April 27, 2018

Division of Air Quality
Delaware Department of Natural Resources and Environmental Control
100 West Water Street, Suite 6A
Dover, DE 19904

RE: Comments Regarding Proposed Beneficiary Mitigation Plan

The Fuel Cell and Hydrogen Energy Association (FCHEA) appreciates the opportunity to comment on the Delaware Department of Natural Resources and Environmental Control, Division of Air Quality's proposed Beneficiary Mitigation Plan ("Plan").[1] The plan is provided by Appendix D of the Partial Consent Decree stemming from Volkswagen "Clean Diesel" Marketing, Sales Practices and Products Liability litigation (United States of America v. Volkswagen AG et al., Case No. 16-cv-295 (N.D. Cal.).[2]

1. Phased Funding Approach and Eligible Applicants

The Plan describes three phases of funding specific activities. In Phase One (2018-2019), the Plan proposes to replace old diesel school buses with new propane school buses; in Phase Two (2019-2020), the Plan proposes a competitive RFP for projects in all categories; in Phase Three (2020-2021), the Plan will allocate 15 percent of the funds for electric vehicle supply equipment (EVSE) and evaluate Phase One and Two to develop a path forward to best fit Delaware's needs with the remaining funds.

FCHEA urges the Plan be revised to fund EVSE in Phase Two (2019-2020). Doing so will advance nitrogen oxides emission reduction by funding zero emission vehicle (ZEV) recharging and refueling infrastructure during the period private investment will be expanding their now-nascent networks. Further, as hydrogen demand grows, producers and infrastructure developers can achieve improved project efficiencies and cost reductions. For instance, cost reductions result when hydrogen producers can supply both light-duty vehicle refueling station networks and separate infrastructure for refueling hydrogen-powered heavy-duty trucks, commercial buses, materials handling equipment and airport ground support equipment.

[1] "Proposed Environmental Mitigation Plan," March, 2018
http://www.dnrec.delaware.gov/Air/Documents/Proposed_Draft_VW%20Mitigation%20Plan%20vFinal.pdf
[2] "Appendix D-2, Eligible Mitigation Actions and Mitigation Action Expenditures," United States of America v. Volkswagen AG et al., Case No. 16-cv-295 (N.D. Cal.)
https://www.vwcourtsettlement.com/en/docs/DOJ/Approved%20Appendix%20D-2.pdf

Fuel cell technologies have the scope and demonstrated capabilities to mitigate diesel emissions in each of the application categories described in the Plan. Fuel cell-powered trucks are operating in leading U.S. ports. Fuel cell electric buses (FCEB) are in transit, shuttle, and student transportation operations in twelve States. Fuel cells power cargo tractors at Memphis (TN) International Airport, and forklifts operating in warehouses, distribution centers and ports nationwide. More than 4,400 light-duty fuel cell electric vehicles (FCEV) have been purchased or leased in California today, and later this year FCEV will be available in one or more key Northeast market areas.[3] Companies with a Delaware presence have active fuel cell presence include W.L. Gore and Air Liquide. There is also on-going fuel cell and hydrogen research being conducted at the University of Delaware. Accordingly, FCHEA applauds DENRC for including in the Plan all of the categories of Eligible Mitigation Actions described in Appendix D-2.[4]

2. Request for Proposal (RFP) Award Criteria

The Plan describes selection criteria for Phase Two projects. FCHEA endorses the criteria and the weighting assigned because fuel cell technologies have the demonstrated capabilities to replace on-road and non-road diesel vehicles and engines regularly operating in or near areas that bear a disproportionate share of the air pollution burden.

As noted above, fuel cells power trucks, buses, cargo tractors and forklifts successfully operate in ports, airports and warehouse distribution centers. Because these facilities are often located in areas with high population and/or traffic density, the use of fuel cell powered engines and vehicles at such sites address those concerns.

Fuel cell technologies are at the forefront of innovation and sustainability. Seeking to promote innovation in energy supply, leading global energy, transport, and industrial companies have pledged to accelerate their investments in hydrogen and fuel cell development and commercialization.[5] In the United States, U.S. Department of Energy programs have advanced innovation by successfully generating more than 580 patents, more than 30 commercial technologies, and 65 technologies that are expected to reach commercial scale within the next three to five years.[6]

Hydrogen-powered fuel cells are two to three times more efficient compared to internal combustion engines. Fuel cells do not emit any greenhouse gases (GHG) during operation.

[3] "Report to U.S. Dept. of Energy Hydrogen Technical Advisory Cmte.," California Fuel Cell Partnership, May, 2017 https://www.hydrogen.energy.gov/pdfs/htac_may17_14_white.pdf
[4] "Appendix D-2, Eligible Mitigation Actions and Mitigation Action Expenditures"
[5] "How Hydrogen Empowers the Energy Transition," The Hydrogen Coalition, January, 2017 http://hydrogencouncil.com/
[6] "Pathways to Commercial Success: Technologies and Products Supported by the Fuel Cell Technologies Office," U.S. Department of Energy, Page 3-2 https://energy.gov/sites/prod/files/2016/02/f29/fcto_2015_pathways_commercial_success.pdf

Depending on how the hydrogen is produced, there are substantially fewer or no upstream GHG emissions compared with fossil fuels.[7]

Hydrogen refueling infrastructure ("networks") can be deployed in a timely manner. Twenty-four months are typically needed to construct a refueling station, according to an analysis by the California Energy Commission.[8] FCHEA member companies, representing the complete fuel cell and hydrogen supply chain, have significant subject matter expertise regarding fuel cell application and infrastructure design, planning, and implementation. FCHEA member companies look forward to sharing their expertise with the DNREC as projects are designed, planned, and implemented.

3. Dedicate an Impactful Portion of ZEV EVSE Funds to FCEV Refueling

Volkswagen's announced National ZEV Investment Plan seeks to increase access to Battery Electric Vehicle (BEV) recharging infrastructure. Significantly, the Plan makes no investment in hydrogen refueling stations (HRS). Accordingly, FCHEA urges DNREC's Plan allocate a portion of ZEV EVSE funds for FCEV refueling infrastructure.[9] Further, FCHEA urges the portion be impactful, capable in volume capacity and station count to help advance the expansion of the a network linking Northeastern and Mid-Atlantic population centers. Together, the Plan-funded and private-funded stations will promote consumer interest in FCEV and help attract additional private investment for use in future network expansion.

4. Funding EVSE Infrastructure for FCEV is Feasible and Prudent

Several factors make funding EVSE infrastructure for FCEV feasible and a prudent use of Plan monies. First, consumer understanding of and interest in ZEV is growing.[10] Increasingly, consumers include vehicle efficiency and new technology features as key purchase factors. Here, FCEV excel, offering 300-400 miles of driving range per tank, refueling in less than five minutes and operating quietly with highly responsive performance characteristics. FCEV are safe, reliable and require little maintenance.

Second, a dynamic regulatory environment is working to accelerate hydrogen fuel cell commercialization. National standards for hydrogen quality and refueling station safety have

[7] "Hydrogen Fuel Cell Vehicles," Center for Climate and Energy Solutions
https://www.c2es.org/technology/factsheet/HydrogenFuelCellVehicles
[8] "Joint Agency Staff Report on Assembly Bill 8: 2016 Assessment of Time and Cost Needed to Attain 100 Hydrogen Refueling Stations in California," January, 2017, Page 22
http://www.energy.ca.gov/2017publications/CEC-600-2017-002/CEC-600-2017-002.pdf
[9] "Appendix D-2, Eligible Mitigation Actions and Mitigation Action Expenditures," Page 8.
https://www.vwcourtsettlement.com/en/docs/DOJ/Approved%20Appendix%20D-2.pdf
[10] "Monthly Plug-In Sales Scorecard," Inside EVs
http://insideevs.com/monthly-plug-in-sales-scorecard/

been set. California's hydrogen metrology standard can serve as a model for other States. States and municipalities are evaluating roadway access and transport rules to assure facility safety and to improve the efficient movement of hydrogen.

Third, State policymakers have ready access to network planning expertise. Station developers with "real world" experience gained from planning and building California's hydrogen station network are available to share best practices. The U.S. Department of Energy-affiliated research laboratories provide sophisticated technical services; for instance, network planning tools that model preferred station locations, hydrogen production, and FCEV costs.

Fourth, stakeholders are working to establish a coalition to advocate for public policies that will foster the creation of a network linking major Northeastern population centers. To fulfill the vision, stakeholders - hydrogen producers, vehicle manufacturers, fuel cell supply chain providers, federal energy laboratories, clean energy advocates and others – are developing a plan ("roadmap") describing strategies and resources for growing the network through enactment of needed public policies. These include policies to create public investment and facilitate station site and construction reviews by local building officials. In June of 2017, coalition leaders briefed State policy makers, describing current network development activities and pledging future collaboration and communication.

Finally, hydrogen producers, fuel cell manufacturers, and infrastructure component manufactures are capable of utilizing eligible Mitigation Actions to deliver projects successfully. Hydrogen producers include highly capitalized multi-national industrial gas companies, and leading global automakers have FCEV development programs. Together they are estimated to have invested more than $9 billion to improve technical performance and manufacturing efficiencies.[11] Since 2014, non-government entities have invested more than $96 million in a growing network of hydrogen refueling stations in California.[12] As the hydrogen fuel cell supply chain rapidly matures, hydrogen refueling station construction costs and completion times are shrinking, hydrogen production costs are dropping, and new production processes have enhanced renewable hydrogen availability.[13]

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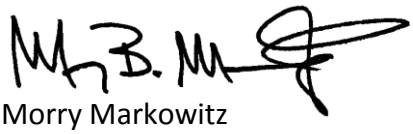
[11] "The Hydrogen Transition: This Time, for Real?," Institute of Transportation Studies. Retrieved June 28, 2017
https://its.ucdavis.edu/blog-post/the-hydrogen-transition-this-time-for-real/
"Fuel Cell Electric Vehicles," H_2USA. Retrieved June 28, 2017
http://h2usa.org/fuel-cell-electric-vehicles

[12] "2016-2017 Investment Plan Update for the Alternative and Renewable Fuel and Vehicle Technology Program," California Energy Commission, May, 2016, Page 20
http://www.energy.ca.gov/2015publications/CEC-600-2015-014/CEC-600-2015-014-CMF.pdf
"Grants Approved for Northern California Hydrogen Stations," California Energy Commission, August 9, 2017
http://www.energy.ca.gov/releases/2017_releases/2017-08-09_grants_forest_waste_to_energy_nr.html

[13] "Joint Agency Staff Report on Assembly Bill 8: 2016 Assessment of Time and Cost Needed to Attain 100 Hydrogen Refueling Stations in California," January, 2017, Page 2
http://www.energy.ca.gov/2017publications/CEC-600-2017-002/CEC-600-2017-002.pdf

Thank you for your consideration of these comments. If you have any questions, please contact me at mmarkowitz@fchea.org.

Sincerely,



Morry Markowitz
President
Fuel Cell and Hydrogen Energy Association

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FCHEA is the trade association dedicated to the commercialization of fuel cells and hydrogen energy technologies. FCHEA member organizations represent the full global supply chain for hydrogen and fuel cells, including automakers; material, component, fuel cell stack and system manufacturers; hydrogen producers and energy companies; utilities; and end users.