BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Continue Implementation and Administration, and Consider Further Development, of California Renewables Portfolio Standard Program.	Rulemaking 18-07-003 (Filed July 12, 2018)

COMMENTS OF BLOOM ENERGY, INC. ON THE ISSUES STIPULATED IN THE BIOENERGY MARKET ADJUSTING TARIFF (BIOMAT) PROGRAM REVIEW AND STAFF PROPOSAL

Erin Grizard
Senior Director
Regulatory and Government Affairs
Bloom Energy Corporation
1299 Orleans Drive
Sunnyvale, CA 94089
Phone: (408) 543-1073
Fax: (408) 543-1501
Email: erin.grizard@bloomenergy.com

December 7, 2018

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Pursuant to Rule 14.3 of the Commission's Rules of Practice and Procedure, Bloom Energy, Inc. (Bloom) respectfully submits these Comments on the Issues Stipulated in Bioenergy Market Adjusting Tariff (BioMAT) Program Review and Staff Proposal.

I. Introduction

Bloom Energy (Bloom) appreciates the opportunity to provide these comments on the Bioenergy Market Adjusting Tariff (BioMAT) Program Review and Staff Proposal. Bloom is a provider of an all-electric solid oxide fuel cell technology that produces reliable power using a highly resilient and environmentally superior non-combustion process. Bloom recently unveiled a technological breakthrough wherein a standard Bloom Energy Server is integrated with a new biogas clean-up module to generate clean electricity from methane emitted by landfill, agricultural, waste water treatment, and municipal solid waste facilities. The clean-up module enables Bloom's fuel cells to produce electricity at world class efficiency and reliability while dramatically reducing methane emissions in the process. Bloom estimates that for every megawatt of electricity generated by a Bloom fuel cell from waste biogas, 7.7 million pounds of CO_2 emissions, 10,500 pounds of NOx, and 4,500 pounds of SO_2 emissions could be avoided annually.[1] Based upon the California Energy Commission's estimates of the total economically feasible renewable gas potential in the state, Bloom fuel cells could generate 1.26 GW of

[1] Bloom Energy, Inc. Technical Highlights: https://bloomenergy.com/datasheets/energy-server-es5-300kw.

electricity—with a zero carbon footprint and a substantial reduction of harmful emissions.[2] The BioMAT program is a keystone to providing the market structure and price signals necessary to realize these benefits.

II. Summary of Comments

With world leading efficiency and virtually no criteria air pollutants, Bloom fuel cells can help the state reach the ambitious renewable power generation goals of SB 100; the methane reduction goals of SB 1383; and the criteria air pollutant emission reduction goals of AB 617. The BioMAT program is essential to provide the stable price signals and market structure to ensure that California can reach these goals. As such, Bloom suggests the following policies to increase participation and enhance BioMAT's impact:

<u>Pricing</u>

- Developing a BioMAT-eligible project is logistically and financially complicated: Doing so often involves conducting feasibility studies, cleaning contaminants from the biogas, securing interconnection agreements, obtaining financing, and installing infrastructure. Consequently, because of the long project development timeline, pricing predictability is paramount; potential BioMAT participants need pricing certainty in order to invest the time and resources necessary to be successful.
- As such, Bloom supports the proposed pricing mechanism adjustments in the staff proposal but suggests altering the pricing increments to $2/MWh to avoid volatility.
- To reward additional air quality and health benefits, Bloom suggests an additional incentive for criteria air pollutant reductions—with an additional adder for those projects that reduce these harmful emissions in state-designated disadvantaged communities—and recommends two potential methodologies to incorporate those benefits into the tariff structure:
    - The EPA's Clean Power Plan Regulatory Impact Analysis estimates the negative impacts of exposure to criteria air pollution—including increased incidence of asthma, lost work days, and hospital emissions—to calculate the monetary benefits of reducing these pollutants on a per ton basis.[3]

[2] 2017 Integrated Energy Policy Report, p.254.

[3] U.S. EPA – Regulatory Impact Analysis for the Clan Power Plan Final Rule: https://www3.epa.gov/ttnecas1/docs/ria/utilities_ria_final-clean-power-plan-existing-units_2015-08.pdf.

- Additionally, the Institute for Policy Integrity has developed a step-by-step guide to quantify these impacts and benchmark them against the per ton quantity of criteria air pollutants a distributed energy resource displaces.[4]

Incremental Generation

- Incremental generators may have lower costs (sunk capital expenditures, pre-existing interconnection agreements, established gas upgrade infrastructure), and consequently may be able to submit lower bids into BioMAT—thus driving down the tariff price and potentially making it uneconomical for new entrants into the market. This very real potential could diminish program participation from the most efficient, newest generation technologies.
- To avoid this outcome, the Commission should put two safeguards in place:
  - Establish a separate program allocation cap for incremental generation: For example, only 15% for each of the 3 categories should be allotted for incremental generation.
  - Ensure the pricing impacts of incremental generation are considered separately from greenfield developers, either by employing a separate queue or another mechanism that will not influence the prices of non-incremental generators.

Program Extension

- Bloom strongly supports extending the BioMAT program to 2026:
  - BioMAT is consistent with multiple state goals: SB 100, AB 617, and SB 1383.
  - To realize these goals, this extension allows these proposed changes to BioMAT sufficient time to take effect.

Increase the Generation Limit

- Bloom strongly supports the staff proposal to eliminate the current 3 MW generation cap while maintaining the 5 MW nameplate capacity ceiling. Indirectly, the current generation limit penalizes more efficient generators with higher capacity factors: Bloom

[4] Valuing Pollution Reductions – How to Monetize Greenhouse Gas and Local Air Pollutant Reductions from Distributed Energy, March 23, 2018: https://policyintegrity.org/publications/detail/valuing-pollution-reductions.

has identified multiple scenarios where deploying a highly efficient fuel cell would push a potential BioMAT project over the 3 MW cap.

GHG Reduction Methodology

- BioMAT results in methane being destroyed and converted into a beneficial end-product: RPS eligible electricity.
- Additionally, the program is already consistent with ARB's Short-Lived Climate Pollutant Reduction Strategy, which seeks to minimize the climate impacts of methane. As a GHG, methane is 56 times more potent over a 20 year time period than CO_2.[5]
- As such, Bloom does not believe an additional GHG reduction eligibility criteria makes sense for BioMAT.

III. Detailed Responses

Please find Bloom Energy's detailed responses to the questions posed in the BioMAT staff review below. Bloom has responded to those questions we have input and experience to share and omits those where we do not have comment at this time.

1. Do you support the proposal to reduce the market depth requirement from five to three for unaffiliated applicants? Why or why not?

Bloom agrees with this proposed change and concurs with the staff's rationale: As the program data demonstrate, the current unaffiliated threshold may be too high to trigger price changes. Given that the goal of this program design is "to arrive at PPA prices that encourage project development at the lowest cost to ratepayers," Bloom supports lowering this trigger.[6]

2. Do you support proposal 2 to revise when the BioMAT offer price moves up, moves down, and stays the same? Why or why not?

Bloom supports the proposed mechanism to adjust the BioMAT offer price. This revised approach streamlines the pricing mechanism, consequently enhancing responsiveness, while preserving predictability.

[5] UNFCCC – Global Warming Potentials: https://unfccc.int/process/transparency-and-reporting/greenhouse-gas-data/greenhouse-gas-data-unfccc/global-warming-potentials.

[6] Bioenergy Market Adjusting Tariff (BioMAT) Program Review and Staff Proposal, p.13

3. Should the Commission transition to a fixed price feed-in-tariff instead of the price adjusting mechanism? Why or why not?

Bloom favors the certainty this approach creates, but the price should be responsive to changing market conditions, cost structures, and feedstock availability. As such, Bloom supports the proposed changes to the current pricing mechanism proposal.

4. Should the Commission transition to a renewable auction mechanism (RAM) instead of the price adjusting mechanism? Why or why not?

Bloom does not support transitioning to a RAM. Such a system creates uncertainty—adding substantial ambiguity to the already immense challenges associated with planning, financing, and executing onsite biogas development and generation. This approach also increases administrative costs that may be passed on to ratepayers, a real threat given the program's historically low participation.

5. Should the Commission consider changes to the BioMAT definition of "unaffiliated applicants" to better ensure that projects with common developers count as affiliated for the purpose of determining market depth? Why or why not? a. If so, please explain what the changes should be.

No, Bloom believes this definition strikes the correct balance between avoiding undue coordination without preventing partnerships.

6. As noted in Staff's observations on page 7, BioMAT offer prices are now sufficiently high to encourage price acceptance and project development within each category. This raises a concern that even small price adjustments in the future could lead to ratepayer overpayment for projects willing to execute contracts at lower PPA prices, and offer prices that are too low for other projects that need higher PPA prices. For example, a project developer willing to execute a contract for an additional $4/MWh would receive an $8/MWh windfall if the offer price increases by $12/MWh. Should the Commission consider changes to simplify the price adjustment mechanism and allow for more granular pricing (e.g. revise the price adjustment amount to $4 per MWh, rather than the current system of $4, $8, and $12)? Please explain.

Bloom suggests changing the price adjustments to $2 per MWh increments. Doing so creates multiple benefits: First, it provides more sensitive pricing signals; second, it obviates concerns about both overly high and low prices—resulting in windfalls and financial losses, respectively—due to potentially unnecessarily large price swings; and finally, it would dampen

the overall volatility in the market, adding much-needed certainty necessary to develop more onsite biogas projects.

7. Are there any other program *pricing* proposals that the Commission should consider? If so, explain the proposal and how it would be consistent with Public Utilities Code section 399.20.

AB 617 (2017) established ambitious goals to reduce criteria air pollutants—including NOx, SOx, and VOCs—that impair air quality and can affect human health.[7] Indeed, reducing air pollution was one of the original intents of BioMAT's enabling legislation of SB 1122: The Author's Statement makes clear that the BioMAT tariff is designed to provide "benefits to ratepayers and the environment from reducing air pollution and global warming emissions by generating electricity from small renewable biomass and biogas [emphasis added]."[8] Given this clear intent, Bloom suggests that projects that advance this goal—namely, reducing or eliminating criteria air pollutants in the course of generating BioMAT eligible electricity—should receive an additional payment.

Additionally, SB 535 identifies disadvantaged communities (DACs) in California to make targeted investments "aimed at improving public health . . . in California's most burdened communities at the same time reducing pollution that causes climate change." Bloom suggests that BioMAT projects located in DACs—as identified by the Office of Environmental Health Hazard Assessment (OEHHA)—that also reduce criteria air pollutants receive an additional payment adder. Doing so will provide an incentive to equitably maximize the benefits of the BioMAT program for all Californians.

The Commission could rely upon two rigorous, established methodologies to quantify the benefits of reducing criteria air pollutants. First, the Clean Power Plan's Regulatory Impact Analysis estimates the negative impacts of exposure to criteria air pollution—including increased incidence of asthma, lost work days, and hospital emissions—to calculate the monetary benefits

[7] California Legislative Information: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180AB617.

[8] Cal. P.U.C. Dec.14-12-081, December 18, 2014: https://www.pge.com/includes/docs/pdfs/b2b/wholesaleelectricsuppliersolicitation/BioMAT/SB1122_D-14-12-081.pdf, p.6-7.

of reducing these pollutants on a per ton basis.[9] Additionally, the Institute for Policy Integrity has developed a step-by-step guide to quantify these impacts and benchmark them against the per ton quantity of criteria air pollutants a distributed energy resource displaces.[10] Either approach is customizable, meaning that the Commission could also choose to reward projects that are located in state-designated Disadvantaged Communities, or those identified as part of AB 617's community air monitoring plan due to their elevated air pollution levels.

By whichever approach, valuing criteria air pollutant reductions in the BioMAT pricing tariff is consistent with the author's intent and will ensure the ratepayer funds maximize both environmental and human health benefits.

9. Do you support the proposal to set a 30-day deadline to execute contracts after the program participant accepts the offered price and provides all necessary information to the IOU? Why or why not?

Bloom supports the additional certainty this type of deadline would ensure in the PPA process. Bloom would support either a 30 day or 60 day deadline. Either option is an important protection against extensive delays for both BioMAT buyers and sellers. This proposal provides a commonsense safeguard to enhance process predictability.

10. Do you support the proposal to extend the current program end date for an additional five years, from February 2021 to February 2026? Why or why not?

The BioMAT program is critical to developing the state's biogas resources and achieving the goals laid out in SB 100, AB 617, and SB1383. Currently, the program is drastically undersubscribed: Only 13 percent of the cumulative capacity has been fulfilled by executed contracts.[11] Extending the BioMAT program from 2021 to 2026 is foundational to achieving the state's GHG, methane, and air criteria pollutant reduction goals.

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[9] U.S. EPA – Regulatory Impact Analysis for the Clan Power Plan Final Rule: https://www3.epa.gov/ttnecas1/docs/ria/utilities_ria_final-clean-power-plan-existing-units_2015-08.pdf

[10] Valuing Pollution Reductions: https://policyintegrity.org/publications/detail/valuing-pollution-reductions.

[11] Bioenergy Market Adjusting Tariff (BioMAT) Program Review and Staff Proposal, p.8.

11. Do you support the proposal to extend a project's Guaranteed Commercial Operation Date by 12 months if it fails to interconnect by the PPA's Guaranteed Commercial Operation Date due to delays beyond the Seller's reasonable control? Why or why not?

Bloom strongly supports extending a project's Guaranteed Commercial Operation Date by 12 months—an additional 6 months on top of the currently available extension—due to delays outside of the Seller's reasonable control. In Bloom's extensive experience shepherding nearly 200 projects in California through multiple interconnection processes, challenges are common and take reasonable time to properly address. As such, BioMAT sellers should be granted additional runway in this uncertain environment.

Program Eligibility – The following questions pertain to Staff Proposals 7-9, as well as other questions specific to program eligibility and expanding program participation.

12. Do you support the proposal to remove the three MW cap on payments via BioMAT PPAs for facilities larger than three MW? Why or why not?

    a. Do you believe that the Commission can implement this change under existing statutory authority, or would legislation be required to enable BioMAT PPAs for capacities greater than three MW?

Bloom strongly supports the staff proposal to eliminate the current 3 MW generation cap while maintaining the 5 MW nameplate capacity ceiling. Indirectly, the current generation limit penalizes more efficient generators with higher capacity factors. This proposed change would address this barrier. Bloom encourages the Commission to explore any and all avenues to implement this proposal.

13. Do you support the proposal to allow incremental generation from existing units to be eligible for the BioMAT program? Why or why not?

Bloom supports increasing participation in BioMAT. Incremental generators, however, may have an unfair advantage when compared to new entrants to the BioMAT market. For example, a pre-existing participant in BioMAT has almost certainly already invested in the interconnection infrastructure, gas upgrade, and generating equipment. As such, this incremental generator may be able to submit a lower bid to BioMAT—thus driving down the tariff price, and potentially making it uneconomical for new entrants and more efficient technologies to

participate in the market. Under this scenario, incremental generation may actually result in decreased participation in the BioMAT program.

To avoid this outcome, Bloom suggests implementing safeguards to ensure that incremental generation does not distort the BioMAT market. Potential guiderails could include:

- Establishing a separate program allocation cap for incremental generation: For example, allocating 15% of the overall cap for each of the 3 categories to incremental generation.
- Bids from incremental generators—and their impact on the pricing mechanism—should be considered separately from those submitted by new entrants into the program.

These policies are necessary to ensure a level-playing field and send the correct signals to all market participants—key criteria to increase overall participation in BioMAT.

15. Should the Commission also consider a geographic component to the requirement that facilities be "strategically located" to better ensure that BioMAT projects are optimized to meet the state's wildfire and greenhouse gas reduction goals (e.g. require Category 3 projects to be located in areas of the state most in need of hazardous fuels treatment, with the highest levels of tree mortality, or located in areas of state that do not already have other nearby facilities that could utilize the wood)? Please explain.

Please see the DAC pricing proposal detailed above in Question 7.

Other policy efforts

17. As noted in Staff's observations on pages 11-12, BioMAT is connected to the policy efforts of other State and Federal agencies. How could the Commission coordinate more closely with other agencies to streamline bioenergy development, increase consistency across related programs, and reduce costs for market participants and ratepayers? a. What actions should the Commission take to better coordinate/maximize funding from federal agencies to support BioMAT program goals?

Bloom applauds the Commission for undertaking this staff review to enhance BioMAT. This program is critical to ensuring that the state's scarce biogas resources are deployed for the highest and best environmental use, including electricity generation. Currently, both state and federal public policy is incentivizing the use of biogas almost exclusively for the transportation market, where it is combusted using less-efficient technologies that emit criteria air pollutants. As a recent report by the California Council on Science and Technology concluded: "The current value of the Federal and State incentives far exceeds the market value of the biomethane.

Financial incentives through the California Low Carbon Fuel Standard (LCFS) and the Federal Renewable Fuel Standard (RFS) programs can be a factor of up to 18 times greater than the commodity value of the biomethane itself."[12] This market distortion makes it uneconomical for biogas developers to prioritize non-transportation end uses, such as the most efficient non-combustion electricity generating fuel cells. In sum, the RFS and LCFS have skewed the renewable gas market toward pipeline injection for transportation use, leading to biogas utilization by higher emission combustion technologies that contribute to California's air quality challenges.

Bloom appreciates how the Commission is coordinating closely with other state agencies and funding streams. This engagement—especially with ARB and CEC—should continue. Opportunities to direct research and development funding, create a dedicated biogas carve out for electricity generation, and correct market distortions are essential to meeting the state's SB 100, AB 617, and SB 1383 goals and mandates.

Achieving GHG reductions

18. Achieving pollution and GHGs reductions was an original goal of BioMAT. However, whether or not individual projects reduce net lifecycle emissions depends on project-specific factors. Do you think that the Commission should establish a requirement that facilities reduce emissions as a condition for BioMAT eligibility? In your response, please explain how such a program requirement would complement or not complement the work of other state or local agencies that regulate or provide grants to BioMAT-eligible facilities.

As the Commission is well-aware, BioMAT is already only available for RPS eligible resources. Additionally, as BioMAT results in the beneficial use and destruction of methane, the program is already substantially reducing a potent short-lived climate pollutant (SLCP). Indeed, as ARB noted with the SLCP Reduction Strategy: "Their [SLCPs] relative potency, when measured in terms of how they heat the atmosphere, can be tens, hundreds, or even thousands of times greater than that of CO_2. SLCPs are harmful air pollutants and the impacts of SLCPs are especially strong over the short term. Reducing these emissions can make an immediate beneficial impact on climate change and improve public health." Fuel cells efficiently convert

[12] CCST – Biomethane in California Common Carrier Pipelines: Assessing Heating Value and Maximum Siloxane Specifications: https://ccst.us/publications/2018/2018biomethane.pdf, p.79.

this methane into RPS-eligible electricity with virtually no criteria air pollutants. Bloom does not believe additional GHG program eligibility requirements are necessary.

Other items

19. Are there additional actions the Commission should take to address program barriers and expand program participation? Please explain your proposal(s) and provide rationale.

20. Do you anticipate any challenges transitioning from the existing BioMAT program to a program that incorporates any of the changes under consideration? Explain the challenge(s) and provide a proposal to address the challenge(s).

Bloom believes that the proposals detailed above can be achieved through the process outlined in the staff proposal. These recommendations pertain to market design and policy setting to increase program participation, and will have little-to-no additional administrative burden beyond the scope of this review and subsequent proceeding.

Dated: December 7, 2018

Respectfully submitted,

By: /s/

Erin Grizard
Senior Director
Regulatory and Government Affairs
Bloom Energy Corporation
1299 Orleans Drive
Sunnyvale, CA 94089
Phone: (408) 543-1073
Fax: (408) 543-1501
Email: erin.grizard@bloomenergy.com