RESURETY

June 9, 2026

To: Bloom Energy
From: Resurety

Re: Bloom Fuel Cells at Project Jupiter in New Mexico

Project Jupiter is planning to deploy Bloom fuel cells to power a 2.45 GW datacenter campus behind-the-meter (BTM) as a Tier 3 or Tier 4 microgrid.

We analyzed:

1. The size of renewables plus battery energy storage systems (BESS) that would be required to power Project Jupiter BTM
2. The difference in emissions from powering Project Jupiter with Bloom vs the grid

Our results show that BTM renewables plus BESS is not a feasible alternative to Bloom due to the extreme overbuild (5.6x solar, 16.1x BESS) required to maintain even Tier 3 microgrid uptime (99.982%) with redundancy. BTM renewables would require 59,000 acres, equivalent to the size of Seattle or Sacramento and more land than the entire New Mexico Solar Energy Zone. The BESS required is double the total capacity of new BESS installed in 2025 in all of the US. Even when considering partial load coverage of 20%, the solar installation would require 12,000 acres, equivalent to 40% of the New Mexico Solar Energy Zone or 13 NMSU campuses.

Our results also show that the emissions from using Bloom BTM are nearly identical to those that would be induced from powering Project Jupiter using the grid. Differences in emissions calculation methodology can vary these results, as discussed below.

Feasibility of a Renewables plus BESS Microgrid

Using our forecasts of renewables generation near the Project Jupiter location of Santa Theresa, NM, we calculated the nameplate capacity of solar and BESS needed to support 2.45 GW of flat load.

We focused our analysis on solar and BESS because Project Jupiter is limited in the renewable technologies available for BTM generation. Wind speeds are low in this portion of the state (2-3 times less than Central or Eastern NM), so wind power would be ineffective at Project Jupiter's large scale. Geothermal has good resource potential (i.e., high sub-surface temperatures) and has gained traction as a nascent firm technology, but is still in first-of-a-kind development and will take years to mature so will not fit the Project Jupiter timeline.

We modeled hourly solar generation capacity using historic irradiance data in the region applied to an input nameplate capacity, producing hourly generation. Excess solar energy generated during the day is stored in BESS, which is dispatched to provide firm power BTM when solar is no longer generating.

We optimized the solar and BESS nameplate capacity to find the minimal combination needed to support a Tier 3 microgrid.

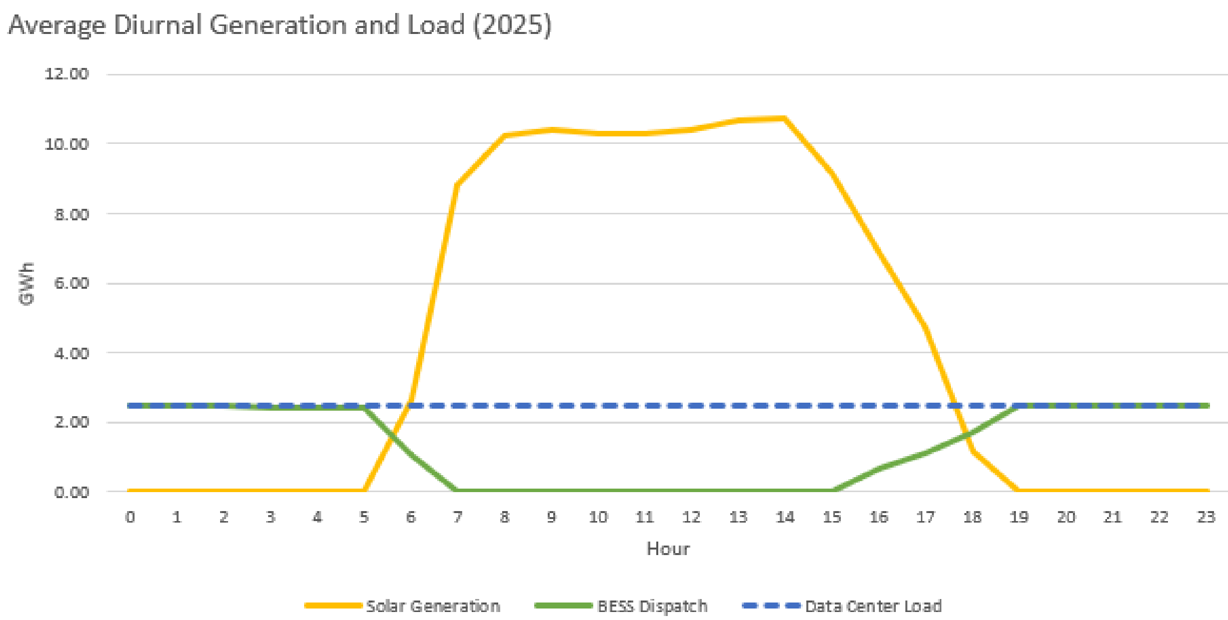
Although solar consistently generates during the day, nighttime, overcast days, and seasonal drops in irradiance cause low generation periods. BESS is required to carry the system through prolonged periods of insufficient generation (e.g., 2-3 overcast days in a row), and solar overbuild is required to charge the BESS while also powering the site.

We found that 12 GW of solar (4.9x overbuild vs the 2.45 GW load) is required with 33 GW of 4-hour BESS (13.6x overbuild, 133 GWh). This system would have a footprint of 59,000 acres, twice the acreage of the existing Afton Solar Energy Zone, and require twice the total new BESS capacity installed in the US in 2025. Including redundancy to account for typical solar and BESS degradation and failure rates further increases overbuild to 5.6x and 16.1x respectively.

Attempting to achieve a Tier 4 microgrid at this scale with renewables and storage would be even less practical.

An alternative approach could use solar and BESS to cover the large majority of datacenter load (95%), alongside backup gas/diesel power for the remaining ~5% and redundancy. This approach would still require 8.9 GW solar (3.6x overbuild) and 10.4 GW of 4-hour BESS (4.2x overbuild). Further reductions of renewables coverage supported by gas/diesel backup are possible, but come at the cost of increasing emissions.

Using renewables to cover a portion of the datacenter load at Tier 3 reliability would still require the same ratio of overbuild. For example, solar plus storage covering 20% of the load would require 2.4 GW of solar and 6.6 GW of 4-hour BESS. This installation would require a 12,000 acre footprint and the BESS built would be equivalent to 46% of new BESS capacity added in the US in 2025.



Annual diurnal generation showing the solar overbuild required to support a Tier 3 microgrid

Bloom Emissions vs Grid

New Mexico is physically separated from the geographically proximate ERCOT and SPP markets (except through limited DC ties), operating in an area controlled by the Western Electricity Coordinating Council (WECC). Southern WECC has seen some of the highest growth rates of solar and storage, due in part to strong solar resources and in part due to state-level mandates.

Marginal emissions rates, used for consequential emissions analysis, quantify the emissions induced or avoided by a project and are composed of two parts: operating and build emissions rates.

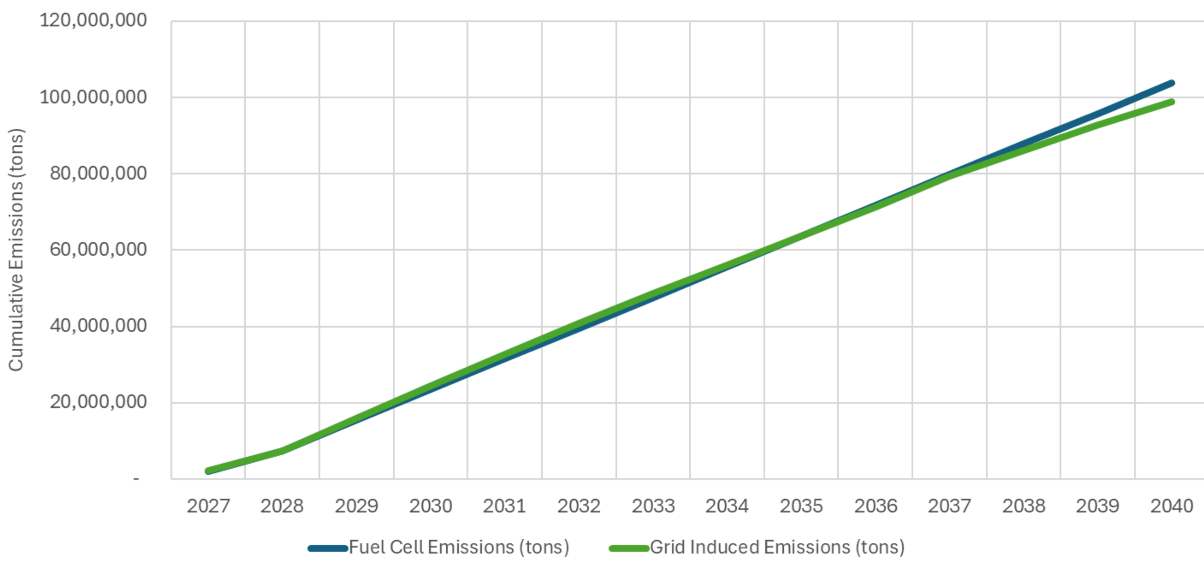
Operating marginal emissions rates calculate how a given project will influence the real-time dispatch of generators in future hours. Operating emissions rates are only available in organized, competitive markets, where generator merit order can be established through price and data transparency. We forecast marginal operating emissions rates for SP15 (southern California) as a proxy for southwest New Mexico using our production cost model from 2027-2040. These forecasted operating emissions rates for SP15 are close to the direct emissions rates for Bloom fuel cells, but may be conservative (i.e., lower than in New Mexico) due to higher renewable penetration.

Build marginal emissions rates calculate how a given project will impact which resources get built in the future. For this data, we sourced 2025 historical build marginal emissions rates for New Mexico's PNM region from Climate TRACE. Due to record-leading solar and storage buildout, the build margin emissions rates for New Mexico are extremely low, about half of Bloom's direct emissions rates.

Our standard analysis process uses operating marginal emissions only, as build margin emissions data has historically been limited and of uncertain quality. This results in very similar cumulative emissions between Bloom and the grid (104M MT CO2e direct emissions vs 99M MT CO2e grid emissions).

Alternative approaches to this analysis might include:

- Using a 50/50 weighting of build margin to operating margin emissions rates, as has been proposed for consequential reporting by the Greenhouse Gas Protocol (GHGP). This would result in grid-induced emissions 32% lower than Bloom's direct emissions from fuel cells, because build margin emissions rates are so low in New Mexico.
- Using SPP South as a proxy for forecasted operating marginal emissions rates, rather than SP15. We discourage this approach, given that SPP is physically on a different grid (Eastern Interconnect) than the Project Jupiter location (Doña Ana County, in the Western Interconnect) with extremely limited transmission between the two grid regions. However, parts of SPP extend into New Mexico, so it is physically proximate and a relevant point of comparison. Using SPP South for operating margin emissions rates results in grid induced emissions 36% higher than Bloom.



Cumulative emissions from powering Project Jupiter with Bloom and the grid