



SUBMITTED ELECTRONICALLY

October 25, 2024

Kevin Greener
New Jersey Department of Environmental Protection
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RE: Clean Energy Group Comments on Draft Air Pollution Control Operating Permit Significant Modification for Passaic Valley Sewage Commission Proposed Standby Generating Facility

Dear Mr. Greener,

Clean Energy Group (CEG) respectfully submits these comments in response to the Draft Air Pollution Control Operating Permit Significant Modification¹, issued to the Passaic Valley Sewage Commission (PVSC) and posted on August 23, 2024. These comments reflect the position of CEG, a national nonprofit organization that has been advocating for an equitable clean energy transition since 1998. These comments do not necessarily reflect the position of CEG's partner organizations or funders.

Through the multi-year [Phase Out Peakers](#) initiative, CEG works in conjunction with organizations representing low-income communities and communities of color to accelerate the retirement of polluting fossil-fuel peaker plants, including modelling the effective deployment of energy storage and renewable generation to replace peaker plants nationally, including in New York City². This work is informed by CEG's [Resilient Power Project](#), which accelerates the equitable deployment of solar and battery storage (solar+storage) technologies in historically marginalized communities advancing policies and programs that ensure more equitable access to solar+storage technologies, including highlighting the value of solar+storage for power outage response. Through the work of Phase Out Peakers and the Resilient Power Project, CEG has repeatedly demonstrated

¹ Latourette, Shawn M. *Air Pollution Control Operating Permit Significant Modification*, August 28, 2024. <https://dep.nj.gov/wp-content/uploads/boss/public-notices/07349-bop210002-draftpermit.pdf>

² PEAK Coalition. *The Fossil Fuel End Game: A Frontline Vision to Retire New York City's Peaker Plants by 2030*, March 2021. <https://www.cleanegroup.org/publication/fossil-fuel-end-game/>

that not only can battery storage paired with renewable generation effectively replace fossil fuel assets, but that in doing so it can provide additional resiliency benefits.

Resilience

Per the GR2 Environmental Justice Special Conditions listed in the Draft Permit, PVSC is permitted to operate the proposed standby generating facility, which includes three 28 megawatt (MW) natural gas-fired combustion turbines generators, two 2 MW natural gas-fired emergency black start generators, and two 147 kilowatt (kW) diesel-fired emergency fire pump engines, for up to 48 hours in advance of a storm event, or a total of 960 hours annually, based on an estimate of 10 storm outage events per year³, indicating that the facility is anticipated to provide backup generation for an average period of approximately 96 hours during outage events. In the Compliance Statement provided in its Title V Operating Permit Significant Modification Application, PVSC stated: “The PVSC Wastewater Treatment Plant historical average and maximum electrical power demand is 23 megawatts (MW) and 29 MW, respectively. The current planned power consumption is 34 MW to accommodate new flood mitigation measures being implemented under the FEMA Resiliency Program,”⁴ indicating that the facility typically operates at an average demand of 23 MW and may increase its maximum demand to 34 MW due to planned modifications.

PVSC has not provided sufficient evidence that the proposed three 28 MW combustion turbines are necessary to meet an anticipated maximum demand of 34 MW during a 96-hour outage period, nor has adequate evidence been provided that natural gas-fired combustion turbines are the best technology to reliably provide adequate backup generation during an outage period. During severe weather events, gas-powered generation is only as reliable as the gas supply, which can be disrupted due to freezing conditions, flooding, or other weather conditions, as seen in recent national disasters such as Winter Storm Uri⁵ or Hurricane Milton⁶, or historically during Superstorm Sandy. Unlike fuel-reliant technologies, solar+storage technology can operate independent of the grid and fuel supply chains, and if adequately sized can supply power to the entire facility for short-to-medium duration outages. Longer-duration storage technologies, such as Form Energy’s iron air battery, which can supply up to 100 hours of resilience, are also quickly

³ Latourette, pg 19.

⁴ Passaic Valley Sewage Commission. *Standby Power Generation Facility Project Program Interest ID No. 07329 BOP 190004, AO 2021-25 Compliance Statement*, pg 33. July 2, 2021.

⁵ Kennedy, Ryan. “Climate, the Texas Grid, and Solar + Batteries to the Rescue.” *PV Magazine*, May 13, 2022. <https://pv-magazine-usa.com/2022/05/13/climate-the-texas-grid-and-solar-batteries-to-the-rescue/>.

⁶ Elassar, Ashley R. Williams, Brian Abel, Amanda Musa, Alaa. “Floridians Return Home to Clean up from Two Hurricanes, with Gas and Power in Short Supply.” CNN, October 10, 2024. <https://www.cnn.com/2024/10/13/us/hurricane-milton-florida-recovery-sunday/index.html>.

reaching maturity⁷. Reflecting these advancements in battery storage technology, the Federal Emergency Management Agency (FEMA) has expanded its definition of eligible secondary power sources for resilience funds to emphasize the use of solar, battery storage, and microgrid technologies⁸. This expanded definition would apply to any secondary power sources developed using the \$300 million in hazard mitigation funds PVSC received from FEMA following Superstorm Sandy⁹.

Development of a 34 MW, four-hour duration battery storage system on-site at PVSC within the 1.5-acre footprint of the proposed standby facility would be feasible. Analysis conducted on the feasibility of large-scale battery storage development in high-density areas in New York City found that four-hour duration storage projects can have a density of 23 to 30 MW per acre, or up to 40 MW under certain conditions¹⁰. PVSC has indicated that up to seven acres of property is available for development, which would allow for the development of a much longer-duration battery storage system and possible on-site solar. The addition of on-site solar generation would further extend the duration of backup power the battery system would be able to provide. Developing a 34 MW battery storage system, in addition to providing resilient backup power, would also eliminate the need for the standby facility to operate for 48 hours prior to an anticipated storm outage event, as currently outlined in the Draft Permit. Unlike gas turbines, batteries can instantaneously provide maximum power to a facility to prevent uncontrolled shutdown in the event of a power disruption. A battery system would be able to meet the energy needs of the facility during regular power outages and would provide ample time to adjust operations to reduce demand and/or pursue alternate energy sources such as mobile generators in the unlikely event of an extended outage. If solar is added to the system, the duration of backup power would be extended even further, as the batteries would be able to charge on-site even if grid power is not available.

Environmental Justice Conditions

CEG strongly objects to several of the Environmental Justice Special Conditions included in the Draft Permit, particularly Special Conditions 8-10. Special Conditions 8 and 9 state that the PVSC will be required to install a minimum of 5 MW of solar and 5 MW of battery storage at the facility by December 31, 2026¹¹. While solar+storage technology can provide

⁷ Knapschaefer, Johanna, and Debra Rubin. "Long Duration Battery Storage Developer Hits Milestones on Projects, Fund-Raising." *Engineering News Record*. Accessed October 23, 2024. <https://www.enr.com/articles/59514-long-duration-battery-storage-developer-hits-milestones-on-projects-fund-raising>.

⁸ FEMA.gov. "B.11. Secondary Power Source," March 3, 2024. <https://www.fema.gov/grants/mitigation/guide/part-12/b/11>.

⁹ FEMA.gov. "Sandy Funding and Program Coordination Continue to Support Resiliency in New Jersey and New York," January 1, 2015. <https://www.fema.gov/blog/sandy-funding-and-program-coordination-continue-support-resiliency-new-jersey-and-new-york>.

¹⁰ New York Power Authority. *Small Clean Power Plant Adaptation Study*, April 2022. <https://www.nypa.gov/-/media/nypa/documents/document-library/NYPA-SCPP-Adaptation-Study.pdf>

¹¹ Latourette, pg. 22.

emissions-free renewable power to the facility, the minimum standard of 5 MW of solar panels and battery storage is not enough to meaningfully reduce emissions from the three 28 MW natural gas turbines, nor have any requirements regarding the use of solar+storage to reduce emissions been established. In an analysis of emissions from hybrid solar+storage and fossil fuel power plants since 2018, CEG found that in hybrid gas turbine and battery systems in which the battery storage asset was sized to be significantly smaller than the gas turbine, emissions remained the same or worse than in non-hybrid plants¹². Furthermore, unless the system is configured such that the battery is called upon before the gas turbine, emissions reductions are minimal at best¹³. As mentioned above, there is adequate space available within the footprint of the proposed facility for a much larger battery system as well as on-site solar panels. If Special Conditions 8 and 9 are intended to reduce the air pollution burden the proposed facility will place on the already overburdened environmental justice communities of Newark, the minimum size of the battery storage system should be at least 23 MW, and the minimum size of the solar should be 10 MW. Furthermore, PVSC should be required to call on the battery storage system first for backup power in the event of an outage, with the proposed gas turbines only being called upon in the event of a longer duration outage.

CEG also strongly objects to Special Condition 10, which states that the PVSC shall transition the proposed natural gas turbines to green hydrogen or another technically feasible renewable energy resource within 120 days of commissioning the standby facility¹⁴. In the Compliance Statement provided in its Title V Operating Permit Significant Modification Application, PVSC stated that the manufacturer was confident that the proposed turbines “will accept 65% hydrogen, with the goal of being 100% hydrogen capable by 2030.”¹⁵ It should be noted that, while the manufacturer of the proposed turbines was not disclosed, a comparable hydrogen-capable turbine manufactured by GE Vernova is only capable of combusting up to 50 percent hydrogen, and does not currently have an available timeline for 100 percent hydrogen combustion¹⁶. Because hydrogen is less energy dense than natural gas, combusting a blend of hydrogen and natural gas will not lead to a one-to-one reduction in carbon emissions. This, combined with hydrogen’s role as an indirect greenhouse gas which extends the lifetime of methane in the atmosphere, means that combusting a blend of 50 percent hydrogen would only lead to a 10 percent reduction in lifecycle greenhouse gas emissions¹⁷. Additionally, when combusted hydrogen produces six times as much of the harmful air pollutant nitrogen

¹² Ramanan, Abbe. “The Promise and Pitfalls of Fossil Power Plant Hybridization with Energy Storage.” Clean Energy Group, July 25, 2024. <https://www.cleanegroup.org/the-promise-and-pitfalls-of-fossil-power-plant-hybridization-with-energy-storage/>.

¹³ Ramanan.

¹⁴ Latourette, pg. 23.

¹⁵ Passaic Valley Sewage Commission, pg. 33.

¹⁶ GE Vernova. “9HA Gas Turbine | 9HA.01 and 9HA.02.” Accessed October 24, 2024. <https://www.gevernova.com/gas-power/products/gas-turbines/9ha>.

¹⁷ DiChristopher, Tom. “Hydrogen Blending in Gas Pipelines Faces Limits Due to Leakage: US DOE Lab,” October 27, 2023. <https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/natural-gas/102723-hydrogen-blending-in-gas-pipelines-faces-limits-due-to-leakage-us-doe-lab>.

oxide (NOx) as natural gas¹⁸. Even in hydrogen-capable combustion turbines in which air pollution control technologies can be effectively applied, NOx emissions will remain the same as that of a newer natural gas plant, consigning nearby communities to decades more of harmful pollution¹⁹. Switching the proposed turbines to combust green hydrogen fuel will not alleviate the environmental justice concerns related to this development and may even worsen conditions for nearby communities.

Considering the above concerns, CEG strongly recommends that the New Jersey Department of Environmental Protection rescind the Draft Permit and direct PVSC to explore the feasibility of clean energy alternatives, primarily solar and battery storage. At minimum, the Environmental Justice Special Conditions should be amended to require that PVSC install a 23 MW-or-larger battery storage system and 10 MW of solar, which should be called upon first in the event of an outage. Additionally, PVSC should not transition to combustion of green hydrogen or other alternative fuels as a means of addressing environmental justice concerns.

Respectfully submitted,



Abbe Ramanan
Project Director
Clean Energy Group

¹⁸ Celtek, Mehmet Salih, and Ali Pınarbaşı. "Investigations on Performance and Emission Characteristics of an Industrial Low Swirl Burner While Burning Natural Gas, Methane, Hydrogen-Enriched Natural Gas and Hydrogen as Fuels." *International Journal of Hydrogen Energy* 43, no. 2. January 11, 2011. <https://doi.org/10.1016/j.ijhydene.2017.05.107>.

¹⁹ Kawasaki Heavy Industries, Ltd. "World's First Successful Technology Verification of 100% Hydrogen-Fueled Gas Turbine Operation with Dry Low NOx Combustion Technology Improving Power Generation Performances to Realize a Hydrogen Society," July 21, 2020. https://global.kawasaki.com/news_200721-1e.pdf.