

Submitted via email to Evan Kersnar

October 21, 2019

Mary D. Nichols, Chair
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Comments to the Proposed Fiscal Year 2019-20 Funding Plan for Clean Transportation Incentives for Low Carbon Transportation Investments and the Air Quality Improvement Program

Dear Chair Nichols and Members of the Air Resources Board:

On behalf of BAE Systems, I hereby submit comments in response to the Proposed Fiscal Year 2019-20 Funding Plan for Clean Transportation Incentives, released September 20, 2019.

BAE Systems is committed to electrifying transit in California and around the world. As a global company with over 20 years of experience developing and advancing electric powertrain technologies, BAE Systems provides full electric systems for battery and hydrogen powered buses, and solutions that bridge the transition to zero emission through electric hybrid powertrains and conversion to all-electric systems, geo-fencing, anti-idle and plug-in features. Technologies BAE Systems developed for electric hybrid buses are used today in our zero emission powertrains and are being transferred for use to medium and heavy duty trucks and marine vessels.

We appreciate and support the Air Resources Board's (ARB) continued inclusion of both battery and hydrogen electric bus funding in the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP). BAE Systems' Gen2 fuel cell system was the first to achieve HVIP listing in 2018, and we intend to qualify our newest Gen3 battery system for HVIP and On-Board Diagnostics (OBD) compliance in the near future.

We appreciate the acknowledgment by ARB staff in the Heavy-Duty Investment Strategy (Appendix D) that manufacturers of hybrid electric bus systems, particularly series-hybrid systems "have added increased energy storage and the capacity to operate in extended zero-emission mode, activated via geo-fencing to protect sensitive areas or populations." ARB staff also recognized "all auxiliary systems (such as air conditioning heating, steering) are being electrified to enable zero-emission operations" which allow "buses to meet all extended range or hours of op-

eration needs a transit operation might have while still providing meaningful emission reductions.”¹ We also appreciate ARB staff highlighting the transfer of BAE Systems’ electric hybrid transit powertrains to marine vessels.²

While Heavy-Duty Investment Strategy findings are supportive of electric hybrid systems, these findings are not reflected in the Proposed Fiscal Year 2019-20 Funding Plan for Clean Transportation Incentives. In particular, BAE Systems urges changes proposed for HVIP be made in the final Fiscal Year 2019-20 Funding Plan to reflect the Heavy-Duty Investment Strategy, and **amend the proposed change that graduates new hybrid vehicles and hybrid conversions from HVIP eligibility**, as follows:

- Remove the stated rationale for graduating new electric hybrid vehicles and conversions. The rationale that “hybrids have had no significant technological improvements or cost reductions over the years” does not align with the Heavy-Duty Investment Strategy. We recommend that ARB adopt language around electric hybrids that aligns with the Heavy-Duty Investment Strategy findings as cited above.
- Continue to classify full electric conversions from electric hybrid vehicles as zero emission buses (ZEBs) for the purpose of HVIP funding, Innovative Clean Transit (ICT) purchase requirements, bonus credits and compliance determinations. ARB staff confirmed at its ICT workshop held on June 13, 2018, that electric hybrid conversions to full electric vehicles will be counted as zero emission buses (ZEBs). As such, full electric conversions should continue

¹ Appendix D, Page D-48

² A hybrid electric excursion vessel on the San Francisco Bay, the Enhydra, traces its powertrain directly to the components used by BAE Systems to power 60-foot articulated electric hybrid transit buses. Appendix D, Page D-20.

Tech Example, Appendix D, Page D-49:

Transit Bus Powertrains Adaptable to Marine Platforms

“BAE Systems is one of the world’s largest technology companies that serves multiple industries. BAE is currently utilizing its multi-industry expertise to expand the application of electric bus powertrains. The company has adapted and transferred its bus powertrains to light rail, trucking, and marine applications.

“As an example, BAE Systems powertrains from 60-foot articulated transit buses are being used as the power and propulsion system for an electric-hybrid passenger vessel now in regular service in the San Francisco Bay. Red and White Fleet’s Enhydra electric hybrid passenger vessel operates with less noise and emissions, and operates at a higher efficiency, than its sister ships with conventional propulsion.

“Enhydra serves as one example of how this hybrid system can be used in multiple applications, greatly leveraging the initial engineering designs and expanding the applications that together can increase supply chain volumes.

“This same system can function either as the lone power source or as the HybriGen Assist system that provides electric power to larger vessels. BAE Systems has leveraged its market influence and the flexibility of its electric propulsion systems to expand into additional markets and provide more emissions- and fuel-reduction propulsion solutions.”

to be eligible under HVIP and counted as ZEBs in transit agencies' purchase requirements, bonus credits and compliance determinations.

- Amend the proposal to retain vouchers for new hybrid vehicles that will achieve at least 35 miles of all-electric range, consistent with the ARB-approved Innovative Technology Regulation (ITR), and instead retain vouchers for new hybrid vehicles that will achieve at least 30 miles of all-electric range, consistent with existing targets in the United Kingdom.
- Specify electric hybrid systems for marine sector be eligible under the HVIP program. ARB is relying upon electric hybrid systems developed for the transit sector to be transferred successfully to the marine sector and proposes funding for electric hybrid marine projects be continued in the out-years. Electric hybrid systems for new transportation sectors should be included in the final funding plan and not part of a proposed change to the HVIP program.

Thank you for your consideration of BAE Systems' comments to the Proposed Fiscal Year 2019-20 Funding Plan for Clean Transportation Incentives. We welcome the opportunity to answer questions on our comments and work with the ARB team to meet California's zero emission transportation objectives.

Sincerely,



Stephen J. Trichka
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BAE Systems

cc: R. Corey, ARB
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