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Subject: BATTERY NOT HYDROGEN for Line-Haul and Passenger Trains

Comment: Public Meeting to Consider the Draft 2022 Climate Change Scoping Plan, June 23, 2022

June 21, 2022:

by Phil Birkhahn, Co-Chair, Transportation Committee of San Diego 350

Change requested p. 58, "Freight and Passenger Rail, Line haul and passenger rail rely primarily on hydrogen fuel cell technology, and others primarily utilize electricity". CHANGE "Hydrogen" to "Battery electric or Hydrogen, depending on new analysis", not analysis done in 2016.

Change requested, Appendix C, p. 4, Table C-1, "Line haul and passenger rail rely primarily on hydrogen fuel cell technology, and others primarily utilize electricity". CHANGE "hydrogen" to "ZEV" in all four Scenarios.

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Assuming hydrogen-powered trains is speculative. Meanwhile, battery powered trains are lower cost and feasible now, depending on getting a fair trial on California rail routes.

Battery trains are likely to cost about one-fourth less than hydrogen trains, just like found in other heavy-duty land transportation such as Class 8 trucks and buses. Achieving tolerable operating cost also requires huge reductions in hydrogen cost promised by 2030, but success of that is speculation.

Doubling battery capacity by 2030 is a better bet because of rapid capacity and charge-time progress on a vast front. So is eliminating plug-in and overhead charging by 2030 using magnetic resonance or inductance charging that can charge trains moving at their normal operating speed with no connection at all. Hydrogen can never do that.

Yet battery trains are not in the plan, while hydrogen trains are. Battery-powered trains deserve to be included in all scenarios until the technologies sort themselves out, probably in favor of battery trains. Other heavy-duty vehicles like transit buses are already pushing hydrogen aside as transit agencies vote with their feet. As of 2020, 551 battery buses were in service and just 38 hydrogen buses (UC Davis). Plans for 2023 were to add 531 more battery buses and just 8 more hydrogen buses.

Assigning trains to hydrogen is a rare misstep in the Scoping Plan Draft and California's Zero Emission Vehicle programs. Correct this by adding battery train pilot projects and subsidies comparable to the hydrogen train program. Call them ZEVs in the Scoping Plan instead of preempting for hydrogen.

CARB's hybrid freight train pilot with BNSF from Barstow over Tehachapi to Sacramento is a start but replaces only small part of the diesel. It ignores the potential for batteries to replace diesel across the full spectrum of rail transportation for freight and passengers, starting with routes of a few hundred miles.

#### REFERENCES

University of California Davis, 2021, CalTrans Research Report: Fuel Cell Electric Bus, Battery Electric Bus, and Battery Electric Train Infrastructure, p. 2.