



GE Transportation

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To: Ms. Lisa Jennings
California Air Resources Board
Air Pollution Specialists
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Date: March 21, 2018

Subject: GE EMD GP38/SD40 Tier 4 Modernizations – VW Switcher Funding Comment 8

Hello Lisa,

I greatly appreciate your February 15, 2018 response to my questions submitted to the VW Mitigation Trust comment docket, regarding the VW Consent Decree freight switcher definition and the likely addition of a freight switcher power cap restriction. GE respectfully requests your review and consideration of our recommendation not to implement a VW Mitigation Trust freight switcher power cap restriction, as summarized below.

GE believes that the VW Environmental Mitigation Trust provides California and other states a unique opportunity to modernize freight switcher locomotives used at railyards, while reducing emissions and improving air quality, including in areas that may be disproportionately impacted by air pollution. New Tier 4 locomotive technology – available from GE and other OEMs – offers reduced NOx and PM emissions, as well as fuel savings and associated GHG emissions reductions. Replacing uncertified (pre-Tier 0) switcher locomotives currently operating at most railyards in California with Tier 4 technology offers a number of environmental benefits. As CARB explains, these uncertified units typically consume 10,000 to 50,000 gallons of diesel fuel annually with medium horsepower units consuming 2 to 3 times as much fuel, making upgrades to Tier 4 technology a very cost-effective emission reduction strategy.

In this comment letter, GE respectfully requests CARB's consideration of a broader definition of freight switcher locomotive, as defined in the VW Consent Decree, to take into account the environmental benefits of upgrading existing switchers whether the final locomotive is certified to a Tier 4 switcher or Tier 4 linehaul duty cycle. This would allow for open participation of different Tier 4 upgrade technologies.

Freight Switchers under the VW Consent Decree

Based on the language of the VW Consent Decree, GE asks that CARB consider a broader interpretation of freight switchers to allow any Tier 4 locomotive technology to be eligible for VW Environmental Mitigation Trust funds if such project can demonstrate the

appropriate cost-effective emissions reductions sought by CARB as it determines how to allocate the VW trust funds. GE acknowledges that EPA's definition of "switch locomotive" includes a maximum rated power restriction of 2,300 horsepower ("HP") or less.¹ With that said, the VW Consent Decree did not include this maximum power restriction when describing eligible mitigation actions and expenditures available for freight switchers.² Additionally, Appendix D-2 of the VW Consent Decree defines "Freight Switcher" as "a locomotive that moves rail cards around a rail yard as compared to a line-haul engine that move freight long distances."³ Based on the language of the VW Consent Decree and technology options discussed below, GE believes that CARB could exercise its discretion more broadly interpreting freight switchers for purposes of the VW Environmental Mitigation Trust funds.⁴ Specifically, GE proposes that a locomotive need not be limited to 2,300 HP or less to be eligible for VW Environmental Mitigation Trust funds, as long as it meets the operational definition of a "freight switcher" as defined above.

Switcher Gross Horsepower (GHP) Rating

Traditionally, railroads used lower power rated switchers for yard switching operations. In today's market, however, railroads seek switcher locomotives with higher horsepower ratings to allow them greater operational flexibility. Although higher horsepower switchers are mostly used as yard switchers, they could also be used for local or branch line operations as required by railroad. Existing switcher locomotives have evolved into a wide range of HP ratings for this reason, including higher than 2300 HP. Specifically, there are approximately 6,000 locomotives with a power rating greater than 2,300 HP that are certified to US EPA line-haul emissions standards and typically used in switcher applications.

An emissions upgrade solution of an existing switcher locomotive is preferred by railroads at a higher HP rating to allow for usage in different operations. In accordance with the current emissions regulations⁵, a Tier 4 locomotive rated to greater than 2300 HP must be certified to the Tier 4 line haul duty cycle. Given the environmental benefit of modernizing these switchers to technology capable of meeting US EPA Tier 4 emission standards, GE believes that CARB should broadly define switch locomotives to include locomotives meeting Tier 4 emissions standards – whether certified to switch (<2300HP) or linehaul duty cycle (>2300HP).

Emissions Upgrade Technology Options

GE has observed that many higher speed engine applications on Tier 2 and Tier 3 switch locomotives do not appear to have been entirely successful; this is expected to be further complicated with a Tier 4 solution that incorporates exhaust aftertreatment.

¹ See 40 C.F.R. 1033.901 ("S

² See Appendix D-2, at 3-4, to First Partial Consent Decree in re: Volkswagen "Clean Diesel" Marketing, Sales Practices, and Products Liability Litigation, MDL No. 2672 CRB (JSC) (Dkt. No. 2103-1), Oct. 25, 2016.

³ See Appendix D-2, at 11, to First Partial Consent Decree.

⁴ GE notes that other clean diesel and emission reduction programs, such as the California Carl Moyer Program, Texas Emissions Reduction Incentive Grants Program, provide flexibility to fund emission reductions from locomotive projects regardless of the horsepower of the locomotive. For example, the Carl Moyer Program explains that "[a]lternative technology locomotives which are not switch locomotives may be considered for funding on a case-by-case basis. See Carl Moyer Program Guidelines, Chapter 11, at 11-6.

⁵ See 40 C.F.R. 1033.101

GE's understanding is that the corresponding complexity of such solutions has resulted in unacceptable performance of the pre-T4 upgraded switcher locomotive for the railroads in the past. Feedback from several railroads to GE is that the previously funded emissions upgrade programs have not been widely incorporated into these railroads' operations. GE has successfully developed a Tier 4 heavy haul freight locomotive design that does not use an exhaust aftertreatment system. This technology addresses some of the complexities understood to be inherent in the after-treatment based high speed engine upgrade solutions. This design architecture would be scaled for a switcher emissions upgrade with an offering that is rated at greater than 2300 HP and certified to Tier 4 line haul duty cycle. Multiple railroads have expressed a keen interest in the GE design offering for their switcher upgrades, as compared to the other offerings in the market. Deployment of the GE solution along with other Tier 4 higher horsepower freight switcher solution would be expected to generate higher utilization and respective environmental benefits.

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GET appreciates this opportunity to comment on the funding opportunities available under ARB's VW Environmental Mitigation Trust, and thanks the Board for its consideration. If you have any questions regarding these comments, please contact John McGowan at Richard.McGowan@ge.com or Jennifer Shea at Jennifer.Shea@ge.com.

Best regards,



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