited available research on the expected medium- and heavy duty vehicle market growth indicates moderate growth in states with supportive policies. A scenario without such supportive policies would likely see minimal development. As evidenced by actions taken by other public entities throughout the country, there is a need for public intervention during this nascent stage of

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Edison Company, January 2017, accessed November 27, 2017. http://www3.sce.com/sscc/law/dis/dbattach5e.nsf/0/F5582C9D0A9A3659882580AE007F74A4/$FILE/A1701XXX-SCE%20TE%20Testimony%201-20-17.pdf

[17] SB350 IOU Applications Graphic, California Public Utilities Commission, January 2017, Accessed November 27, 2017. http://www.cpuc.ca.gov/sb350te/

the medium- and heavy duty electric vehicle market. BYD will continue to focus its deployment efforts on states with policies supporting transportation electrification and associated investments and is hopeful to include New Jersey as a focus of deployment in the near future.

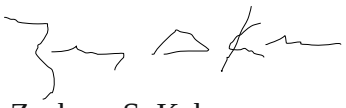
Closing Remarks

The economic, emission, and energy-specific benefits of electrified equipment are clear – all-electric vehicles generate no tailpipe emissions while delivering a lower total cost of ownership over the lifetime of the vehicle than conventional petroleum fuels and natural gas. Further, the commercial-scale medium- and heavy-duty electric transportation market is rapidly maturing, as demonstrated by the price reduction of more than 25% in our bus products over the last five years. The opportunity for utilities to further support these deployments represents a unique chance to create immediate emission and economic benefits for New Jersey residents, as well as build the groundwork for a sustainable electric transportation marketplace.

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 of all-electric vehicles. We have committed to and successfully delivered substantial price reductions from our first generation of products.

BYD thanks the BPU for the opportunity to submit these comments and we hope to continue this progress by supporting the BPU address a broad spectrum of economic and environmental issues.

Sincerely,



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