

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**



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Order Instituting Rulemaking Regarding
Microgrids Pursuant to Senate Bill 1339.

Rulemaking 19-09-009
(Filed September 12, 2019)

**COMMENTS OF BLOOM ENERGY CORPORATION
ON THE ORDER INSTITUTING RULEMAKING REGARDING MICROGRIDS
PURSUANT TO SENATE BILL 1339**

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Pursuant to Section 14.3 of the California Public Utilities Commission (“Commission”) Rules of Practice and Procedure, Bloom Energy Corporation (“Bloom”) respectfully submits these opening comments on the Order Instituting Rulemaking Regarding Microgrids Pursuant to Senate Bill 1339.

I. Introduction

Bloom appreciates the Commission’s leadership in launching this proceeding. Microgrids are a clean, resilient, cost-effective solution that will enable California’s communities, critical facilities, vulnerable populations, and businesses to ride through power outages caused by Public Safety Power Shutoffs (PSPS), extreme heat, flooding, droughts, other climate related disasters, and everyday outages due to aging infrastructure and operations. Microgrid, depending on the jurisdiction, agency, developer or other factors, can refer to or mean different things. It can include multiple customers or just one. It can include one or more buildings, on one or more streets, at one or more addresses. It can mean multiple technologies or just one. In any case, microgrid configurations are a natural progression of the 21st century energy market. They allow for more flexibility, reliability, and advances in technology. California’s microgrid policy should reflect the nimbleness of microgrid configurations.

To fully realize the benefits of microgrids, Bloom respectfully makes the following points with respect to the OIR:

- Expedite the proceeding by prioritizing the topics into separate tracks: In recognition of the immense public health and safety risks from PSPS, wildfires and other outages, this proceeding should be split into two, concurrent tracks. In this first track, the CPUC should create a tariff for behind-the-meter, customer-owned microgrids that include technologies that already meet Rule 21 interconnection requirements, like solar, battery storage, and fuel cells. The tariff should include the rules, charges, and requirements for interconnection, including timelines the utilities must meet. This track should be completed by March 30, 2020. Customers and technology providers will need the second quarter of 2020 to design, install, and commission these projects before the next fire season commences. Simultaneously, the Commission can initiate a second track to address the other, more complicated issues: DC standards, community-level microgrids, formation of working groups, interaction with the wholesale market, etc.
- Encourage all forms of microgrid ownership: public, private, utility, tribal, and community. All entities should have the option to invest in microgrids and resilient technologies to protect themselves from natural disasters and grid outages.
- Maintain technology neutrality: Given the enormity of the challenge and immense benefits these projects can provide, this proceeding and all resulting standards, rules, tariffs, and policies should be designed such that all technologies that meet the operational, safety, and environmental standards specified in SB 1339 have an equal opportunity to participate. The scale of the problem is too great to unnecessarily constrain the solution set.

The proceeding comments will provide context on the current situation and expand upon these points.

II. The Problems this Rulemaking Can Solve

a. Increasing loads + more frequent outages

After decades of flat load profiles, the California Energy Commission (CEC) is forecasting that electricity demand in California will climb rapidly.¹ Driven by an EV charging, building electrification, and increased demand for heating and cooling during more extreme temperatures caused by climate change, this increased electricity consumption must be properly managed to meet—and not jeopardize—the state’s goals to ensure reliability, affordability, and GHG reductions in the electricity sector.²

This reliance on electricity, however, increases the state’s vulnerability to climate caused events. Californians have been warned to prepare for PSPS events that will last for longer than 48 hours³; extreme heat causes rolling blackouts⁴; wildfires and severe flooding threaten electricity infrastructure. In the immediate wake of the October 9-12 PSPS event—where an estimated 2.25 million customers were de-energized across California⁵—many nightmare scenarios are becoming reality:

¹ CED 2019 Preliminary Forecast; Summary of Statewide Results accessed from: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=229424&DocumentContentId=60830>.

² Ibid, p.11.

³ PG&E Outage Notifications: https://www.pge.com/en_US/residential/outages/alerts/alerts.page.

⁴ Samenow, *Record heat put thousands of Californians in the dark Friday. Scientist predict this from climate change*, Washington Post (July 9, 2018): <https://www.washingtonpost.com/news/capital-weather-gang/wp/2018/07/09/record-heat-put-thousands-of-californians-in-the-dark-friday-scientists-predicted-this-from-climate-change/>.

⁵ Adler, *Interview: Stanford Professor Says California Blackouts Not A ‘False Choice,’* Capital Public Radio (Oct. 10, 2019): <http://www.capradio.org/articles/2019/10/10/stanford-professor-california-blackouts-not-a-false-choice/>.

- California’s medical baseline customers lost power to respirators, dialysis machines, and other life-saving equipment—prompting the County of Santa Clara to declare a state of emergency and deploy emergency personnel to locate and assist these vulnerable Californians;⁶
- Key infrastructure was on the verge of being shuttered: The Caldecott Tunnel on SR 24 and the Tom Lantos Tunnel on SR 1 were hours from being closed—eliminating key transportation and escape routes in the case of wildfires, earthquakes, or other emergencies.⁷
- 461 K-12 schools closed across the state for the nearly 250,000 students they serve.⁸ These closures likely depriving many lower-income students of access to nutrition they receive at schools and forcing caretakers to bring their children to work, stay home, or arrange childcare.
- The City of Morganhill declared a curfew in order to reduce crime and/or potential looting as a result of the extended power outage.⁹
- The Stanford Woods Institute estimates this outage will cost California’s residents, workers, and businesses \$2.5 billion dollars—due to lost wages, spoiled inventory,

⁶ KRON4 Staff, *Santa Clara County declares state of emergency* (Oct. 9, 2019):

<https://www.kron4.com/news/bay-area/santa-clara-county-declares-state-of-emergency/>.

⁷ Guzman, SFGATE, *Caldecott Tunnel to stay open during PG&E power shut-off* (Oct. 9, 2019):

<https://www.sfgate.com/bayarea/article/Caldecott-Tom-Lantos-tunnel-to-close-PGE-shutoff-14502496.php>.

⁸ Cano, Cal Matters, *This week’s wildfires and blackouts have now kept nearly a quarter-million CA kids out of school* (Oct. 8, 2019): <https://calmatters.org/education/k-12-education/2019/10/pge-power-outage-blackout-schools-closed-100000-kids-home-from-school/>.

⁹ Kingston, KRON4, PG&E Shutoffs, *Morgan Hill to enforce a curfew Wednesday night* (Oct. 9, 2019):

<https://www.kron4.com/powershutoffs/authorities-enforce-curfew-in-morgan-hill-to-mitigate-potential-crimes/>.

cancelled contracts, and other material harms.¹⁰

- Cell phone services was spotty as telecommunication towers lost power; traffic snarled as signals went dark.¹¹

Thankfully, these impacts were not worse. But, as California discovered during the most recent PSPS episode, the prospect of even more pronounced disruptions and loss of life are very real and have largely been unanticipated. The potential future impacts of blunt PSPS events may include:

- Water agencies that lose power may be unable to pump water for drinking, bathing, and/or fighting fires;
- 911 center and emergency response organizations may be grounded;
- EV vehicles, light rails, buses, forklifts, and other electrified forms of transport may be stranded.

b. Current back-up options: dirty diesel generators

Unfortunately, Californians currently have scant options other than relying on dirty diesel generators during these prolonged outages. This reliance makes a bad situation worse:

According to the California Air Resources Board, operating an uncontrolled one-megawatt diesel engine for only 250 hours per year results in a 50 percent increase in cancer risk to residents within one city block.¹² Demand for backup generators has spiked 1,400% since the policy to

¹⁰ Moench, S.F. Chronical, 'A cool billion': Economists estimate PG&E outages could have big impact (Oct. 9, 2019): <https://www.sfchronicle.com/business/article/A-cool-billion-Economists-estimate-PG-E-14505047.php>.

¹¹ Callahan, Rossmann, and Schmitt; The Press Democrat, *Winds pick up as PG&E shutoff enters second day* (Oct. 9, 2019): <https://www.pressdemocrat.com/news/10153265-181/pge-outage-limits-cell-service?sba=AAS&artslide=7>.

¹² Santa Barbara County Air Pollution Control District: <https://www.ourair.org/do-you-really-need-a-diesel-generator/>.

rely on PSPS went into effect.¹³ The City of Lathrop (population 22,000) is preparing for 5 day PSPS events and expects to burn 10,000 gallons of diesel/day to power the city’s critical facilities during these outages. In the Bay Area Air Quality Management District, there are 7,600 permitted, stationary diesel generators.¹⁴ Based upon the EPA’s potential to emit calculator,¹⁵ if these diesel generators were fired up to ride through a 48 PSPS event, they could release the equivalent amount of CO₂ as burning over 2,000 tons of coal and tens-of-thousands of pounds of toxic air pollutants—enough to increase the risk of asthma and cancer.

Residential diesel generator use—which does not require a permit—has exploded during these PSPS events: Home Depot shelves were empty during the most recent episode.¹⁶ Many Californians are dusting off and deploying generators that are multiple-decades old—in one case, leading a homeowner to accidentally light their house on fire.¹⁷ This new reliance on diesel generators is causing concern amongst air quality management districts and other state agencies about “spewing carcinogens right where we breathe.”¹⁸

¹³ Shao, S.F. Chronicle, *Demand for generators lights up as PG&E power shutoffs loom* (June 27, 2019): <https://www.sfchronicle.com/business/article/Demand-for-generators-lights-up-as-PG-E-power-14054242.php>.

¹⁴ BAAQMD Technology Assessment, *Status of Zero-Emissions Technology (as of 2018)*: <http://dieselfree33.baaqmd.gov/tech-assessment>.

¹⁵ Potential to Emit Calculator for Boilers and Emergency Engines (Excel): https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=2ahUKewjg-umFvpTIAhWB4J4KHa70BwUQFjAAegQIAhAC&url=https%3A%2F%2Fwww.epa.gov%2Fsites%2Fproduction%2Ffiles%2F2016-09%2Fboilers_and_emergency_engines_pte_calculator_version_1.0.xlsx&usg=AOvVaw2Wm8MSUb_nA3mrisCKL_gVs.

¹⁶ ABC7 Melissa Pixcar (Oct. 17, 2019): <https://twitter.com/melissaabc7?lang=en>.

¹⁷ Habegger, ABC 10, *‘I’m just grateful that I didn’t cause a wildfire’ | Generator causes fire during PG&E power shutoff* (Sept. 26, 2019): <https://www.abc10.com/article/news/local/wildfire/generator-causes-fire-during-pge-power-outage/103-ce5ce56e-e5d1-4032-8f98-1a00515f2049>.

¹⁸ Flesher, Associated Press, *California Power Shutdowns Raise Air Pollution Worries* (Oct. 12, 2019): <https://www.apnews.com/1e3a4ce2027648a7aef417444fba29e5>.

c. Microgrids: A Promising Solution

Californians should not have to choose between being blacked out for multiple days and dirty diesel generators. Microgrids—as defined by SB 1339—are a critical solution to these challenges that give Californians a key tool to protect themselves. As the CPUC and CEC reports cited in the preliminary scoping memo make clear, the main hurdles to deploying microgrids in California are regulatory in nature: a lack of rules, unclear standards, and no required timelines to interconnect microgrids are key pinch points. Fortunately, they are all problems this proceeding can resolve.

III. Prioritize the Proceeding Into Separate Tracks

The preliminary scoping memo seeks to resolve the relevant issues within 24 months from the date this OIR is adopted. Bloom appreciates the complexity of the issues before the Commission with respect to microgrids. However, three fire seasons (2019, 2020, and 2021)—including multiple potential PSPS events with millions of customers losing power for 3+ days—will pass under the proposed 24-month time frame. California’s emergency centers, public safety providers, clean water agencies, hospitals, residents, and businesses need the tools that this proceeding can provide as soon as possible.

As such, Bloom respectfully encourages the Commission to move the proceeding forward expeditiously to ensure California’s communities, customers, and businesses have access to a standardized microgrid tariff and accompanying rules before the next fire season. Given the catastrophic impacts of wildfires and the enormous benefits microgrid solutions can provide to obviating them, there is no time to delay. Specifically, Bloom suggests a tracked approach:

- Track 1: The first track should result in a standardized tariff—rules, charges, and interconnection standards—that allows all customer-owned, behind-the-meter projects that deploy technologies already approved under Rule 21 and are able to

interconnect via existing tariffs to be operate in a resilient grid-islanding fashion, either alone or combined with other technologies. Indeed, it is currently possible to interconnect and operate solar, solar+storage, wind, and fuel cells individually on clear, specified timelines. Current attempts to pair these technologies into a microgrid, or operate in a grid-islanding fashion, however, often languish for months, years, or indefinitely. This problem is quickly solvable with a standardized tariff for resilient projects; it should be completed by March 30, 2020. Customers and microgrid providers will need the second quarter of 2020 to design, install, and commission projects before the fire season commences. This timeline will ensure that Californians have a tool to protect themselves, their families, their homes, and their businesses before it does.

- Track 2: Simultaneously, the Commission can initiate a second track to address the other, more complicated issues: DC standards, community-level microgrids using distribution lines, formation of working groups, interaction with the wholesale market, etc. These can be resolved in parallel with the first track by the statutory deadline of December 1, 2020.

The Commission has established precedent to split proceedings into concurrent tracks in order to prioritize critical issues. For example, in R.18-12-005, the “Order Instituting Rulemaking to Examine Electric Utility De-Energization of Power Lines in Dangerous Conditions,” the “assigned Commissioner divided the proceeding into two Phases. In Phase 1, the Commission examined and adopted Public Safety Power Shutoffs (PSPS) guidelines . . . in advance of the 2019 wildfire season.” This Phase ran concurrently to address important—but less urgent—matters related to PSPS before the commission. Given the dire public safety

implications and the promising solution set microgrids provide, Bloom respectfully encourages the Commission to replicate this approach.

IV. Ownership structures

The policies resulting from this proceeding should be available to all types of microgrid owners and operators; the tariff, rules, and resulting standards should be ownership-neutral. This principal will encourage increased investment from multiple parties—private developers, IOUs, POU, CCAs, local governments, businesses—for maximum deployment and resiliency impact.

V. Technology Neutral

Fundamentally, microgrids provide localized power when the macro-grid is insufficient. In many situations—for public safety, critical facilities, and disaster preparedness—microgrids will need to operate continuously without interruption for days or possibly longer. Given the enormity of the challenge and immense benefit and diversity of solutions microgrids can provide, this proceeding and all resulting standards, rules, tariffs, and policies should be designed such that all technologies that meet the operational, safety, and environmental standards specified in SB 1339 have an equal opportunity to participate.

As the enabling statute makes clear, microgrids are flexible configurations that can—and should—be customized for individualized customer load profiles, geographic areas, and use cases in order to provide their full suite of benefits. In some cases, a microgrid configuration will require combining multiple technologies to achieve the intended goals of SB 1339: For example, a medical campus in the central valley that has multiple critical loads, thermal needs, and spiky load patterns due to needing to balance seasonal heating and cooling demands and variable operating hours. In other cases, a single technology will be sufficient: For example, a data center located in Silicon Valley may have a relatively constant load profile, no seasonal heating needs, and 24-7-365 operating hours. Both customers need the resiliency and reliability

benefits clean microgrids projects can provide, but they also absolutely require the ability to customize their configurations to reach this goal. This principal should be a bedrock throughout the proceeding.

In this vein, fuel cell systems are uniquely designed to address certain use cases to provide enhanced resiliency. A fuel cell installation innately operates as an energy management system, with critical loads for backup power already identified and immediately followed in the case of an outage. A fuel cell system can smoothly transition from the grid to fully power the load during a grid outage and to seamlessly re-connect to the grid when its power is restored.

In addition to these benefits, this innovative, non-combustion technology—which produces virtually no criteria air pollutants—addresses multiple resiliency needs:

- Reliable power in the event of a grid outage or de-energization event;
- Baseload power in communities with constrained transmission, including disadvantaged communities or rural locations;
- Long-duration (longer than 24 hours) generation for emergency service centers, telecommunications and critical services such as hospitals, gas stations, and grocery stores. Indeed, the City of Hartford installed a fuel cell-powered microgrid to provide continuous power to these facilities that are co-located on the same block¹⁹;
- By natively producing DC power, fuel cells are able to efficiently charge electric vehicles, buses, and other DC loads during a grid outage and do so while minimizing the efficiency losses that occur when converting to AC power;

¹⁹ Wood, Microgrid Knowledge, *Connecticut's Latest Microgrid and Fuel Cell Project Goes Live in Hartford* (Apr. 25, 2017): <https://microgridknowledge.com/microgrid-and-fuel-cell-hartford/>.

- Underground fuel lines eliminate the vulnerability to weather and risk of sparks from traditional poles and wires infrastructure;
- Modular design allows the system to continue operating even while individual components are being repaired or replaced;
- Time to build, uptime, and recovery time are often faster than the electric utility grid network can achieve;
- Leading power density: Fuel cells produce the largest quantity of clean, near-zero criteria air pollutant, electricity in proportion to their equipment footprint compared to any technology currently on the market.

Fuel cells can serve as the backbone for projects that integrate numerous distributed energy resources (solar, batteries, etc.) and controls. Microgrids that use fuel cell systems as baseload power are able to immediately disconnect from the grid and island (operate autonomously) from the larger grid when circumstances demand (e.g., grid outage).

Additionally, fuel cell systems—both alone and when paired with other technologies—support the utility grid network and can also provide ancillary services such as peak demand reduction, power quality, frequency and voltage support, capacity and spinning reserve, and avoidance of expensive transmission and distribution upgrades.

As a manufacturer, installer, and operator of resilient technology solutions—including microgrids—Bloom has extensive experience designing these systems to ride through multiple natural and human-caused disasters: supplying critical load power by islanding the customer, to a healthcare facility during triple-digit temperature heat waves that triggered outages for 57,000 customers in Southern California in 2018. Additionally, Bloom fuel cells withstood the Sonoma fires in 2018, the recent 7.1 magnitude Ridgecrest earthquake, and even when a bulldozer was

accidentally dropped upon them at a customer site in 2016. These systems were installed and interconnected, however, in spite of enormous policy challenges—rather than facilitated by market rules to encourage these benefits. Indeed, many of these projects were forced to wait for 2+ years in order to be interconnected, often languishing in opaque approval processes with no clear deadline by which they must be commissioned to allow a customer to operate them. In other instances, Bloom has been required to remove microgrid configurations and renegotiate contracts due to a lack of approval or excessive interconnection delays.

To resolve these hurdles and unleash the benefits of these resilient projects, it is critical that the policies, tariffs, standards, and rules resulting from this proceeding are designed to be technology neutral so that customers are able to configure projects for their unique needs. The scale of the problem is too great to unnecessarily constrain the solution set.

VI. Conclusion

Bloom appreciates the Commission’s consideration of these recommendations and looks forward to sharing our expertise and experience to benefit this rulemaking.

DATED: October 21, 2019

Respectfully submitted,

By: _____/s/_____

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