

David Bomse

I request that the New Mexico Environment Department reject air quality permit application 10883 from Yucca Growth Infrastructure, LLC to construct a methane-fueled power plant near Santa Teresa, New Mexico in southern Doña Ana County. The application skirts important issues described below including methane emissions, ozone concentration increases, and uncertainties in Bloom Energy fuel cell performance.

In addition, people acting on behalf of Project Jupiter have submitting fraudulent comments supporting YGI's application. Those illegal acts cast doubt on any inferences drawn from the online comments and, therefore, now require open public hearings on YGI's application.

Here are details about three major concerns.

1. Methane, the major component of natural gas, is a greenhouse gas with 28 times the global warming potential of carbon dioxide. Straightforward calculations based on YGI's stated carbon dioxide emissions of 10.1 million tons per year and the 1:1 stoichiometry of methane fuel cell oxidation, show that YGI's power plant will consume 200 lbs of methane per second all day every day. Yet, YGI's application states zero methane emissions. No methane will leak from pipes, fittings, compressors, and valves, and no unreacted methane will exit the fuel cells. That is beyond belief and is no minor omission. If only 1% of the methane escapes – a reasonable estimate – then carbon dioxide equivalent emissions will increase by 28% to 13 million ton-equivalents per year. As described in the application, YGI's global warming impact will exceed that from Albuquerque, Santa Fe, and Las Cruces combined. Methane emissions will further increase the global warming impact.

2. Ozone forms in the atmosphere when NO_x reacts with volatile organic compounds (VOC) in the presence of sunlight. Ozone is a corrosive pollutant that irritates the lungs, constricts breathing, exacerbates asthma, and can cause a variety of serious respiratory and cardiovascular illnesses, even premature death. Consequently, EPA has established a national ambient air quality standard (NAAQS) for eight-hour ozone of 70 parts per billion (ppb). EPA has designated both Sunland Park and El Paso, Texas as nonattainment areas for the 2015 NAAQS for ozone, and monitors in both cities continue to report violations of the NAAQS. Although the Bloom Energy's fuel cells emit less NO_x than the turbines originally proposed by Acoma, ozone pollution will continue to exceed NAAQS limits under YGI's new plan. The 37.20 tons of NO_x that will be emitted will add to the existing excess ozone.

Heat from the power plant will raise ozone concentrations by 1.1 to 1.7 ppb for every 1°C increase in temperature. Temperature changes well above 2 °C are feasible based on temperature measurements downwind of datacenters in Phoenix and on modeling of a proposed Utah datacenter. These expected elevated ozone levels will cause real harm to individuals living in the entire region. According to analysis by researchers at New York University and the American Thoracic Society, elevated ozone levels in the El Paso-Las Cruces area cause, on an annual basis, about 22 premature deaths, 110 emergency room visits, and over 224,000 missed work or school days.

3. Fuel cell reliability. YGI's application is incomplete because it does not include sufficient and reliable information about Bloom Energy's methane fuel cells. Emission predictions are based on

tests of only a small number of new fuel cells. As noted above, testing did not address possible methane emissions due to incomplete oxidation under normal operating conditions, start up, or upsets. None of the tests performed could detect formaldehyde, a toxic and carcinogenic vapor, that is an intermediate in methane oxidation. YGI plans to replace fuel cells every five years; no information is given regarding changes in performance such as increased emissions that may occur during the five-year-long operating lifetime.

Bloom Energy's largest installation is a 40 MW power plant in South Korea that began operation six months ago. The plant is 60 times smaller than YGI's proposal yet represents the best available real-world comparison to YGI's application. But no information is available about the South Korean facility's emissions including emissions during startup and operational upsets. The fuel cells are ceramic and operate at around 800 °C (1475 °F). Ceramics similar to those that form the fuel cells crack or shatter upon sudden cooling as could occur during an unplanned shutdown and may have occurred during the initial six months of operation in Korea. YGI's application is incomplete without details about the South Korean installation.

Additional issues exist. These include the vast amount of heat that will be dumped onto an already parched and hot part of New Mexico; YGI's failure to include required plans for mitigating greenhouse gas emissions; the lack of required continuous emissions monitoring equipment; and, actions required by the La Paz agreement between the US and Mexico. For all of these reasons, I urge NMED to reject YGI's application and to hold public meetings to address the shortcomings of the application.

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