

Comment Letter #93



BUILDING A STRONGER L.A.

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October 18, 2022

Dr. Sang-Mi Lee
Planning and Rules Manager, Rule Development and Implementation
South Coast Air Quality Management District
21865 Copley Dr
Diamond Bar, CA 91765-0830

Subject: Comments on the Revised 2022 Air Quality Management Plan

Dear Dr. Lee:

The Los Angeles Department of Water and Power (LADWP) appreciates the opportunity to provide comments on the 2022 South Coast Air Quality Management Plan (AQMP). LADWP recognizes the significant work the South Coast Air Quality Management District (SCAQMD) has invested in development of this AQMP and looks forward to additional refinements to ensure successful attainment of air quality standards in a cost-effective manner.

In response to SCAQMD's request for stakeholder input, LADWP offers the following comments on five proposed Control Measures in the Revised Draft 2022 AQMP.

L-CMB-06: NOx Emission Reductions from Electricity Generating Facilities

Electricity generating units must comply with the Rule 1135 NOx emission limits by December 31, 2023. LADWP is currently implementing projects that involve equipment testing and modifications in order to comply with this rule. The draft AQMP's proposal to require further emission reductions would be difficult to achieve for facilities still trying to meet the Rule 1135 requirements. LADWP appreciates SCAQMD's consideration of the potential for stranded assets, and the incorporation of stranded asset costs as part of the cost-effectiveness calculations, noting that the cost-effectiveness for measure L-CMB-06 is already considerable at \$722,000 per ton of nitrogen oxides (NOx) reduced.

LADWP requests clarification whether the combustion of hydrogen-blended natural gas fuel in electricity generating units fits under control measure L-CMB-06, or whether a separate category of emerging technologies needs to be explored for the use of hydrogen fuel.

The Los Angeles 100% Renewable Energy Study (LA100) explored pathways for LADWP to achieve a 100% renewable and carbon-free electricity supply as early as 2035. The LA100 scenarios recognize the need for dispatchable combustion-based electricity generating units located within the Los Angeles Basin to meet the last 10 to 20 percent (%) of electricity demand that is not feasible to supply from wind, solar, and batteries. All LA100 scenarios rely on the emerging technology of hydrogen combustion to generate electricity by 2045, making hydrogen a crucial aspect in maintaining grid reliability. The use of hydrogen is necessary to reduce

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greenhouse gas emissions to achieve the goals of the California Air Resources Board's (CARB) AB 32 Climate Change Scoping Plan, which lays out a path to achieve carbon neutrality no later than 2045. By 2045, LADWP is planning to have sufficient carbon-free generation to serve its load, as well as, hydrogen-fueled local generating capacity to ensure a reliable electricity supply during all hours of the year including periods of high electricity demand and emergency situations.

Combustion turbines fueled with green hydrogen will not generate greenhouse gas (GHG) emissions because the hydrogen is produced from electrolysis of water powered by renewable electricity, and combustion of hydrogen does not result in carbon dioxide emissions. Studies are being conducted to monitor NO_x emissions from combustion of hydrogen blended with natural gas. A preliminary study with General Electric (GE) shows positive results for NO_x emissions not significantly increasing during steady-state operations relative to normal natural gas-fired operations. The New York Power Authority (NYPA), Electric Power Research Institute (EPRI), and GE led a pilot project¹ focused on hydrogen-fueled power generation by operating a combustion turbine on hydrogen blended with natural gas, ranging from 5% to 44% hydrogen. By increasing water injection rates, GE was able to maintain NO_x levels at a constant level as hydrogen fuel increased to greater than 35% by volume. In addition, as the hydrogen fuel percentage increased with steady water injection, the NO₂/NO_x levels decreased by up to 61%, which benefits turbine turndown capability.

While the pilot project was done with wet combustion, LADWP plans to use dry combustion for its hydrogen/natural gas fueled combustion turbines. NO_x emissions will be controlled by installing additional selective catalytic reduction catalyst and other controls such as low NO_x combustors and ammonia reagent. LADWP expects the hydrogen-fueled combustion turbines will maintain the SCAQMD permit limits that govern operations during startup, shutdown, and normal operations. In addition, a new method for measuring NO_x emissions will be used to accurately quantify emissions when combusting hydrogen; this new method will be discussed at the upcoming Air & Waste Management Association West Coast Section Annual Conference on October 20, 2022.

Having a reliable electricity supply is essential to support electrification, which is a key strategy to reduce emissions in other sectors of the economy. SCAQMD has stated that electric technology options will be required for residential and commercial water heating, space heating, cooking devices, non-emergency internal combustion engines, large turbines, and petroleum refineries. As vehicles, homes and businesses transition from other fuels to electricity, the demand for electricity is expected to grow 59%-84% statewide according to CARB's scoping plan modeling data. To serve the expected increase in electricity demand, electric utilities must plan for adequate generating capacity and resiliency to ensure a reliable electricity supply. The pressing need for utilities to "keep the lights on" has become even more pronounced in light of the recent heat wave and the Governor's emergency proclamation. Hydrogen will provide a

¹ 1. Martz T, Steele T (2022) Hydrogen Cofiring Demonstration at New York Power Authority's Brentwood Site: GE LM6000 Gas Turbine. EPRI Report 000000003002025167, EPRI. Available at <https://www.epri.com/research/products/000000003002025167> [Verified 13 October 2022].

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reliable and carbon-free path forward to ensure a reliable electricity supply, and is a resource that should be embraced on the path to achieving attainment. LADWP would be happy to provide more information about the research conducted and hydrogen options explored by LADWP, as well as, the LA100 study which highlights hydrogen as a crucial element in the decarbonized future electricity supply for Los Angeles. At the time of the LA100 study, hydrogen is the only known technology that can provide dispatchable generating capacity at the scale needed within the Los Angeles basin, to achieve the Los Angeles City Council goal of a carbon-free electricity supply by 2035. However, achieving this goal depends on hydrogen fuel being delivered to our Los Angeles Basin generating stations.

L-CMB-04: Emission Reductions from Emergency Standby Engines

LADWP requests clarification of the emissions inventory estimates on which the proposed emission reductions are based, and the cost of the emergency engine replacement strategy.

Table L-CMB-04-A shows Total NO_x emissions from diesel emergency internal combustion engines (ICEs) to be 2.6 tons per day. This value appears rather high; LADWP's emergency engines typically operate (on average) 20 to 30 hours per year. When estimating the emission inventory, if SCAQMD assumed 200 hours of operation per year which is the permitted maximum, this assumption would over-estimate actual emissions because emergency engines typically operate only a fraction of the permitted hours. If SCAQMD applied the default NO_x emissions factor of 469 lbs/1000 gallons diesel to all engines, that also would over-estimate actual emissions. LADWP recommends utilizing engine-specific emission data when available, such as engine-specific emission data that was gathered for the Rule 1470 compliance plan and manufacturer emission data for certified engines. In addition, Annual Emission Reports (AER) for each diesel ICE will be submitted in March 2023 under the CARB Regulation for the Reporting of Criteria Air Pollutants and Toxic Air Contaminants, so SCAQMD will soon have a more accurate emission inventory for the diesel ICEs. If NO_x emissions from diesel ICEs are over-stated, then the expected emission reductions from this control measure may not be real. LADWP recommends that SCAQMD recalculate the expected emission reductions for Control Measure L-CMB-04 using the 2022 AER data, then re-evaluate whether replacement of existing emergency engines is worthwhile.

In addition, LADWP encourages SCAQMD to consider the cost effectiveness of requiring replacement of emergency engines that have low annual usage (e.g., 20-30 hours per year). With regards to replacement of CARB Ultra Low Sulfur Diesel fuel with renewable diesel for emergency engines with low annual usage, LADWP asks SCAQMD to specifically address and verify that renewable diesel fuel is stable enough to be stored in the emergency engine's fuel tank for an extended time (several years) without turnover and still remain viable. LADWP has experienced firsthand the challenges of trying to operate our emergency engines on biodiesel, which created serious reliability issues and in some cases the biodiesel clogged the fuel lines and made the emergency engines inoperable. While we recognize that renewable diesel is different than biodiesel, LADWP is concerned that renewable diesel has not been proven effective for use in emergency engines with low fuel turnover.

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Reliability of emergency engines is important to operate our critical back-up generators and pumps when called upon to maintain pressure in the water distribution system for firefighting purposes and delivery of safe treated drinking water in the event of an emergency such as a power outage, breakdown of electric water pumps/treatment equipment, or natural disaster such as an earthquake. Therefore, the feasibility study for use of renewable diesel should evaluate scenarios where the emergency engines have low usage, as well as older engines that specifically require diesel fuel only, and determine if there are any impacts with respect to low fuel turnover, long term fuel storage, use, and emergency operation of engines. Moreover, the feasibility study for replacement of water utility emergency standby engines should carefully assess reliability, fast response capability, and operation for an extended period of time to ensure continued supply of safe drinking water and for critical firefighting purposes. LADWP also recommends including a technical infeasibility exemption from the engine replacement requirement, similar to other rules such as SCAQMD Rule 1196 (for clean on-road heavy-duty public fleet vehicles).

C-CMB-02: Emission Reductions from Replacement with Zero Emission or Low NOx Appliances – Commercial Space Heating

On behalf of our business customers, LADWP thanks SCAQMD for acknowledging that the commercial market for heat pumps is not as mature as the residential market, and therefore implementation of the zero NOx emission standard for commercial space heating and cooling would start later than those for residential buildings.

LADWP continues to recommend against imposing a mitigation fee for low NOx appliances. Since there are few zero emission appliances currently available in the market, this mitigation fee will be an unnecessary financial burden for our customers.

CTS-01: Further Emission Reductions from Coatings, Solvents, Adhesives, and Lubricants

LADWP appreciates SCAQMD considering the needs of public service utilities to use denatured alcohol for cleaning specific types of equipment used in the electric grid and drinking water treatment systems. Denatured alcohol is specified in the original equipment manufacturer (OEM) instructions for cleaning of Sulfur Hexafluoride (SF6) gas-insulated electrical circuit breakers (used in the electric grid) and ozone generators (for the treatment of potable water). Denatured alcohol dries quickly and does not leave a residue which is a key consideration for cleaning sensitive equipment, since residue provides a pathway for conducting electricity which could have catastrophic results. If the equipment is not properly maintained per the OEM's instructions, the equipment's warranty could be declared void, compelling equipment owners/operators to use denatured alcohol to ensure continued warranty coverage. The California Air Resources Board recognized utilities' need to use denatured alcohol per the OEM's instructions, so in the recent amendments to the Consumer Products Regulation, CARB specifically excluded from the definition of "Multi-purpose Solvent" denatured alcohol products sold to a public utility and used to maintain electrical equipment that is owned by a "Public Utility", and where the equipment manufacturer states that maintenance can only be performed with denatured alcohol.

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In response to SCAQMD's suggestion to use semi-conductor grade acetone as a substitute for denatured alcohol, LADWP reached out to SF6 gas-insulated circuit breaker manufacturers to inquire if semi-conductor grade acetone could be used. The response was that acetone could be used to clean surfaces **external** to the gas space, but only denatured alcohol is approved to clean the O-rings, interrupter components and solid support insulators **internal** to the gas compartment. In addition, use of acetone is not recommended to clean composite hollow core insulators (Bushing insulators) to guard against possible degradation of the hydrophobic effect of the silicone sheds. LADWP also reached out to the manufacturer of the ozone generators and was informed that acetone is not approved for maintenance, therefore they do not recommend its use.

LADWP requests the Rule 1171 exemption (g)(4) be modified to include liquid as well as aerosol products. Since the previous supplier that packaged denatured alcohol in aerosol cans went out of business, it has been difficult to find another supplier willing to "can" the product. In addition, utilities prefer to use denatured alcohol in liquid rather than aerosol form, because liquid is safer to use around electrical equipment (from a flammability perspective), avoids atomization of the product, provides better transfer efficiency for wipe cleaning, has no propellant, generates no aerosol can waste, and has a lower cost. For maintenance of ozone generators, a specific exemption will be needed since a larger quantity of denatured alcohol is needed to do the job, but the emissions impact is small since the recommended cleaning frequency is once every five to fifteen years.

FUG-02: Emission Reductions from Industrial Cooling Towers

As SCAQMD considers a technology assessment to evaluate controls and practices to reduce VOC emissions from industrial cooling towers and potential cooling tower rule development, LADWP requests that SCAQMD consider land availability and the potential for reduction in efficiency. Monitoring and control equipment will potentially require additional land for which space considerations must be evaluated. In addition, cooling towers are operated to maximize the heat transfer from the working fluid. Installing monitoring and control equipment and mandating certain ways of operation may interfere with the current, optimized cooling tower operations.

In closing, your consideration of these comments on the Revised Draft 2022 AQMP is appreciated. If you have any questions or would like additional information, please contact Ms. Andrea Villarin, of my staff, at (213) 367-0409 or Ms. Tejasree Ganapa, of my staff, at (213) 367-6332.

Sincerely,

Katherine Rubin Digitally signed by Katherine Rubin
 Date: 2022.10.18 14:07:57 -07'00'

Katherine Rubin
 Director of Environmental Affairs

TG:cy
 Enclosures
 c/enc: Ms. Andrea Villarin
 Ms. Tejasree Ganapa